Channel Islands National Park
California

National Park Service
U.S. Department of Interior

SCORPION PIER REPLACEMENT
DRAFT ENVIRONMENTAL IMPACT STATEMENT

August 2015
Draft

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SCORPION PIER REPLACEMENT

CHANNEL ISLANDS NATIONAL PARK

CALIFORNIA

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Scorpion Pier Replacement
Draft Environmental Impact Statement
Channel Islands National Park, California

Lead Agency: National Park Service, U.S. Department of the Interior

The National Park Service (NPS or Park Service) has prepared the Scorpion Pier Replacement Draft Environmental Impact Statement (EIS) to evaluate the proposed action of replacing and potentially relocating the existing Scorpion Pier at Santa Cruz Island, as well as making improvements to the connecting access road. The key purpose of this action is to create a safe, high-quality, and environmentally responsible welcome and support area that connects visitors to the history of Scorpion Ranch, the most visited destination in Channel Islands National Park. The existing Scorpion Pier, a flatbed railcar installed in 2000 originally intended for only temporary use, is deteriorating and in poor structural condition. Public ferry service to Scorpion Pier is provided several times per day for most of the year by a park concessioner, and the Park Service uses the pier several times per week to transport staff and cargo. The existing pier structure requires visitors to climb ladders above pitching and shifting seas and is located in water that is too shallow for NPS or concessioner boats to safely approach or dock when tides are low or when wave heights are greater than 1 or 2 feet. The planned improvement project is to replace the existing pier so that it provides safer and easier access for the public and NPS staff, provides adequate water depth for concessioner and NPS vessels, and meets basic administrative functional requirements.

This Draft EIS analyzes the potential consequences of three alternatives: the No Action Alternative; Alternative 1, which would replace the existing pier in the same location and make road improvements; and Alternative 2, which would construct a new replacement pier south of the existing location and make minor road improvements. It also proposes mitigation measures to minimize the adverse impacts from construction or operation of the alternatives where such impacts may occur. Road improvements would be more extensive under Alternative 1.

All public comments must be postmarked or transmitted not later than 60 days from the date that the U.S. Environmental Protection Agency publishes notice of filing and release of the Draft EIS in the Federal Register. To conserve resources, the Park Service encourages readers to review the document online. The Draft EIS is available for review on the Project's website: http://parkplanning.nps.gov/ScorpionPier. Paper copies of the Draft EIS are also available for public review at the Office of the Superintendent (1901 Spinnaker Drive, Ventura, California); and at the main branch of the Santa Barbara Public Library (40 East Anapamu Street, Santa Barbara, California).

For further information, please contact the Superintendent by phone at (805) 658-5700, by fax at (805) 658-5799, or by sending a written inquiry to: Superintendent, Channel Islands National Park, Attention: Scorpion Pier Replacement EIS, 1901 Spinnaker Drive, Ventura, California, 93001.

Executive Summary

INTRODUCTION

The National Park Service (NPS or Park Service) proposes to replace and relocate Scorpion Pier, as well as make improvements to the access road, in order to improve park operations, improve the visitor experience, and provide safe access to Santa Cruz Island. The selection of a replacement site, including construction and operations, is hereafter referred to as the Project.

The Park Service prepared this Environmental Impact Statement (EIS) in accordance with the requirements of the National Environmental Policy Act (NEPA) and Director's Order No. 12, *Conservation Planning, Environmental Impact Analysis, and Decision-Making* (DO-12). The Park Service is the lead federal agency under NEPA. It is anticipated that this EIS would be adopted as the California Environmental Quality Act compliance document, with the California State Lands Commission (CSLC) acting as the lead agency.

Scorpion Pier provides access to Santa Cruz Island, the most visited island in Channel Islands National Park. Land ownership on Santa Cruz is split between the Park Service, which owns and manages the eastern 24% of the island, and The Nature Conservancy, which owns and manages the remaining 76% of the island. Scorpion Pier is located on NPS land at the northeastern end of the island within the Scorpion Anchorage, inside the Scorpion Marine Reserve and the Channel Islands National Marine Sanctuary (Sanctuary).

Santa Cruz Island provides numerous recreational opportunities including beach activities, hiking trails, a historic district, a 240-person campground, kayaking, swimming, scuba diving, and snorkeling sites. Scorpion Anchorage is a semi-protected ocean environment that poses challenges in making boat-to-pier transitions safely, particularly during strong ocean swell conditions. The existing Scorpion Pier was only intended as a temporary and relatively low cost solution for providing urgent access following the Park Service's 1996 acquisition of the east end of the island. The existing pier is rapidly deteriorating due to wave action and salt water, and has never fully met administrative or visitor accessibility needs. Disembarkation requires visitors and NPS staff to use ladders in pitching and shifting seas, and it is not safe for boats to approach or dock when tides are low or when wave heights are greater than 1 or 2 feet. The boats are not moored or tied up to the dock because wave action generally makes the boat unsteady; instead, boat operators thrust into contact with the dock during loading and unloading of passengers and cargo. Any adverse swells or surges can easily cause dangerous situations to develop—boat operators are sometimes required to quickly power vessels away from the pier to avoid potential damage or injury.

After disembarking, visitors are required to traverse approximately 400 feet across an access road consisting of a sandy, gravelly, and rocky surface that can be difficult to negotiate, especially for older individuals or visitors with mobility disabilities, while carrying bags, packs, and other gear. This access road must be repaired and re-graded several times per year due to impacts from storms, wave erosion, and the flooding of Scorpion Creek, a nearby seasonal stream.

PROJECT PURPOSE AND NEED

PURPOSE OF THE PROJECT

The overall purpose of the Scorpion Pier Replacement Project (Project) is to provide a safe, high-quality, and environmentally responsible pier and landside approach to allow year-round access to Santa Cruz Island at Scorpion Anchorage in a variety of weather conditions for visitors and NPS staff. The Project should improve the visitor experience; improve the pier while protecting marine and terrestrial environments; improve access for NPS and concessioner boats; improve passenger, cargo, and operations circulation; protect archeological resources; preserve and enhance the historic and visual character of Scorpion Ranch and the Project area; and improve efficiency and sustainability.

NEED FOR THE PROJECT

The need for the Project is driven by the following factors:

Scorpion Pier should provide safe access to Santa Cruz Island. The existing pier is deteriorating and does not meet NPS requirements for administrative use or safe visitor access. The access road to the current location also requires frequent rebuilding. The embarkation process requires passengers to climb—one person at a time, often while carrying heavy gear—a single unsteady ladder that is not compliant with Architectural Barriers Act (ABA) standards for accessible design. Strong wave activity or a simple misstep could cause a slip, trip, or fall, and could lead to injuries. Mooring or tying off to the dock is not possible due to wave action, so boat operators must thrust into contact with the dock to unload and load passengers. Due to the current pier design, the pier cannot be approached safely when tides are low or when wave heights are greater than 1 or 2 feet. Vessel operators therefore have difficulty docking without risk to individuals, vessels, and the pier itself. Once on the pier, individuals must walk along the narrow, 9-foot-wide deck that lacks suitable handrails (which are needed to maintain balance during severe wind and wave conditions). Once on land, visitors must traverse the 400-foot-long rough, coarsely graded gravel access road (which is also not ABA compliant) to Scorpion Ranch; the road surface is composed primarily of sand, gravel, and rocks up to 10 inches in diameter.

All of these issues introduce considerable risk of injury, especially for children, the elderly, and those with disabilities. Harsh weather, including high winds and adverse swells or surges, exacerbate these issues.

Scorpion Pier should provide efficient access to Santa Cruz Island that accommodates visitor demand. The existing pier and access road significantly weaken the efficiency of NPS operations. The one-person ladder needed for embarkation, for example, lengthens the entire boarding process and increases visitor exposure to adverse weather conditions. The narrow width of the pier also causes delays because it cannot simultaneously accommodate visitors and large cargo (i.e., maintenance vehicles); as such, passenger embarkation must occur separately from many maintenance activities. Additionally, the lack of adequate armoring in the area increases the need for regular and expensive repairs to the eroding access road. The number of visitors to Santa Cruz Island has risen steadily in the past, and future visitation levels are anticipated to remain at maximum capacity as determined by the concessioner contract, weather, and park rules and regulations (i.e., the Channel Islands National Park Final General Management Plan/Wilderness Study/Environmental Impact Statement [GMP/Wilderness Study/EIS]) and Park Superintendent's public use limits for the island. Improvement of the pier and access

road is necessary to meet these visitor demands.

Scorpion Pier and the access roadway should be operated in a manner that protects sensitive resources. The access road is extremely susceptible to harsh weather conditions, and is often washed out by Scorpion Creek when it floods. Maintenance of the existing pier access road currently requires repairing and re-grading several times per year due to wave and storm erosion.

As a result of these ground-disturbing activities, sensitive archeological resources may be threatened. Ongoing re-construction can also impact the environment through air emissions, erosion, and possible inputs of pollutants (e.g., oils, lubricants, gasoline, etc.) to waterways and sensitive habitats.

Scorpion Pier should provide access to Santa Cruz Island in consideration of predicted sea level rise. The predicted rise in sea level due to global warming must also be considered in the new design for the pier. Current predictions range from 0.33 foot to 1.1 foot by the year 2050, and 0.74 foot to 3.2 feet by 2100. Anticipated sea level rise has implications for the new pier design, as well as for the dynamics of Scorpion Creek during large storm events.

PUBLIC REVIEW PROCESS

The Notice of Intent (NOI) for the Project was published in the Federal Register on May 29, 2013. The NOI announced the preparation of an EIS by the Park Service as the federal lead agency. The NOI also included background information, potential alternatives, and methods for public comment. The comment period closed on July 29, 2013. The Final EIS will include a summary of the Draft EIS review process including a compilation of public comments.

PUBLIC INVOLVEMENT

The Park Service announced the scoping period and public meeting dates and locations to existing NPS mailing list recipients via postal and electronic mail, as well as on its Project website at http://parkplanning.nps.gov/ScorpionPier. Scoping meetings were held on June 18 and 19, 2013, at the Robert J. Lagomarsino Visitor Center in Ventura and the Santa Barbara Public Library, respectively.

In addition to the website, mailing, and public meetings in June, the Park Service has conducted outreach with the California Department of Fish and Wildlife, State Historic Preservation Officer (SHPO), CSLC, Chumash Council of Elders, Santa Ynez Band of Chumash Mission Indians, and Island Packers, Inc. (the Park Service's current boat concessioner).

CONCERNS AND ISSUES

Over the course of the 60-day comment period, the Park Service formally received comment letters from the Sanctuary, U.S. Environmental Protection Agency (USEPA), California Coastal Commission (CCC), Santa Barbara County Air Pollution Control District (SBAPCD), and the SHPO. Together, these letters generally expressed concerns regarding adverse effects on the topics listed in the following paragraph. No public comments were received. Comments from the USEPA focused on the Project's location in the Scorpion State Marine Reserve and the Sanctuary, and potential impacts to aquatic habitats and species. CCC requested that the EIS contain a thorough analysis of potential adverse impacts to marine resources in order for a consistency determination to be issued. SBAPCD requested that the EIS include an evaluation of air pollutant emissions and global climate change effects. SHPO requested that in consideration of historic properties on site, the Park Service coordinate with SHPO in order to comply with Section 106 of the National Historic Preservation Act of 1966 (16 USC 470f), as amended, and its implementing regulations at 36 Code of Federal Regulations [CFR] 800.8(c).

ALTERNATIVES

The alternatives analyzed in this Draft EIS include the No Action Alternative, Alternative 1, and Alternative 2. Alternative 2 is the preferred alternative.

NO ACTION ALTERNATIVE

The No Action Alternative is analyzed in this EIS pursuant to the Council on Environmental Quality (CEQ) regulations (40 CFR 1502). This alternative, which represents no change from the Park Service's current management direction, provides a baseline for comparing the other alternatives' proposed changes and potential subsequent effects. It assumes a continuation of existing conditions at the existing location. There would be no construction costs, and no additional funding would be required to implement this alternative.

The existing conditions of the pier measurements and configuration would remain the same for the No Action Alternative. As a result, the pier would continue to have operational depth of -8.5 feet mean lower low water (MLLW), and access from the concessioner boats would continue to require a ladder propped along the south side of the pier. The pier's steel guardrail would remain.

No improvements would be made to the connecting access road. In general, no armoring would be installed as part of this alternative. Instead, regular repairs and maintenance activities would continue to keep the pier and access road as safe and serviceable as possible.

The No Action Alternative assumes no change in concessioner operations bringing visitors to Santa Cruz Island and no change to ferry vessel capacities or number of crossings.

ALTERNATIVE 1

Alternative 1 would remove and demolish the existing pier and abutments and replace it with a longer, wider pier, oriented nearly parallel to the existing pier and extended farther into deeper water. The new pier would accommodate a greater range of water depths for safe embarkation as well as a mobile crane. To access the pier from the concessioner boats, visitors would use the gangway and landing aligned parallel to the pier.

Significant improvements to the existing access road would also occur under Alternative 1. The improved access road would connect the new pier terminus to North Scorpion Valley Road and be supported by a steel sheetpile retaining wall, and protective rock armoring would be installed along the shoreline. The surface of the access road would be finished with an even layer of crushed rock, and a small stairway would provide beach access.

Once construction is complete, site access and arrival options under Alternative 1 would be consistent with those of the No Action Alternative, although improved in terms of safety and accessibility.

Although the number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity, visitor levels are ultimately controlled by the concessioner contract, weather, and park rules and regulations (i.e., the GMP/Wilderness Study/EIS and Park Superintendent's public use limits for island). While the pier would provide improved access and efficiency of operations, the pier would not inherently increase visitation.

ALTERNATIVE 2 (PREFERRED ALTERNATIVE)

Alternative 2 would construct a longer, wider pier approximately 300 feet south of the existing pier, which is significantly closer to the Scorpion Canyon North Road. Once the new pier is completed, the existing pier and abutments would be removed and disposed of on the mainland. The new pier would accommodate various water depths for safe embarkation as well as a mobile crane. To access the pier from the concessioner boats, visitors and staff would use the gangway and landing aligned parallel to the pier.

The relatively short access road that would connect the new pier terminus to North Scorpion Valley Road would be supported by a steel sheetpile retaining wall that is protected from extreme waves and flood waters by rock armoring. The road would be paved with an even layer of crushed rock. A small stairway would be constructed to provide beach access.

Once construction is complete, site access and arrival options under Alternative 2 would generally be consistent with those of the No Action Alternative, although greatly improved in terms of safety and accessibility.

Although the number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity, visitor levels are ultimately controlled by the concessioner contract, weather, and park rules and regulations (i.e., the GMP/Wilderness Study/EIS and Park Superintendent's public use limits for island). While the pier would provide improved access and efficiency of operations, the pier would not inherently increase visitation.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

In accordance with DO-12 and NEPA, the Park Service is required to identify the environmentally preferred alternative, or "the alternative that will promote the national environmental policy as expressed in the NEPA's Section 101."

For each of the action alternatives, long-term adverse impacts by resource topic are generally reduced from the No Action Alternative. The No Action Alternative would result in long-term, major, adverse impacts related to recreation and visitor use and public health and safety. The action alternatives would reduce or eliminate impacts to recreation and visitor use and public health and safety, thereby providing a long-term, major, beneficial impact. The magnitude of adverse impacts for the action alternatives would be similar and less than major, with the exception of recreation; Alternative 1 would result in short-term, major, adverse impacts to recreation and visitor use during construction, while Alternative 2 would result in short term, minor, adverse impacts to recreation and visitor use during construction. Each of the action alternatives would fulfill the Project objectives, while the No Action Alternative would not meet the Project objectives.

For all of the other resource topics, Alternative 2 would result in the fewest impacts. Alternatives 1 and 2 would result in equivalent negligible to minor adverse impacts in the categories of air quality; noise and vibration; geology, soils, and seismicity; water quality and hydrology; terrestrial biological resources; and public health and safety. Both Alternatives 1 and 2 would result in equivalent moderate adverse impacts to geology, soils, and seismicity, and noise and vibration. Compared to Alternative 1, Alternative 2 would have reduced impacts related to transportation and circulation (during construction), aquatic biological resources, and visual resources. Less than major impacts related to recreation and visitor use would be differing but comparable between Alternative 1 and Alternative 2.

Therefore, Alternative 2 has been identified as the environmentally preferred alternative, as this alternative would fulfill the Project objectives while incurring reduced transportation and circulation, aquatic biological resources, visual resources, and recreation and visitor use impacts and similar or reduced impacts to the remaining resource topics compared to Alternative 1.

ENVIRONMENTAL CONSEQUENCES

The following topics were raised during the scoping process or were deemed relevant for evaluation by the Park Service and selected for detailed analysis in this Draft EIS: transportation and circulation; air quality; noise and vibration; geology, soils, and seismicity; water quality and hydrology; aquatic biological resources; terrestrial biological resources; visual resources; cultural and historic resources; recreation and visitor use; and public health and safety.

The rationale for selection of each impact topic was based on potential for substantive impact; environmental statutes, regulations, and executive orders; and/or NPS management policies and guidance.

Table ES-1 summarizes the potential impacts of each of the alternatives evaluated in this Draft EIS as well as proposed mitigation measures.

