Environmental Assessment
For

Issuance of an Incidental Harassment Authorization
for
Cher-Ae Heights Indian Community of the Trinidad Rancheria's Trinidad Pier Reconstruction Project in Trinidad, California

August, 2011

Lead Agency: U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Office of Protected Resources

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Location: Trinidad Bay, California

Abstract: The National Marine Fisheries Service (NMFS) proposes to issue an Incidental Harassment Authorization (IHA) for takes of marine mammals in the wild, pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA, 16 U.S.C. 1361 *et seq*.). The authorization would be valid from August 1, 2011 through January 31, 2012, and would authorize the incidental taking, by Level B harassment of small numbers of Pacific harbor seals (*Phoca vitulina richardsi*), California sea lions (*Zalophus californianus*), and Eastern Pacific gray whales (*Eschrichtius robustus*) during pile-driving and renovation operations on the Trinidad Pier in Trinidad, California.

CHAPTER 1 PURPOSE OF AND NEED FOR ACTION

1.1 DESCRIPTION OF ACTION

1.1.1 Summary of IHA Request

On November 3, 2009, the National Marine Fisheries Service (NMFS), Permits, Education, and Conservation Division received a request from the Cher-Ae Heights Indian Community of the Trinidad Rancheria (Trinidad Rancheria) to take, by Level B harassment only, small numbers of Pacific harbor seals, California sea lions, and Eastern Pacific gray whales incidental to pile-driving and renovation operations associated with the Trinidad Pier Reconstruction Project in Trinidad, California. Revised Incidental Harassment Authorizations (IHA) applications were submitted on March 24, 2010, and July 23, 2010. On May 18, 2011, NMFS published a notice in the *Federal Register* (76 FR 28733) disclosing the effects on marine mammals, making preliminary determinations and including a proposed IHA. The notice initiated a 30 day public comment period. The Trinidad Pier has served the Trinidad Community for decades and continues to be one of the marine economic generators for the area. This project will not only address the structural deficiencies of the aged pier, but will completely remove the presence of creosote and other wood preservatives from Trinidad Bay and eliminate non-point source run-off. As such, NMFS proposes to issue an IHA pursuant to section 101(a)(5)(D) of the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1371 *et seq*.), and the regulations governing the taking and importing of marine mammals (50 CFR Part 216).

1.1.2 Purpose and Need

MMPA Incidental Take Authorization Process

The purpose and need of the action is to ensure compliance with the MMPA and its implementing regulations for the activities associated with the Trinidad Rancheria. The MMPA prohibits takes of all marine mammals in the U.S. (including territorial seas) with a few exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq*.) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and regulations are issued or, if the taking is limited to harassment, notice of a proposed authorization is provided to the public for review.

An authorization to take small numbers of marine mammals shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and the permissible methods of taking and requirements pertaining to the mitigation, monitoring, and reporting of such takings are set forth to achieve the least practicable adverse impact. NMFS has defined "negligible impact" in 50 CFR 216.103 as "...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."

Section 101(a)(5)(D) of the MMPA established an expedited process by which citizens of the U.S. can apply for an authorization to incidentally take small numbers of marine mammals by harassment. Except with respect to certain activities not relevant here, the MMPA defines "harassment" as

> "...any act of pursuit, torment, or annoyance which (a) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (b) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment]."
> (16 USC 1362[18])

Section 101(a)(5)(D) establishes a 45-day time limit for NMFS review of an application followed by a 30-day public notice and comment period on any proposed authorizations for the incidental harassment of small numbers of marine mammals. Within 45 days of the close of the comment period, NMFS must either issue or deny issuance of the authorization.

NEPA Requirements and Scope of NEPA Analysis

NMFS's decision of whether or not to issue the Trinidad Rancheria an IHA is a major Federal action that requires an analysis of its effect on the human environment pursuant to the National Environmental Policy Act (NEPA). This Environmental Assessment (EA) contains that analysis and is intended to support NMFS's issuance of an IHA authorizing the incidental take of small numbers of marine mammals associated with the Trinidad Rancheria's Trinidad Pier Reconstruction Project.

The proposed issuance of authorization for incidental take of marine mammals through an IHA is not categorically excluded from NEPA review. In addition, it is not the type of action normally requiring preparation of an Environmental Impact Statement (EIS). Therefore, NMFS has prepared this EA to assist in determining whether the direct, indirect, and cumulative impacts related to its issuance of the authorization for incidental take under the MMPA are likely to result in significant impacts to the human environment, or whether the analysis contained herein, including documents referenced and incorporated by reference and public comments received on the proposed IHA, support the issuance of a Finding of No Significant Impact (FONSI). Given the limited scope of the decision for which NMFS is responsible (i.e., whether or not to issue the authorization including prescribed means of take, mitigation and monitoring measures) that this EA is intended to inform, the scope of analysis is limited to evaluating and disclosing impacts to living marine resources and their habitat likely to be affected by the reconstruction operations. As described more fully below, the EA identifies all marine mammals, species protected under the Endangered Species Act (ESA), and essential fish habitat (EFH) likely to occur within the action area. The primary analysis focuses on the impacts to Pacific harbor seals, California sea lions, and Eastern Pacific gray whales likely to result from the proposed reconstruction operations of the Trinidad Pier that would be conducted under the IHA and associated mitigation, monitoring, and reporting requirements, impacts that would result from the alternatives that are presented, and to consider potential cumulative environmental impacts. Impacts to other species and habitat located in the action area were considered unlikely, and, thus

did not receive detailed evaluation. The need for this EA is to provide a NEPA analysis informing the decision of whether or not to issue the IHA and to determine whether the proposed action has any potential for significant impacts.

The San Francisco District of the U.S. Army Corps of Engineers (ACOE) prepared a *Permit Evaluation and Decision Document (File Number 2007-400318)* which also served as an EA to consider the direct, indirect and cumulative impacts on other elements of the human environment likely to occur as a result of issuing a Clean Water Act Section 404/Rivers and Harbors Act Section 10 permit for the project. That document resulted in a FONSI. The ACOE's FONSI was based on a review of information incorporated in the final EA, including views of the applicant, general public, and resource agencies having special expertise or jurisdiction by law. The ACOE concluded that the permitted activity would not significantly affect the quality of the human environment and an EIS will not be required. NMFS incorporates the decision document by reference in this EA.

1.1.3 Objectives of the Trinidad Pier Reconstruction Project

The Trinidad Pier, located on Trinidad Bay, is an antiquated structure that requires reconstruction in order to maintain public safety and to redress certain environmental deficiencies in the existing structure. The 165 m (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 including lighting, railing, four hoists, three sheds, a saltwater intake pipe used by Humboldt State University's (HSU) 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, 2011 through May 1, 2012, however the pile-driving and removal activities potentially resulting in incidental take of marine mammals will occur from August 1, 2011 through January 31, 2012.

1.2 SCOPING SUMMARY

The purpose of scoping is to identify the issues to be addressed and any potentially significant environmental issues related to the proposed action, as well as to identify and eliminate from detailed study the issues that are not significant or that have been covered by prior NEPA analyses and environmental review. An additional purpose of the scoping process is to identify the concerns of the affected public and Federal agencies, states, and Indian tribes. While the Council on Environmental Quality's (CEQ) regulations and NOAA Administrative Order 216-6, implementing the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq*.), do not require that a draft EA be made available for public comment as part of the scoping process, NMFS uses the IHA review process to the maximum extent practical to inform the public of environmental issues and information related to the proposed action being analyzed in

the EA and to obtain public comment for consideration prior to making final determinations regarding the significance of environmental impacts.

Under 50 CFR 216.104(b) of NMFS's implementing regulations for the MMPA, NMFS must, after deeming the application adequate and complete, publish in the *Federal Register* a notice of proposed IHA or receipt of a request for the implementation or re-implementation of regulations governing the incidental taking. Information gathered during the associated comment period is considered by NMFS in ensuring adequacy of preliminary determinations and proposed monitoring and mitigation measures for IHAs. In accordance, a notice of proposed issuance of an IHA was published in the *Federal Register* on May 18, 2011 (76 FR 28733) and made available for public review and comment for 30 days. Comments received on the proposed IHA were also used to develop the scope of this EA.

Pursuant to 50 CFR §216.33(d)(2), NMFS consulted with the Marine Mammal Commission (Commission) in reviewing the application for an IHA under the MMPA. Concurrent with the publication of the proposed IHA in the *Federal Register* for the availability of public comment, copies of the IHA application were forwarded to the Commission and its Committee of Scientific Advisors for review.

The Commission provided comments on the proposed action. Generally, the Commission comments recommended that NMFS defer issuance of the IHA until it has: required the applicant to develop a more realistic estimate of the number of harbor seal takes that (1) accounts for all harbor seal haul-out sites in the area (2) corrects seal abundance estimates to account for seals in the water during counts, (3) incorporates a more realistic assessment of the portion of seals that will enter the water in the Level B harassment zone during the proposed construction operations, (4) includes a reasonable basis for estimating takes that occur from in-air construction sound, and (5) is based on a realistic estimate of the time required to remove 205 wood piles; reviewed estimates of numbers of takes for California sea lions and gray whales during the proposed activities; re-estimated the distances to various in-water and in-air Level A and B harassment thresholds for all three types of proposed sound-producing activities and then re-evaluated the proposed mitigation and monitoring measures to ensure that the appropriate areas are adequately monitored; required the applicant to verify the associated Level A and B harassment zones through calibrated in-situ sound measurements and to adjust those zones as appropriate; required that shut-down procedures be established for both species of pinnipeds; provided further analysis and justification regarding the efficacy of visual monitoring for the proposed activities and the manner in which the number of takes can be determined accurately; required the applicant to use 30 minutes as the appropriate clearance time for gray whales before ramp-up activities may commence and to use hydrophones for acoustic detection of gray whales; and addressed the deficiencies identified by the Commission and publish a new proposed IHA in the *Federal Register* with the corrected information and provide for an additional 30 day public comment period.

These comments were considered by NMFS in developing the IHA and specific responses will be provided in the *Federal Register* notice announcing the issuance of the IHA. NMFS did not receive any NEPA specific comments during the public comment period of the proposed IHA.

1.3 APPLICABLE LAWS AND NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS

This section summarizes Federal, state, and local permits, licenses, approvals, and consultation requirements necessary to implement the proposed action, as well as who is responsible for obtaining them. Even when it is the applicant's responsibility to obtain such permissions, NMFS is obligated under NEPA to ascertain whether the applicant is seeking other Federal, state, or local approvals for their action.

1.3.1 National Environmental Policy Act

The NEPA was enacted in 1969 and its environmental review requirements set forth in section 102(C) are applicable to all "major" Federal actions with the potential to result in significant affecting the quality of the human environment. A major Federal action is an activity that is fully or partially funded, regulated, conducted, or approved by a Federal agency. NMFS's issuance of incidental take authorizations represents approval and regulation of activities. While NEPA does not dictate substantive requirements for permits, licenses, etc., it requires consideration of environmental issues in Federal agency planning and decision making. The procedural provisions outlining Federal agency responsibilities under NEPA are provided in the CEQ's implementing regulations (40 CFR Parts 1500-1508).

NOAA has, through NOAA Administrative Order (NAO) 216-6, established agency procedures for complying with NEPA and the implementing regulations issued by the CEQ. NAO 216-6 specifies that issuance of incidental take authorizations under the MMPA is among a category of actions that are generally exempted (categorically excluded) from further environmental review if they are tiered to a pre-existing programmatic environmental review, except under extraordinary circumstances. When a proposed action that would otherwise be categorically excluded is the subject of public controversy based on potential environmental consequences, has uncertain environmental impacts or unknown risks, established a precedent or decision in principle about future proposals, may result in cumulatively significant impacts, or may have an adverse effect upon endangered or threatened species or their habitats, preparation of an EA or EIS is required. NMFS has not prepared a programmatic NEPA analysis covering the proposed IHA. Since issuance of the IHA has the potential to adversely affect species protected under the MMPA, NMFS has decided to prepare an EA to evaluate the context and intensity of such impacts to determine whether or not they have the potential to be significant. This EA is prepared in accordance with NEPA, its implementing regulations, and NAO 216-6.

As noted above, the ACOE, San Francisco District, has prepared a permit evaluation and decision document that constitutes an EA, Statement of Findings, and review and compliance determination for the proposed action, which analyzed the projects purpose and need, alternatives, affected environment, and environmental effects for the proposed action. NMFS has reviewed the ACOE EA for consistency with regulations published by the CEQ and NAO 216-6, Environmental Review Procedures for Implementing the NEPA. While NMFS has incorporated that document and analysis by reference and does not repeat the analysis contained therein, it is conducting this EA as a separate NEPA analysis to evaluate the effects of

authorizing the incidental take of marine mammals and the issuance of the IHA to the Trinidad Rancheria with a focus on effects to marine mammals and their habitat.

1.3.2 Marine Mammal Protection Act

The MMPA prohibits takes of all marine mammals in the U.S. (including territorial seas) with a few exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq*.) directs the Secretary of Commerce (Secretary) to allow, upon request, the incidental, but not intentional taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and regulations are issued or, if the taking is limited to harassment, notice of a proposed authorization is provided to the public for review.

Authorization for incidental takings may be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for certain subsistence uses, and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring, and reporting of such takings are set forth. NMFS has defined "negligible impact in 50 CFR 216.103 as: "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."

Under the MMPA, harassment is defined as any act of pursuit, torment, or annoyance which has the potential to: (i) injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment). An IHA may be issued, except for activities that have the potential to result in serious injury or mortality (i.e., it may only authorize Level A and B harassment), for a period of no more than one year, following a 30-day public review period. Alternatively, regulations may be granted for a period of five years and may include takes by serious injury and mortality. Upon rulemaking (i.e., defining regulations), Letters of Authorization (LOAs) will be issued to the authorization holder. The rulemaking and associated LOAs cannot be valid for a period of more than five consecutive years. For both an IHA and regulations, authorization shall be granted if the Secretary finds that the taking will have a negligible impact on a species or stock, and that the IHA or regulations are prescribed setting forth the permissible methods of taking, the means of effecting the least practicable adverse impact, and requirements pertaining to monitoring and reporting. For authorizations associated with activities that could impact marine mammals in Arctic waters (i.e., waters north of 60º North), the action agency must also consider means of effecting the least practicable impact on the availability of the species for subsistence uses.

1.3.3 Endangered Species Act (ESA)

Section 7 of the ESA requires consultation with the appropriate Federal agency (either NMFS or the U.S. Fish and Wildlife Service) for Federal actions that "may affect" a listed species or adversely modify critical habitat. NMFS's issuance of an authorization affecting ESA-listed

species or designated critical habitat, directly or indirectly, is a Federal action subject to these section 7 consultation requirements. Section 7 requires Federal agencies to use their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of endangered and threatened species. NMFS is further required to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of habitat for such species. Regulations specify the procedural requirements for these consultations (50 Part CFR 402).

1.3.4 Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA)

Under the MSFCMA, Congress defined Essential Fish Habitat (EFH) as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802[10]). The EFH provisions of the MSFCMA offer resource managers means to accomplish the goal of giving heightened consideration to fish habitat in resource management. NMFS Office of Protected Resources is required to consult with NMFS Office of Habitat Conservation for any action it authorizes (e.g., research permits), funds, or undertakes, or proposes to authorize, fund, or undertake that may adversely affect EFH. This includes renewals, reviews, or substantial revisions of actions.

1.3.5 Coastal Zone Management Act

Congress enacted the Coastal Zone Management Act (CZMA) (16 U.S.C. 1451 *et seq*.) to protect the coastal environment from growing demands associated with residential, recreational, commercial, and industrial uses (e.g., State and Federal offshore oil and gas development). Those coastal states with an approved Coastal Zone Management Plan, which defines permissible land and water use within the state's coastal zone, can review Federal actions, licenses, or permits for "Federal consistency." "Federal consistency" is the requirement that those Federal permits and licenses likely to affect any land/water use or natural resources of the coastal zone be consistent with the Program's enforceable policies. NMFS consults with states on issuance of permits for activities that fall within the state's Coastal Zone Management Plan.

CHAPTER 2 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This chapter describes the range of potential actions (alternatives) determined reasonable with respect to achieving the stated purpose and need for the proposed action, as well as alternatives eliminated from detailed study. This chapter also summarizes the expected outputs and any related mitigation of each alternative. One alternative is the "No Action" alternative where the proposed permit would not be issued. The No Action alternative is the baseline for the rest of the analyses. The Proposed Action alternative represents the activity proposed in the submitted application for an IHA, with standard IHA mitigation, monitoring, and reporting requirements specified by NMFS.

2.1 ALTERNATIVE 1 – NO ACTION

Under the No Action alternative, NMFS would not issue an IHA to the Trinidad Rancheria authorizing the take of small numbers of marine mammals incidental to the specified activity. The Trinidad Rancheria would still be authorized to conduct the activity, as allowed for under their Section 404 Army Corps of Engineers permit; however, the MMPA prohibits all takings of marine mammals unless authorized by a permit or exempted under the MMPA. Thus, moving forward with reconstruction operations that could affect Pacific harbor seals, California sea lions, and Eastern Pacific gray whales could result in the unauthorized take of marine mammals and monitoring and mitigation measures would not be implemented. While the Trinidad Rancheria is unlikely to do this, and this alternative is thus not feasible for selection, NMFS has included it in the EA to establish an environmental baseline against which the environmental impacts of the preferred alternative, including mitigation and monitoring measures, can be compared and contrasted.

2.2 ALTERNATIVE 2 – PROPOSED ACTION (ISSUANCE of an IHA, PREFERRED ALTERNATIVE)

Under the Proposed Action (preferred) alternative, an IHA would be issued for takes of small numbers of marine mammals incidental to specified activities as proposed by the applicant, with the mitigation, monitoring, and reporting conditions contained within the Trinidad Rancheria's application and NMFS's proposed IHA *Federal Register* notice (76 FR 28733, May 18, 2011). The primary distinction between the proposed action and no action alternative is the proposed action's requirement to implement mitigation and monitoring measures to minimize adverse impacts to marine mammals. The monitoring, mitigation, and reporting requirements in this document are incorporated into the IHA.

2.2.1 Dates, Duration, and Specific Geographic 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 North, 124.14741 West) (see Figure 2-1 of the BA). The construction schedule is from August 1, 2011 to May 1, 2012, with noise and activity effects requiring an IHA, occurring from August 1, 2011 through January 31, 2012.

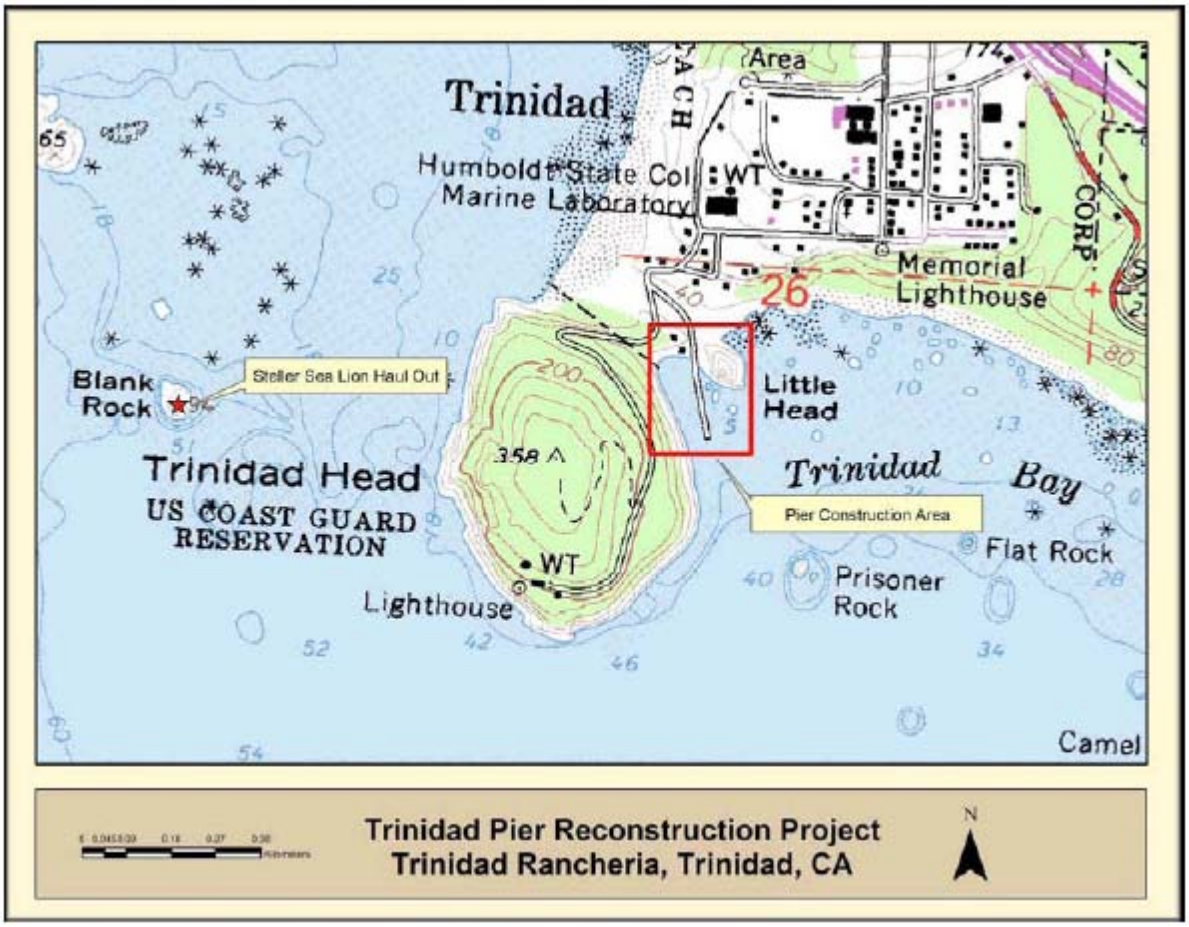
Trinidad Bay is a commercial port located between Humboldt Bay and Crescent City. The bay contains numerous vessel moorings which include permanent commercial vessel anchors as well as 100 moorings that are placed for recreational vessel owners (Donahue, 2007). The uplands have residential, commercial, 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 for the 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.

Trinidad Bay is a shallow, open bay about 0.8 km (0.5 mi) deep (in the southwest-northeast direction) and 1.6 km (1 mi) wide (in the northwest-southeast direction). Figure 1 (below, Figure 1 of the IHA application) shows the whole bay. Generally the bay shelves at a moderate slope to about 9.1 m (30 ft) depth and then flattens out, with most of the outer bay between 9.1 to 15.2 m (30 to 50 ft) deep. Substrates in the bay include rock, cobble, gravel, and sand. The floor of the

bay is irregular with some areas of submerged rock. 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 1. Area of effect for underwater noise.

Figure 2. Map of location of the Trinidad Pier Reconstruction Project.



Construction Timing and Sequencing

The project is expected to be completed within nine months (approximately six months of loud noise-producing activities). Reconstruction of the pier is planned to commence on August 1, 2011 and terminate on May 1, 2012. The potential for marine mammal harassment from noise-generating reconstruction operations are expected to occur from August 1, 2011 through January 31, 2011. These dates will be specified in the IHA. 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; however, Trinidad Harbor is a sheltered area and does not often experience severe weather that would preclude the proposed work. 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, 2012.

Removal of all 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 7.6 m (25 ft) 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 (i.e., 115 piles to be placed [one per day] during 115 days of work or 23 weeks of five days each). 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 23 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.

Action Area

The action area is defined 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 7.9 m (26 ft) of the Trinidad Bay shoreline.

In-air (i.e., sub-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 re 1 µPa (rms) for each doubling of distance, underwater sound from pile-driving (detailed in Section 6 of the BA) would elevate noise above 120 dB (rms) up to 800 m (2,625 ft) (the Port of Anchorage measured 168 dB re 1 µPa [rms] at a distance of 20 m from a pile, application of the practical spreading model with 4.5 dB attenuation for doubling of distance yields 120 dB [rms] at 800 m) 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 6.6.1 of the BA, 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. The assumptions regarding in-air and underwater noise in the IHA application, BA, and in this notice are generally regarded as extremely conservative.

In-air (or sub-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 104 dB at 15.2 m (50 ft) (FHWA, 2006). Assuming an ambient background

noise level of 59 dB, typical of residential neighborhoods, and a sound attenuation rate of 7.5 dB (rms) for each doubling of distance, the action area for aerial sound would extend 975.4 m (3,200 ft) in an 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 (rms) for each doubling of distance and an ambient marine noise background of 50 dB, the action area for above-water effects would extend 7.7 km (4.8 mi) seaward from the pier.

The seaward attenuation rate assumes no environmental damping or attenuation and thus is produced by a simple inversion square law. The landward attenuation rate assumes a low level of environmental damping due to non-forest vegetation, structures, topography, etc. and corresponds to the rate recommended by WSDOT (2006) for terrestrial in-air in non-forest environments. The 59 dB and 50 dB estimates are based on EPA (1971), a standard source of data on typical background sound levels (in dBA) for various environments. These typical levels were revised upwards by approximately 3 dB because the dBA curve down-weights sound intensity at the lower frequencies typical of vibratory pile-driving noise, which is the principal source of noise considered in demarcation of an action area for the proposed action. Thus the 59 dB and 50 dB values represent unweighted estimates of background sound levels. The IHA application and BA provides a detailed explanation of the Trinidad Pier Reconstruction Project location as well as project implementation.

2.2.2. Specified Activity

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 HSU's 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 is a federally-recognized tribe composed of descendants of the Yurok, Weott, and Tolowa peoples. In 1906, the Trinidad Rancheria was established by a U.S. congressional enactment, and a congressional action authorized the purchase of small tracts of land for landless homeless California Indians. In 1908, 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, the Trinidad Rancheria purchased the Trinidad Pier, harbor facilities, and the Seascape Restaurant. The Trinidad 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 area of special biological significance (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.

Pier Construction Overview

Summary plans for the pier and staging area are presented in Appendix A of the IHA application. Pier improvements are proposed to replace at a one-to-one ratio, approximately 1,254 m^2 (13,500 ft^2) of the pre-cast concrete decking. In addition, the project includes installation of 115 concrete piles (and removal of 205 piles) including batter and moorage piles (45.7 cm or 18 inches [in] 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 1.5 m (5 ft) intervals along 7.6 m (25 ft) long concrete bents. A total of 22 bents separated 7.6 m (25 ft) apart shall be used. The decking of the new pier will be constructed of pre-cast 6.1 m (20 ft) long concrete sections. The new pier will be 164.6 m (540 ft) long and 7.3 to 7.9 m (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 6.4 m (21 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, 1.1 m (3.5 ft) in height shall be constructed of tubular galvanized steel rail bars (approximately 1.9 cm [¾ in] diameter) uniform in shape throughout the length of the 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.

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 20 horse-power (hp) (14.9 kiloWatt [kW]) pump and saltwater intake pipes, CICORE's 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.

All existing piles located in the section of pier being worked on (active construction area) will then be removed by vibratory extraction, unless some are broken in the process. 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 piling will be stored upland, at the staging area, until the piles are transferred for upland disposal. Each such extraction will require approximately 40 minutes (min) of vibratory hammer operation, with up to five piles extracted per day (a total of 3.3 hours per day). Operation of the vibratory hammer is the primary activity within the pier demolition group of activities that is likely to affect marine mammals by potentially exposing them to both in-air (i.e., airborne or sub-aerial) and underwater noise.

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. Waterjetting would potentially be performed by divers working around the base of the piles and is not expected to potentially result in the incidental take of marine mammals.

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 of at an approved upland disposal site. The contractor shall also follow Best Management Practices (BMPs): NS-14 – Material Over Water, NS-15 – Demolition Adjacent to Water, and WM-4 – Spill Prevention and Control listed in the California Stormwater Quality Association (CASQA) Handbook (http://www.cabmphandbooks.com/Development.asp).

The existing Douglas-fir piles are creosote treated. The depth of creosote penetration into the piles varies from 0.6 to 5.1 cm (0.25 to 2 in). 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 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 non-hazardous/non-designated sediment.

The pressure treated 2x4 in 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.

Pile Installation

Design - Two 45.7 cm (18 in) 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 1.5 m (5 ft) apart.

Overview - New piles will be installed initially from shore and then, as construction proceeds, from the reconstructed dock. Following removal of each existing pile, steel casings will be vibrated (using a vibratory hammer) to a depth of approximately 0.8 m (2.5 ft) above the top elevation of the proposed pile (7.6 to 10.7 m [25 to 35 ft] below the mudline). The steel shell of 1.9 cm (¾ in) 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 polymer to protect the casings for corrosion. The steel shell will be coasted with 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.

Pile Excavation - Following installation of the steel casing, each hole will be augered to the required pile depth of 7.6 to 10.7 m (25 to 35 ft) below the mudline. An auger drill shall be used to excavate the sediment and rock from the steel shell. Geotechnical studies (Taber, 2007) indicate that the material encountered in the test borings can be excavated using typical heavy duty foundation drilling equipment. Driving the new piles and augering the holes are the primary activities within the pile installation group of activities most likely to result in incidental harassment of marine mammals by potentially exposing them to underwater and in-air noise.

Steel casing member of 1.9 cm (3/4 in) 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 6.1 m (20 ft) below the mudline. Each one of the existing 0.3 m (1 ft) diameter pile has displaced 0.4 m^3 (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 91.7 m^3 (3,238.4 ft^3). Each of the proposed CISS piles requires the displacement of approximately 1.5 m^3 (53 ft^3) of sediment. There are 115 CISS piles to install. A total of approximately 172 m^3 (6,074 ft^3) of sediment would have to be removed in order to auger 115 holes to a depth of 9.1 m (30 ft) below the mudline. It is estimated that 7.6 to 76.5 m^3 (268.4 to 2,701.5 ft^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 than 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 fifty 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).