TABLE ES-1. POTENTIAL IMPACTS OF ALTERNATIVES

No Action Alternative	Alternative 1	Alternative 2
Transportation and Circulation		
• Construction: no impact • Operation: long-term, major, adverse impact	• Construction: short-term, moderate, adverse impact • Operation: beneficial long-term impact	• Construction: no impact • Operation: beneficial long-term impact
Air Quality		
No impact	• Construction: short-term, minor, adverse impact • Operation: no impact	• Construction: short-term, minor, adverse impact • Operation: no impact
Noise and Vibration		
No impact	• Off-site receptors: negligible impact • Directly adjacent receptors: short-term, moderate, adverse impact • Vibration: no impact • Mitigation measure: Noise-MM-1	• Off-site receptors: negligible impact • Directly adjacent receptors: short-term, moderate, adverse impact • Vibration: no impact • Mitigation measure: Noise-MM-1
Geology, Soils, and Seismicity		
• Seismically induced ground shaking or liquefaction: long-term, moderate, adverse impact • Erosion or landslides, and seismically induced settlement and subsidence: long-term, minor, adverse impact • Expansive soils and tsunami and seiche events: negligible impact	• Seismically induced ground shaking or liquefaction: long-term, moderate, adverse impact but reduced from the No Action Alternative • Bluff erosion or landslides, and seismically induced settlement and subsidence: long-term, minor, adverse impact • Roadway fill pad erosion, expansive soils, and tsunami and seiche hazard: negligible impact	• Seismically induced ground shaking or liquefaction: long-term, moderate, adverse impact but reduced from the No Action Alternative • Bluff erosion or landslides, and seismically induced settlement and subsidence: long-term, minor, adverse impact • Roadway fill pad erosion, expansive soils, and tsunami and seiche hazard: negligible impact

No Action Alternative	Alternative 1	Alternative 2
Water Quality and Hydrology		
• Construction: no impact • Operation: negligible impact • Flood hazard and sea level rise: long-term, moderate, adverse impact	• Construction: negligible impact • Operation: negligible impact • Flood hazard and sea level rise: long-term, major, beneficial impact	• Construction: negligible impact • Operation: negligible impact • Flood hazard and sea level rise: long-term, major, beneficial impact
Aquatic Biological Resources		
No impact	• Invertebrates and marine vegetation: long-term, moderate, adverse impact • Fish, marine mammals, and wetlands: short-term, minor, adverse impact • EFH: negligible impact • Eelgrass: no impact (short-term, minor, adverse impact if discovered) • Mitigation measures: Aquatic-MM-1, 2, 3, and 4	• Invertebrates and marine vegetation: negligible impact • Fish and marine mammals: short-term, negligible to minor, adverse impact • EFH and wetlands: negligible impact • Eelgrass: no impact (short-term, minor, adverse impact if discovered) • Mitigation measures: Aquatic-MM-1, 2, 3, and 4
Terrestrial Biological Resources		
• Vegetation: negligible impact • Common wildlife species and habitats and special status and protected species: no impact • Non-native or invasive species: no impact	• Vegetation: no impact • Common wildlife species, Santa Cruz Island fox, pallid bats, western mastiff bats, and CESA and MBTA protected bird species: negligible impact • Townsend's big eared bat and island spotted skunk: no impact • Non-native or invasive species: no impact • Mitigation measures: Noise-MM-1, Terrestrial-MM-1	• Vegetation: no impact • Common wildlife species, Santa Cruz Island fox, pallid bats, western mastiff bats, and CESA and MBTA protected bird species: negligible impact • Townsend's big eared bat and island spotted skunk: no impact • Non-native or invasive species: no impact • Mitigation measures: Noise-MM-1, Terrestrial-MM-1
Visual Resources		
No impact	• Construction: negligible impact • Operation: long-term, moderate, adverse impact	• Construction: negligible impact • Operation: long-term, minor, adverse impact
Cultural Resources		
No impact	• Archeological sites: short-term, minor, adverse impact • Historic structures and cultural landscapes: no impact • Mitigation measures: Cultural-MM-1 and 2	• Archeological sites: short-term, minor, adverse impact • Historic structures: no impact • Cultural landscapes: short-term, minor, adverse • Mitigation measures: Cultural-MM-2, 3, 4, and 5

No Action Alternative	Alternative 1	Alternative 2
Recreation and Visitor Use		
• Construction: no impact • Operation: long-term, major, adverse impact	• Construction: short-term, major, adverse impact • Operation: long-term, major, beneficial impact	• Construction: short-term, moderate, adverse impact • Displacement of available recreational activities: long-term, minor, adverse impact • Operation: long-term, major, beneficial impact
Public Health and Safety		
• Disturbance or exposure to hazardous materials, operational use of potentially hazardous material, and siting on or near hazardous materials site: no impact • Operation: long-term, major, adverse impact	• Disturbance or exposure to hazardous materials, operational use of potentially hazardous material, and siting on or near hazardous materials site: no impact • Operation: long-term, major, beneficial impact	• Disturbance or exposure to hazardous materials, operational use of potentially hazardous material, and siting on or near hazardous materials site: no impact • Operation: long-term, major, beneficial impact

Notes:
CESA – California Endangered Species Act
EFH – Essential Fish Habitat
MBTA – Migratory Bird Treaty Act of 1918

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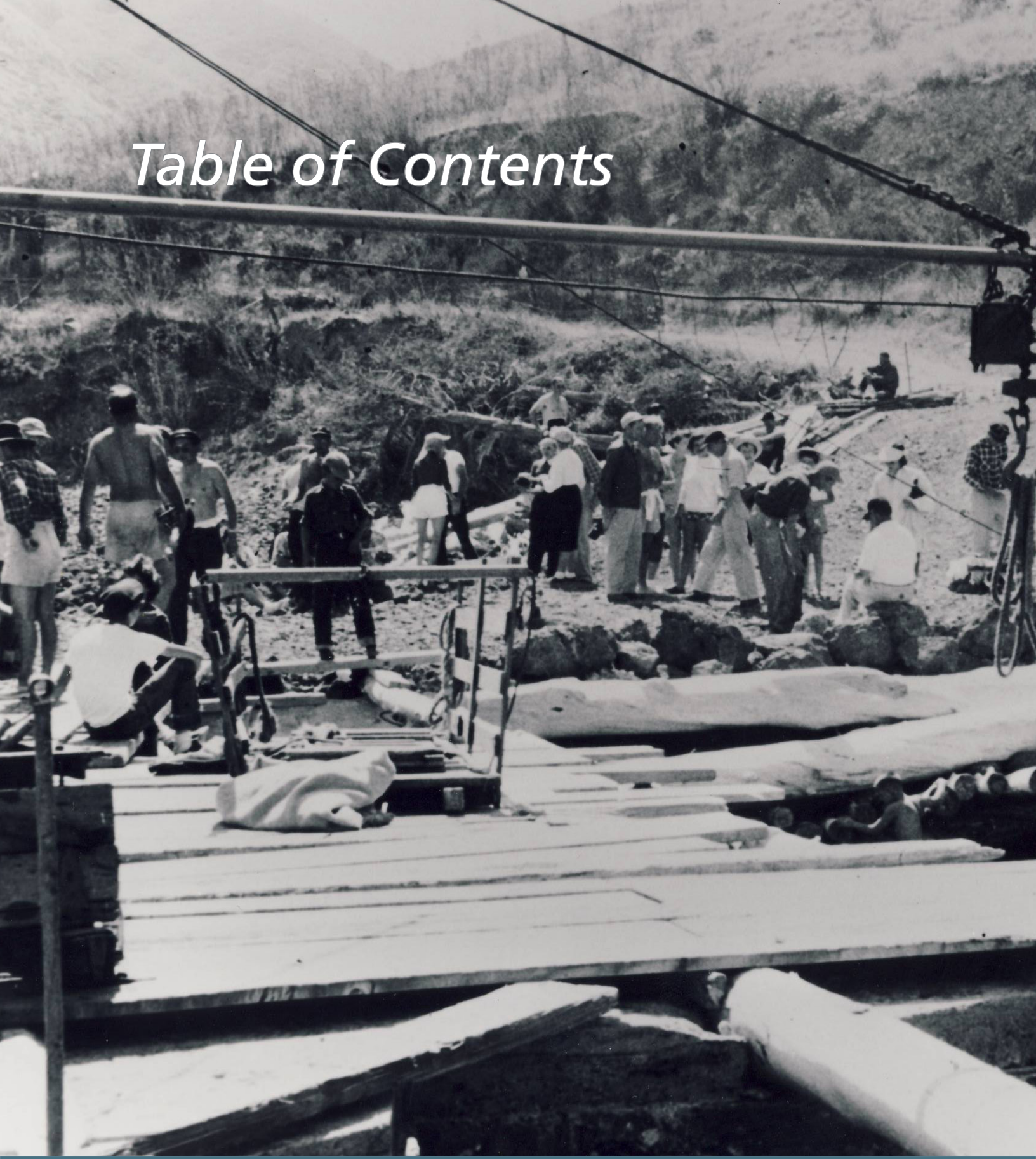

First Scorpion pier, constructed in 1936 at the location of the present-day pier.

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Terms and Abbreviations

LIST OF ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
μg/m³	micrograms per cubic meter
AB	Assembly Bill
ABA	Architectural Barriers Act
ACHP	Advisory Council on Historic Preservation
CAAQS	California Ambient Air Quality Standards
Cal-Adapt	2009 California Climate Adaptation Strategy
CARB	California Air Resources Board
CAP	Clean Air Plan
CCC	California Coastal Commission
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CEMP	California Eelgrass Mitigation Policy
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CH_4	methane
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CSLC	California State Lands Commission
CWA	Clean Water Act
cy	cubic yard
CZMA	Coastal Zone Management Act
dB	decibel
dBA	A-weighted decibel
DDT	dichlorodiphenyltrichloroethane
DO	Director's Order
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FMP	Fisheries Management Plan
FTA	Federal Transit Administration
FR	Federal Register
g	gravitational acceleration
GHG	greenhouse gas
GMP/ Wilderness Study/EIS	*Channel Islands National Park Final General Management Plan/ Wilderness Study/Environmental Impact Statement*
HDPE	high-density polyethylene

H_s	significant wave heights
L_{dn}	Day-Night Noise Level
L_{eq}	Equivalent Noise Level
L_{max}	Maximum Noise Level
L_{min}	Minimum Noise Level
MBTA	Migratory Bird Treaty Act
MLLW	mean lower low water
MPA	Marine Protected Area
MMPA	Marine Mammal Protection Act
M-SFCMA	Magnuson-Stevens Fishery Conservation and Management Act
N_2O	nitrous oxide
N/A	not applicable
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NO_x	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
O_3	ozone
Park Service	National Park Service
PM	particulate matter
$PM_{2.5}$	particulate matter with particle diameter less than 2.5 microns
PM_{10}	particulate matter with particle diameter less than 10 microns
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
ppm	parts per million
PPV	peak particle velocity
PRC	Public Resources Code
RWQCB	Regional Water Quality Control Board
Sanctuary	Channel Islands National Marine Sanctuary
SBAPCD	Santa Barbara Air Pollution Control District
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SMR	Scorpion State Marine Reserve
SO_2	sulfur dioxide
SOF	Statement of Findings
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TNC	The Nature Conservancy
USACE	U.S. Army Corps of Engineers
USC	United States Code
USCG	U.S. Coast Guard

USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VdB	vibration decibel
VOC	volatile organic compound

GLOSSARY OF TERMS

100-year flood—A flood event that has a 1% probability of occurring in any given year.

Alternative—An option that can accomplish an agency's objectives.

benthic—Relating to or occurring on the seafloor.

bulkhead—An armoring structure typically used along shorelines to prevent erosion.

capacity—The maximum sustained traffic flow of a transportation facility under prevailing traffic and roadway conditions in a specified direction.

concessioner—An individual or business entity that holds a concession contract with the National Park Service for the provision of approved visitor services in a unit of the national park system.

cultural resource—An aspect of a cultural system that is valued by or significantly representative of a culture or that contains significant information about a culture.

cumulative impact—Two or more environmental effects that, when considered together, are considerable or that compound or increase other environmental impacts.

diatoms—Any of the various microscopic single-celled or colonial algae of the class Bacillariophyceae.

direct impact—An impact that occurs as a result of the proposal or alternative in the same place and at the same time as the action.

endangered species—Any species that are likely to become extinct.

Environmental Impact Statement (EIS)—A detailed National Environmental Policy Act (NEPA) document that is prepared when a proposal or alternatives have the potential for significant impact on the human environment.

environmentally preferred alternative—Of the alternatives analyzed, the one that would best promote the policies in NEPA Section 101. This is usually identified by the Project team members. It is presented in the NPS NEPA document (draft and final EIS or Envionmental Assessment) for public review and comment.

essential fish habitat (EFH)—Aquatic habitat used by fish to spawn, breed, feed, or grow to maturity.

expansive soils—Soils that expand when water is added and shrink when water is removed.

floodplain—Land on either side of a stream or river that is submerged during floods.

footprint—The area impacted by Project activities.

General Agreement—A document that formalizes a relationship or agreement between the Park Service and federal or nonfederal entities.

General Management Plan (GMP)—A plan that clearly defines direction for resource preservation and visitor use in a park, and serves as the basic foundation for decision making. GMPs are developed with broad public involvement.

Habitat Area of Particular Concern—Subsets of EFH that are rare or particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area.

haulout—Behavior associated with pinnipeds when temporarily leaving the water between periods of foraging activity for sites on land or ice.

human environment—Defined by the Council on Environmental Quality as the natural and physical environment, and the relationship of people with that environment (1508.14). Although the socioeconomic environment receives less emphasis than the physical or natural environment in the Council on Environmental Quality regulations, the Park Service considers it to be an integral part of the human environment.

impact—An adverse impact is assumed negatively affect the environment, while a beneficial impact is assumed to have a positive effect on the environment.

indirect impact—Reasonably foreseeable impacts that occur removed in time or space from the proposed action. These are "downstream" impacts, future impacts, or the impacts of reasonably expected connected actions (e.g., growth of an area after a highway to it is complete).

interpretive—Used to describe an exhibit or rest area which hosts a variety of cues (i.e., visual and auditory) that engage the visitor for a desired effect or experience.

invasive species—Plants, animals, or pathogens that are non-native to the ecosystem under consideration and whose introduction causes or is likely to cause harm.

jurisdiction—A municipal government agency, such as a city or county, and as appropriate, federal, and state agencies and federally recognized tribes. The term can mean "to have authority over."

lithic debitage—Debris from the manufacture of stone tools, including waste flakes, spalls, and cores.

marine protected area (MPA)—MPAs are discrete geographic marine estuarine areas that have been designated by law or administrative action to protect or conserve marine life and habitat.

minimization—Taking measures to reduce potential effects to the smallest practical amount, extent, size, or degree.

mitigation measure—A modification of the proposal or alternative that lessens the intensity of its impact on a particular resource.

National marine sanctuary—A marine sanctuary is a general type of marine protected area. The National Marine Sanctuary System consists of 14 marine protected areas.

National Register of Historic Places (national register)—The comprehensive list of districts, sites, buildings, structures, and objects of national, regional, state, and local significance in U.S. history,

architecture, archeology, engineering, and culture. This list is maintained by the National Park Service under authority of the national historic preservation act of 1966.

No Action Alternative—Project alternative that would result in no project being implemented.

noise muffler—A device or technique used to absorb noise.

Notice of Availability (NOA)—Separate notices submitted to the Federal Register that the Draft EIS and the Final EIS are ready for distribution.

Notice of Intent (NOI)—The notice submitted to the federal register indicating that an EIS will be prepared. It describes the proposed action and alternatives, identifies a contact person at the Park Service, and gives time, place, and descriptive details of the agency's scoping process.

preferred alternative—The alternative an NPS decision maker has identified as preferred at the Draft EIS or EA stage. Identification of the preferred alternative helps the public focus its comments during review of the NEPA document.

public scoping—The procedure by which an agency identifies important issues and determines the extent of analysis necessary for an informed decision on a proposed action.

Record of Decision—The document that is prepared to substantiate a decision based on an EIS. When applicable, it includes a detailed discussion of rationale and reasons for not adopting all mitigation measures analyzed.

riprap—A foundation or retaining wall made of rock or other materials used to armor shorelines, streambeds, piles, and other shoreline structures against damage and erosion.

scoping—An integral part of environmental analysis, which includes early involvement of interested and affected public, as well as internal and external agency contacts.

sea level rise—Increase in the mean sea level elevation potentially attributable to global climate change or other forces.

sensitive receptor—Land uses that are considered to have an increased susceptibility to noise effects, such as residences and schools.

special-status species—For purposes of this EIS, any species listed or proposed for listing under the state or federal endangered species acts, or considered locally rare by recognized authorities.

species of special concern—A species, subspecies, or distinct population of an animal native to California that has been extirpated from the state; can be considered threatened or endangered (but may not be formally listed); has experienced population declines or range retractions; or has naturally small populations that exhibit high susceptibility to risk.

stakeholder—An individual, group, or other entity that has a strong interest in decisions concerning park resources and values. Stakeholders may include, for example, recreational user groups, permittees, and concessioners. In the broadest sense, all Americans are stakeholders in the national parks.

subject matter expert—An individual who specializes in a particular area or topic.

take—Harm to a species, including harassment, pursuit, hunting, shooting, wounding, killing, trapping, capturing, or collecting.

state marine reserve (SMR)— SMRs are a strictly regulated subset of Marine Protected Areas.

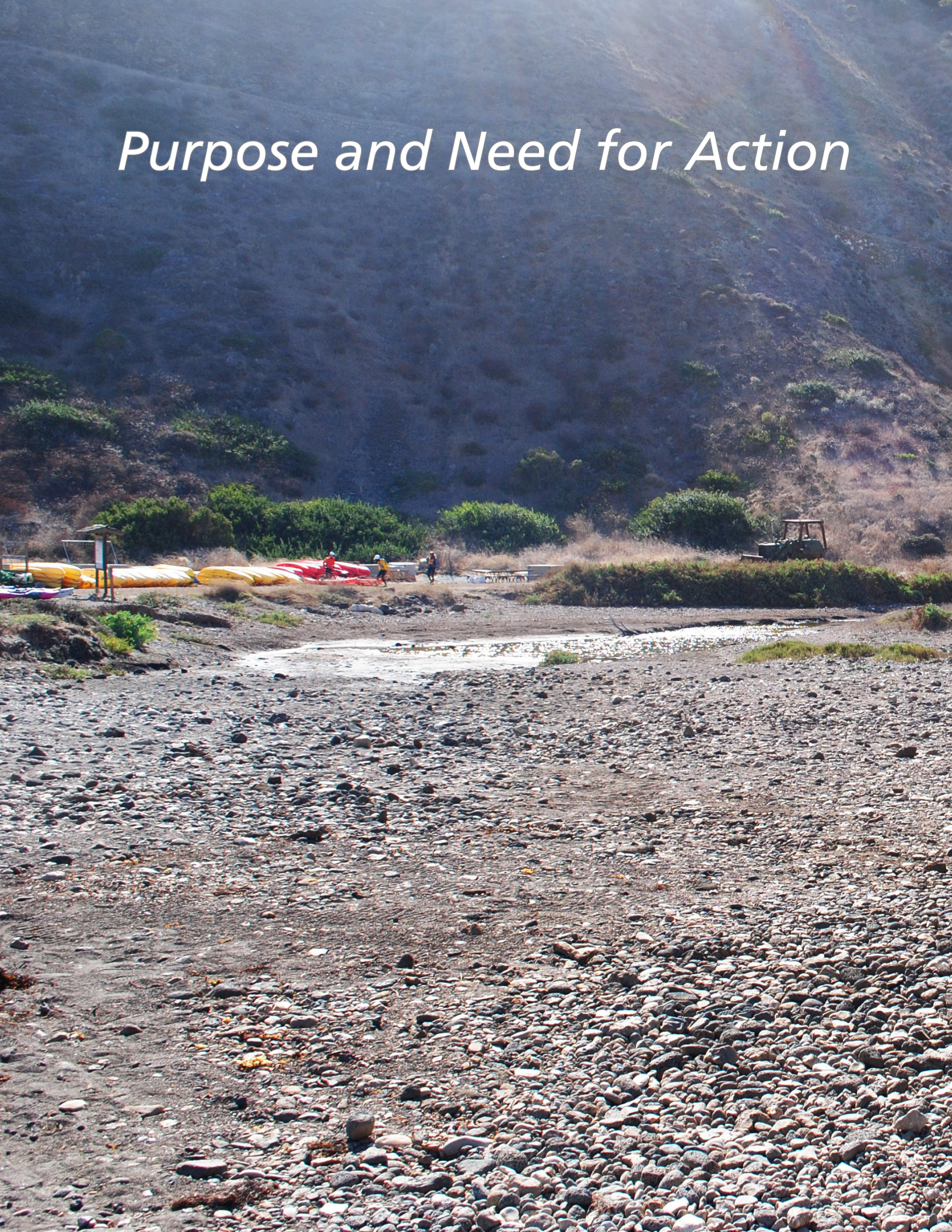
study area—The area specifically evaluated for environmental effects.

total maximum daily load—A regulatory term used in the Clean Water Act to describe the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards.

Value Analysis—An organized multidiscipline team effort that analyzes the functions of facilities, processes, systems, equipment, services, and supplies for the purpose of achieving essential functions at the lowest lifecycle cost consistent with required performance, reliability, quality, and safety.

water column—A conceptual column of water from surface to bottom sediments.

Purpose and Need for Action



INTRODUCTION

The National Park Service (NPS or Park Service) proposes to replace and relocate Scorpion Pier, as well as make improvements to the access road, in order to improve park operations, improve the visitor experience, and provide safe access to Santa Cruz Island. The selection of a replacement site, including construction and operation, is hereafter referred to as the Project.

The Park Service prepared this Environmental Impact Statement (EIS) in accordance with the requirements of the National Environmental Policy Act (NEPA; 42 United States Code [USC] Sections 4321 et seq.) and Director's Order No. 12 (DO-12), "Conservation Planning, Environmental Impact Analysis, and Decision-Making" (NPS 2011a). The Park Service is the lead federal agency under NEPA. It is anticipated that this EIS would be adopted as the California Environmental Quality Act compliance document, with the California State Lands Commission (CSLC) acting as the lead agency.

Scorpion Pier provides access to Santa Cruz Island, the most visited island in Channel Islands National Park. Land ownership on Santa Cruz is split between the Park Service, which owns and manages the eastern 24% of the island, and The Nature Conservancy (TNC), which owns and manages the remaining 76% of the island. Scorpion Pier is located on NPS land at the northeastern end of the island within the Scorpion Anchorage, inside the Scorpion Marine Reserve and the Channel Islands National Marine Sanctuary (Sanctuary; Figure 1). For purposes of this EIS, the Project's study area encompasses the marine and upland areas adjacent to the pier and access road as shown in Figure 2.

Santa Cruz Island provides numerous recreational opportunities including beach activities, hiking trails, a historic district, a 240-person campground, kayaking, swimming, scuba diving, and snorkeling sites. Scorpion Anchorage is a semi-protected ocean environment that poses challenges in making boat to pier transitions safely, particularly during strong ocean swell conditions (Photo 1). Scorpion Pier supports approximately 1,055 vessel landings per year (approximately 65 landings for park operations and 990 landings for park concessioner operations; NPS 2014a).

The existing Scorpion Pier was originally installed in 2000 using a flatbed railcar as a temporary and relatively low cost solution for providing urgent access to Santa Cruz Island from Scorpion Anchorage following the Park Service's 1996 acquisition of the east end of the island. In addition to only being intended as a temporary solution, it is rapidly deteriorating due to wave action and salt water, and it has never fully met administrative or visitor accessibility needs. The pier has a 90-foot-long by 9-foot-wide fixed span, which is connected to the island by a thick concrete platform, supported by a boulder (Photo 2). Disembarkation requires visitors and NPS staff to use ladders in pitching and shifting seas, and it is not safe for boats to approach or dock when tides are low or when wave heights are greater than 1 or 2 feet (Photo 3). The boats are not moored or tied up to the dock because wave action generally makes the boat unsteady; instead, boat operators thrust into contact with the dock during loading and unloading of passengers and cargo. Any adverse swells or surges can easily cause dangerous situations to develop—boat operators are sometimes required to quickly power vessels away from the pier to avoid potential damage or injury.

After disembarking, visitors are required to traverse approximately 400 feet across an access road consisting of a sandy, gravelly, and rocky surface that can be difficult to negotiate, especially for older individuals or visitors with mobility disabilities, while carrying bags, packs, and other gear (Photo 4). This access road must be repaired and re-graded several times per year due to impacts from storms,

wave erosion and the flooding of Scorpion Creek, a nearby seasonal stream.

The existing pier needs to be replaced and reconfigured in order to improve safety and accessibility, allowing all visitors to move safely from vessels to the pier deck, and to provide easy access to the adjacent shoreline, the historic Scorpion Ranch and visitor center, restrooms, orientation displays, campground, and hiking trails. A new pier constructed in deeper water (either in the same location or in an adjacent area) needs to accommodate the current range of NPS boats and concessioner ferry vessels, increase efficiency of loading and offloading cargo, and improve circulation of visitors, cargo, and NPS operations.

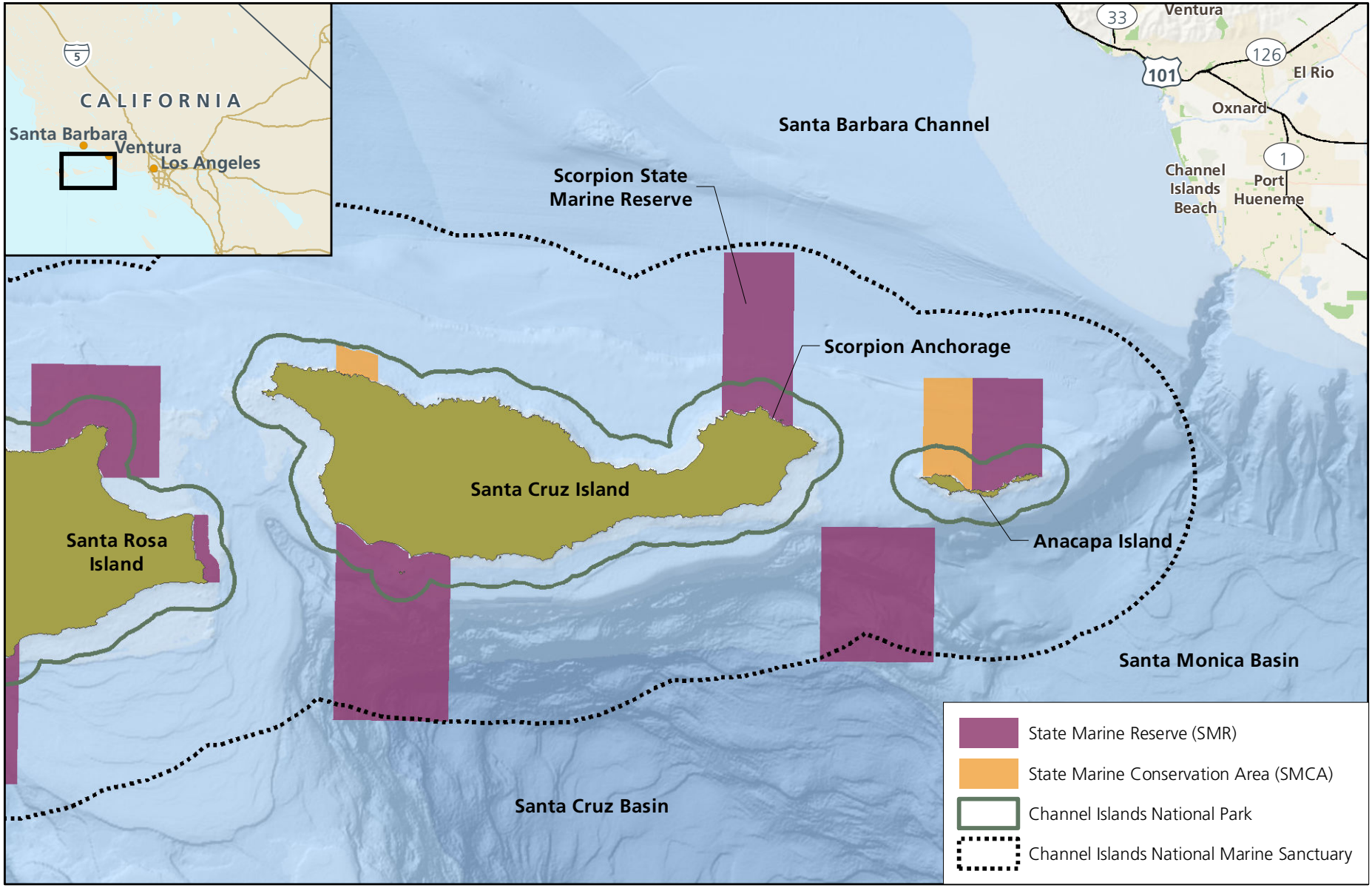
The alternatives considered for this EIS were developed by the Park Service and evaluated through public and stakeholder outreach, and a Value Analysis process. At the conclusion of this process, two action alternatives (Figure 2) and the No Action Alternative were identified to be carried forward for detailed evaluation in this EIS. Alternative 2 has been identified as the preferred alternative. These alternatives are described in detail in the "Alternatives" chapter.

Photo 1.
View of Scorpion Pier, Scorpion Anchorage, Scorpion Ranch, and surrounding areas.

Photo 3.
View of disembarking procedure at Scorpion Pier from concessioner boat.

Photo 2.
View of existing Scorpion Pier from Scorpion Anchorage.

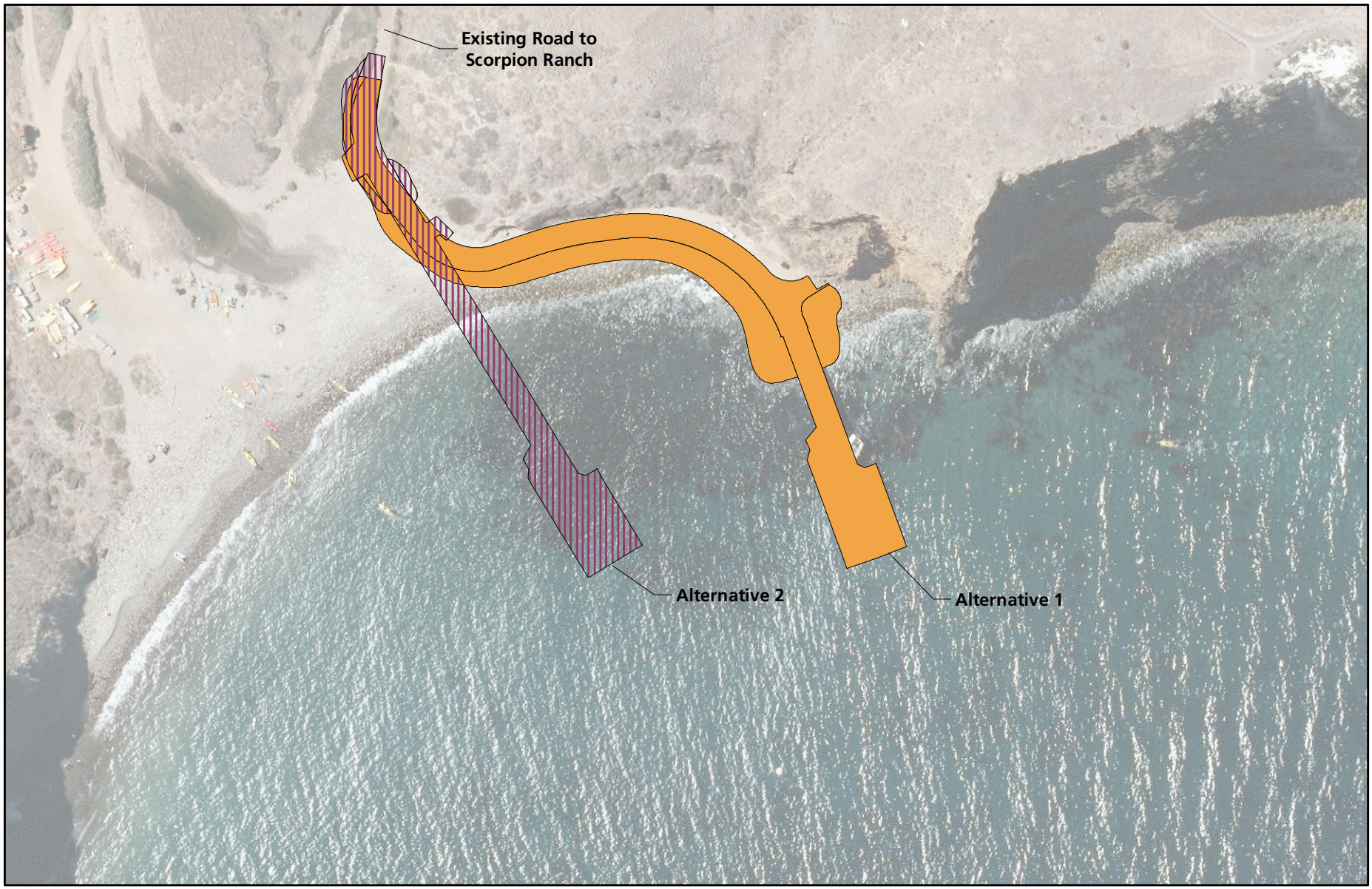
Photo 4.
View of approach roadway towards Scorpion Anchorage.



0 6 Miles

Source: USGS Coastal and Marine Geology Program 2013

FIGURE 1
VICINITY MAP
Channel Islands National Park
National Park Service/U.S. Department of the Interior
Draft - August 2015



0 100 Feet

FIGURE 2
LOCATION OF SCORPION PIER ALTERNATIVE SITES
Channel Islands National Park
National Park Service/U.S. Department of the Interior
Draft - August 2015

PURPOSE OF THE PROJECT

The overall purpose of the Project is to provide a safe, high-quality, and environmentally responsible pier and landside approach to allow visitors and NPS staff year-round access to Santa Cruz Island at Scorpion Anchorage in a variety of weather conditions. The Project should improve the visitor experience; improve the pier while protecting marine and terrestrial environments; improve access for NPS and concessioner boats; improve passenger, cargo, and operations circulation; protect archeological resources; preserve and enhance the historic and visual character of Scorpion Ranch and the Project area; and improve efficiency and sustainability.

NEED FOR THE PROJECT

The need for the Project is driven by the following factors:

Scorpion Pier should provide safe access to Santa Cruz Island. The existing pier is deteriorating and does not meet the Park Service requirements for administrative use or safe visitor access. The access road to the current location also requires frequent rebuilding. The embarkation process requires passengers to climb—one person at a time, often while carrying heavy cargo—a single unsteady ladder that is not compliant with Architectural Barriers Act (ABA) Accessibility Standards. Strong wave activity or a simple misstep could cause a slip, trip, or fall, and could lead to injuries. Due to the pier design and embarkation process, boats cannot safely approach when tides are low or when wave heights are greater than 1 or 2 feet. Vessel operators therefore have difficulty docking without risk to individuals, vessels, and the pier itself. Once on the pier, individuals must walk along the narrow, 9-foot-wide deck that lacks adequate handrails (which are needed to maintain balance during severe wind and wave conditions). Once on land, visitors must traverse the 400-foot-long, rough, coarsely graded gravel access road (which is also not ABA compliant) to Scorpion Ranch; the road surface is composed primarily of sand, gravel, and rocks up to 10 inches in diameter.

All of these issues introduce considerable risk, especially for children, the elderly, and those with disabilities. Harsh weather, including high winds and adverse swells or surges, exacerbate these issues.

Scorpion Pier should provide efficient access to Santa Cruz Island that accommodates visitor demand. The existing pier and access road significantly weaken the efficiency of NPS operations. The one-person ladder needed for embarkation, for example, lengthens the entire boarding process and increases visitor exposure to adverse weather conditions. The narrow width of the pier also causes delays because it cannot simultaneously accommodate visitors and large cargo (i.e., maintenance vehicles); as such, passenger embarkation must occur separately from many maintenance activities. Additionally, the lack of adequate armoring in the area increases the need for regular and expensive repairs to the eroding access road. The number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity. Improvement of the pier and access road is necessary to meet current and future visitor demands.

Scorpion Pier and the access roadway should be operated in a manner that protects sensitive resources. The access road is extremely susceptible to harsh weather conditions, and is often washed out by Scorpion Creek when it floods. Maintenance of the existing pier access road currently requires repairing and re-grading several times per year due to wave and storm erosion. As a result of these ground-disturbing activities, sensitive archeological resources may be threatened. Ongoing re-construction can also impact the environment through air emissions, erosion, and possible inputs of pollutants (e.g., oils, lubricants, gasoline, etc.) to waterways and sensitive habitats.

Scorpion Pier should provide access to Santa Cruz Island in consideration of predicted sea level rise. The predicted rise in sea level due to global warming must also be considered in the new design for the pier. Current predictions range from 0.33 foot to 1.1 foot by the year 2050, and 0.74 foot to 3.2 feet by 2100. Anticipated sea level rise has implications for the new pier design, as well as for the dynamics of Scorpion Creek during large storm events.

PROJECT OBJECTIVES

Specific Project objectives in relation to the stated Project purposes are shown in Table 1.