Concrete Seal Installation - A tremie (i.e., a steel pipe) will be used to seal the bottom 0.9 m (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 using a similar method of removing any adhering soil or debris in order 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 to 48 hours.

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.

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 0.9 cm [¾ in] 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 1.5 m (5 ft). 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.

Pier Deck Construction

Following the installation of the concrete piles, pre-cast concrete bent caps measuring 7.6 m (25 ft) – 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 6.1 m (20 ft) – 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.

Utilities

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

Power: A 2 in 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.

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 7.6 m (25 ft) 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.

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 of the IHA application, for details of the conveyance and treatment system. The pier-deck construction, utility replacement, and drainage improvements are anticipated to result in discountable effects to marine mammals.

BMPs

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 the 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 of 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 x 4 in 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 (189 L) 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 areas 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 A of the IHA application, drawings C-5 to C-8, for details.

Construction Timing and 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 NMFS-qualified Protected Species Observers (PSOs) to perform required observations.

Project Benefits:

This EA describes in detail BMPs that will be implemented for the proposed project. The BMPs are focused almost exclusively on protecting water quality, and while they may have ancillary benefits to some marine resources such as Essential Fish Habitat (EFH), they are not intended to serve as monitoring and mitigation measures for adverse effects to marine mammals. The only exception might be the ability to further modify noise timing restrictions to allow Protected Species Observers (PSOs) to perform their duties.

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 205 piles to be removed and 115 piles to be installed and a white concrete construction, will result in less shading of nearshore habitat. The project may have benefits to environmental resources other than marine mammals.

CHAPTER 3 AFFECTED ENVIRONMENT

This chapter presents baseline information necessary for consideration of the alternatives, and describes the resources that would be affected by the alternatives, as well as environmental components that would affect the alternatives if they were to be implemented. The effects of the alternatives on the environment are discussed in Chapter 4.

3.1 PHYSICAL ENVIRONMENT

3.1.1 Trinidad, California

The Trinidad Pier Reconstruction Project is located in the city of Trinidad, California, Humboldt County, at Township 8N, Range 1W, Section 26 (41.0559° North, 124.14741° West. 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 as 100 moorings that are placed for recreational vessel owners. 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 (ICF Jones & Stokes, 2009).

The Trinidad Pier is an aging structure originally constructed in 1946 out of creosoted wood pilings and chemically preserved wood decking with an approximate surface area of 0.31 acres. 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 164.6 m (540 ft) into Trinidad Bay to the south from a low bench that connect the mainland to Trinidad Head. 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 (ICF Jones & Stokes, 2009).

The intertidal habitat of the area consists of bedrock benches, boulders, small tide pools, and concrete slabs. During intertidal surveys, a total of 104 species were observed including 53 species of algae. Red, brown and green algae were observed as well as a diversity of barnacles, limpets, littorine snails, and anemones (ICF Jones & Stokes, 2009).

The subtidal habitat of the area consists of sand, bedrock/boulder, and wood substrate of existing pilings. Sand substrates dominated the shallow and midpoint transects, shifting to dominance of boulder substrated in the deep transects. The sand substrate areas had low cover (25% in 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 (*Pterogrophor californica*) was the most abundant brown algae around the pier, and was almost entire confined to the shallow transect on the east side of the pier. The algae *Cystoseira osmundacea* and *Laminaria setchelli* were also present in hard substrate areas. 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 mid-point transects were dominated almost exclusively by *Pista pacifica*, but it disappeared in the deep transects, where sea stars were again most abundant along with sea cucumber *Cucumaria miniata* and sever species of *Cancer* crabs (ICF Jones & Stokes, 2009).

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* spp., and an unidentified *Pholidae* (ICF Jones & Stokes, 2009).

Surveys of existing wood pilings identified four communities corresponding to increasing water depth: the algae zone (-1.6 m [5.3 ft] MLLW), bryozoans zone (-2.8 m [9.2 ft]), amphipod zone (-3.8 m [12.5 ft]), 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 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 to 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 bryozoans and amphipod zones; and the presence of rockfish in the kelp attached to pier pilings (ICF Jones & Stokes, 2009).

Trinidad Rancheria's BA includes an in-depth analysis on fish present in the action area and that section is incorporated here by reference.

3.1.2 Sanctuaries, Parks, Historic Sites, etc.

The ACOE's EA analyses impacts to cultural resources and includes mitigation for the reconstruction activities. The issuance of an IHA to the Trinidad Rancheria is not expected to impact these particular resources, and therefore this aspect of the environment will not be further discussed or analyzed.

3.1.3 Essential Fish Habitat

Essential Fish Habitat (EFH) means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. For the purpose of interpreting the definition of EFH, "waters" include aquatic areas that are used by fish and their associated physical, chemical, and biological properties and may include areas historically used by fish where appropriate;

"substrate" includes sediment, hard bottom, structures, underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and a healthy ecosystem ; and "spawning, breeding, feeding, or growth to maturity" covers a species' entire life cycle.

EFH has been designated for many of the fish species managed under the Pacific Coast Salmon, Pacific Coast Groundfish, and Coastal Pelagics Fishery Management Plans within the action area. The substrate of the intertidal and subtidal habitats under and adjacent to the Trinidad Pier includes bedrock benches, boulders, concrete slabs, and sand. The wooden pier pilings serve as attachment sites primarily (50 to 75% cover) for red algae (*Polyneura lastissima*) and secondarily (25% cover) kelps (*Alaria marginata*, *N. Luetkeana*, *Pterogophora californica*, and *Laminaria* spp.). The attached algae and kelps provide habitat for prey species as well as cover for EFH species (e.g., juvenile rockfish and salmonids). Further details of the designations and descriptions of the habitats are available in the Pacific Fishery Management Plans. Activities that have been shown to affect EFH include disturbance or destruction of habitat from stationary fishing gear, dredging and filling, agricultural and urban runoff, direct discharge, and the introduction of exotic species.

3.1.4 Designated Critical Habitat

The ESA mandates the Federal government to designate "critical habitat" for every listed species except in limited circumstances. Critical habitat is an area deemed essential to the conservation of a species listed under the ESA. There is no designated critical habitat for ESA-listed marine mammals, Chinook and coho salmon, and steelhead within the action area.

3.2 BIOLOGICAL ENVIRONMENT

3.2.1 Description of Marine Mammals in the Activity Area

One cetacean species and two species of pinnipeds are known to or could occur in the proposed Trinidad Bay action area and off the Pacific coastline (see Table 1 below). Eastern Pacific gray whales, California sea lions, and Pacific harbor seals are likely to be found within the proposed activity area. Steller sea lions and transient killer whales could potentially be found in small numbers within the activity area, but authorization for "take" by incidental harassment is not requested for Steller sea lions and transient killer whales due to their rarity and the feasibility of avoiding impacts to these species by pausing work in the event that they are detected, as detailed in the Marine Mammal Monitoring Plan. NMFS, based on the best available science, agrees that transient killer whales and Steller sea lions are not likely to be present in the proposed action area during implementation of the specified activities and are thus unlikely to be exposed to the effects of the specified activities. NMFS does not expect incidental take of these marine mammal species and therefore has not authorized take of these two species in the IHA. The potential presence of Steller sea lions is detailed in Section 5.6 of the Trinidad Rancheria's BA. The potential presence of gray whales, killer whales, harbor seals, and California sea lions is detailed in Appendix C of the IHA application.

A variety of other marine mammals have on occasion been reported from the coastal waters of northern California. These include bottlenose dolphins, harbor porpoises, northern elephant seals, northern fur seals, and sea otters. However, none of these species has been reported to occur in the proposed action area, and in particular none were mentioned by the regional NMFS specialist in the identification of species to be addressed in the IHA application. The USFWS has informed the ACOE that a section 7 under the ESA consultation is not necessary for any of their jurisdictional species, including sea otters. Table 1 below presents information on the cetacean and pinnipeds species, their habitat, and conservation status in the general region of the proposed project area.

Table 1. The habitat and conservation status of marine mammals inhabiting the general region of the action area in the Pacific Ocean off the U.S. west coast.

Species	Habitat	ESA[1]	MMPA[2]
Mysticetes			
Gray whale (*Eschrichtius robustus*)	Coastal and shelf	DL – Eastern Pacific stock (or population) EN – Western Pacific stock (or population)	NC – Eastern Pacific stock (or population) D – Western Pacific stock (or population)
Odontocetes			
Killer whale (*Orcinus orca*)	Widely distributed	NL	D – Southern Resident and AT1 Transient populations
Bottlenose dolphin (*Tursiops truncatus*)	Offshore, inshore, coastal, estuaries	NL	NC
Harbor porpoise (*Phocoena phocoena*)	Coastal and inland waters	NL	NC
Pinnipeds			
Pacific harbor seal (*Phoca vitulina richardsi*)	Coastal	NL	NC
Northern elephant seal (*Mirounga angustirostris*)	Coastal, pelagic when migrating	NL	NC
California sea lion (*Zalophus californianus*)	Coastal, shelf	NL	NC
Steller sea lion (*Eumetopias jubatus*)	Coastal, shelf	T	D
Northen fur seal (*Callorhinus ursinus*)	Pelagic, offshore	NL	D – Pribilof Island/Eastern Pacific population

[1] U.S. Endangered Species Act: EN = Endangered, T = Threatened, NL = Not listed, DL = Delisted

[2]U.S. Marine Mammal Protection Act: D = Depleted, NC = Not classified

Pacific Harbor Seals

Harbor seals are widely distributed in the North Atlantic and North Pacific. The subspecies in the eastern North Pacific Ocean inhabits near-shore coastal and estuarine areas from Baja California, Mexico, to the Pribilof Islands in Alaska. These seals do not make extensive pelagic migrations, but do travel 300 to 500 km (186 to 311 mi) on occasion to find food or suitable breeding areas (Herder, 1986; D. Hanan unpublished data). Previous assessments of the status of harbor seals have recognized three stocks along the west coast of the continental U.S.: (1) California, (2) Oregon and Washington outer coast waters, and (3) inland waters of Washington. In California, approximately 400 to 600 harbor seal haul-out sites are distributed along the mainland and on offshore islands, including intertidal sandbars, rocky shores, and beaches (Hanan, 1996; Lowery *et al*., 2005).

Pinnipeds produce a wide range of social signals, most occurring at relatively low frequencies (Southall *et al*., 2007), suggesting that hearing is keenest at these frequencies. Pinnipeds communicate acoustically both on land and in the water, but have different hearing capabilities dependent upon the medium (air or water). Based on numerous studies, as summarized in Southall *et al*., 2007), pinnipeds are more sensitive to a broader range of sound frequencies underwater than in air. Underwater, pinnipeds can hear frequencies from 75 Hertz (Hz) to 75 kiloHertz (kHz). In air, the lower limit remains at 75 Hz, but the highest audible frequencies are only around 30 kHz (Southall *et al*., 2007).

Goley *et al*. (2007) detailed harbor seal abundance at varied sites in Humboldt County, including the haul-out at Indian Beach, which generally refers to beaches in Trinidad Bay. Seals haul-out on rocks and at small beaches at many locations that are widely dispersed within Trinidad Bay; the closes such haul-out is 70 m (229.7 ft) from the pier, while the most distant are over 1 km (0.6 mi) away near the south end of Trinidad Bay (Goley, pers. comm.). Seals haul-out at rocks in Trinidad Bay regularly throughout the year, so harbor seals approaching or departing these haul-outs would be subject to underwater and in-air noise from pile-driving and thus, potential behavioral modification.

Table 7 in Goley *et al*. (2007) lists the sighting rates for harbor seals during nine years of monthly observations at Trinidad Bay. A sighting rate of zero occurred only three 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 approximately 37 seals per monthly observation. In contrast, the average detection rate in the months of February through July was 50.7 seals per monthly observation. In practice, seals can usually be seen and/or heard vocalizing from the existing pier (Goley, pers. comm.).

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 nearshore 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. The Trinidad Bay harbor seal population, which consists of approximately 200 seals, shows very little interchange with the nearby Humboldt Bay population (Goley, pers. comm.). Goley observed Humboldt Bay seals show high site fidelity for sandy beach haul-outs, whereas the Trinidad Bay and Patrick's Point seals have corresponding fidelity for rocky haul-outs (Goley, pers. comm.). However, there is also a much larger population 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, the Trinidad Bay seals are highly dependent upon available haul-outs in Trinidad Bay (Goley, pers. comm.).

Palmer's Point is a specific geographical feature within the Patrick's Point headland area. Seals also haul-out at other rocks in the area. Dr. Dawn Goley has stated that it is unknown whether there is interchange between the Patrick's Point and Trinidad Bay seals. Data that would allow a conclusive determination on this point, such as genetic or radio/acoustic tracking studies, have not been gathered. However, Goley *et al*. (2007) do state that "harbor seals exhibit high site fidelity, utilizing one to two haul-out sites within their range (Sullivan, 1980; Pitcher *et al*., 1981; Stewart *et al*., 1994), rarely traveling more than 25 to 50 km (15.5 to 31.1 mi) from these haul-outs (Brown and Mate, 1983; Suryan and Harvey, 1998). Movements between and the use of alternate haul-out sites has been attributed to the use of alternative foraging areas near their new haul-out site (Thompson *et al*., 1996b; Lowry *et al*., 2001) and the seasonal use of certain haul-out sites for pupping and molting (Herder, 1986; Thompson *et al*., 1989)." Based on the fact that the Palmer's Point and Trinidad Bay haul-outs are close to each other (9 km [5.6 mi]) compared to the foraging areas used by harbor seals, and that the Patrick's Point area is home to approximately 1,000 harbor seals (Goley, pers. comm.), a far larger grouping than the one found at Trinidad Bay, and given that observations of harbor seals at Trinidad Bay go through strong seasonal fluctuations, it is not appropriate to dismiss a hypothesis that there is interchange between the two areas. If the seals do seasonally vacate Trinidad Bay for alternative foraging grounds, then Patrick's Point is their most likely alternative haul-out.

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 three observations of 33 to 52 animals). At this time, it is highly probable that harbor seals use this haul-out frequently for essential activities such as rearing pups and molting. After August and September, use of the haul-out by seals 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. While harbor seals may be present and use the haul-out in Trinidad Bay at any time of the year, Goley *et al*. (2007) states that harbor seals "are typically less abundant during the winter months as seals tend to spend more time foraging at sea during this time."

A complete count of all harbor seals in California is impossible because some are always away from the haul-out sites. A complete pup count (as is done for other pinnipeds in California) is also not possible because harbor seals are precocious, with pups entering the water almost

immediately after birth. Based on the most recent harbor seal counts (2004 and 2005) and including a revised correction factor, the estimated population of harbor seals in California is 34,233 (Carretta *et al*., 2005), with an estimated minimum population of 31,600 for the California stock of harbor seals. Counts of harbor seals in California showed a rapid increase from approximately 1972 to 1990, but since 1990 there has been no net population growth along the mainland or the Channel Islands. Though no formal determination of Optimal Sustainable Population (OSP) has been made, the decrease in the growth rate may indicate that the population is approaching its environmental carrying capacity. The harbor seal is not listed under the ESA and the California stock is not considered depleted under the MMPA.

California Sea Lions

The U.S. stock of California sea lions extends from the U.S. Mexico border north into Canada. Breeding areas of the sea lion are on islands located in southern California, western Baja California, and the Gulf of California and they primarily use the central California area to feed during the non-breeding season. California sea lions, although abundant in northern California waters, have seldom been recorded in Trinidad Bay during the surveys reported by Goley *et al.* (2007), but no records were kept of whether they were seldom observed in water or on haul-outs. This may be due to the presence of a large and active harbor seal population there.

Like Pacific harbor seals, California sea lions are pinnipeds that hear the best at low frequencies. Underwater, pinnipeds can hear frequencies from 75 Hz to 75 kHz. In air, the low limit remains at 75 Hz, but the highest audible frequencies are only around 30 kHz (Southall *et al*., 2007).

The entire population of California sea lions cannot be counted because all age and sex classes are never ashore at the same time. In lieu of counting all sea lions, pups are counted during the breeding season (because this is the only age class that is ashore in its entirety), and the numbers of births is estimated from the pup count. The size of the population is then estimated from the number of births and the proportion of pups in the population. Population estimates for the U.S. stock of California sea lions, range from a minimum of 141,842 to an average of 238,000 animals. The California sea lion is not listed under the ESA and the U.S. stock is not considered depleted under the MMPA.

Eastern Pacific Gray Whales

There are two recognized stocks of gray whales in the North Pacific, the Eastern North Pacific stock (or population), which lives along the west coast of North America, and the Western North Pacific or "Korean" stock (or population), which lives along the coast of eastern Asia (Rice, 1981; Rice *et al*., 1984; Swartz *et al*., 2006). Most of the Eastern Pacific stock spends the summer feeding in the northern and western Bering and Chukchi Seas (Rice and Wolman, 1971; Berzin, 1984; Nerini, 1984). However, gray whales have been reported feeding in the summer in waters near Kodiak Island, Southeast Alaska, British Columbia, Washington, Oregon, and California (Rice and Wolman, 1971; Darling, 1984; Nerini, 1984; Rice *et al*., 1984; Moore *et al*., 2007). Each fall, the whales migrate south along the coast of North America from Alaska to Baja California in Mexico (Rice and Wolman, 1971), most of them starting in November or December (Rugh *et al*., 2001). The Eastern Pacific stock winters mainly along the west coast of

Baja California, using certain shallow, nearly landlocked lagoons and bays, and calves are born from early January to mid-February (Rice *et al*., 1981), often seen on the migrations well north of Mexico (Shelden *et al*., 2004). The northbound migration generally begins in mid-February and continues through May (Rice *et al*., 1981, 1984; Poole, 1984a), with cows and newborn calves migrating northward primarily between March and June along the U.S. West Coast.

Goley *et al*. (2007) lists the sighting rates for gray whales during eight 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 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. The majority of these detections were within 2 km (1.2 mi) of the shorelines. Visibility conditions seldom allow detection of whales at greater distances.

Gray whales, like other baleen whales, are in the low-frequency hearing group. There are no empirical data on gray whale hearing; however, Wartzok and Ketten (1999) suggest that mysticete hearing is most sensitive at the same frequencies at which they vocalize. Underwater sounds produced by gray whales range from 20 Hz to 20 kHz (Richardson *et al*., 1995)

The population size of the Eastern Pacific gray whale stock has been increasing over the past several decades. Based on the most recent abundance estimates, the minimum population for this stock is 17,752 animals. As of 1994, the Eastern Pacific stock of gray whales is no longer listed as endangered under the ESA and is not considered depleted under the MMPA. The Western Pacific stock of gray whales is listed as endangered under the ESA and is considered depleted under the MMPA.

Steller Sea Lions

Steller sea lions range along the North Pacific rim from northern Japan to California (Loughlin *et al*., 1984), with centers of abundance and distribution in the Gulf of Alaska and Aleutian Islands, respectively. The species is not known to migrate, but individuals disperse widely outside of the breeding season (late May to early July), thus potentially intermixing with animals from other areas. Despite the wide-ranging movements of juveniles and adult males in particular, exchange between rookeries by breeding adult females and males (other than between adjoining rookeries) appears low, although males have a higher tendency to disperse than females (NMFS, 1995; Trujillo *et al*., 2004; Hoffman *et al*., 2006). A northward shift in the overall breeding distribution has occurred, with a contraction of the range in southern California and new rookeries established in southeastern Alaska (Pitcher *et al*., 2007).

The eastern stock of Steller sea lions breeds on rookeries located in southeast Alaska, British Columbia, Oregon, and California; there are no rookeries located in Washington. Counts of pups on rookeries conducted near the end of the birthing season are nearly complete counts of pup production. Using the most recent 2002 to 2005 pup counts available by region from aerial surveys across the range of the eastern stock, the total population of the eastern stock of Steller sea lions is estimated to be within the range of 45,095 to 55,832 (NMFS, 2009).

Steller sea lions are migratory and appear to be most abundant in Humboldt County area during spring and fall. The nearest documented haul-out site for Steller sea lions is Blank Rock, situated approximately 1 km (0.6 mi) due west of the Trinidad Pier, on the opposite side of Trinidad Head (see Figure 2 of IHA application). 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 (NMFS, 2008). Steller sea lions have not been documented within Trinidad Bay over eight years of surveys conducted at the site (Goley, 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 (NMFS, 2006). The applicant has not requested authorization for incidental take of Steller sea lions. Based on its assessment of the occurrence, distribution, and behavioral patterns of the Steller sea lion, NMFS does not expect that the proposed specified activities are likely to result in incidental take of the species.

Killer Whales

Killer whales have been observed in all oceans and seas of the world (Leather wood and Dahlheim, 1978). Although reported from tropical and offshore waters, killer whales prefer the colder waters of both hemispheres, with greatest abundances found within 800 km (497.1 mi) of major continents (Mitchell, 1975). Along the west coast of North America, killer whales occur along the entire Alaska coast (Braham and Dahlheim, 1982), in British Columbia and Washington inland waterways (Bigg *et al*., 1990), and along the outer coasts of Washington, Oregon, and California (Green et al., 1992; Barlow, 1995, 1997; Forney *et al*., 1995). Seasonal and year-round occurrence has been noted for killer whales through Alaska (Braham and Dahlheim, 1982) and in the intracoastal waterways of British Columbia and Washington State, where pods have been labeled as 'resident,' 'transient,' and 'offshore' (Bigg *et al*., 1990; Ford *et al*., 1994) based on aspects of morphology, ecology, genetics, and behavior (Ford and Fisher, 1982; Baird and Stacey, 1988; Baird *et al*., 1992; Hoelzel *et al*., 1998). Movements of killer whales between the waters of Southeast Alaska and central California have been documented (Goley and Straley, 1994).

Based on data regarding association patterns, acoustics, movements, genetic differences and potential fishery interactions, five killer whale stocks are recognized within the Pacific U.S. Exclusive Economic Zone: (1) the Eastern North Pacific Northern Resident stock – occurring from British Columbia through Alaska, (2) the Eastern North Pacific Southern Resident stock – occurring mainly within the inland waters of Washing State and British Columbia, but also in coastal waters from British Columbia through California, (3) the Eastern North Pacific Transient stock – occurring from Alaska through California, (4) the Eastern North Pacific Offshore stock – occurring from Southeast Alaska though California, and (5) the Hawaiian stock (NMFS, 2000, 2004).

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). The applicant has not requested authorization for incidental take of killer whales. Based on its assessment of data

regarding the distribution, migratory patterns and occurrence of transient killer whales, NMFS does not expect that the proposed specified activities are likely to result in incidental take of the species.

ESA-Listed Marine Species

Four ESA-listed species are potentially present in the Trinidad Pier Reconstruction Project action area were identified by the USFWS and NMFS. These species include the threatened Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*), California Coastal (CC) Chinook salmon (*Onchorhynchus tshawytscha*), Northern California (NC) steelhead (*Onchorhynchus mykiss*), and the Eastern stock of Steller sea lion (*Eumetopias jubatus*). A more detailed description and analysis on these species and there occurrence can be found in Trinidad Rancheria's BA, which is incorporated here by reference. The Trinidad Rancheria's BA describes the status, biology, and lack of designated critical habitat for these ESA-listed marine species.

3.3 SOCIAL AND ECONOMIC ENVIRONMENT

Economic and social factors are listed in the definition of effects in the NEPA regulations. However, the definition of human environment states that "economic and social effects are not intended by themselves to require preparation of an EIS." An EA must include a discussion of a proposed action's economic and social effects when these effects are related to the natural or physical environment.

The repair and renovation of the Trinidad Pier would not have any negative economic or social impact as the pier is not used to facilitate economic growth (e.g., not a shipping port) but is often used for recreational fishing and boating. Social impacts would be beneficial as more visitors would be able to access and enjoy the pier.

NMFS's proposed action is to issue an IHA authorizing harassment of marine mammals within the action area. There are no subsistence uses of marine mammals within the action area.

3.4 IMPACT OF AVAILABILITY OF AFFECTED SPECIES FOR TAKING FOR SUBSISTENCE USES

Under the MMPA, NMFS must determine that an activity would not have an unmitigable adverse impact on the subsistence needs for marine mammals. While this includes usage of both cetaceans and pinnipeds, the primary impact by construction activities is expected to be impacts from noise generated by reconstruction operations on harbor seals, California sea lions, and gray whales. In 50 CFR 216.103, NMFS has defined unmitigable adverse impact as:

> An impact resulting from the specified activity: (1) That is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by: (i) causing the marine mammals to abandon or avoid hunting areas, (ii) directly displacing subsistence users, or (iii) placing physical barriers between the marine mammals and the subsistence hunters; and (2) That cannot be sufficiently mitigated by

other measures to increase the availability of marine mammals to allow subsistence needs to be met.

There is no subsistence hunting for marine mammals in the waters off of the coast of California that implicates MMPA section 101(a)(5)(D) and thus no potential for an unmitigable adverse effect on the availability of marine mammals for subsistence uses.

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

The impact of Federal actions must be considered prior to implementation to determine whether the action will significantly affect the quality of the human environment. In this section, an analysis of the environmental impacts of issuing an IHA to the Trinidad Rancheria and the alternatives to that proposed action are presented with a primary focus on impacts to marine mammals and their habitat.

This chapter represents the scientific and analytic basis for comparison of the direct, indirect, and cumulative effects of the alternatives. Regulations for implementing the provisions of NEPA require consideration of both the context and intensity of a proposed action (40 CFR Parts 1500-1508).

4.1 EFFECTS OF ALTERNATIVE 1: NO ACTION

Under the No Action alternative, NMFS would deny the Trinidad Rancheria an authorization to harass marine mammals incidental to pile-driving and renovation operations during the Trinidad Pier Reconstruction Project. To avoid violation of the MMPA if no IHA is issued, the Trinidad Rancheria would have to shut-down all pile-driving and renovation operations whenever a marine mammal is sighted within the Level B harassment zones during vibratory pile-driving. These underwater Level B harassment zones have been modeled to extend 5 km (3.1 mi), 2.4 km (1.5 mi), and 23.3 km (14.5 mi) for pile-removal, augering, and pile-installation, respectively. The in-air Level B harassment zones have been estimated to extend 26.5 m (87 ft), 18.3 m (60 ft), and 26.5 m for harbor seals and 10.5 m (34.5 ft), 7.3 m (24 ft), and 10.5 m (34.5 ft) for all other pinnipeds for pile-removal, augering, and pile-installation, respectively. The no action alternative would move forward without implementation of the mitigation or monitoring requirements imposed by the IHA. Therefore, the risk of exposure of marine mammals to underwater and in air noise resulting from reconstruction activities would increase due to a decrease in the likely detection of marine mammals in the action area during such activities. The no action alternative could therefore result in a higher level of take by incidental harassment of all three species of affected marine mammals when compared to the preferred alternative. The impacts to other environmental resources, such as water quality and EFH, should not differ meaningfully from the preferred alternative as the applicant would be required to implement the BMPs and other mitigation measures required by the CWA 404 permit.

4.2 EFFECTS OF ALTERNATIVE 2: PROPOSED ACTION (ISSUANCE OF IHA, PREFERRED ALTERNATIVE)

This section describes potential impacts to the human environment from issuance of a MMPA IHA allowing the harassment of marine mammals incidental to the Trinidad Pier Reconstruction Project.

4.2.1 Potential Effects of Activities on Marine Mammals

Pile-driving and renovation operations at the Trinidad Pier may temporarily impact marine mammals within the action area due to elevated in-water and in-air noise levels. NMFS has prepared, supplemented, or adopted numerous EAs leading to Findings of No Significant Impact (FONSI's) for pile-driving activities in general, including ones for the State of California Department of Transportation (Caltrans) projects which involved pile-driving large piles in sections of San Francisco Bay. The analysis of pile-driving impacts to marine mammals and their environment under NEPA have been conducted to facilitate issuance of other IHAs. Examples of such EAs include:

> *Environmental Assessment on the Authorization for the Harassment of Marine Mammals Incidental to the Seismic Retrofit of the Richmond-San Rafael Bridge, San Francisco Bay, CA Under Section 101(a)(5) of the Marine Mammal Protection Act* (1997);
>
> *Environmental Assessment on the Authorization for the Harassment of Marine Mammals Incidental to Construction of the East Span of the San Francisco-Oakland Bridge Under Section 101(a)(5) of the Marine Mammal Protection Act* (2003);
>
> *Environmental Assessment on the Authorization for the Harassment of Marine Mammals Incidental to Retrofitting Three Bridges at Humboldt Bay in Humboldt County, CA by the California Department of Transportation Under Section 101(a)(5) of the Marine Mammal Protection Act* (2005)

Marine mammals are continually exposed to many sources of sound. Naturally occurring sounds such as lighting, rain, sub-sea earthquakes, and biological sounds (e.g., snapping shrimp, whale sounds) are ubiquitous throughout the world's oceans. Marine mammals produce sounds in various contexts and use sound for various biological functions including, but not limited to: (1) social interactions; (2) foraging; (3) orientation; and (4) predator detection. Interference with producing or receiving these sounds may result in adverse impacts. Impacts from noise exposure are expected to be both auditory and behavioral, as described in the below sections.

Auditory Impacts - In mammals, high intensity sound may rupture the eardrum, damage the small bones in the middle ear, or over-stimulate the electromechanical hair cells that convert the fluid motions caused by sound into neural impulses that are sent to the brain. Lower level exposures may cause a loss of hearing sensitivity, termed a threshold (TS) (Miller, 1974). Incidence of TS may be either permanent, referred to as permanent threshold shift (PTS), or temporary, referred to as a temporary threshold shift (TTS).