TABLE 1. PROJECT OBJECTIVES

Purpose	Objectives
Improve the Visitor Experience	• Provide safe access to Santa Cruz Island and the historical Scorpion Ranch, in all seasons and in the broadest range of wave/weather conditions feasible • Comply with U.S. Department of the Interior regulations of the 1973 Rehabilitation Act Section 504 as amended • Meet ABA Accessibility Standards where applicable • Allow safe areas for swimming, kayaking, and other desired recreational activities • Provide temporary gear storage at or near the pier
Improve Pier While Protecting Marine and Terrestrial Environments	• Replace the existing pier in order to better meet vessel embarkation requirements in a way that protects the waters and habitats in the Scorpion State Marine Reserve, Sanctuary, and Channel Islands National Park • Create a solution that lies lightly upon the land and lightly on the seabed • Avoid disruption of natural functioning systems and minimize impacts to existing marine and terrestrial environments (including eelgrass beds) • Minimize construction of sea walls, stabilization treatments, etc.
Improve Access for NPS and Concessioner Boats	• Provide adequate water depth conditions during low tides or when wave heights are greater than 1 or 2 feet (the existing pier lacks the necessary water depths for most NPS and concessioner boats) • Reduce the risk of damage to vessels across a wide variety of wind and wave conditions
Improve Passenger, Cargo, and Operations Circulation	• Improve safety and efficiency of loading and unloading passengers and cargo by reducing conflicts between visitor circulation, cargo, and NPS operations and equipment • Meet operational requirements and goals of the park and concessioner, including improving ability to load and unload cargo efficiently, which may include use of a crane • Minimize need for annual and ongoing reconstruction of access road
Protect Archeological Resources	• Preserve and protect archeological sites by appropriate design that is sensitive to the resource and considers visitor tendencies that could have indirect impacts • Minimize harm to archeological resources during construction and mitigate for any impacts
Preserve the Historic Landscape Qualities and Visual Character of Scorpion Ranch	• Retain the historic character of Scorpion Ranch by incorporating design solutions that are compatible with historic features and functions found at Scorpion Ranch and Santa Cruz Island • Protect and preserve the character and quality of existing viewsheds

Purpose	Objectives
Improve Efficiency and Sustainability	• Strive for cost effectiveness, efficiency, and low maintenance requirements through thorough and thoughtful design, with appropriate material choices • Minimize maintenance requirements for landside and access road areas • Construct a pier that would withstand high wind waves and storm surges • Consider the long-term implications of anticipated sea level rise and design a pier that would accommodate sea level rise in the 50- to 100-year horizon; this may mean the pier substructure would be designed with flexibility to accommodate deck replacement at a higher elevation than initially constructed

PARK PURPOSE AND SIGNIFICANCE

CHANNEL ISLANDS NATIONAL PARK

Recognized as home to significant natural and cultural resources, the U.S. Congress established Channel Islands National Park under Public Law 96-199 on March 5, 1980. This action expanded the boundary from a two-island national monument (established by President Roosevelt in 1938) to a 250,000-acre national park comprising Santa Barbara, Anacapa, Santa Rosa, Santa Cruz, and San Miguel islands, as well as their surrounding waters. The purpose of the new designation was "to protect the nationally significant natural, scenic, wildlife, marine, ecological, archeological, cultural, and scientific values of the Channel Islands" (16 USC 410ff). The new designation gives attention to the brown pelican (*Pelecanus occidentalis*); pinnipeds; undisturbed tide pools; Eolian landforms and caliche; and archeological resources.

Santa Cruz is the largest of the Channel Islands (60,645 acres). Land ownership on Santa Cruz is split between the Park Service, which owns and manages the eastern 24% of the island, and TNC, which owns and manages 76% of the island. Scorpion Pier is located on the northeast side of Santa Cruz Island, on land owned by the Park Service.

OTHER SITES IN THE STUDY AREA

Scorpion Pier and Scorpion Anchorage are in the Scorpion State Marine Reserve (SMR) and Sanctuary. Santa Cruz Island is listed in the National Register of Historic Places (national register) for its archeological significance, and its ranching resources have been determined eligible for the national register.

Channel Islands National Marine Sanctuary

The waters surrounding all five islands of the park, from the mean high tide line to 6 nautical miles offshore, constitute the Sanctuary, which is administered by the National Oceanic and Atmospheric Administration (NOAA). The marine habitat of the park (the first mile offshore) is fully contained in the Sanctuary.

The Sanctuary regulates uses and activities in the park's marine waters, including oil and mineral extraction; disturbance to wildlife from aircraft; discharge or deposits of substances; alteration of or construction on the seabed; commercial vessel operations; and protection of submerged cultural resources. Implementation of this Project requires the approval of NOAA due to work in the Sanctuary.

Scorpion State Marine Reserve

Scorpion Pier is in SMR. SMRs are a type of Marine Protected Area (MPA). MPAs, as designated by the California Department of Fish and Wildlife (CDFW), are discrete geographic marine or estuarine areas that have been designated by law or administrative action to protect or conserve marine life and habitat. SMRs are among the most strictly regulated MPAs; in SMRs, it is unlawful to damage, take, or possess any living, geological, or cultural marine resource, except under a permit or specific authorization from the state for research, restoration, or monitoring purposes. Implementation of this Project is expected to be permitted in the SMR, because California Regulation Public Safety (Title 14 Section 632(a)(10)) states, "Public safety activities, including installation, maintenance and/or seasonal placement and removal of safety-related artificial structures, including but not limited to lifeguard towers, are allowed in any MPA classification pursuant to any required federal, state and local permits, or as otherwise authorized by the department."

RELEVANT POLICIES AND PLANS

This section describes the relevant overarching policies and plans that guided or influenced the development of this EIS. Additional resource-specific policies, regulations, and plans are described in the relevant resource topic sections of the "Affected Environment" chapter.

ORGANIC ACT OF 1916

Management of Park Service resources, which includes Channel Islands National Park, is guided by the principles of the Organic Act, as amended. Signed into law on August 25, 1916, the Organic Act established the Park Service and provided direction for the future management of national parks, monuments, and reservations. Specifically, the Organic Act instructs the Park Service to "conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (16 USC 1). As such, the Park Service is required to avoid—or minimize to the greatest extent practicable—any adverse impacts on park resources and values.

NEPA, AS AMENDED

NEPA (42 USC Section 4321 et seq.; 40 Code of Federal Regulations [CFR] Section 1500.1) was enacted by the U.S. Congress in 1969 to ensure evaluation of the probable environmental consequences of proposals before decisions are made by federal agencies. When a federal agency determines that a preferred alternative could result in significant environmental impacts, an EIS is prepared. The Park Service has its own procedures for implementing NEPA, which are outlined in DO-12 (NPS 2011a). An EIS informs decision makers and the public of reasonable alternatives that avoid or minimize significant impacts on, or enhance the quality of, the environment, while accomplishing the purpose and need of the proposed Project. An EIS is not only a disclosure document, it is a tool for federal agencies to plan actions and make decisions. NEPA also requires federal agencies to diligently attempt to involve the interested and affected public before any decision affecting the environment is made. This Project constitutes a major federal action requiring NEPA review.

GENERAL AUTHORITIES ACT OF 1970

The General Authorities Act of 1970, in combination with its 1978 Redwood Amendment, clarified the provisions of the Organic Act regarding administration of the national park system. Specifically, this act authorized a variety of activities and expenses deemed necessary for properties in NPS jurisdiction, with the understanding that these "activities shall be construed and the protection, management, and administration of national park areas shall be conducted in light of high public value and integrity of the national park system and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress" (16 USC 1a).

NPS MANAGEMENT POLICIES 2006

Considered the first level of policy guidance in the NPS directives system, the NPS Management Policies state that the Park Service has "the management discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of a park, so long as the impact does not constitute impairment of the affected resources and values" (NPS 2006a). When considering the use of park resources, NPS decision-makers must investigate potential conflicts with the national park system's fundamental purpose of conserving park

resources and values. An action constitutes as an impairment when its impacts "harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values" (NPS 2006a). To determine if an action would cause impairment, NPS decision-makers must use environmental reviews required by NEPA; relevant consultations and completed studies; advice or insights offered by subject matter experts and others who have relevant knowledge or experience; the results of civic engagement and public involvement activities relating to the decision; and best professional judgment. When a decision is finally made for this Project, a non-impairment determination will be prepared and appended to the Record of Decision.

DIRECTOR'S ORDER NO. 12

DO-12, *Conservation Planning, Environmental Impact Analysis, and Decision-Making*, revised and effective as of October 5, 2011, sets forth the policies and procedures by which the Park Service will comply with NEPA. The provisions of NEPA and the Organic Act jointly commit the Park Service to make informed decisions that conserve and preserve park resources for the unimpaired benefit and enjoyment of future generations. Policies and procedures described in DO-12 center on completing environmental review and management decisions informed through scientific and interdisciplinary analysis, with resource preservation as the highest of many priorities (NPS 2011a).

DIRECTOR'S ORDER NO. 77-1

DO-77-1, *Wetland Protection*, revised and effective as of October 30, 2002, establishes NPS policies, requirements, and standards for implementing Executive Order 11990 "Protection of Wetlands" (42 Federal Register [FR] 26961). Included in DO-77-1 are: 1) adoption of a "no net loss of wetlands" goal; and 2) adoption of the Cowardin et al. (1979) wetland classification system for defining and identifying wetlands (NPS 2002a). Per DO-77-1: Wetland Protection and Procedural Manual #77-1, Section 4.2, the preferred alternative is excepted from requiring a wetland Statement of Findings (SOF), as it entails construction of a pier with a total long-term wetland impact of 0.1 acre or less.

DIRECTOR'S ORDER NO. 77-2

DO-77-2, *Floodplain Management*, effective as of September 8, 2003, establishes NPS policies, requirements, and standards for implementing Executive Order 11988. DO-77-2 requires federal agencies to develop agency guidance and take action to reduce the risk of flood loss; minimize the impact of floods on human safety, health and welfare; and restore and preserve the natural and beneficial values served by floodplains (NPS 2003a). DO-77-2 provides direction for the preparation of a floodplain SOF. The preferred alternative would be located within the floodplain, and a floodplain SOF has been prepared for the project (Appendix C).

Reference Manuals

The Park Service has developed Reference Manuals (RMs) to provide comprehensive information, standard operating procedures, and other recommendations for implementing the policies and requirements of various DOs.

RM 39-1: Ocean and Coastal Park Jurisdiction (NPS 2011b) helps define NPS land ownership and jurisdiction, specifically in regards to waters of the United States and submerged lands.

RM-77: Natural Resource Management (NPS 2004), offers comprehensive guidance to Park Service employees responsible for managing, conserving, and protecting the natural resources found in national park system units. RM-77 replaces NPS-77, the Natural Resource Management Guideline, issued in 1991 under the previous NPS guideline series.

NPS CLIMATE CHANGE ACTION PLAN 2012 TO 2014

The NPS Climate Change Action Plan provides guidance to help park managers and staff effectively plan for and respond to climate change. The plan identifies the regulatory context for climate change-related action, outlines near-term priorities, and describes how park and program managers might consider additional actions in anticipation of future actions. The plan was prepared in consideration of Executive Order 13514, which requires federal agencies to: a) evaluate risks and vulnerabilities to manage short- and long-term effects of climate change on agency mission, programs, and operations, and (b) integrate climate change adaptation into agency planning, operations, policies, and programs; as well as Secretarial Order 3289, which requires bureaus to consider and analyze climate change impacts in planning and decision making, and in designing research agendas. Climate change is addressed in the "Air Quality" and "Water Quality and Hydrology" sections of the "Affected Environment" and "Environmental Consequences" chapters.

CHANNEL ISLANDS NATIONAL PARK ENABLING LEGISLATION

As previously noted, Channel Islands National Park was established by the U.S. Congress in 1980 through Public Law 96-199. The park is to be "administered on a low-intensity, limited-entry basis." Additionally, in recognition of the special fragility and sensitivity of park resources, Congress intended "that visitor use within the park be limited to assure negligible adverse impact on the park resources."

CHANNEL ISLANDS NATIONAL PARK FINAL GENERAL MANAGEMENT PLAN/WILDERNESS STUDY/EIS

The Channel Islands National Park Final General Management Plan/Wilderness Study/Environmental Impact Statement (GMP/Wilderness Study/EIS) is a 20- to 40-year plan intended to define a direction for resource preservation and visitor experience at Channel Islands National Park. It contains three alternatives for the management and use of Channel Islands National Park, developed based on the significance of the park and in consideration of issues and concerns identified by the public and the Park Service (NPS 2015a). The GMP/Wilderness Study/EIS was finalized in response to comments received on the Draft GMP/Wilderness Study/EIS, which was circulated for comment in November 2013. Each of the alternatives analyzed in the GMP/Wilderness Study/EIS are intended to emphasize resource stewardship, including ecosystem preservation and restoration, and preservation of natural landscapes, cultural landscapes, archeological resources, and historic structures. Under the GMP/Wilderness Study/EIS preferred alternative, 66,576 acres of Channel Islands National Park would be proposed for wilderness designation, primarily on Santa Rosa and Santa Cruz islands, and expanded opportunities to accommodate visitors would be provided. The preferred alternative would place more attention than the other alternatives on expanding education and recreational opportunities and accommodations to provide diverse visitor experiences on the islands, by expanding opportunities to bring the people to the park.

CHANNEL ISLANDS NATIONAL MARINE SANCTUARY

The primary purpose of the National Marine Sanctuary program is resource protection (USC Section 1431b). Prohibitions in the Sanctuary that are relevant to aquatic resources in the park are as follows:

1. Exploring for, developing, and producing hydrocarbons except pursuant to leases executed prior to March 30, 1981, and except the laying of pipeline (a number of stipulations regarding oil spill equipment apply to laying pipeline).
2. Discharge of Substances. Exceptions are fish, fish parts, bait, water, and other biodegradable effluents incidental to vessel use of the Sanctuary generated by marine sanitation devices, routine vessel maintenance (e.g., deck wash down), engine exhaust, and meals aboard vessels.
3. Alteration of, or construction on, the seabed (precludes drilling and dredging, but anchoring and commercial trawling is allowed).
4. Commercial vessels (e.g., cargo, tankers) are prohibited within 1 nautical mile of an island except to transport persons or supplies to or from an island. This does not apply to fishing (including kelp harvesting), recreational, or research vessels.
5. Motorized aircraft are prohibited less than 1,000 feet over the waters within 1 nautical mile of any island except for enforcement purposes, to engage in kelp bed surveys, or to transport persons or supplies to or from an island.

STATEMENT FOR MANAGEMENT, CHANNEL ISLANDS NATIONAL PARK 1991

The 1991 Statement for Management discussed different influences that affect management of the park, including legislative and administrative requirements, resource conditions, land uses and trends, visitor uses and trends, and facilities. Major issues facing the park were identified, including land protection, alien species, restoration of native ecosystems, external threats, and access. General management objectives were identified for natural ecosystems, cultural resources, visitor use, and facility development and staffing. Although no longer being prepared by the Park Service, the Statement for Management was used as a foundation document in preparing the GMP/Wilderness Study/EIS .

PARK ACCESSIBILITY

The policy of the Park Service is that park buildings, facilities, programs, and services are accessible to and usable by all people, including those with disabilities, to the highest level that is reasonable. Guidance on this topic is provided by federal statutes, regulations, and guidelines, including: the ABA of 1968; 28 CFR, Part 36; Title 36, 43 CFR Part 17; the Uniform Federal Accessibility Standards of 1984; the Draft Final Accessibility Guidelines for Outdoor Developed Areas (2009); DO-42: Accessibility for Visitors with Disabilities in NPS Programs and Services; and NPS Management Policies 2006, and U.S. Department of the Interior regulations of the 1973 Rehabilitation Act Section 504.

COASTAL ZONE MANAGEMENT ACT AND CALIFORNIA COASTAL ACT

Federal agency activities in or affecting California's coastal zone must comply with Section 307 of the Coastal Zone Management Act (CZMA) and implementing regulations, which require that such federal activities be conducted in a manner consistent to the maximum extent practicable with California's Coastal Management Program.

Although Channel Islands National Park is federal land and is excluded from California's coastal zone, the park is subject to the federal CZMA. The Park Service has determined that the preferred alternative described in this EIS is consistent with California's Coastal Management Program.

With the Park Service acting as the federal lead agency, the Project would comply with CZMA requirements by preparing a CZMA Consistency Determination. If the state of California concurs with the Park Service's

consistency determination, it would transmit its formal concurrence in a letter, and that letter would be published in the Final EIS.

SCORPION STATE MARINE RESERVE

The Project site is located in Scorpion SMR, where take of all living marine resources is prohibited. Public Resources Code (PRC) Section 36710(a) states the following related to a SMR:

> *It is unlawful to injure, damage, take, or possess any living geological, or cultural marine resource, except under a permit or specific authorization from the managing agency for research, restoration, or monitoring purposes. While, to the extent feasible, the area shall be open to the public for managed enjoyment and study, the area shall be maintained to the extent practicable in an undisturbed and unpolluted state. Access and use for activities including, but not limited to, walking, swimming, boating, and diving may be restricted to protect marine resources. Research, restoration, and monitoring may be permitted by the managing agency. Educational activities and other forms of non-consumptive human use may be permitted by the designating entity or managing agency in a manner consistent with the protection of all marine resources.*

The preferred alternative (Alternative 2) is consistent with California Regulation Public Safety (Title 14 Section 632(a)(10)). Public safety activities, including installation, maintenance and/or seasonal placement and removal of safety-related artificial structures, including but not limited to lifeguard towers, are allowed in any MPA classification pursuant to any required federal, state, and local permits, or as otherwise authorized by the department. Accordingly, the proposed Project is permissible in the Scorpion SMR.

CALIFORNIA STATE LANDS COMMISSION LEASE

CSLC is responsible for administering and managing the use of the state's tidelands, submerged lands, and submerged cultural resources around the islands. Although these lands have been leased to CDFW, CSLC has retained authority over these areas for oil, gas, geothermal, and other mineral exploration and development. CSLC also has permit authority over dredging, disposal of dredging spoils, mining, piers, docks, moorings, and salvage operations on these lands.

The Park Service has been issued a Public Agency Use General Lease (No. PRC 8390.9) from CSLC. The Park Service has determined the proposed Project is consistent with the provisions of the current lease.

SCOPING FOR THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

Public scoping is an early and open process to determine the scope of environmental issues and alternatives to be addressed in an EIS, in accordance with NEPA and DO-12. NEPA requires a 30-day minimum public scoping period, during which input is sought from the public, agencies, and state and local governments. To ensure that stakeholders had sufficient time to provide comments, the Park Service elected to conduct a 60-day public scoping period for the Project. The public scoping period began on May 29, 2013, with publication of a Notice of Intent (NOI) in the Federal Register. The NOI included a brief description of background information, potential alternatives, and methods for submitting public comments. The comment period closed on July 29, 2013.

Additional information on public and agency involvement is presented in the "Consultation and Coordination" chapter.