PTS consists of non-recoverable physical damage to the sound receptors in the ear, which can include total or partial deafness, or an impaired ability to hear sounds in specific frequency ranges; PTS is considered Level A harassment. TTS is recoverable and is considered to result

from temporary, non-injurious impacts to hearing-related tissues; TTS is considered Level B harassment. There are no empirical data on onset of PTS in any marine mammal; therefore PTS-onset must be estimated from TTS-onset measurements and from the rate of TTS growth with increasing exposure levels above the level eliciting TTS-onset. PTS is presumed to be likely if the hearing threshold is reduced by ≥ 40 dB (i.e., 40 dB of TTS). Due to proposed mitigation measures and source levels, NMFS does not expect that marine mammal would be exposed to levels that could elicit PTS; therefore, it will not be discussed further.

The Trinidad Rancheria requests authorization for Level B harassment of three species of marine mammals (i.e., Pacific harbor seals, Eastern Pacific gray whales, and California sea lions) incidental to the use of heavy equipment and its propagation of underwater and in-air noise from various acoustic mechanisms associated with the Trinidad Pier Reconstruction Project and the proposed specified activities discussed above. Marine mammals potentially occurring in Trinidad Harbor include Pacific harbor seals, Eastern Pacific gray whales, California sea lions, Steller sea lions, and killer whales (transient). Killer whale and Steller sea lion observations in the specific geographic area, as noted, are very rare (less than one per year) and thus not likely to be affected by the proposed action. But the gray whale and California sea lion are observed occasionally, and harbor seals are seldom absent from the harbor, and thus considered likely to be exposed to sound associated with the Trinidad Pier Reconstruction Project.

Current NMFS practice, regarding exposure of marine mammals to high-level underwater sounds is that cetaceans and pinnipeds exposed to impulsive sounds of at or above 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 the 160 dB (rms) threshold for impulse sounds (e.g., impact pile-driving) and the 120 dB (rms) threshold for continuous noise (e.g., vibratory pile-driving). No impact pile-driving is planned for the proposed activity in Trinidad Bay. Current NMFS practice, regarding exposure of marine mammals to high-level in-air sounds, as a threshold for potential Level B harassment, is at or above 90 dB re 20 µPa for harbor seals and at or above 100 dB re 20 µPa for all other pinniped species (Lawson *et al*., 2002; Southall *et al*., 2007). NMFS has not established a threshold for Level A harassment for marine mammals exposed to in-air noise; however, Southall *et al*. (2007) recommends 149 dB re 20 µPa (peak) (flat) as the potential threshold for injury from in-air noise for all pinnipeds.

The acoustic mechanisms involved entail in-air and underwater non-impulsive noise caused by the activities of vibratory pile removal, auger operation, and vibratory pile placement. Anticipated peak underwater noise levels may exceed the 120 dB (rms) threshold for Level B harassment for continuous noise sources, but are not anticipated to exceed the 180 and 190 dB (rms) Level A harassment thresholds for cetaceans and pinnipeds, respectively. Expected in-air noise levels are anticipated to result in elevated sound intensities within 152.4 m (500 ft) of the proposed construction activities involving vibratory pile-driving and augering and do not exceed the threshold put forth by Southall *et al*. (2007) for in-air sound exposure. No other mechanisms are expected to affect marine mammal use of the area. The debris containment boom, for instance, would not affect any haul-out and would not entail noise, and activity in the water is not materially different from normal vessel operations at the pier, to which the animals are already habituated.

Underwater Noise

Background – When a pile is vibrated, the vibration propagates through the pile and radiates sound into the water and the 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 negative or positive pressure peak (see Table 1 of the IHA application 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 and Rodkin, 2008). This rms term is described as rms 90 percent in this document. In this analysis, underwater peak pressures and rms sound pressure levels are expressed in decibels (dB) re 1 μPa. The total sound energy in an impulse accumulates over the duration of that impulse.

Baseline Underwater Noise Level – Currently, no data are available describing baseline levels of underwater sound in Trinidad Bay. Sound dissipates more rapidly in shallow waters and over soft bottoms (i.e., sand). Much of Trinidad Bay is characterized by its shallow depth (30 to 50 ft), flat bottom, and floor substrate of rock, cobble, gravel, sand, and irregularly submerged rock in some areas, thereby making it a poor acoustic environment. Currents, tides, waves, winds, commercial and recreational vessels, and in-air noise may further increase background sound levels near the proposed action area. 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 (rms) at 100 Hz (National Research Council, 2003; Guedel, 1992). Underwater sound levels in Elliott Bay near Seattle, Washington, representative of an area receiving moderately heavy vessel traffic, are about 130 dB (rms) (WSDOT, 2006). In Lake Pend Oreille, Idaho, 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 mid-week 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. The rationale for using the background estimate of 120 dB (rms) is based upon comparison with inland or protected marine waters (Puget Sound in Washington, and Lake Coeur d'Alene in Idaho) that are not subject to the severity of wave and storm activity that can occur in the Trinidad Bay area. It is likely that intermittent directional sound sources of higher intensity constitute a part of the normal acoustic background, to which seals in the area are habituated. Assuming that such intermittent background sound sources may be twice as loud as the regionally averaged rms background sound level of 120 dB, then seals are unlikely to show a behavioral response to any sounds quieter than 126 dB (rms). A sound that is as loud as or below ambient/background levels is likely not discernable to marine mammals and therefore, is not likely to have the potential to harass a marine mammal.

Noise Thresholds - There has been extensive effort directed towards the establishment of underwater sound thresholds for marine life. Various criteria for marine mammals have been established through precedent. Current NMFS practice 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 Level B harassment (behavioral) to occur when marine mammals are exposed to sounds below injury thresholds, but at or above 160 dB (rms) for impulse sounds and/or above 120 dB (rms) for continuous noise (e.g., vibratory pile-driving). As noted above, current NMFS practice, regarding exposure of marine mammals to high-level in-air sounds, as a potential threshold for Level B harassment, is at or above 90 dB re 20 µPa for harbor seals and at or above 100 dB re 20 µPa for all other pinniped species. Since, as noted above, background sound levels in Trinidad Bay are anticipated to frequently exceed the 120 dB (rms) threshold, this analysis evaluates potential effects relative to a background level of 126 dB (rms).

Anticipated 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 and Rodkin (2008) collected data at several different projects with pile sizes ranging from 33 to 183 cm (13 to 72 in). The most representative data from these measurements would be from the Ten Mile River Bridge Replacement Project and the Port of Anchorage Marine Terminal Redevelopment Project. At Ten Mile, 96 cm (30 in) CISS piles were measured in cofferdams filled with water in the Ten Mile River at 33 ft (m) and 330 ft (m) from the piles. The sound level in the water channel ranged from less than 150 to 166 dB (rms). 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 (45.7 cm or 18 in) than the piles measured at Ten Mile.

Illingworth and Rodkin (2008) gathered data at the Port of Anchorage (POA) during the vibratory driving of steel H piles. These data, and data gathered by others, were used as the basis for the Environmental Assessment that was prepared by NMFS for the issuance of an IHA at the POA. These data were summarized in the POA IHA. The POA IHA concluded that average sound levels of vibratory pile-driving sounds would be approximately 162 dB re 1 µPa at a distance of 20 m (65.6 ft). Furthermore, for vibratory pile-driving, the 120 dB level would be exceeded out to about 800.1 m (2,625 ft) from the vibratory hammer.

A selection of additional projects using vibratory hammers was made from the "Compendium of Pile-Driving Sound Data" (Illingworth and Rodkin, 2007). This includes all projects in the compendium that used a vibratory hammer to drive steel pipe piles or H-piles. Data from these projects, and the two project named above are summarized in Table 2 of the IHA application.

Table 2. Sound level data.

Project	Distance (m and ft)	Pile Type	Water Depth	dB re 1 µPa (rms)
10 Mile	10 m (33 ft)	76.2 cm (30 in) steel pipe	Not stated	166
10 Mile	100.6 m (330 ft)	76.2 cm (30 in) steel pipe	Not stated	Less than 150
Port of Anchorage	20.1 m (66 ft)	H-pile	Not stated	162
San Rafael Canal	10 m (33 ft)	25.4 cm (10 in) H-pile	2.1 m (7 ft)	147
San Rafael Canal	20.1 m (66 ft)	25.4 cm (10 in) H-pile	2.1 m (7 ft)	137
Mad River Slough	10 m (33 ft)	33 cm (13 in) steel pipe	4.9 m (16 ft)	154 to 156
Richmond Inner Harbor	10 m (33 ft)	1.8 m (6 ft) steel pipe	Not stated	167 to 180
Richmond Inner Harbor	29.9 m (98 ft)	1.8 m (6 ft) steel pipe	Not stated	160
Stockton Wastewater Crossing	10 m (33 ft)	0.9 m (3 ft) steel pipe	Not stated	168 to 175
Stockton Wastewater Crossing	20.1 (66 ft)	0.9 m (3 ft) steel pipe	Not stated	166
San Rafael Sea Wall	10 m (33 ft)	25.4 cm (10 in) H-pile	2.1 m (7 ft)	147
San Rafael Sea Wall	20.1 m (66 ft)	25.4 cm (10 in) H-pile	2.1 m (7 ft)	137
Source: Illingworth and Rodkin (2007, 2008)				

Based on these data, the results for 76.2 cm to 0.9 m (30 in to 3 ft) steel pipe driven in water would appear to constitute a conservative representation of the potential effects of driving 45.7 cm (18 in) steel pipe at the Trinidad Pier. Those indicate an rms level of 166 to 175 dB at 10 m (33 ft) from the pile. Calculations in this analysis assume the high end of this range. For this analysis, close to the pile, it is assumed that there would be a 4.5 dB (rms) decrease for every doubling of the distance (practical spreading loss model). Isopleth distances base on this inference are presented in Table 3 of Trinidad Rancheria's IHA application. Figure 1 of the IHA application 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 Level A harassment (injury) threshold for cetaceans or pinnipeds by exceeded, but the specified activities would likely exceed the Level B harassment threshold, which also corresponds to background sound level in the area, throughout Trinidad Harbor. Shielding by headlands flanking the harbor would, however, prevent acoustic impacts to waters outside the harbor that are not on a line-of-sight to the sound source. This effect is shown in Figure 1 of the IHA application.

Noise Levels from Augering – An auger is a device used for moving material or liquid by means of a rotating helical shaft into the earth. An attempt was made to measure the noise from augering out the 76.2 cm (30 in) piles at the Ten Mile Bridge Replacement Project. The levels were below the peak director of the equipment, 160 dB peak, and so measurements were stopped. Augering is expected to generate noise levels at or below the lower end of this range (Illingworth and Rodkin, 2008). Using the uniform "practical spreading model" transmission loss rate of 4.5 dB (rms) per doubling of distance, background sound levels would exceed the Level B harassment threshold at distances of less than 2.4 km (1.5 mi) (see Table 4 and Table 3 of the IHA application).

Table 3. Predicted distances to underwater and in-air acoustic threshold levels for the Trinidad Pier Reconstruction Project.

Construction Activity	Distance from activity to isopleths					
	190 dB (rms)	180 dB (rms)	160 dB (rms)	126 dB (rms)	90 dB in-air for harbor seals	100 dB in-air for all other pinnipeds
45.7 cm (18 in) Pile Vibratory Installation	0.9 m (3 ft)	4.9 m (16 ft)	101.5 m (333 ft)	23.3 km (14.5 mi)	26.5 m (87 ft)	10.5 m (34.5 ft)
Augering	0 m (0 ft)	0.3 m (1 ft)	10.1 m (33 ft)	2.4 km (1.5 mi)	18.3 m (60 ft)	7.3 m (24 ft)
Wood Pile Removal	0 m (0 ft)	0.9 m (3 ft)	21.6 m (71 ft)	5 km (3.1 mi)	26.5 m (87 ft)	10.5 m (34.5 ft)

Noise Levels from Removal of Wood Piles – Removal of the existing wood piles would be accomplished with the use of a vibratory hammer. 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 wood piles is generally lower than steel shell piles. Illingworth and Rodkin (2007, 2008) have had only one opportunity to measure the installation of woodpiles and this was with a 1,360.8 kg (3,000 lb) impact hammer. The levels measured at a distance of 10 m (32.8 ft) were as follows: 172 to 182 dB peak, 163 to 168 dB (rms). For a comparable CISS pile, using a 1,360.8 kg (3,000 lb) drop hammer, the levels measured were 188 to 192 dB peak, 172 to 177 dB (rms). 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 (rms) and 190 dB (rms) are expected to occur in the water at very small distances as a result of pile removal (see Table 4). 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 (rms) at a distance of 20.1 m (66 ft). Using the uniform practical spreading loss model transmission loss rate of 4.5 dB (rms) per doubling of distance, the Level B harassment threshold distance would be 5 km (3.1 miles) (see Table 3 in the IHA application).

Potential for Biological Effects – Based on the foregoing analysis, the proposed action could result in underwater acoustic effects to marine mammals. The injury thresholds for pinnipeds and cetaceans would not be attained, but the acoustic background level in the area, 126 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. Effects distances for these activities are shown in Table 3 of the IHA application, and range up to 23.3 km (14.5 mi). The duration of exposure varies between activities.

Table 4. Noise generating activities.

Construction Activity	Number of piles	Time per pile	Duration of activity	Number of days when activity occurs	126 dB (rms) isopleth distance
45.7 cm (18 in) pile vibratory installation	115	0:15	28:45	58	23.3 km (14.5 mi)
Augering	115	1:00	115:00	58	2.4 km (1.5 mi)
Wood pile removal	205	0:40	136:40	58	5 km (3.1 mi)

Pile installation would occur for approximately 30 min (up to two piles would be driven each day at up to 15 min drive time per pile) on each of 58 days (see Table 5 above and Table 4 of the IHA application), resulting in sound levels exceeding the behavioral effect threshold within 23.3 km (14.5 mi) of the activity.

Pile removal is a quieter activity performed for a longer time: approximately 136 hours and 40 minutes distributed evenly over 58 days, or about 2.5 hours on each day when the activity occurs. Sound levels would exceed the behavioral effect threshold within 5 km (3.1 mi) of the activity.

Augering the least-noisy activity, is estimated to require 1 hour for each of 115 piles with activity occurring on each of 58 days evenly distributed during a 180 day period, or about two hours on each day when the activity occurs. Sound levels would exceed the behavioral effect threshold within 2.4 km (1.5 mi) of the activity. These activities could be performed on the same day, but are expected to normally occur on consecutive days, with a cycle of pile removal – pile installation – augering – grouting occurring as each of 25 successive bents is placed.

As shown in Figures 1 and 2 of the IHA application, Trinidad Bay is protected from waves coming from the north and west, but open to coastline on the south. The coast extending to the south, and the rocky headland to the west of the pier, would shield waters from the acoustic effects described above except within the bay itself. These topographic considerations result in a situation such that underwater noise-generating activities would produce elevated underwater sound within most of the bay itself, but would have a minor effect on underwater sound levels outside the bay.

Seals outside of Trinidad Harbor and more than 1.6 to 3.2 km (1 to 2 mi) offshore are likely already exposed to and habituated to loud machinery noise in the form of deep-draft vessel traffic along the coast; such vessels may produce noise levels on the order of 170 to 180 dB (rms) at 10 m and thus have areas of effect comparable to the 23.3 km (14.5 mi) radius of effect calculated for vibratory pile-driving noise. In this context, the 23.3 km (14.5 mi) radius of effect is likely unrealistic, just as it is likely unrealistic to think that these seals alter their behavior in response to the passage of a large vessel 23.3 km (14.5 mi) away. Behavioral considerations suggest that the seals would be able to determine that a noise source does not constitute a threat if it is more than a couple of miles away, and the sound levels involved are not high enough to result in injury (Level A harassment). Nonetheless, these data suggest that pile-driving may affect seal behavior throughout Trinidad harbor, i.e., within approximately 1.6 km (1 mi) of the proposed activity. The nature of that effect is unpredictable, but logical responses on the part of the seals include tolerance (noise levels would not be loud enough to induce temporary threshold shift in harbor seals), or avoidance by using haul-outs or by foraging outside the harbor.

With regard to noises other than pile-driving (i.e., pile removal, augering, and construction noise), estimation of biological effects depends on the characteristics of the noise and the behavior of the seals. The noise is qualitatively similar to that produced by the engines of fishing vessels or the operations of winches, noises to which the seals are habituated and which they in fact regard as an acoustic indicator signaling good foraging opportunities near the pier. There are no data about the magnitude of this acoustic indicator, but the noise produced by the fishing vessel engines entering or leaving the harbor is likely not less than 150 dB (rms) at 10 m, though it will be quieter as vessels "throttle back" near the pier. This level (150 dB [rms]) is the same as the estimated noise level from augering, and 15 dB less than the estimated noise level from pile removal. In this context, behavioral responses due to augering are not likely, except that initially seals might approach the work area in anticipation of foraging opportunities. Such behavior would likely cease once the seals learned the difference between the sound auger and that of a fishing vessel. Behavioral responses in the form of avoidance due to pile removal might occur within a distance of about 50 m (164 ft) from the proposed activity, but the area so affected constitutes a small fraction of Trinidad Harbor and has no haul-outs; thus very few seals would be expected to be affected.

In-Air Noise – The principal source of in-air noise would be the vibratory pile driver used to extract old wood piles and to place the new CISS piles. Laughlin (2010) has recently reported unweighted sound measurements from vibratory pile drivers used to place steel piles at two projects involving dock renovation for the Washington State Ferries. In both projects, noise levels were measured in terms of the 5 min average continuous sound level (Leq). Frequency-domain spectra for the maximum sound level (Lmax) were also measured. The Leq measurements in this case were equivalent to the unweighted rms sound level, measured over a 5 min period.

At the Wahkiakum County Ferry Terminal, one measurement station was used to take measurements of the vibratory placement (APE hammer) of one 45.7 cm (18 in) steel in-water pile, the same size that would be placed during the Trinidad Pier renovation. At the Keystone Ferry Dock renovation, four measurement stations were used to take measurements of the vibratory placement (APE hammer) of one 76.2 cm (30 in) steel in-water pile. At both sites,

piles were placed in alluvial sediments, whereas the Trinidad Pier piles would be placed in pre-bored holes in sandstone. Results from the Wahkiakum and Keystone piles (Laughlin, 2010) are shown in Table 5 of the IHA application.

Based on these data (Laughlin, 2010), in-air noise production during pile-driving at the Trinidad Pier will likely be between 87.5 and 96.5 dB re 20 µPa unweighted at 50 ft. For the purpose of the analysis presented below, it is assumed that in-air noise from vibratory pile-driving would produce 96 dB (rms) unweighted. This noise would be produced during both pile removal and pile placement activities. The augering equipment produces slightly less noise, 92 dB (rms) unweighted (WSDOT, 2006). All other power equipment that would be used as part of the proposed action (e.g., trucks, pumps, compressors) produces at least 10 dB less noise and thus has much less potential to affect wildlife in the area.

In contrast, background noise levels near the Trinidad Pier are already elevated due to normal pier activities. Marine mammals at Trinidad Bay haul-outs are presumably habituated 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 82 to 86 dB (unweighted) at 15.2 m (50 ft) for periods of up to several hours at a time. Accordingly 82 dB (unweighted) is chosen as the background level for noise near the pier.

Effects on Pacific Harbor Seals – In-air sound attenuates at the rate of approximately 5 dB/km for a frequency of 1 kHz, air temperature of 10° C (50° F), and relative humidity of 80 percent (Kaye and Laby, 2010). These conditions approximate winter weather in Trinidad. Under these conditions, the noise of the vibratory pile-driver would attenuate to approximately 82 dB at approximately 2.8 km (1.7 mi) from the pier. Attenuation, which is proportional to frequency, would be reduced at lower frequencies, and would be much greater at higher frequencies. Attenuation would also be greater at locations where headlands or sea stacks interfere with sound transmission, as shown in Figure 1 of the IHA application. Accordingly, the sounds produced by pile extraction, augering, and pile replacement would exceed background levels within almost all of Trinidad Harbor.

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 through January 31, 2010) (see Table 4 of the IHA application). 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 radius of effect around the pile-driving activity. Harbor seals haul-out on rocks and at small beaches at many locations that are widely dispersed within Trinidad Bay; the closest such haul-out is 70 m (229.7 ft) from the pier, while the most distant is over 1 km (0.6 mi) away near the south end of Trinidad Bay.

Behavioral effects could result to all seals that were in the water within the area of effect during the portion of the day when piles were being driven (typically two piles per day). For instance, if seals spent 10 percent of the day in the water within the radius of effect, and assuming that the number of seals present that day was approximately 37 (as discussed above in the context of data presented by Goley *et al.* [2007]), then about 3.66 seals would be affected by each of two pile

drives. Because the drives occurred during different parts of the day, different seals would likely be affected, resulting in a total impact on that day to seven or eight seals.

The 10 percent estimate given above for the time seals spend within the radius of effect is a representative figure for the purposes of illustration. There are no data available on relative seal use of the haul-outs in Trinidad Bay, versus their use of waters in Trinidad Bay, versus their use of waters or haul-outs elsewhere. The radius of effect is only a small fraction of Trinidad Bay, and only a fraction of the rocks that comprise the Indian Beach haul-out described in Goley *et al*. (2007) are within that radius of effect. However, it is known that during winter months (when the proposed construction is scheduled to occur), seal use of the haul-outs in Trinidad Bay likely declines because the seals spend a larger fraction of their time at sea, foraging in offshore waters (Goley, 2007). Figure 1 of the IHA application shows that topographic shielding by headlands blocks a large area of offshore habitat from potential underwater construction noise effects.

Impacts attributable to pile removal would be similar to those of pile-driving, but pile removal would occur for a total of approximately 2.5 hours per day on each of 58 days (see Table 4 of the IHA application). Subject to the same assumptions as described above, but this time with the activity being performed on an average of 3.5 piles per day, about 3.66 seals would be affected by each of 3.5 pile removal events for a total daily impact to 13 seals.

Impacts attributable to augering would also be similar, but augering would occur for a total of approximately two hours per day on each of 58 days. Subject to the same assumptions as described above, but this time with the activity being performed on an average of two piles per day, about seven or eight seals would be affected by each of two augering events for a total daily impact to seven or eight seals. These numbers would vary if more or fewer seals were present in the area of effect, and if seals spent more or less of their time in the water rather than on the haul-out.

Although harbor seals could also be affected by in-air 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 82 dB at 15.2 m (50 ft) for periods of up to several hours at a time. The operation of loud equipment, including the vibratory pile-driving rig and the auger, are above and outside of the range of normal activity at the pier and have the potential to could cause seals to leave a haul-out in Trinidad Bay. This would constitute Level B harassment (behavioral). To date, such behavior by harbor seals has not been documented in Trinidad Bay in response to current levels of in-air noise and activity in the harbor, but does have the potential to occur. On the contrary, seals have been documented often approaching the pier during normal fishing boat activities in anticipation of feeding opportunities associated with the unloading of fish and shellfish. This circumstance suggests seal habituation to existing noise levels encountered near the pier.

Based on these examples it appears likely that few harbor seals at haul-outs would show a behavioral response to noise at the pier, particularly in view of their existing habituation to noise

activities at the pier. The great majority of haul-out locations in Trinidad Bay are at least 304.8 m (1,000 ft) from the pier, but one minor haul-out is 70.1 m (230 ft) from the pier (Goley, pers. comm.). In view of the relatively large area that would be affected by elevated in-air noise, it appears probable that some seals could show a behavioral response, despite their habituation to current levels of human-generated noise; incidental take by this mechanism may amount to an average of one seal harassed per day, when the activities of pile removal, augering, or pile placement are occurring (in addition to the seals harassed by underwater noise).

Harbor seal presence in the activity area is perennial, with daily presence of an average of approximately 37 seals at a nearby haul-out during the months when the activity would occur. The fraction of these seals that would be in the activity area is difficult to estimate. Traditionally the seals have regarded the pier as a prime foraging area due to the recreational fishing activity and the unloading of fishing boats that occur there. During the construction period, however, these activities would cease, and it is plausible that the seals would modify their foraging behavior accordingly. Based on the analysis in the IHA application and here in this EA, seals would be affected once per day on each of 116 days when pile-driving or augering occurred, 13 seals would be affected per day on each of 58 days when pile removal occurred, and one seal would be affected by in-air sound on each of 164 days when pile removal, installation, or augering occurred. The potentially affected seals include adults of both sexes. Goley *et al*. (2007) states that the seals are year-round residents; that they are non-migratory, dispersing from a centralized location to forage; and that they exhibit high site fidelity, utilizing one to two haul-out sites within their range and rarely traveling more than 25 to 50 km (15.5 to 31.1mi) from these haul-outs. The winter population of seals in Trinidad Bay seems to consist mostly of resident seals (Goley *et al*., 2007), so it is likely that most seals in the population would be affected more than once over the course of the proposed construction period. It is therefore possible that some measure of adaptation or habituation would occur on the part of the seals, whereby they would tolerate elevated noise levels and/or utilize haul-outs relatively distant from construction activities. There are a large but inventoried number of haul-outs within Trinidad Bay, so such a strategy is possible, but it is difficult to predict whether the seals would show such a response.

Project scheduling avoids sensitive life history phases of harbor seals. Project activities producing underwater noise would commence in August. This is after the end of the annual molt, which normally occurs in June and July. Project activities producing underwater noise are scheduled to terminate at the end of January, which is a full month before female seals begin to seek sites suitable for pupping.

Effects on California Sea Lions – California sea lions, although abundant in northern California waters, have seldom been recorded in Trinidad Bay (i.e, there is little published information or data with which to determine how they use Trinidad Bay). The low abundance in the area may be due to the presence of a large and active harbor seal population there, which likely competes with the sea lions for foraging resources. 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. Observed use of the area by California sea lions amounts to less than one percent of the number of harbor seals (Goley, pers. comm.); assuming a one percent utilization rate, total

impacts to California sea lions amount to one percent of the effects of harbor seals, described above.

There is a possibility of behavioral effects related to project acoustic impacts, in the event of California sea lion presence in the activity area. Based on an interview with Dr. Dawn Goley (pers. comm.), California sea lions have been seen in the activity area, albeit infrequently, and there are no quantitative estimates of the frequency of their occurrence. Assuming that they are present with one percent of the frequency of harbor seals, it is possible California sea lions might be subject to behavioral harassment up to one percent of the levels described for harbor seals. The potentially affected sea lions include adults of both sexes.

Effects on Eastern Pacific Gray Whales – Goley *et al*. (2007) list the sighting rates for gray whales during eight 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. The majority of these detections were within 2 km (1.2 mi) of the shoreline (Goley *et al*., 2007). These data suggest that the effect rate for gray whales would be approximately 0.21 whales per hour. Since vibratory pile-driving of CISS piles would occur for a total of approximately 28.75 hours (115 piles at 15 min drive time apiece; see Table 4 of the IHA application), vibratory pile-driving activities would be expected to affect 0.21 x 28.75 = 6.04 or approximately six gray whales.

Acoustic effects would be expected to result from pile removal, which is a quieter activity performed for a longer time. Approximately 205 piles will be removed, with 40 min of vibratory pile driver noise for each pile, resulting in a total exposure of 136.67 hours (see Table 4 of the IHA application). Thus this activity would be expected to affect 6.04 x 136.7/28.75 = 28.7 or approximately 29 gray whales.

Acoustic effects would also be expected to result from pile augering, which is an even quieter activity. There will be 115 holes augered, with one hour of noise for each hole, resulting in a total exposure of 115 hours (see Table 4 of the IHA application). Thus this activity would be expected to affect 6.04 x 115/28.75 = 24.2 or approximately 24 gray whales. No mechanism other than underwater sound generation is expected to affect gray whales in the action area.

The most likely number of gray whales that would be taken is 59. Based on the low detection rate of 0.21 whales per hour (Goley *et al*., 2007), most of these take events would likely be independent, whales and would likely occur with adults of both sexes.

The potential effects to marine mammals described in this section of the document do not take into consideration the proposed monitoring and mitigation measures described later in this document (see the “Mitigation” and “Monitoring and Reporting” sections) which, as noted are designed to effect the least practicable impact on affected marine mammal species or stocks.

4.2.2 Estimated Take by Harassment

Except with respect to certain activities not pertinent here, the MMPA defines "harassment" as:

> Any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding or sheltering [Level B harassment].

Based on the NMFS's assessment of the potential effects of the specified activities on marine mammals likely to occur within the action area, NMFS determined that incidental harassment of Pacific harbor seals, California sea lions, and Eastern Pacific gray whales is anticipated for the following reasons:

(1) Surveys have demonstrated that harbor seals are almost always present within the area that would be affected by underwater sound. Thus, it is not possible to avoid affecting harbor seals at an exposure level below the Level B harassment threshold. Potential effects to harbor seals have been minimized by constructing during a period when sensitive life history stages (pupping and molting) do not occur, and by using construction methods that generate the lowest practicable levels of underwater sound.

(2) California sea lions are found among the harbor seals, at about one percent of the harbor seal abundance; thus there is a substantial risk of incidentally affecting California sea lions at the same times and by the same mechanisms at an exposure level above the Level B harassment threshold that harbor seals are affected.

(3) Gray whales have a high likelihood of occurring in Trinidad Bay during the proposed construction period. They may not be detected by PSOs if they occur near the outer limits of the area of Level B harassment impact zone.