PUBLIC INVOLVEMENT

The Park Service announced the scoping period and public meeting dates and locations to existing NPS mailing list recipients via postal and electronic mail, as well as on its Project website at http://parkplanning.nps.gov/ScorpionPier. Scoping meetings were held on June 18 and 19, 2013, at the Robert J. Lagomarsino Visitor Center in Ventura and the Santa Barbara Public Library, respectively.

In addition to the website, mailing, and public meetings in June, the Park Service conducted outreach with CDFW, State Historic Preservation Officer (SHPO), CSLC, Chumash Council of Elders, Santa Ynez Band of Chumash Indians, and Island Packers, Inc. (the Park Service's boat concessioner).

CONCERNS AND ISSUES

Over the course of the 60-day comment period, the Park Service formally received comment letters from the Sanctuary, U.S. Environmental Protection Agency (USEPA), California Coastal Commission (CCC), Santa Barbara County Air Pollution Control District (SBAPCD), and SHPO. Together, these letters generally expressed concerns regarding adverse effects on the topics listed in the following paragraphs. No public comments were received.

Comments from the USEPA focused on the Project's location in the Scorpion SMR and the Sanctuary, and potential impacts to aquatic habitats and species. CCC requested that the EIS contain a thorough analysis of potential adverse impacts to marine resources in order for a consistency determination to be issued. SBAPCD requested that the EIS include an evaluation of air pollutant emissions and global climate change effects. SHPO requested that in consideration of historic properties on site, the Park Service coordinate with SHPO in order to comply with Section 106 of the National Historic Preservation Act of 1966 (NHPA; 16 USC 470f), as amended, and its implementing regulations at 36 CFR 800.8(c).

IMPACT TOPICS SELECTED FOR DETAILED ANALYSIS

The following issues were either raised during the scoping process or deemed relevant by the Park Service for evaluation in this EIS. Rationale for selecting the impact topics was based on the potential for substantive impact; environmental statutes, regulations, and executive orders; and NPS Management Policies.

Transportation and Circulation

In order to improve long-term accessibility at Scorpion Anchorage, the Project may temporarily impact vessel navigation and embarkation activities, pedestrian and vehicle circulation along the access road and other connecting public paths, and freight deliveries.

Air Quality

Because direct and indirect construction and operational activities in the study area would result in air emissions, the Project's air quality and greenhouse gas (GHG) emissions must be analyzed.

Noise and Vibration

Because the study area includes natural, cultural, historical, and commercial uses, noise and vibration impacts from Project construction activities and operations may be felt by visitors, wildlife, and concessioners.

Geology, Soils, and Seismicity

The Project's proposed ground-altering activities (i.e., grading, armoring, and pile installation) may impact geologic and hydrologic resources.

Water Quality and Hydrology

The Project's in- and above-water construction activities, as well as associated vessel traffic, may impact water quality. Of particular concern are increases in turbidity and contamination from hazardous materials. Potential effects of sea level rise resulting from climate change must also be considered.

Climate Change

The Project's short-term construction activities and long-term operations may emit GHGs that contribute to climate change effects like sea level rise and high intensity storms. Potential impacts associated with climate change are discussed in the "Air Quality" and "Water Quality and Hydrology" sections.

Biological Resources

Santa Cruz Island is home to hundreds of plant and animal species, several of which are unique to the island. Scorpion Anchorage is located in the Sanctuary and SMR, both of which provide refuge for federal and state-listed threatened and endangered species. Other ecologically critical areas include Scorpion Creek and the adjacent floodplain and wetlands. As a result, the Project's potential effects on threatened or endangered terrestrial or aquatic species, or designated critical habitat, must be assessed.

Visual Resources

Visual resources in the study area could be affected by the Project, including temporary construction staging and storage, as well as structures that are built, altered, or removed. Certain alternatives may offer superior views in the study area. Nighttime view impacts, including impacts on lightscapes and the photic environment, would not occur, as the existing pier does not include lighting and the proposed alternatives would not create any new sources of light or glare.

Cultural and Historic Resources

Santa Cruz Island contains a variety of significant cultural and historic resources. The Project's study area is home to several Native American sacred sites and sensitive artifacts. The Park Service must avoid or minimize adverse effects to these resources.

Recreation and Visitor Use

Implementation of the Project could affect land- and aquatic-based recreational activities such as water sports, wildlife viewing, and boating. Conversely, the Project would have a positive impact on recreation and visitor use in that it would enhance visitor access to Santa Cruz Island.

Public Health and Safety

While a key goal of the Project is to minimize unsafe conditions, Project implementation may cause short-term adverse effects on public health and safety if improperly managed.

IMPACT TOPICS DISMISSED FROM DETAILED ANALYSIS

The following impact topics would not be affected or would be affected negligibly by the Project. Therefore, these topics were dismissed from detailed analysis.

Land Use

Existing land uses at Scorpion Anchorage include the following:

- Vessel embarkation for ferries and excursion boats
- Open space and public access, including public paths and trails
- Visitor services such as educational interpretation
- Recreation, including a designated kayak storage area

While the Project may result in reconfiguration of land uses in the area (e.g., relocating the vessel landing area), the Project does not propose to alter the availability or capacity of these uses. As such, existing land uses at Scorpion Anchorage would not be impacted by the Project. The Project would not conflict with any land use plans, policies, or controls for Santa Cruz Island or Scorpion Anchorage.

Energy Requirements and Conservation

Channel Islands National Park strives to conserve resources. Santa Cruz Island, for example, has no electric or gas utilities or facilities. Additionally, all NPS housing on the island uses solar energy and diesel for electricity, as well as propane for some uses. The Project would have no impact on energy requirements and conservation because it does not propose to alter the availability or capacity of the energy needed to protect or administer Channel Islands National Park.

Natural or Depletable Resource Requirements and Conservation

None of the alternatives being considered would result in the extraction of resources from Santa Cruz Island or Scorpion Anchorage. Under each of the alternatives, best management practices and mitigation measures would be applied to ensure that the park's natural resources were maintained and not impaired. The Project would therefore have no impact on natural or depletable resources.

Urban Quality and Design of the Built Environment

Santa Cruz Island does not include urban environments. Within the Project area, the built environment includes Scorpion Ranch structures, the access road, and the existing pier. The Project would not affect existing Scorpion Ranch buildings and would replace the deficient pier and access road. These improvements would not conflict with or detract from the built environment. The Project would therefore have no impact on urban quality and design of the built environment.

Environmental Justice

Executive Order 12898 ("Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations") requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. According to USEPA, environmental justice is defined as the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, or commercial operations, or the execution of federal, state, local, and tribal programs and policies.

Given this definition, when considering the location and nature of the Project, the Project would not have disproportionate health or environmental effects on minorities, low income populations or communities, or any socially disadvantaged populations. Potential impacts to sensitive artifacts including Native American resources are addressed in the "Cultural and Historic Resources" section.

Prime and Unique Agricultural Lands

The Project would have no impact on prime or unique agricultural lands because agricultural practices no longer occur anywhere on Santa Cruz Island.

Public Services and Utilities

Other than potable water and three outhouses available at the Scorpion Ranch Campground, no additional public services are provided at or nearby the Project study area. Helicopters from the mainland are flown to the island for emergency medical relief. Because the Project does not propose to alter the availability or capacity of these resources, the Project would have no impact on public services and utilities.

Wild and Scenic Rivers

The Wild and Scenic Rivers Act of 1968 established the national wild and scenic river system to preserve certain rivers with outstanding cultural, natural, or recreational values. Based on this system and its current database, there are no designated wild, scenic, or recreational rivers in the study area.

Sacred Sites

Because no sacred sites have been documented within Santa Cruz Island or Scorpion Anchorage, this topic has been dismissed from further analysis in this EIS. Potential impacts to sensitive artifacts including Native American resources are addressed in the "Cultural and Historic Resources" section.

Indian Trust Lands

The Park Service does not manage or administer Indian trust assets, nor are any lands within Santa Cruz Island or Scorpion Anchorage held in trust by the Secretary of the Interior solely for the benefit of American Indians due to their status as American Indians. Therefore, this topic was dismissed from further analysis.

PLANNING PROCESS

A description of NEPA and how it guides development of the Project is presented in the "Relevant Policies and Plans" section of this chapter.

The formal public comment period for this Draft EIS began upon publication of the Notice of Availability (NOA) in the Federal Register. All interested parties have the opportunity to review and comment on this document during the formal comment period, which spans 60 days. Copies of the Draft EIS will be available at the offices and libraries noted in the "Consultation and Coordination" chapter. The Park Service will record, categorize, and respond to all substantive public comments received on this Draft EIS. For specific comment period start and end dates, as well as the dates, times, and locations of the public hearings, please visit the Project website at http://parkplanning.nps.gov/ScorpionPier.

The Final EIS will incorporate text revisions corresponding to comments received, and will identify the Park Service's reasons for identifying its preferred alternative. The release of the Final EIS will be announced through publishing an NOA in the Federal Register and posting updates on the Project website. Release of the Final EIS will be followed by a 30-day no action period, as directed by Council on Environmental Quality (CEQ) regulations. The Record of Decision will document and discuss the identified alternative, the environmentally preferable alternative (if different from the identified alternative), and any accompanying mitigation measures. The Record of Decision will be issued a minimum of 30 days after USEPA's publication of the NOA for the Final EIS in the Federal Register.

Alternatives

INTRODUCTION

NEPA requires that federal agencies considering actions that could affect the quality of the human or natural environment, "study, develop, and describe appropriate alternatives to recommended courses of action," for any proposal that includes, "unresolved conflicts concerning alternative uses of available resources." CEQ's NEPA implementing regulations (CFR Title 40 Parts 1500-1508) further require federal agencies to, "rigorously explore and objectively evaluate all reasonable alternatives," to the federal action under consideration.

This chapter provides information on the range of alternatives considered for the Project, including a discussion of the alternatives development process and a brief explanation of those alternatives considered and dismissed from further study. Descriptions of the No Action Alternative and the two action alternatives (including the environmentally preferred alternative) identified for detailed analysis are provided, including discussions of how each alternative meets the purpose, need, and objective of the Project. Finally, a summary comparison of the alternatives is provided, highlighting potential impacts and mitigation measures.

DESIGN CRITERIA

During conceptual design and development of the alternatives evaluated in this EIS, the following key design criteria were developed by the Park Service.

WATER DEPTH AT PIERHEAD TERMINUS REQUIREMENTS

Water depths in the vicinity of the existing pier are too shallow to meet the needs of NPS staff and park visitors. A minimum water depth of 10 feet below mean lower low water (MLLW) was determined to be an optimal minimum water depth for all vessels accessing the new pier in all tidal conditions. The alternative pier designs should be of sufficient length to provide a minimum of 10 feet of water depth during MLLW tide at the waterward end of the pierhead (the end of the pier that is farthest from the shore). NPS vessel captains also agreed that the MLLW water depth of 6 feet at the landward end of the pierhead was acceptable.

PIER WIDTH REQUIREMENTS

The existing Scorpion Pier is 8 feet and 10 inches wide (clear distance between curbs), and is too narrow to achieve Project objectives. The alternative designs would include 18-foot-wide piers (landward of the pierheads). This is the same width as the 370-foot-long Prisoners Harbor Pier (located on the north side of Santa Cruz Island), and the inside clear width of the new 575-foot-long pier on Santa Rosa Island. A narrower pier would be unable to accommodate trucks with trailers, and would require an equal number of piles as the 18-foot concept, thereby incurring similar costs and associated pile installation impacts.

While a pier width of greater than 18 feet would provide additional room for vehicles, gear, staff and visitors, the increase in cost would not be justified because a width of 18 feet at the Prisoners Harbor Pier has been determined to be adequate by NPS staff. The 18-foot width was agreed upon during a November 2012 Project team meeting.

PIERHEAD LENGTH AND WIDTH REQUIREMENTS

The Park Service has determined that the pierhead for any action alternative should measure 60 feet in length and 31 feet in width. The length of 60 feet is an optimal minimum for accommodating the NPS vessel *Ocean Ranger* when pulled alongside the pier, according to Channel Island National Park staff (the *Ocean Ranger* is the vessel preferred by NPS staff for transporting most cargo). A width of 31 feet was a result of doubling the transverse pile spacing used to support the 18-foot-wide portion of the pier, using the same 3-foot pile cap cantilever on both sides. These dimensions provide enough deck space to maneuver a mobile crane into position to load and unload cargo, while still allowing enough additional space for a cargo staging area and for staff circulation.

PIER DECK ELEVATION – DESIGN FOR SEA LEVEL RISE AND STORM CONDITIONS

Making a determination of the deck elevation requires balancing the need to keep the deck low enough for optimal operations and the need to design for sea level rise, storms, and wind and wave conditions. The design approach for the proposed pier and its deck elevation considered a sea level rise of 1.1 feet in 2050, which is a mid-range estimate consistent with recent guidance from CCC. Selection of steel piles and superstructure allows for the pier to be modified (elevated) in the future by which time better estimates and understanding of the sea level rise projections will be available to make informed decisions on the modified deck elevation. The use of a steel superstructure ensures the ability to

structurally raise the pier in the future, if necessary. In this way, the new pier is adaptable to increasing sea level rise and climate change.

Storm waves that reach the site are either swell from the northwest Pacific Ocean storms or wind waves from the east. Waves from the east are higher than waves from the northwest and dictate design of the pier deck elevation. Data from a 2011 technical report for information concerning sea level rise and wave climates (Coast and Harbor Engineering 2011) indicates that wave heights and bottom depths where waves will break for the pier locations that were considered for various return period storms given a mean higher high water tide. Storm waves that occur at lower tides do not dictate the design.

The steel superstructure also allows for the lower portion of the pierhead structure (outer bents) to raise upwards to an elevation of +16.0 MLLW. This effectively reduces the risk of the pile cap being struck by waves.

The *California Coastal Commission Sea Level Rise Policy Guidance* dated May 27, 2015, also illustrates the uncertainty in predicted sea level rise (CCC 2015). This report indicates sea level rise projections by 2050 range between 5 to 24 inches (average of 1.21 feet) and by 2100 between 17 to 66 inches (average of 3.46 feet). The accuracy of sea level rise predictions decreases as time frames for the predictions increase. The risk of selecting an inaccurate sea level rise value therefore increases with a longer design life. To avoid such risk would require selection of the maximum predicted sea level rise, the consequences of which would dramatically impact the aesthetic, design, cost, and operation of any waterfront structure. As noted previously, the use of the steel superstructure allows for the pier to adapt to changes over time.

CRANE REQUIREMENTS

The Park Service has evaluated the pier to accommodate a mobile crane, as opposed to a fixed crane, to load and unload cargo transported by vessels. Some of the advantages of a mobile crane at this location are as follows:

- A mobile crane is faster and can perform more complex dynamic lifting operations than a fixed crane.
- A mobile crane can be serviced in an upland location, outside the sensitive coastal zone, thereby minimizing environmental risks associated with fueling, maintenance and repairs.
- A mobile crane can be stored in an upland location, minimizing its exposure to the harsh salt spray environment (which tends to decrease the durability of equipment).
- A mobile crane can be used for other functions in the Scorpion Ranch area and elsewhere on the island, including lifting or hauling operations for routine or emergency situations.
- A mobile crane would only occupy the pier on a temporary basis and would only be visible when needed on the pier, whereas a fixed crane (and associated generator) would always be visible on the pier from many viewpoints.
- The Park Service already owns a mobile crane, currently located at Prisoners Harbor on the north side of Santa Cruz Island, which could be transported for use on the new pier.

ACCESS ROAD REQUIREMENTS

The unpaved road that currently provides access to the existing pier is subject to erosion from extreme waves and occasional flooding of Scorpion Creek, and requires periodic maintenance and reconstruction. This necessitates the use of heavy equipment, increases the risk of damaging archeological resources, and takes valuable staff time away from other functions. The existing road would have to be raised above flood elevations for continued use, regardless of the proposed Project. The Park Service has identified the need for a steel sheetpile retaining wall to

support an improved road, as well as the need for armoring of key portions of an improved road to protect it from potentially damaging wave and flood waters. The proposed alternatives evaluated in this EIS include varying degrees of armoring. The improved road will provide reasonable accessibility for all visitors given its remote location and surrounding site conditions.

PIER FOUNDATION, SUPERSTRUCTURE, AND PILE MATERIAL REQUIREMENTS

A range of pier foundation and superstructure materials was evaluated. Pile materials considered included steel, timber, concrete, and caisson-style footings. Pier superstructure materials considered included timber, steel, concrete, and prefabricated bridges. A tubular steel pier superstructure supported by steel cylindrical piles is proposed for the alternatives evaluated in this EIS.

Steel piles are strong, durable, relatively easy to handle and construct, and require only a moderate level of maintenance. Steel piles are significantly stronger and have a greater longevity than timber piles, and they can be recycled at the end of their useful life. They are lighter and are generally easier to install than concrete piles, which is a significant consideration for transport and installation at an island location. Although it is a remote possibility, should a pile be damaged during transport or construction, it is anticipated that the turnaround time for obtaining a steel pile would be less than that required to manufacture, cure, and transport a concrete pile. Steel piles can readily be lengthened or shortened, if necessary, in the field while maintaining their structural capacity. The pier would include 18-inch steel structural piles, 16-inch steel berthing piles, and 12-inch fiberglass fendering piles.

Should the need arise to elevate the pier superstructure in the future due to increased or accelerated sea level rise, the use of steel piles would allow for the possibility of doing so by lengthening the steel piles using a cut-and-splice technique. Steel pile-supported piers are also common in the Channel Islands.

The steel piles and connecting hardware would be subject to corrosion and would require a moderate amount of maintenance. The piles would be protected as follows:

- The 18-inch-diameter steel structural piles would have a 24-inch black high-density polyethylene (HDPE) sleeve, filled with grout.
- The 16-inch-diameter steel berthing piles would be epoxy coated.
- The 12-inch-diameter fiberglass fender piles would have a black HDPE sleeve.

Prefabricated bridges, which could limit the amount of in-water construction needed, were considered but found to be economically and logistically infeasible to construct and install at this location. A timber structure was considered as well, but would not provide enough support needed for the construction process; progressive installation of the pier requires that a large crane be supported during construction.