(4) The area has a high incidence of harbor fog, which complicates successful detection of animals when they enter waters where they may be exposed to sound levels in excess of the Level B harassment threshold. Dense fog is a common occurrence in this area in all seasons of the year. In 2008, for instance, the NOAA weather station in nearby Eureka reported 63 days of fog with visibility less than 0.4 km (0.25 mi), and 176 cloudy days. Local anecdotal reports indicate that the incidence of fog is much higher on the harbor waters than on the adjacent uplands. Attempting to only perform underwater sound generating activities during periods of high visibility is therefore impracticable, as it would greatly prolong the time required for construction. For this reason it is possible that marine mammals may enter waters where they may be exposed to sound levels in excess of the Level B harassment threshold without being detected by PSOs. This is why the Marine Mammal Monitoring Plan (see Appendix C of the IHA application) provides for work stoppage when visibility is less than 30.5 m (100 ft), and provides for auditory detection (for both cetacean and pinniped monitoring) in conditions of reduced visibility and assumes that any auditory direction represents an animal that is within the area with sound levels in excess of the Level B harassment threshold.

Incidental take estimates are based on estimates of use of Trinidad Bay by various species as reported by Goley (2007 and pers. comm.). All reconstruction activities generating underwater sound during the project are expected to exceed background sound levels through Trinidad Bay. Table 5 of this document outlines the number of marine mammals that might be taken by Level B harassment from the various activities (both in-air and underwater estimates are provided for pinnipeds).

Table 5. Summary of the noise production and anticipated incidental take by Level B harassment for the Trinidad Rancheria's proposed action generating in-air and underwater noise.

Variable	Wood Pile Removal		Augering		Vibratory Pile Installation	
	Underwater Noise	In-Air Noise	Underwater Noise	In-Air Noise	Underwater Noise	In-Air Noise
Sound Amplitude	156.5 dB (rms) at 10.1 m (33 ft)	104 dB at 50 ft	150 dB (rms) at 15.2 m (50 ft)	94 dB at 50 ft	175 dB (rms) at 10.1 m (33 ft)	104 dB at 50 ft
Sound Duration Per Day (hours)	2.5		2		0.5	
Activity Frequency Per Day	2		3.5		2	
Number of Days*	58		58		58	
Total Hours of Exposure	145		116		29	
Incidental Take of Harbor Seals Per Day	13	1	7 or 8	1	7 or 8	1
Incidental Take of Harbor Seals Total	754	58	435	58	435	58
Incidental Take of California Sea Lions Total	7.5	0.6	4.4	0.6	4.4	0.6
Incidental Take of Gray Whales	28.7	0	28.7	0	6.04	0
Note: *No two activities would be performed on any given day.						

4.2.3 Effects to the Social and Economic Environment

The proposed action is NMFS's issuance of an IHA to the Trinidad Rancheria authorizing the harassment of marine mammals incidental to the pile-driving and renovation operations associated with the Trinidad Pier Reconstruction Project. As described in Chapter 3, there is no commercial, recreational, or subsistence use of marine mammals within the action area. Therefore, the proposed action is not anticipated to effect the social and economic environment.

4.2.4 Effects on the Physical Environment

The issuance of an IHA authorizing harassment to marine mammals would not affect the physical environment. The Trinidad Rancheria is authorized to conduct the project under an ACOE permit. NMFS's authorization solely authorizes take, by Level B harassment, of marine mammals incidental to a specified activity in a specified geographic region. NMFS has determined that the issuance of an IHA for the taking of marine mammals incidental to the Trinidad Pier Reconstruction Project will not have an adverse impact on EFH, therefore, an EFH consultation is not required

Potential Effects of Activities on Marine Mammal Habitat

The anticipated adverse impacts upon habitat consist of temporary changes to water quality and the acoustic environment, as detailed in the IHA application and Appendix B of the BA. These changes are minor, temporary, and limited in duration to the period of construction. No restoration is needed because, as detailed in Section 6.1.6 of the BA, the project would have a net beneficial effect on habitat in the activity area by removing an existing source of stormwater discharge and creosote-treated wood. No aspect of the proposed project is anticipated to have any permanent effect on the location of seal and sea lion haul-outs in the area, and no permanent change in seal or sea lion use of haul-outs and related habitat features is anticipated to occur as a result of the proposed project.

The temporary impacts on water quality and acoustic environment and the beneficial long-term effects are not expected to have any permanent effects on the populations of marine mammals occurring in Trinidad Bay. The area of habitat affected is small and the effects are temporary, thus there is no reason to expect any significant reduction in habitat available for foraging and other habitat uses for marine mammals.

Although artificial, the pier functions as a habitat feature. There would probably be a temporary cessation of seal activity in the immediate vicinity of the pier. It is not clear at this time how this would affect seal behavior. The fishing vessels that normally use the pier during the months when construction would occur have two options; they can either transfer their cargoes to smaller vessels capable of landing at the existing boat ramp (which is on the east side of the rocky headland just east of the pier, a few hundred feet away), or they can make temporary use of pier facilities approximately 32.2 km (20 mi) to the south, in Eureka. Vessels opting to travel to Eureka would likely represent a lost foraging opportunity for seals using Trinidad Bay.

NMFS anticipates that the action will result in no impacts to marine mammal habitat beyond rendering the areas immediately around the Trinidad Pier less desirable during pile-driving and pier renovation operations as the impacts will be localized. Impacts to marine mammal, invertebrate, and fish species are not expected to be detrimental.

4.3 SUMMARY OF COMPLIANCE WITH APPLICABLE LAWS, NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS

As summarized below, NMFS has determined that the proposed IHA is consistent with the purposes, policies, and applicable requirements of the NEPA, MMPA, ESA, MSFCMA, and NMFS regulations. NMFS issuance of the permit would be consistent with the MMPA and ESA.

4.3.1 National Environmental Policy Act

In compliance with the NEPA of 1969 (42 U.S.C. 4321 *et seq*.), NMFS has prepared this EA analyzing the effects of the proposed action (i.e., issuance of an IHA) on the human environment. Based on the analyses in the EA, NMFS has not identified any significant impacts on the human environment resulting from issuance of the IHA. The EA will serve as the basis for preparing a Finding of No Significant Impact and not publishing a notice of intent to prepare an EIS.

4.3.2 Marine Mammal Protection Act

The Trinidad Rancheria submitted an application for an authorization under section 101(a)(5)(D) of the MMPA, which was consistent with applicable issuance criteria in the MMPA and NMFS implementing regulations. The views and opinions of scientists or other persons or organizations knowledgeable of the marine mammals that are the subject of the application or of other matters germane to the application were considered, and support NMFS's determinations regarding the application. In summary, NMFS has determined that the proposed action will result in short-term behavioral changes to marine mammals in-water (e.g., avoidance, change in behavioral patterns at time of exposure) in response to pile-driving during the Trinidad Rancheria's project. Hence, the Trinidad Rancheria's specified activities will result in the incidental take of small numbers of marine mammals, by Level B harassment only, and the total taking will have a negligible impact on the affected species or stocks.

An incidental take authorization issued by NMFS would contain standard terms and conditions stipulated in the MMPA and NMFS's regulations. As required by the MMPA, the authorization would specify:

(1) the location and effective date of the authorization;
(2) the number and kinds (species and stock) of marine mammals that may be taken;
(3) the manner in which they may be taken;
(4) appropriate mitigation measures designed to minimize impacts to affected marine mammals;
(5) a monitoring plan designed to detect impacts or lack thereof; and
(6) reporting requirements.

4.3.3 Endangered Species Act

On July 13, 2009, NMFS Southwest Regional Office (SWRO) received the U.S. Army Corps of Engineers (ACOE) July 9, 2009, letter and BA, requesting initiation of informal consultation on the issuance of a Clean Water Act Section 404 permit to the Trinidad Rancheria to allow in-water work associated with the action. The BA and informal consultation request were submitted for compliance with section 7(a)(2) of the ESA, as amended (16 U.S.C. 1531 *et seq*.), and its implementing regulations (50 CFR 402). On October 27, 2009, NMFS SWRO issued a Letter of Concurrence, concurring with the ACOE's determination that the proposed action is not likely to adversely affect Federally threatened Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*), California Coastal (CC) Chinook salmon (*Onchorhynchus tshawytscha*), and Northern California (NC) steelhead (*Onchorhynchus mykiss*).

On November 30, 2009, the NMFS SWRO issued a separate letter assessing project effects relative to marine mammals protected under the Federal ESA. NMFS's letter concurred with the ACOE's determination that the proposed action may affect, but is not likely to adversely affect the Federally threatened Eastern stock of Steller sea lion (*Eumetopias jubatus*). The USFWS has informed the ACOE that a formal section 7 consultation is not necessary for any of their jurisdictional species (i.e., no ESA-listed species are likely to adversely affected).

4.3.4 Magnuson-Stevens Fishery Conservation and Management Act, Essential Fish Habitat (EFH)

The ACOE requested consultation on EFH, pursuant to the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267, 16 U.S.C 1801 *et seq*.) and its implementing regulations 50 CFR 600.920(a). The ACOE determined that the proposed action would adversely affect EFH for species managed under the Pacific Coast Salmon, Pacific Coast Groundfish, and Coastal Pelagics Fishery Management Plans. NMFS SWRO determined that the proposed action would adversely affect EFH for species managed under the Pacific Coast Salmon, Pacific Coast Groundfish, and Coastal Pelagics Fishery Management Plans. Habitat will be lost during removal of wooden pilings; however, NMFS expected recolonization of the new pilings within a year. NMFS believes the proposed action has been designed to minimize and reduce the magnitude of potential effects during implementation of the proposed action. Therefore, NMFS provides no additional conservation recommendations. In addition, NMFS expects EFH will improve in the vicinity of the pier due to the following:

(1) removal and replacement of creosote-treated wooden piles with CISS concrete pilings;
(2) a stormwater collection and treatment system where all stormwater will be collected and routed by gravity feed to an upland treatment cell that will provide detention, settling, and active filtering prior to complete infiltration;
(3) reduced artificial lighting effects; and
(4) the Humboldt State University marine lab water intake associated with the pier will be fitted with NMFS-approved screens, minimizing the risk of entrainment of small prey fish species.

NMFS Office of Protected Resources determined that issuance of an IHA for the construction and renovation project will not affect EFH. Therefore, an EFH consultation was not conducted for the issuance of an IHA, allowing the take of marine mammals.

4.3.5 Coastal Zone Management Act

The California Coastal Commission has determined that the Trinidad Pier Reconstruction Project is consistent with the Coastal Zone Management Act (CZMA). NMFS has identified a negative determination for the Coastal Zone Management Act and a consistency determination under the CZMA is not required.

4.4 MITIGATION MEASURES

In order to issue an Incidental Take Authorization (ITA) under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses.

The activity proposed by the applicant includes a variety of measures calculated to minimize potential impacts on marine mammals, including:

- Timing the activity to occur during seasonal lows in marine mammal use of the activity area;
- Limiting activity to the hours of daylight (approximately 7 a.m. to 7 p.m., with noise generating activities only authorized from one-half hour after sunrise until one-half hour before sunset);
- Use of a vibratory hammer to minimalize the noise of piling and removal and installation; and
- Use of trained PSOs to detect, document, and minimize impacts (i.e., start-up procedures [short periods of driver use with intervening pauses of comparable duration, performed two or three times, before beginning continuous driver use], possible shut-down of noise-generating operations [turning off the vibratory driver or auger so that in-air and/or underwater sounds associated with construction no longer exceed levels that have the potential to injure marine mammals]) to marine mammals, as detained in the Marine Mammal Monitoring Plan (see Appendix C of the IHA application) and in paragraphs (1)-(8) of the monitoring and reporting provisions found in the Monitoring and Reporting section (below).

Timing Constraints for Underwater Noise

To minimize 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, 2011 to May 1, 2012. The IHA for noise-generating reconstruction activities that have the potential to result in the incidental take of marine mammals will expire on January 31, 2012. Avoiding periods when marine mammals are in the action area is another mitigation measure to protect marine mammals from pile-driving and renovation operations.

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

More information regarding the Trinidad Rancheria's monitoring and mitigation measures, as well as research conducted, (i.e., noise study for potential impacts to marine mammals and fish; potential impacts to historical, archeological and human remains; potential impacts to water quality during reconstruction activities; potential impacts to substrate and water quality during tremie concrete seal pouring; and potential temporary impacts to public access to the pier during construction operations) for the Trinidad Pier Reconstruction Project can be found in Appendix B of the IHA application. NMFS has carefully evaluated the applicant's proposed mitigation measures and considered a range of other measures in the context of ensuring that NMFS prescribes the means of effecting the least practicable adverse impact on the affected marine mammal species and stocks and their habitat. NMFS's evaluation of potential measures included consideration of the following factors in relation to one another:

- The manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts to marine mammals;
- The proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and
- The practicality of the measure for applicant implementation.

Based on review of the application and supporting documentation, public comment, and NMFS experience in issuing similar IHAs, NMFS believes the foregoing mitigation measures in conjunction with the monitoring measures specified below would be feasible and effective at minimizing the potential adverse effects to marine mammal species and their habitat.

4.5 MONITORING AND REPORTING MEASURES

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth "requirements pertaining to the monitoring and reporting of such taking." The MMPA implementing regulations at 50 CFR 216.104(a)(13) indicate that requests for IHAs must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the action area.

Consistent with NMFS procedures, the following marine mammal monitoring and reporting shall be performed for the proposed action:

(1) A NMFS-approved or –qualified Protected Species Observer (PSO) shall attend the project site one hour prior until one hour after construction activities cease each day throughout the construction window.

(2) The PSO shall be approved by NMFS prior to reconstruction operations.

(3) The PSO shall search for marine mammals within behavioral harassment threshold areas as identified within the acoustic effect thresholds in Section 6 of Trinidad Rancheria's

IHA application. The area observed shall depend upon the type of underwater sound being produced (e.g., pile extraction, augering, or pile installation). No practicable technology exists to allow for monitoring beyond the visual range at which seals and sea lions can be detected using binoculars (approximately 0.8 km [0.5 mi]), depending on visibility and sea state. The estimated maximum distance at which PSOs will be able to visually detect gray whales is about 1.6 km (1 mi).

(4) The PSO shall be present on the pier during pile-extraction, pile-driving, and augering to observe for the presence of marine mammals in the vicinity of the proposed specified activity. All such activity will occur during daylight hours (i.e., 30 min after sunrise and 30 min before sunset). If inclement weather limits visibility within the area of effect, the PSO will perform visual scans to the extent conditions allow, but activity will be stopped at any time that the observer cannot clearly see the water surface out of a distance of at least 30.5 m (100 ft) from the proposed activity. In conditions of good visibility, PSOs will likely be able to detect pinnipeds out to a range of approximately 0.8 km (0.5 mi) from the pier, and to detect whales out to a range of approximately 1.6 km (1.0 mi) from the pier. Animals at greater distances likely would not be detected.

(5) Visibility is a limiting factor during much of the winter in Trinidad Bay. As discussed in the BA, shut-downs during times of fog could well result in prolonging the construction period into the beginning of the pupping season for harbor seals. The estimated distances for Level A harassment do not exceed 4.9 m (16 ft) from the activity. The proposed activities could shut-down if visibility is so poor that seals cannot be detected when they are at risk of injury (i.e., if visibility precludes observation of the area within 30.5 m [100 ft] of the pier). During the 30 min prior to the start of the noise-generating activities and the quiet periods between individual noise-generating activities, auditory monitoring may be highly effective for detecting gray whales but probably less effective for harbor seals and California sea lions.

(6) The PSO will also perform auditory monitoring, and will report any auditory evidence of marine mammal activity. Auditory detection will be based only on the use of the human ear (without technological assistance). Auditory monitoring is effective for detecting the presence of gray whales in close proximity to the proposed action area (e.g., blows, splashes, etc.). Close proximity varied depending on how loud the sound produced by the gray whale is, and on the in-air transmission loss rate. Auditory monitoring prior to the start of the noise-generating activity occurs in the absence of masking noise and thus helps to ensure that the auditory monitoring is effective. Auditory monitoring is only likely more effective than visual monitoring under conditions of low visibility (i.e., fog) since work would only occur during daylight hours, at which times the transmission loss rate is very low. Note that there will also be many quiet periods between individual noisy activities, during which whales can be detected. Most of the work day is spent in preparing for a few noisy intervals. Auditory monitoring is less effective for detecting the presence of pinnipeds.

(7) The PSO will scan the area of effect for at least 30 min continuously prior to any episode of pile-driving to determine whether marine mammals are present, and will continue to

scan the area during the period of pile-driving. The scan will continue for at least 30 min after each in-water work episode has ceased. The scan will involve two visual "sweeps" of the area using the naked eye and binoculars. Typically, the sweep would be conducted slowly as follows: one sweep going from left to right and the other returning from right to left. The length of time it takes to do the sweep will depend on the amount of area that needs to be covered, weather conditions, and the time it takes the monitor to thoroughly survey the area.

(8) Pile removal, augering, and pile placement activities will shut-down if any cetaceans or pinniped is about to enter or within the exclusion zone determined by the estimated Level A harassment thresholds (see Table 3 for estimated distances). Since the proposed activities would produce sound levels that have the unlikely potential to result in Level A harassment (due to the very small radii of effect), a measure such as a shut-down may be unnecessary, but it would be appropriate for the Trinidad Rancheria to shut-down and consult with NMFS if measurements indicate that any activities attain sound levels that reach the Level A harassment threshold. If any other marine mammals are observed within the area of effect, pile-driving will not commence. If a marine mammal swims into the area of effect during pile-driving, the PSO will identify the animal and, if it's not a harbor seal, will notify the Project Engineer who will notify the Contractor, and pile-driving will stop (i.e., shut-down). If the animal has been observed to leave the area of effect, or 15 min for pinnipeds and 30 min for cetaceans have passed since the last observation of the animal, pile-driving will proceed. Visual observation of the area of effect (approximately 47 km [29 mi]) is limited to the area that can be practicably observable for animals to be detected, which is approximately 0.8 km (0.5 mi) for pinnipeds and 1.6 km (1 mi) for gray whales.

(9) Whenever a construction halt is called due to marine mammal presence in the area, the Project Engineer (or their representative) shall immediately notify the designated NMFS representative.

(10) If marine mammals are sighted by the PSO within the Level A and/or Level B harassment acoustic threshold areas, the PSO shall record the number of marine mammals within the threshold area and the duration of their presence while the noise-generating activity is occurring. The PSO will also note whether the marine mammals appeared to respond to the noise and if so, the nature of that response. The PSO shall record the following information: date and time of initial sighting, tidal stage, weather, conditions, Beaufort sea state, species, behavior (activity, group cohesiveness, direction and speed of travel, etc.), number, group composition, distance to sound source, number of animals impacted, construction activities occurring at time of sighting, and monitoring and mitigation measures implemented (or not implemented). The observations will be reported to NMFS in a letter report to be submitted on each Monday, describing the previous week's observations.

(11) A final report will be submitted summarizing all in-water construction activities and marine mammal monitoring during the time of the authorization, and any long term impacts from the project.

A written log of dates and times of monitoring activity will be kept. The log shall report following information:

- Time of observer arrival on site;
- Time of the commencement of underwater noise generating activities, and description of the activities (e.g., pile removal, augering, or pile installation);
- For harbor seal observations, notes on seal behavior during noise-generating activity, as described above, and on the number and distribution of seals observed in the project vicinity;
- For observations of marine mammals other than harbor seals, the time and duration of each animal's presence in the project vicinity; the number of animals observed; the behavior of each animal, including any response to noise-generating activities; whether activities were halted in response to the animal's presence; and whether, and if so, the time of NMFS notification;
- Time of the cessation of underwater noise generating activities; and
- Time of observer departure from site.

All monitoring data collected during construction will be included in the biological monitoring notes to be submitted weekly by electronic mail. Monthly summary reports will be submitted to NMFS. A report summarizing the construction monitoring and any general trends observed will also be submitted to NMFS within 90 days after monitoring has ended during the period of pier construction.

Underwater Noise Monitoring

Underwater noise monitoring and reporting shall be performed consistent with conditions of Coastal Development Permit 1-07-046. Those conditions are here summarized:

Prior to commencement of demolition and construction authorized by coastal development permit No. 1-07-046, the applicant shall submit a Hydroacoustic Monitoring Plan, containing all supporting information and analysis deemed necessary by the Executive Director for the Executive Director's review and approval. Prior to submitting the plan, to the Executive Director, the applicant shall also submit copies of the Plan to the reviewing marine biologists of the California Department of Fish & Game and the NMFS for their review and consideration.

At a minimum, the Plan shall:

(1) Establish the field locations of hydroacoustic monitoring stations that will be used to document the extent of the hydroacoustic hazard footprint during vibratory extrication or placement of piles or rotary augering activities, and provisions to adjust the location of the acoustic monitoring stations based on data acquired during monitoring, to ensure that the sound pressure field is adequately characterized;

(2) Describe the method of hydroacoustic monitoring necessary to assess the actual conformance of the proposed vibratory extrication or placement of piles or rotary augering with the dual metric exposure criteria in the vicinity of the vibratory extrication or placement of piles or rotary augering locations on a real-time basis,

including relevant details such as the number, location, distances, and depths of hydrophones and associated monitoring equipment.

(3) Include provisions to continuously record noise generated by the vibratory extrication or placement of piles or rotary augering in a manner that enables continuous and peak sound pressure and other measures of sound energy per strike, or other information required by the Executive Director in the consultation with marine biologists of the California Department of Fish & Game and NMFS, as well as provisions to supply all monitoring data that is recorded, regardless of whether the data is deemed "representative" or "valid" by the monitor (accompanying estimates of data significance, confounding factors, etc. may be supplied by the acoustician where deemed applicable). The permit also species reporting protocols, to be developed in cooperation with and approved by representatives of the California Coastal Commission, the California Department of Fish & Game, and NMFS.

The Trinidad Rancheria would notify NMFS Headquarters and the NMFS Southwest Regional Office prior to initiation of the pier reconstruction activities. A draft final report must be submitted to NMFS within 90 days after the conclusion of the Trinidad Pier Reconstruction Project. The report would include a summary of the information gathered pursuant to the monitoring requirements set forth in the IHA, including dates and times of operations, and all marine mammal sightings (dates, times, locations, species, behavioral observations [activity, group cohesiveness, direction and speed of travel, etc.] tidal stage, weather conditions, sea state, activities, associated pier reconstruction activities). A final report must be submitted to the Regional Administrator within 30 days after receiving comments from NMFS on the draft final report. If no comments are received from NMFS, the draft final report would be considered to be the final report.

While the proposed IHA, would not authorize injury, serious injury, or mortality (i.e., Level A harassment), should the applicant, contractor, monitor or any other individual associated with the pier reconstruction project observe an injured or dead marine mammal, the incident (regardless of cause) will be reported to NMFS as soon as practicable. The report should include species or description of animal, condition of animal, location, time first found, observed behaviors (if alive) and photo or video, if available.

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by this Authorization, such as an injury (Level A harassment), serious injury or mortality, Trinidad Rancheria shall immediately cease the specified activities and immediately report the incident to the Chief of the Permits, Conservation, and Education Division, Office of Protected Resources, NMFS, at 301-427-8401 and/or by email to Michael.Payne@noaa.gov and Howard.Goldstein@noaa.gov and the Southwest Regional Stranding Coordinators (Joe.Cordaro@noaa.gov and Sarah.Wilkin@noaa.gov). The report must include the following information:

- Time, date, and location (latitude/longitude) of the incident;
- The type of activity involved;
- Description of the circumstances during and leading up to the incident;

- Status of all sound source use in the 24 hours preceding the incident; water depth; environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, and visibility);
- Description of marine mammal observations in the 24 hours preceding the incident; species identification or description of the animal(s) involved;
- The fate of the animal(s); and photographs or video footage of the animal (if equipment is available).

Activities shall not resume until NMFS is able to review the circumstances of the prohibited take. NMFS shall work with Trinidad Rancheria to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA. Trinidad Rancheria may not resume their activities until notified by NMFS via letter or email, or via telephone.

In the event that Trinidad Rancheria discovers an injured or dead marine mammal, and the lead PSO determines that the cause of the injury or death is unknown and the death is relatively recent (i.e., in less than a moderate state of decomposition as described in the next paragraph), Trinidad Rancheria will immediately report the incident to the Chief of the Permits Conservation, and Education Division, Office of Protected Resources, NMFS, at 301-427-8401, and/or by email to Michael.Payne@noaa.gov and Howard.Goldstein@noaa.gov, and the NMFS Southwest Regional Office (562-980-4017) and/or by email to the Southwest Regional Stranding Coordinators (Joe.Cordaro@noaa.gov and Sarah.Wilkin@noaa.gov). The report must include the same information identified above. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with Trinidad Rancheria to determine whether modifications in the activities are appropriate.

In the event that Trinidad Rancheria discovers an injured or dead marine mammal, and the lead PSO determines that the injury or death is not associated with or related to the activities authorized in Condition 2 of this Authorization (e.g., previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), Trinidad Rancheria shall report the incident to the Chief of the Permits, Conservation, and Education Division, Office of Protected Resources, NMFS, at 301-427-8401, and/or by email to Michael.Payne@noaa.gov and Howard.Goldstein@noaa.gov, and the NMFS Southwest Regional Office (562-980-4017) and/or by email to the Southwest Regional Stranding Coordinators (Joe.Cordaro@noaa.gov and Sarah.Wilkin@noaa.gov), within 24 hours of the discovery. Trinidad Rancheria shall provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network.

4.6 ***ENCOURAGING AND COORDINATING RESEARCH***

Existing knowledge gaps regarding Trinidad Bay harbor seals were identified in discussions with Dr. Dawn Goley, professor, HSU. Dr. Goley noted that the timing and movements of the Trinidad Bay harbor seals are not well understood, and could be better understood by radio tracking studies of representative groups of seals. Dr. Goley also noted that the radio tracking study might help to elucidate that relationship.

4.7 CUMULATIVE IMPACTS

According to CEQ regulations, cumulative impact is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR §1508.7). Cumulative effects analysis in a document prepared for purposes of the NEPA should consider potential cumulative environmental impacts. Cumulative impacts may occur when there is a relationship between a proposed action and other actions expected to occur in a similar location or during a similar time period. This relationship may or may not be obvious. Actions overlapping within close proximity to the proposed action can reasonably be expected to have more potential for cumulative effects on "shared resources" than actions that may be geographically separated. Similarly, actions that coincide temporally will tend to offer a higher potential for cumulative effects.

Cumulative effects refer to the impacts on the environment that result from a combination of past, present, and reasonably foreseeable future projects and human activities. Past, present, and reasonably foreseeable future activities that are likely to affect the human environment in northern California include shipping, commercial fishing, recreational fishing and boating, and military readiness activities. The following summary describes ongoing and proposed activities in northern California that may contribute to cumulative adverse impacts to the biological and physical environment.

The Trinidad Bay provides recreational resources for the residents of California and is therefore subjected to anthropogenic disturbance. These include recreational and commercial vessel traffic, and coastal construction and development. As described in Richardson *et al*. (1995), marine mammals are likely habituated and tolerant to a certain degree of anthropogenic disturbance, including noise. The Trinidad Rancheria project is not likely to add an increment of disturbance which would cumulatively, when combined with other actions, result in significant adverse impacts to marine mammals.

4.7.1 Current Related Projects in Action Area

Issuance of an IHA to the Trinidad Rancheria is not related to other actions with individually insignificant, but cumulatively significant impacts.

4.7.2 Reasonably Foreseeable Future Actions

There are currently no reasonably foreseeable projects planned for this portion of Trinidad Bay under NMFS authority that are not currently ongoing. Any future authorizations will have to undergo the same permitting process and will take the Trinidad Rancheria's project into consideration when addressing cumulative effects. Should NMFS receive an application from applicants requesting authorization to take marine mammals incidental to specified activities in the action area, NMFS would also consider cumulative impacts to the affected species or stock, as required under NEPA.

CHAPTER 5 NEPA CONCLUSIONS

NAO 216-6 contains criteria for determining the significance of the impacts of the proposed action. In addition the Council on Environmental Quality regulations at 40 CFR 1508.27 state that the significance of an action should be analyzed in terms of "context" and "intensity". Significance was determined by considering the context (geographic, temporal, and societal) in which the action would occur, and the intensity of the effects of the action. The evaluation of the intensity included consideration of the magnitude of the impact, degree of certainty in the evaluation, the cumulative impact when the action is related to other actions, the degree of controversy, and consistency with other laws.

Context: For this action the setting is the terrestrial haul-out and breeding habitat of harbor seals near the Trinidad Pier and underwater area of the surrounding Trinidad Bay in Trinidad Rancheria, California. Any effects of this action are limited to this area. The effect of this action on society within this area is on individuals who may directly and indirectly participate in the Trinidad Rancheria's pile-driving and renovation operations and/or recreational fishing and boating,. Because this action is for the authorization of incidental taking for pile-driving and renovation operations of the Trinidad Pier, the context only applies to those individuals involved in this specific activity and less than 6% of the estimated regional population of Pacific harbor seals and less than 1% of the estimated regional population of California sea lions, and Eastern Pacific gray whales.

Intensity: Listing of considerations to determine intensity of the impacts are in 40 CFR 1508.28(b) and in the NAO 216-6, section 6. Each consideration will be considered and addressed in the NMFS Finding of No Significant Impact (FONSI) in order as it appears in the NMFS Instruction 30-124-1 dated July 22, 2005, Guidelines for Preparation of a FONSI. The preferred alternative is the focus of the responses to the questions.

CHAPTER 6 LIST OF PREPARERS AND AGENCIES CONSULTED

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