GANGWAY

The gangway would be constructed of aluminum with railings and handrails in accordance with the International Building Code. The proposed walking surface is a grated fiberglass material such as Micro-Mesh manufactured by Fibergrate. The grating is corrosion resistant, light weight, low maintenance, non-conductive, UV resistant, ABA compliant, and slip resistant. The gangway is connected at its top end to the pier via a hinge allowing the bottom of the gangway to move up and down and in and out. The bottom of the gangway rests on a platform in turn supported by piles or pier related structure. The platform structure is raised and lowered as necessary to accommodate vessels with fluctuating tide levels. The gangway and platform may also be raised during storm events to keep it from being struck by damaging waves. The lifting mechanism for this gangway system would

require power that would most likely be generated by an independent generator.

CONSTRUCTION SEQUENCE AND METHODOLOGY

The construction sequence and methodology for each alternative are the same.

The pier would be constructed inside out—meaning, within its own footprint. An air-driven rock hammer would be needed to create the borings into the hard volcanic rock in the Project area. At each location, the contractor would position a temporary staging platform to support the pile drilling equipment. This platform would not be driven into the ground; rather, it would rest on the seafloor. Once piles are installed, a crane would advance along the length of the pier, constructing the pier progressively. Bracing and framing would be added before proceeding to the next pile bent. This assemblage of equipment is shown in Figure 3. Barges may be used to supplement, where water depths are sufficient.

The seafloor at Scorpion Anchorage comprises beach deposits consisting of sand, gravel, cobble, and boulder underlain by hard volcanic rock. The bedrock is sufficiently hard enough to preclude any conventional drilling or pile driving, including H-piles with driving shoes. To construct a replacement pier, holes or sockets for the piles would need to be created in the bedrock with a down-the-hole rock hammer drill. An air-driven rock hammer would be needed to create the borings into the hard volcanic rock in the Project area. Waste materials from the pile drilling process would be extracted, contained, and treated. Waste water would be filtered and treated and discharged back to the ocean. Rock waste and other solid debris would be transported off site by the contractor and disposed of in an appropriate location. There would be no use of drilling muds. Only rock debris and seawater are expected byproducts of this operation.

After sockets are drilled, piles would be placed in the sockets in a pipe casing. Grout would then be placed in the socket to anchor the piles in place and the casing would be subsequently removed. For a graphic depicting this sequence, see Figure 4.

Where there is adequate water depth (-7 feet MLLW or deeper), pile installation may be performed with drilling equipment placed upon a conventional floating derrick barge, as opposed to from the pier itself.

The drilling equipment would be powered by diesel-powered air compressors located in the upland or floating barge. The contractor would surround the compressors with a noise wall or shroud to shield visitors, NPS staff, and biota from the noise from these compressors.

Upon completion, the deck and remaining pier components would be installed. Most of these activities would be performed from floating barges and/or a temporary structure.

A new steel sheetpile retaining wall would be installed to support the improved access road between the new pier terminus and North Scorpion Valley Road. Some excavation would be required to install protective rock armoring. The improved access road would be elevated above predicted storm impacts.

The improved access road would be surfaced with crushed rock, and a layer of rock armoring would be installed using boulders. The armoring would slope down from just below the top of the retaining wall at a 2:1 grade. Below, where it intersects with existing grade, the toe of the armoring would be covered with a minimum of 5 feet of native backfill (material put back in place after having been previously excavated). The access road lengths and proposed volume of rock armoring for the two build alternatives are described in the “Alternatives Identified for Detailed Analysis” section.

STAGING

The primary staging area for construction would be located at the existing kayak storage area inland of Scorpion Beach and south of Scorpion Creek, while secondary staging for construction contractor housing and passive use would be located at the existing corral approximately 0.25 mile inland (Figure 5).

Materials and equipment would likely be transported by the contractor on barges or other vessels. During construction, crews would remain on site during the work week to minimize travel costs and maximize their available time on the island. Crews would likely stay in temporary contractor housing facilities (rented trailers) located in the corral staging area. No new facilities would be constructed. Heavy machinery would not be operated within the corral staging area.

During construction, it is likely that access to the park by visitors or employees could be restricted or eliminated for periods of time.

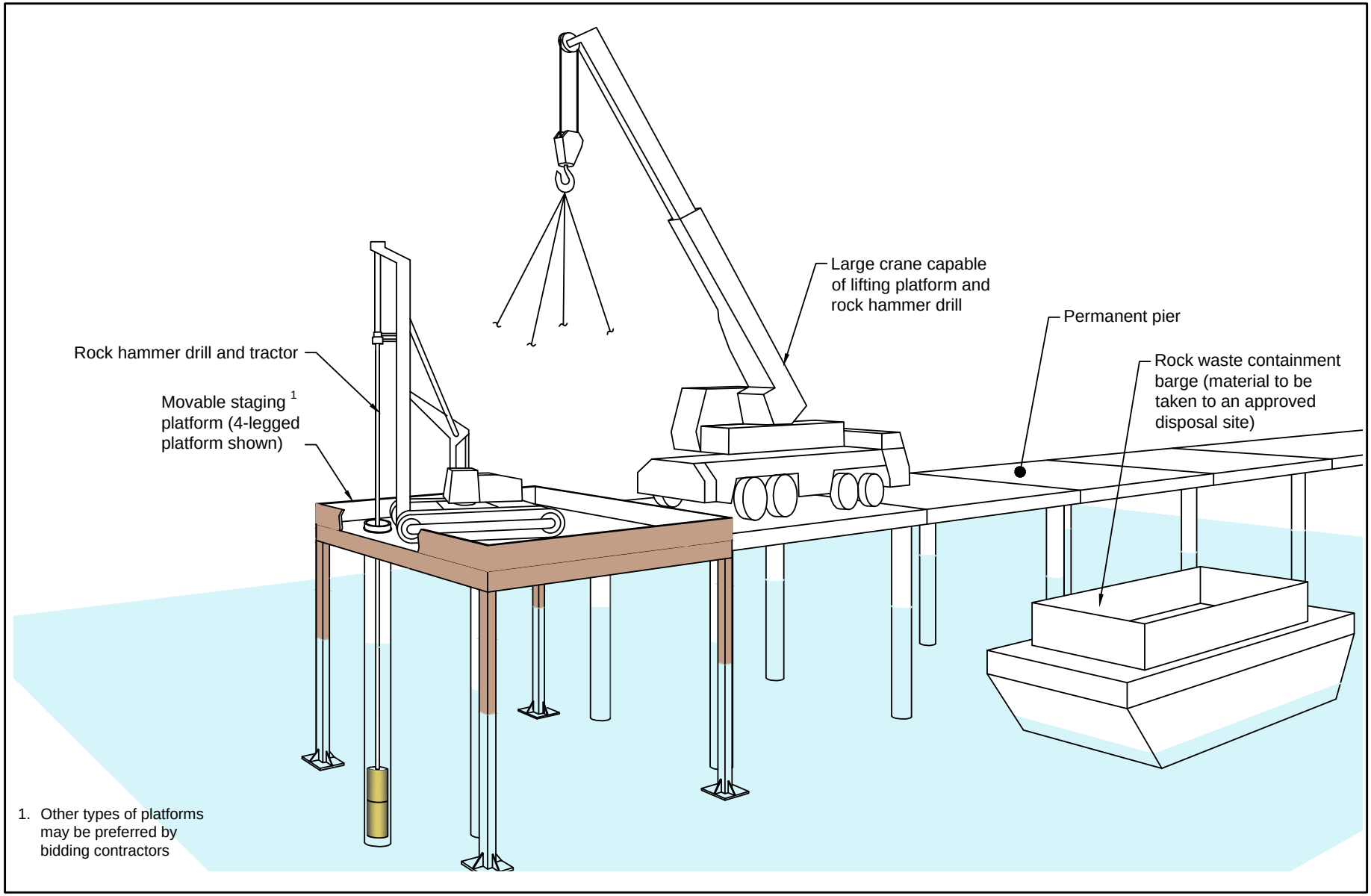


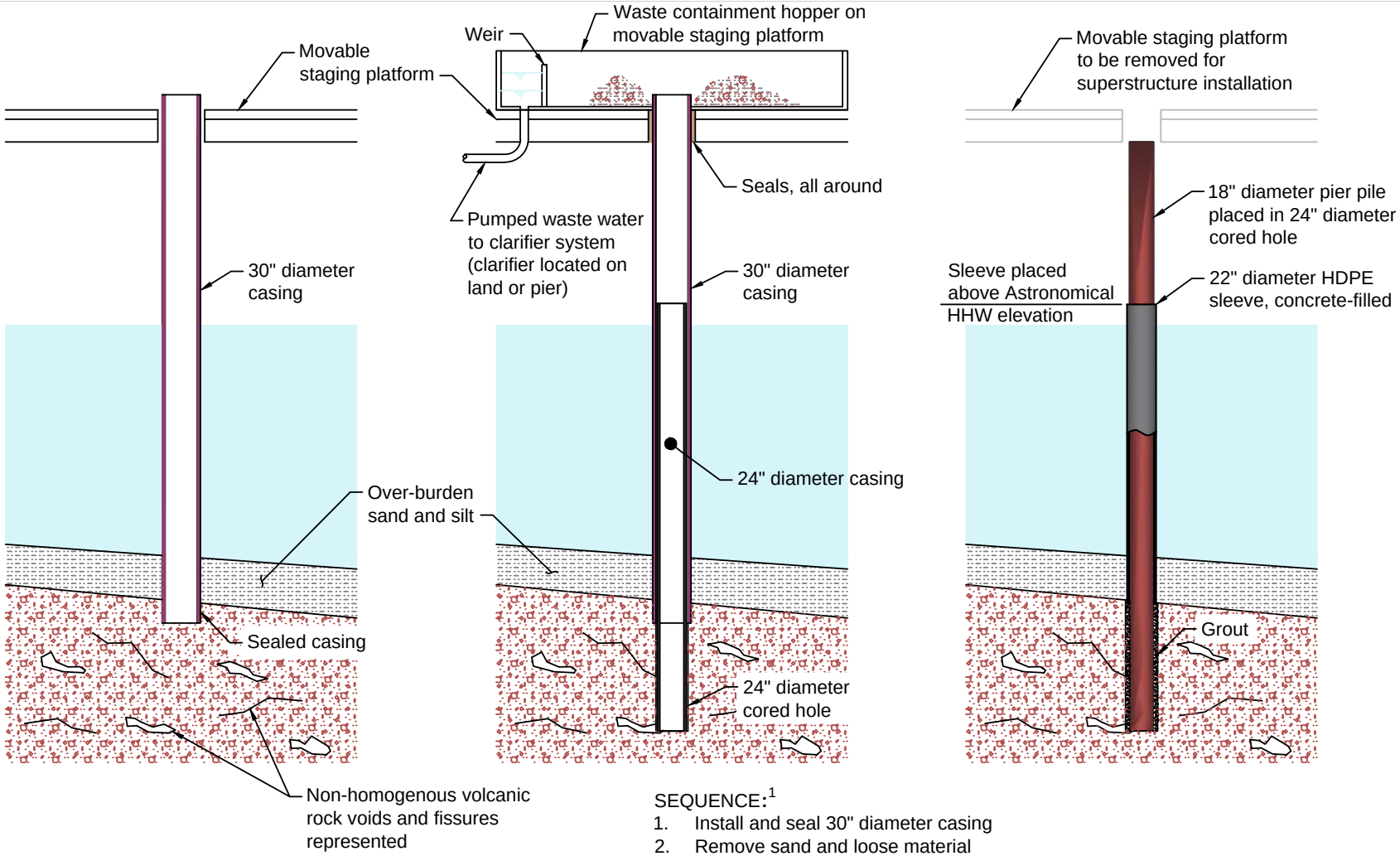
FIGURE 3

PILE INSTALLATION DIAGRAM

Channel Islands National Park

National Park Service/U.S. Department of the Interior

Draft - August 2015



1. Subject to modification based on successful bidder's equipment, means, and methods.

SEQUENCE:[1]

1. Install and seal 30" diameter casing
2. Remove sand and loose material
3. Drill and case 24-inch diameter hole in volcanic rock (8'-0" rock embedment)
4. Place 18" steel pier pile
5. Grout pile

FIGURE 4

SEQUENCE OF PILE INSTALLATION

Channel Islands National Park

National Park Service/U.S. Department of the Interior

Draft - August 2015

FIGURE 5
POTENTIAL STAGING AREAS
Channel Islands National Park
National Park Service/U.S. Department of the Interior
Draft - August 2015

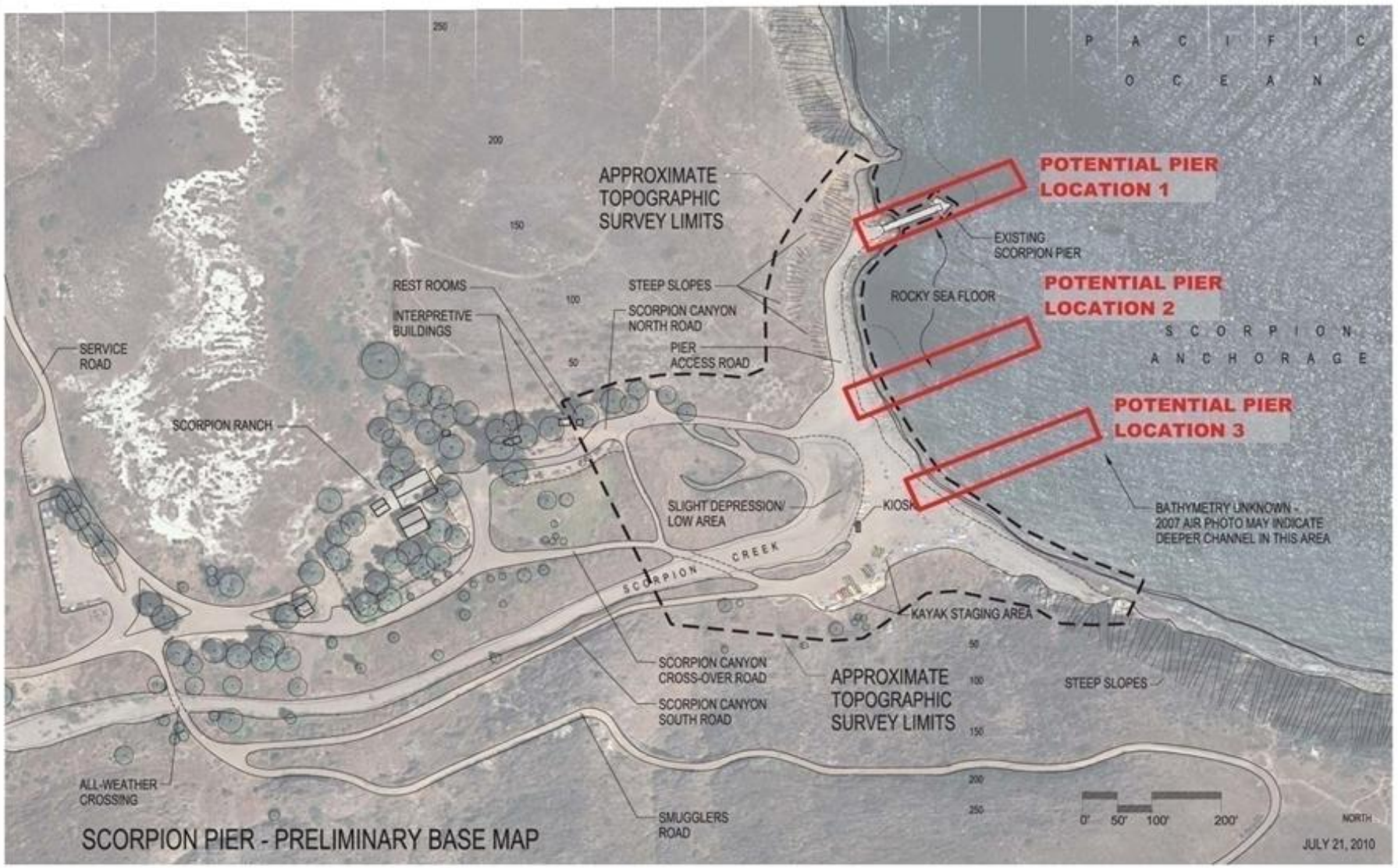
ALTERNATIVES SCREENING PROCESS UNDER NEPA

The goal of the NEPA alternatives screening process is to identify and evaluate alternatives developed during Project development and scoping against a standard set of criteria, and to eliminate alternatives that are found to be unreasonable. Unreasonable alternatives are those that meet one or more of the following criteria:

1. Are unreasonably expensive
2. Cannot be implemented for technical or logistic reasons
3. Do not meet NPS mandates
4. Are inconsistent with NPS statements of purpose and significance, and
5. Are inconsistent with NPS or cooperating agency management objectives

CEQ defines reasonable alternatives as those that are technically and economically feasible and that show evidence of common sense. They also meet Project objectives, resolve needs, and alleviate potentially significant impacts to important resources.

The alternatives development process for the Project began in 2010 when the Park Service identified locations in Scorpion Anchorage that could potentially accommodate the replacement pier. The locations for the action alternatives (see Figures 2 and 6) initially considered included the existing location (Alternative 1), approximately 300 feet south of the existing location (Alternative 2), and approximately 600 feet south of the existing location (Alternative 3). Since then, the Park Service has reviewed the potential locations more closely in relation to the Project objectives and ongoing design development, and conducted a series of studies, as well as stakeholder and public outreach efforts focused on developing and screening the range of alternatives. The alternatives that resulted from the internal planning and external scoping processes are presented later in this chapter. Outreach efforts and the Value Analysis workshop are described in more detail in the following sections. Key studies and outreach efforts are outlined in Table 2 and described in more detail in the paragraphs following the table.



Source: Jones and Jones 2010

FIGURE 6
LOCATION OF PRELIMINARY ALTERNATIVES
Channel Islands National Park
National Park Service/U.S. Department of the Interior
Draft - August 2015

TABLE 2. ALTERNATIVES DEVELOPMENT PROCESS

Event	Date	Highlights
Preliminary Research and Site Visits	Spring 2010	Refined Project objectives; identified potential environmental resource impacts
Internal Scoping Workshop 1 Internal Scoping Workshop 2	Winter 2010 Winter 2012	Identified relative strengths and weaknesses of three action alternatives; eliminated one action alternative and carried forward two action alternatives for value analysis
Public Scoping, including SHPO and outreach to tribes	Summer 2013	Identified stakeholder concerns for the Project
Value Analysis Workshop for Alternatives Development	Spring 2014	Evaluated, screened, and refined the remaining two action alternatives; Alternative 2 identified as preferred alternative for the Project; mobile crane determined to be best option (fixed crane dismissed)

PRELIMINARY RESEARCH AND SITE VISITS – SPRING 2010

In May 2010, the Park Service conducted preliminary research and initial site visits, as well as early scoping meetings. During this time, Project objectives were refined, and the initial three alternatives' potential impacts on various environmental resources were identified and discussed. Some of these resources included biological species and habitats; sacred sites and artifacts; geology and hydrology; visitor use; vessels; operations; safety; and overall site accessibility. It was noted that the lack of bays with access to Scorpion Ranch limited the potential range of alternatives to locations in Scorpion Anchorage (NPS 2010a).

INTERNAL SCOPING WORKSHOP – WINTER 2010

An internal scoping workshop was held in December 2010 to review new information gathered from recent bathymetric surveys and geotechnical investigations, as well as to further discuss potential Project impacts on various environmental resources. The relative strengths and weaknesses of the three initial options that were summarized at the workshop are listed in Table 3.

Following the winter 2010 scoping workshop, it was agreed that Alternative 3 should not be considered further for the reasons listed in Table 3.

TABLE 3. SUMMARY OF INITIAL OPTIONS' PROS AND CONS

Location	Pros	Cons
Alternative 1 – Current Pier Location	• Leaves majority of southern beach area available for kayaking, snorkeling, and swimming	• Continued maintenance of access road affects cultural resources in slope adjacent to road, and may require additional armoring of road • Construction of bulkhead or causeway to protect resources above access road would add significantly to Project costs • Perpetuates NPS cargo, vehicle, and visitor circulation conflicts • Would require concessioner and Park Service to use skiffs or other craft to transport visitors, staff, and cargo during pier reconstruction, which would cause financial hardship for concessioner and increased safety risks
Alternative 2 – Central Portion of the Beach	• Reduces risk of impacts to sensitive cultural resource areas at headland above current access road • Least risk to archeological resources compared to other options • Allows North Scorpion Valley Road to be lined up with pier, which would provide optimal access and more efficient operations • Visitors land at point closest to Scorpion Ranch services • Potential to reduce circulation conflicts • Would allow NPS and concessioner boats to operate in current manner during the construction period	• New construction footprint • Compared to the location of Alternative 1, a longer pier would need to be constructed to reach adequate water depth • Pier location would in effect bisect the beach and Scorpion Anchorage • Would require new armoring of corner of hillside (where current access road turns to the north) • Pier and abutment would be in path of high flows during creek flooding periods; would likely require armoring of stream channel and periodic maintenance (but significantly less than Alternative 1)
Alternative 3 – Southern Portion of the Beach	• Less alteration of the shore and adjacent upland would be required for abutment and pier compared to Alternatives 1 and 2 • Good location and access for trucks and operations equipment to South Scorpion Valley Road • Potential to reduce circulation conflicts compared to Alternative 1 (but not as optimal as Alternative 2) • Would allow NPS and concessioner boats to operate in current manner during the construction period	• Aesthetically negative; highly visible from central portion of Scorpion Ranch and Valley • New construction footprint • Compared to location Alternatives 1 and 2, a longer pier would need to be constructed to reach adequate water depth • Affects current part of beach used by kayakers and considered a prime swimming area; as such, the character of the secluded southern beach would change significantly • Kayak staging area would likely be displaced • Long alternate access road required during storms when Scorpion Creek breaches the beach • Would potentially affect a relatively undisturbed sensitive cultural site

INTERNAL SCOPING WORKSHOP 2 – WINTER 2012

A second internal scoping workshop was held in November of 2012 to discuss NEPA/EIS issues, pier head shape and requirements for boat operations and access, gangway/ accessibility issues, and to evaluate park operational requirements including crane opportunities and constraints.

PUBLIC SCOPING – SUMMER 2013

Stakeholder and public outreach for the Project included a 60-day public scoping period during spring/summer 2013. Two public meetings were held during this period. The Park Service conducted additional outreach with CDFW, SHPO, CSLC, Chumash Council of Elders, Santa Ynez Band of Chumash Mission Indians, and Island Packers (the Park Service's current boat concessioner). No public comments were received. Comments were received from the resource agencies. No alternatives were eliminated from further study as a direct result of public and agency scoping. Stakeholder comments focused on the need for the EIS to adequately evaluate the range of impacts potentially resulting from the Project construction. All comments were considered for inclusion in the Draft EIS. Ultimately, no modifications were made to the alternatives as a result of public scoping.

VALUE ANALYSIS WORKSHOP FOR ALTERNATIVES DEVELOPMENT – SPRING 2014

Value Analysis workshops are an important tool used by the Park Service in determining which alternatives should be analyzed in an EIS. The workshops typically include a review of Project costs and affordability as they relate to park revenue, as well as recommendations for value-based cost savings, refinements to the alternatives, alternatives to be dismissed, and the NPS preferred alternative.

The Park Service conducted a Value Analysis workshop for the Project to evaluate the two action alternatives (Alternatives 1 and 2). The workshop included a review of the location, configuration, and use of the pier, as well as discussion of the potential impacts of the two alternatives. It also included a value-based decision making process to evaluate and determine if the Project should include a fixed or mobile crane as part of the new pier design. At the conclusion of this workshop, Alternative 2 was identified as the preferred alternative for the EIS (NPS 2014a).

ALTERNATIVES IDENTIFIED FOR DETAILED ANALYSIS

As a result of the Project's alternatives development process, the alternatives identified for detailed evaluation in this EIS include the No Action Alternative, Alternative 1 (Current Pier Location), and Alternative 2 (Central Portion of the Beach). This section provides detailed descriptions of each alternative's proposed design components and construction activities.

NO ACTION ALTERNATIVE

The No Action Alternative is analyzed in this EIS pursuant to CEQ regulations (40 CFR 1502). This alternative, which represents no change from the Park Service's current management direction, provides a baseline for comparing the other alternatives' proposed changes and potential subsequent effects. It assumes a continuation of existing conditions at the existing location. There would be no construction costs, and no additional funding would be required to implement this alternative.

Per the existing conditions, the pier measurements and configuration would remain the same for the No Action Alternative. As a result, the pier would continue to have operational depth of -8.5 feet MLLW, and access from the concessioner boats would continue to require a ladder propped along the south side of the pier. The pier's steel guardrail with handrails would remain. No improvements would be made to the connecting access road. In general, no armoring would be installed as part of this alternative. Instead, regular repairs and maintenance activities would continue to keep the pier and access road as safe and serviceable as possible.

Construction

No facilities changes beyond routine maintenance and repair would occur under the No Action Alterative. There would be no new construction of pier facilities or access road improvements under the No Action Alternative.

Operations

The existing Scorpion Pier does not meet critical program elements of providing safe access to Santa Cruz Island and has deficiencies in accommodating operational demands.

Figure 7 shows the layout of the existing pier and approach road. Island Packers operates a fleet of three vessels out of Ventura Harbor in Ventura and Channel Islands Harbor in Oxnard, providing passenger ferry service for visitors to Santa Cruz Island.

Transportation. Visitors and NPS staff arrive at Scorpion Pier via ferry. Each ferry can accommodate up to 110 passengers along with cargo and camping gear. Two or three crossings are scheduled every day in the summer and one crossing is scheduled per day, five or six times a week, in the winter when ocean conditions permit. Transportation options are assumed to remain the same as existing conditions under the No Action Alternative.

Site Circulation. Visitors and NPS staff arrive at Scorpion Pier via ferry, traverse the pier and access road, and gain access to the park and its amenities. The ferries are not moored or tied up to the dock because wave action generally makes the boat unsteady; instead, boat operators thrust into contact with the dock during loading and unloading of passengers and cargo. The ferry disembarkation process requires visitors and NPS staff to climb a single ladder one person at a time, often while carrying heavy cargo. Once on the pier, individuals must walk along a 90-foot-long by 9-foot-wide fixed span that lacks adequate handrails. Upon reaching land, visitors are required to traverse approximately 400 feet

across an access road consisting of a sandy, gravely and rocky surface.

Existing pier conditions create a safety risk to park visitors. Any adverse swells or surges can easily cause dangerous situations to develop—boat operators are sometimes required to quickly power vessels away from the pier to avoid potential damage or injury. Disembarkation requires visitors and NPS staff to use ladders in pitching and shifting seas, and it is not safe for boats to approach or dock when tides are low or when wave heights are greater than 1 or 2 feet. Maintaining balance while crossing the narrow fixed span is challenging during increased wind or wave activity, and the access road can be difficult to negotiate. These issues present a particular challenge to older individuals or visitors with mobility disabilities, while carrying bags, packs and other gear.

Site circulation is assumed to remain the same as existing conditions under the No Action Alternative.

Visitor Levels

Although the number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity, visitor levels are ultimately controlled by the concession contract, weather, and Park Service rules and regulations (i.e., the GMP/Wilderness Study/EIS and Park Superintendent's public use limits for island). As described in the "Transportation" section for this alternative, each ferry can accommodate up to 110 passengers along with cargo and camping gear. Two or three crossings are scheduled every day in the summer and one crossing is scheduled per day, five or six times a week, in the winter when ocean conditions permit. An unlimited number of private boats are also allowed in Scorpion Anchorage. The No Action Alternative assumes no change in concessioner operations bringing visitors to Santa Cruz Island and no change to ferry vessel capacities or number of crossings.

0 100 Feet

FIGURE 7
NO ACTION ALTERNATIVE
Channel Islands National Park
National Park Service/U.S. Department of the Interior
Draft - August 2015

ALTERNATIVE 1

Construction

Alternative 1 would remove and demolish the existing pier and abutments and replace it with a longer, wider pier, oriented nearly parallel to the existing pier and extended farther into deeper water (see Figure 8). The replacement pier would be 18 feet wide and 173 feet long, with a pierhead that measures 31 feet by 60 feet. This new pier would accommodate a greater range of water depths for safe embarkation, and the operational depth would increase to -11 feet MLLW at the pier end. The north and east sides of the pierhead would be lined by fiberglass fender piles and the pier could accommodate a mobile crane. To access the pier from the concessioner boats, visitors would use the gangway and landing aligned parallel to the pier. Park staff would have several options for mooring NPS boats at the pier, and would also use the gangway and landing. Guardrailing would be located around the majority of the pier's perimeter, similar to conditions on the Prisoners Harbor Pier.

The existing pier (including the railroad car) would need to be completely removed prior to installation of the new pier. The Alternative 1 pier would include 52 total piles, comprising 24 steel piles (18 inches in diameter), 9 steel berthing piles (16 inches in diameter) and 19 fiberglass fender piles (12 inches in diameter). Upon completion, the deck and remaining pier components would be installed.

Significant improvements to the existing access road would occur. The improved 435-foot-long access road would connect the new pier terminus to North Scorpion Valley Road. The improved road would be supported by a steel sheetpile retaining wall, and protective rock armoring would be installed along the shoreline. The surface of the access road would be finished with an even layer of crushed rock, and a small stairway would provide access to the beach near the transition to the existing road. The amount of excavation required to construct the retaining wall, roadway, and rock armoring would be approximately 7,200 cubic yards (cy), and the amount of rock armoring required would be approximately 4,400 cy. There would be approximately 1,320 cy of fill below the mean high tide line. Alternative 1 would result in approximately 0.30 acre of wetland resource impacts.

A new steel sheetpile wall would be installed between the new pier terminus and North Scorpion Valley Road to support an improved access road. The improved access road would be in the same location as the current unimproved access road, but it would be approximately 3 feet higher to keep it above extreme wave heights. Excavation of some material would be required to install protective rock armoring, to create the necessary foundation.

Project construction would occur per the methods and sequence described in the "Design Criteria" section.

During construction, access to the park by visitors or employees would have to occur via park and concessioner skiffs because the existing pier would need to be demolished before most construction of the new pier can begin. This would significantly increase the time required to load and unload passengers and to transfer cargo to and from vessels.

The Park Service has determined that a mobile crane is the preferred option for crane equipment for any alternative. Alternative 1 includes long-term use of a mobile crane. The crane would have a lifting capacity of 3,310 pounds with full extension of its 32-foot boom, and would include two outriggers on the sides to provide additional stability.

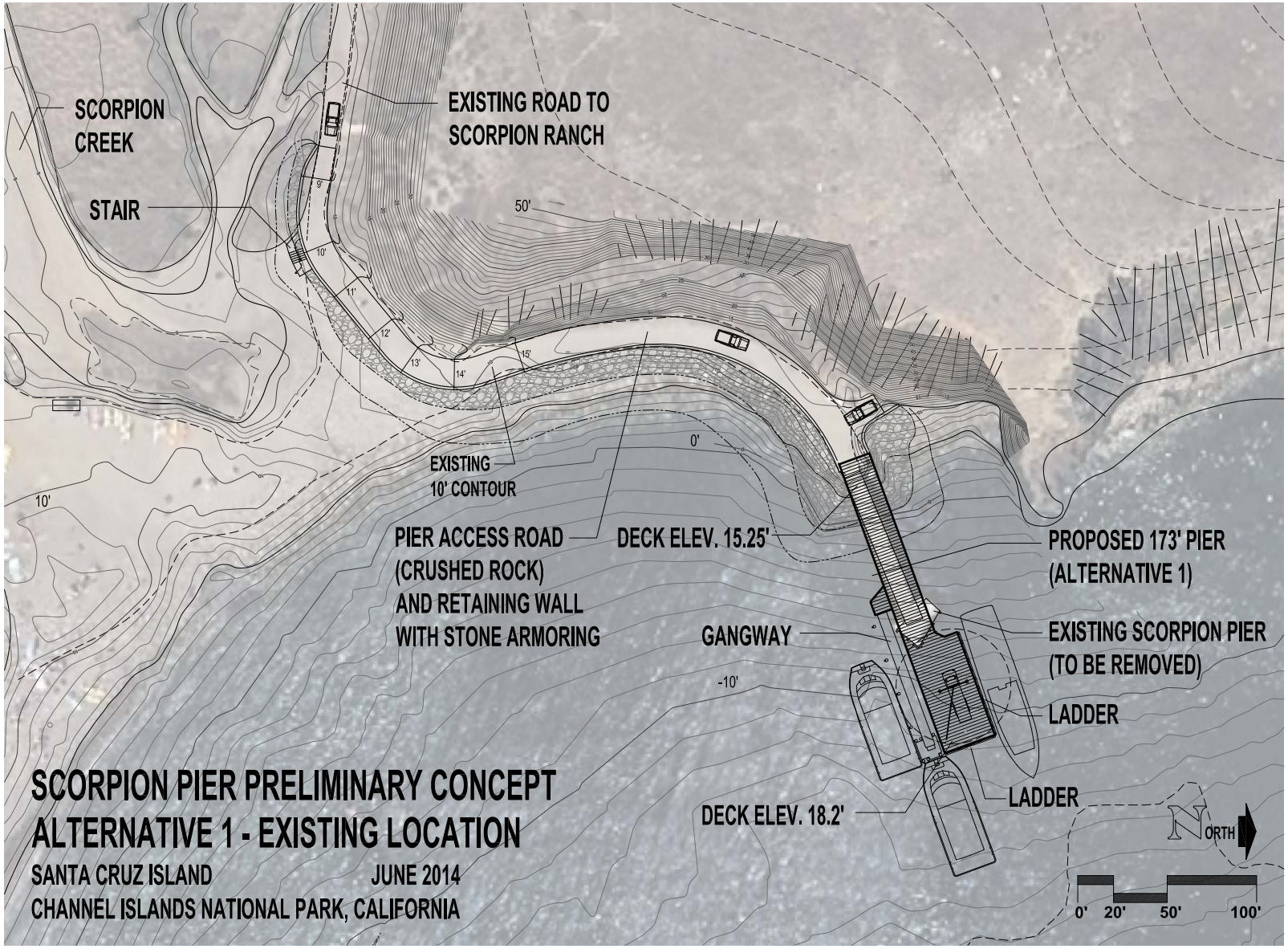
Operations

Transportation. Site access and arrival options would be consistent with those of the No Action Alternative. Transportation options and schedules are determined by the Park Service and the concessioner. Private boat use of the anchorage would not be affected.

Site Circulation. Similar to the No Action Alternative, visitors and NPS staff would arrive at Scorpion Pier via ferry, and traverse the pier and access road to gain access to the park. Ferries would be able to more easily access the pier due to the deeper drafts provided by the longer pier, as well as the improved configuration. Visitors would be able to disembark via a gangway connected to the pier, rather than via ladder, as would occur under the No Action Alternative. The wider approach pier, adequate handrails, and improvements to the access road surface would alleviate existing safety issues present under the No Action Alternative. The permanently constructed access road would improve vehicle and pedestrian circulation on the road, including the mobile crane.

Visitor Levels

Although the number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity, visitor levels are ultimately controlled by the concession contract, weather, and park rules and regulations (i.e., the GMP/Wilderness Study/EIS and Park Superintendent's public use limits for island). While the pier would provide improved access and efficiency of operations, the pier would not inherently increase visitation.



Source: Jones and Jones 2014

FIGURE 8
ALTERNATIVE 1 DESIGN
Channel Islands National Park
National Park Service/U.S. Department of the Interior
Draft - August 2015

ALTERNATIVE 2 (PREFERRED ALTERNATIVE)

Construction

Alternative 2 would construct a longer, wider pier approximately 300 feet south of the existing pier, which is significantly closer to the Scorpion Canyon North Road (Figure 9). Once the new pier is completed, the existing pier and abutments would be removed and disposed of on the mainland. The new pier would be 18 feet wide and 300 feet long, with a pierhead that is 31 feet by 60 feet. The new pier would accommodate various water depths for safe embarkation, and the operational depth would be -10.5 feet MLLW at the pier end. The north and east sides of the pierhead would be lined with a fiberglass fender piles, and the pier could accommodate a mobile crane. To access the pier from the concessioner boats visitors would use the gangway and landing aligned parallel to the pier. Park staff would have several options for mooring NPS boats at the pier and would also use the gangway and landing. Guardrailing, similar to that on the Prisoners Harbor Pier, would be located around the majority of the pier's perimeter.

The Alternative 2 pier would include 66 total piles, comprising 38 steel piles (18 inches in diameter), 9 steel piles (16 inches in diameter) and 19 fiberglass fender piles (12 inches in diameter). Upon completion, the deck and remaining pier components would be installed.

Compared to Alternative 1, the relatively short (approximately 110 feet long) access road that would connect the new pier terminus to North Scorpion Valley Road would be supported by a steel sheetpile retaining wall that is protected from extreme waves and flood waters by rock armoring. The road would be surfaced with an even layer of crushed rock. A small stairway would be constructed to provide access across the pier and to the beach. The amount of excavation required to construct the retaining wall, roadway, and rock armoring would be 1,800 cy, and the amount of rock armoring required would be 920 cy. No fill would be required below the mean high tide line.
Similar to Alternative 1, a new steel sheetpile wall would be installed between the new pier terminus and North Scorpion Valley Road to support an improved access road. The short access road transition would be 2 to 3 feet higher than the current access road to keep it above extreme wave heights. Some excavation would be required to install protective rock armoring. In Alternative 2, however, the armoring would not encroach into the intertidal zone, and the volume of road work, excavation, sheetpile wall, and fill would significantly less for Alternative 2, as compared to Alternative 1.

Project construction would occur per the methods and sequence described in the "Design Criteria" section.

During construction, it is likely that access to the park by visitors or employees could be restricted or eliminated for periods of time, but less than the amount of time associated with Alternative 1. A significant benefit of Alternative 2 is that during construction the existing pier could be used to transport visitors and Park Service staff.

Similar to Alternative 1, a mobile crane is the preferred option for crane equipment at any alternative location. The crane would have a lifting capacity of 3,310 pounds with full extension of its 32-foot boom and would include two outriggers on the sides to provide additional stability.

Operations

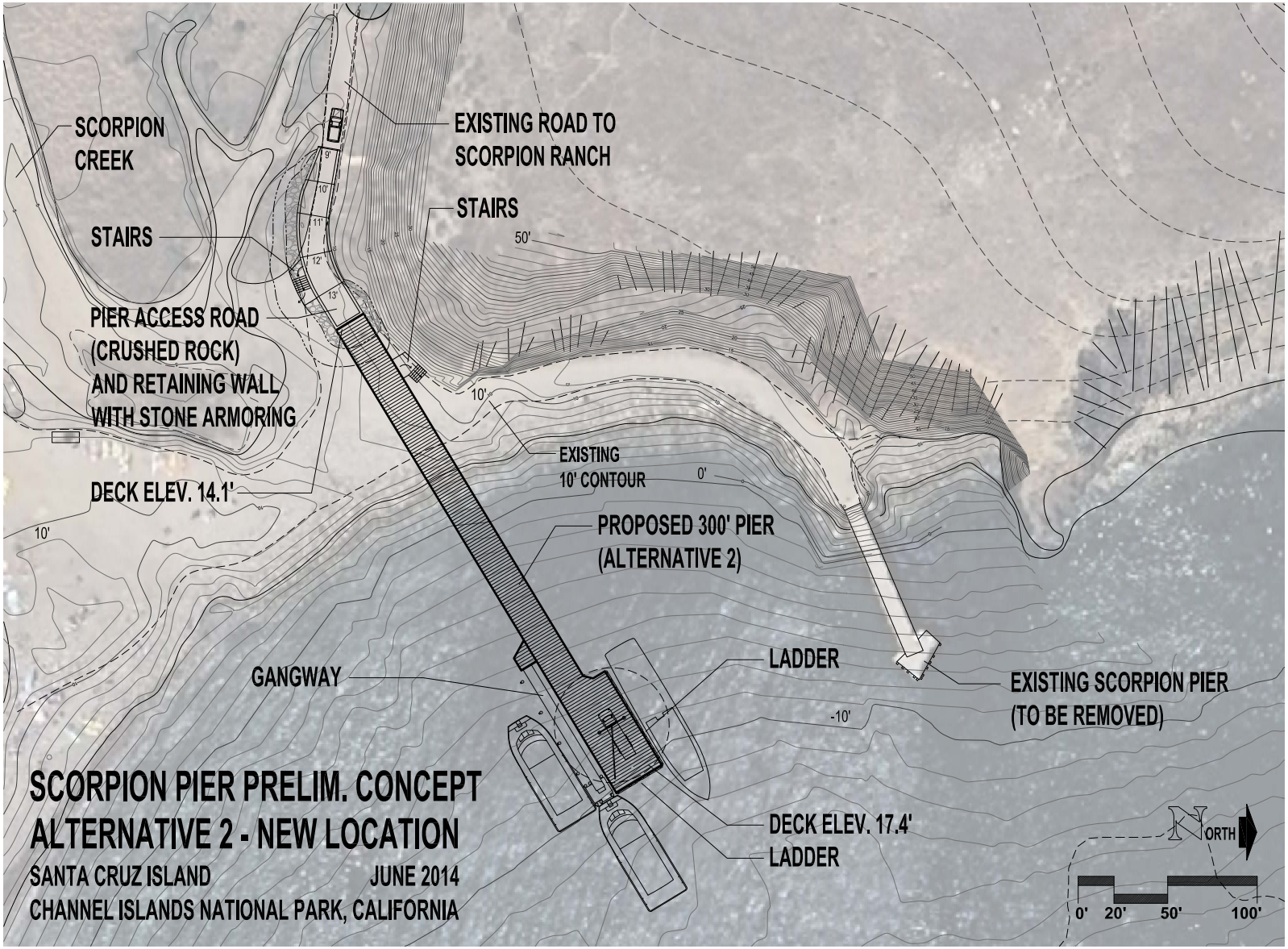
Transportation. Site transportation access and arrival options would be consistent with those of the No Action Alternative and Alternative 1. Transportation options and schedules are determined by the Park Service and the concessioner. Private boat use of the anchorage would not be affected.

Site Circulation. Similar to the No Action Alternative and Alternative 1, visitors and NPS staff would arrive at Scorpion Pier via ferry,

and traverse the pier and access road to gain access to the park. Similar to Alternative 1, ferries would be able to more easily access the pier, due to the deeper drafts provided by the longer pier, as well as the improved configuration. Visitors would be able to disembark via a new gangway and landing aligned parallel to the pier, rather than via ladder as would occur under the No Action Alternative. The wider approach pier, adequate handrails, and improved access road would further alleviate existing safety issues under the No Action Alternative. The permanently constructed access road would improve vehicle and pedestrian circulation on the road, including the mobile crane.

Visitor Levels

Although the number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity, visitor levels are ultimately controlled by the concession contract, weather, and park rules and regulations (i.e., the GMP/Wilderness Study/EIS and Park Superintendent's public use limits for island). Similar to Alternative 1, while the pier would provide improved access and efficiency of operations, the pier would not inherently increase visitation.



Source: Jones and Jones 2014

FIGURE 9
ALTERNATIVE 2 DESIGN
Channel Islands National Park
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ENVIRONMENTALLY PREFERRED ALTERNATIVE

In accordance with DO-12 and NEPA, the Park Service is required to identify the environmentally preferred alternative. CEQ defines the environmentally preferred alternative as, "the alternative that will promote the national environmental policy as expressed in the NEPA's Section 101." Under Section 101(b) of NEPA, it is the continuing responsibility of federal agencies to achieve the following:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations
- Assure safe, healthful, productive, and aesthetically and culturally pleasing surroundings for all Americans
- Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences
- Preserve important historic, cultural and natural aspects of our national heritage, and maintain, wherever possible, an environment that supports diversity and variety of individual choice
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

For each of the action alternatives, long-term, adverse impacts by resource topic are generally reduced from the No Action Alternative. The No Action Alternative would result in long-term, major, adverse impacts related to recreation and visitor use and public health and safety.

The action alternatives would reduce or eliminate impacts to recreation and visitor use and public health and safety, thereby providing a long-term, major, beneficial impact.

The magnitude of adverse impacts for the action alternatives would be similar and less than major, with the exception of recreation; Alternative 1 would result in short-term, major, adverse impacts to recreation during construction, while Alternative 2 would result in short-term, minor, adverse impacts to recreation during construction. Each of the action alternatives would fulfill the Project objectives, while the No Action Alternative would not meet the Project objectives.

Alternative 2 would result in the fewest impacts. Alternatives 1 and 2 would result in equivalent negligible to minor adverse impacts in the categories of air quality; noise and vibration; geology, soils, and seismicity; water quality and hydrology; terrestrial biological resources; and public health and safety. Both Alternatives 1 and 2 would result in equivalent moderate adverse impacts to geology, soils, and seismicity, and noise and vibration. Compared to Alternative 1, Alternative 2 would have reduced impacts related to transportation and circulation (during construction), aquatic biological resources, and visual resources. Less than major impacts related to recreation would be differing but comparable between Alternatives 1 and 2.

Therefore, Alternative 2 has been identified as the environmentally preferred alternative, as this alternative would fulfill the Project objectives while incurring reduced transportation and circulation, aquatic biological resources, visual resources, and recreation and visitor use impacts and similar or reduced impacts to the remaining resource topics compared to Alternative 1.

COMPARISON OF ALTERNATIVES

Table 4 provides a summary of how each of the alternatives presented in this chapter meet the needs of the Project. Table 5 summarizes the anticipated impacts and proposed mitigation measures for all alternatives under evaluation in this Draft EIS. The "Environmental Consequences" chapter provides full descriptions of each of the mitigation measures noted in Table 5.

TABLE 4. SUMMARY OF HOW EACH ALTERNATIVE WOULD MEET THE NEEDS OF THE PROJECT

Needs of the Scorpion Pier Site	No Action Alternative	Alternative 1	Alternative 2
Scorpion Pier should provide safe access to Santa Cruz Island.	Would not likely meet	Would meet	Would meet
Scorpion Pier should provide efficient access to Santa Cruz Island that accommodates visitor demand.	Would not likely meet	Would meet	Would meet
Scorpion Pier and the access roadway should be operated in a manner that protects sensitive resources.	Would not likely meet	Would meet	Would meet
Scorpion Pier should provide access to Santa Cruz Island in consideration of predicted sea level rise.	Would not likely meet	Would meet	Would meet

TABLE 5. SUMMARY OF IMPACTS AND PROPOSED MITIGATION MEASURES FOR ALL ALTERNATIVES

No Action Alternative	Alternative 1	Alternative 2
Transportation and Circulation		
• Construction: no impact • Operation: long-term, minor, adverse impact	• Construction: short-term, moderate, adverse impact • Operation: beneficial long-term impact	• Construction: no impact • Operation: beneficial long-term impact
Air Quality		
No impact	• Construction: short-term, minor, adverse impact • Operation: no impact	• Construction: short-term, minor, adverse impact • Operation: no impact
Noise and Vibration		
No impact	• Off-site receptors: negligible impact • Directly adjacent receptors: short-term, moderate, adverse impact • Vibration: no impact • Mitigation measure: Noise-MM-1	• Off-site receptors: negligible impact • Directly adjacent receptors: short-term, moderate, adverse impact • Vibration: no impact • Mitigation measure: Noise-MM-1

No Action Alternative	Alternative 1	Alternative 2
Geology, Soils, and Seismicity		
• Seismically induced ground shaking or liquefaction: long-term, moderate, adverse impact • Erosion or landslides, and seismically induced settlement and subsidence: long-term, minor, adverse impact • Expansive soils and tsunami and seiche events: negligible impact	• Seismically induced ground shaking or liquefaction: long-term, moderate, adverse impact but reduced from the No Action Alternative • Bluff erosion or landslides, and seismically induced settlement and subsidence: long-term, minor, adverse impact • Roadway fill pad erosion, expansive soils, and tsunami and seiche hazard: negligible impact	• Seismically induced ground shaking or liquefaction: long-term, moderate, adverse impact but reduced from the No Action Alternative • Bluff erosion or landslides, and seismically induced settlement and subsidence: long-term, minor, adverse impact • Roadway fill pad erosion, expansive soils, and tsunami and seiche hazard: negligible impact
Water Quality and Hydrology		
• Construction: no impact • Operation: negligible impact • Flood hazard and sea level rise: long-term, moderate, adverse impact	• Construction: negligible impact • Operation: negligible impact • Flood hazard and sea level rise: long-term, major, beneficial impact	• Construction: negligible impact • Operation: negligible impact • Flood hazard and sea level rise: long-term, major, beneficial impact
Aquatic Biological Resources		
No impact	• Invertebrates and marine vegetation: long-term, moderate, adverse impact • Fish, marine mammals, and wetlands: short-term, minor, adverse impact • EFH: negligible impact • Eelgrass: no impact (short-term, minor, adverse impact if discovered) • Mitigation measures: Aquatic-MM-1, 2, 3, and 4	• Invertebrates and marine vegetation: negligible impact • Fish and marine mammals: short-term, negligible to minor, adverse impact • EFH and wetlands: negligible impact • Eelgrass: no impact (short-term, minor, adverse impact if discovered) • Mitigation measures: Aquatic-MM-1, 2, 3, and 4
Terrestrial Biological Resources		
• Vegetation: negligible impact • Common wildlife species and habitats and special status and protected species: no impact • Non-native or invasive species: no impact	• Vegetation: no impact • Common wildlife species, Santa Cruz Island fox, pallid bats, western mastiff bats, and CESA and MBTA protected bird species: negligible impact • Townsend's big eared bat and island spotted skunk: no impact • Non-native or invasive species: no impact • Mitigation measures: Noise-MM-1, Terrestrial-MM-1	• Vegetation: no impact • Common wildlife species, Santa Cruz Island fox, pallid bats, western mastiff bats, and CESA and MBTA protected bird species: negligible impact • Townsend's big eared bat and island spotted skunk: no impact • Non-native or invasive species: no impact Mitigation measures: Noise-MM-1, Terrestrial-MM-1

No Action Alternative	Alternative 1	Alternative 2
Visual Resources		
No impact	• Construction: negligible impact • Operation: long-term, moderate, adverse impact	• Construction: negligible impact • Operation: long-term, minor, adverse impact
Cultural Resources		
No impact	• Archeological sites: short-term, minor, adverse impact • Historic structures and cultural landscapes: no impact • Mitigation measures: Cultural-MM-1 and 2	• Archeological sites: short-term, minor, adverse impact • Historic structures: no impact • Cultural landscapes: short-term, minor, adverse impact • Mitigation measures: Cultural-MM-2, 3, 4, and 5
Recreation and Visitor Use		
• Construction: no impact • Operation: long-term, major, adverse impact	• Construction: short-term, major, adverse impact • Operation: long-term, major, beneficial impact	• Construction: short-term, moderate, adverse impact • Displacement of available recreational activities: long-term, minor, adverse impact Operation: long-term, major, beneficial impact
Public Health and Safety		
• Disturbance or exposure to hazardous materials, operational use of potentially hazardous material, and siting on or near hazardous materials site: no impact • Operation: long-term, major, adverse impact	• Disturbance or exposure to hazardous materials, operational use of potentially hazardous material, and siting on or near hazardous materials site: no impact • Operation: long-term, major, beneficial impact	• Disturbance or exposure to hazardous materials, operational use of potentially hazardous material, and siting on or near hazardous materials site: no impact • Operation: long-term, major, beneficial impact

Notes:
CESA – California Endangered Species Act
EFH – Essential Fish Habitat
MBTA – Migratory Bird Treaty Act of 1918

ALTERNATIVES ELIMINATED FROM FURTHER STUDY

Based on the alternatives development process carried out for the Project, as summarized in the "Alternatives Development Process" section of this chapter, the following alternative was eliminated from further study.

ALTERNATIVE 3

Alternative 3 would construct a longer, wider pier approximately 600 feet south of the existing pier, near the south side of Scorpion Anchorage (close to where the kayak staging area is currently located), at the east end of the road that leads to Scorpion Ranch on the south side of the valley. However, this alternative was eliminated for reasons described in the following paragraphs.

Construction in this area would adversely affect existing recreational uses of the island. Popular activities in the southern portion of the beach such as kayaking and swimming would be disrupted, and operations would consolidate day use recreational activities in the same location with ferry passengers. There are no other sandy beaches in the area, and the beach's secluded character would be compromised. Furthermore, the site would be visible from the central portion of Scorpion Ranch and the Valley, which would reduce visitor enjoyment of island resources.

Site conditions further diminish the viability of this alternative. Beach cobble terrain may be difficult for visitors to navigate, and the new location would require visitors to traverse an even longer access road. During storms, when Scorpion Creek floods and breaches the beach, access to Scorpion Ranch may be cut off, requiring a long alternative access route. In addition, the new location would disrupt a relatively undisturbed sensitive cultural site.

Affected Environment

INTRODUCTION

This chapter describes the elements of the natural, social, and economic environments that might be affected by the Project. The study area for each resource topic is defined, and emphasis is placed on the current status of each element and any trends that may be evident. This chapter also contains applicable regulations on the federal, state, and local level that would apply to the Project. The environmental resources discussed in this chapter are consistent with and presented in the same order as those presented in the "Environmental Consequences" chapter.

TRANSPORTATION AND CIRCULATION

This section discusses the transportation and circulation conditions of the study area. The study area for this resource topic is defined as Santa Cruz Island, the Santa Barbara Channel, and the local transportation network connecting the mainland to Santa Cruz Island. Transportation conditions are described as related to the construction and operation of the two pier alternative locations (the current pier location [Alternative 1] and the central portion of the beach [Alternative 2]) and roadway.

EXISTING CONDITIONS

This section describes the existing transportation network available for transport to and from Channel Islands National Park as well as the existing roads and modes of transportation available on Santa Cruz Island. All aspects of the transportation network that may be measurably affected by the alternatives are evaluated. The study area is defined by travel corridors and facilities (e.g., local roadways, bicycle lanes, transit lines, and sidewalks) that visitors and employees may use to reach any of the potential sites.

Marine Vessels

Marine vessels represent the primary access mode to the Channel Islands. Park Service concessioners run seasonal ferry service, and the Park Service maintains its own fleet of vessels that provide year-round access to the islands. Ferries and NPS vessels typically depart from the Ventura Harbor and travel through the Santa Barbara Channel. Private vessels also visit the islands but are limited in landing times and locations by NPS regulations. The Project alternatives would not result in additional vessel trips to the island.

Roads and Vehicles

Access is restricted throughout all the NPS-managed lands on the Channel Islands. Visitors are restricted to traveling by foot on cleared footpaths and roads. Bikes are prohibited on the island. NPS employees and those with Park Service permission may travel in NPS vehicles to other locations on the islands that are not accessible to the public. On-island transportation is provided by NPS-owned vehicles. The proposed Project would improve an unpaved access road only accessible to pedestrians or to NPS vehicles for transporting supplies from visiting boats to existing NPS facilities. The road provides access to the pier. In Ventura, most visitors and NPS employees travel in personal vehicles using local roadways to the ferry docks. There is public and employee parking in proximity to the ferry docks in the Ventura Harbor.

REGULATIONS AND POLICIES

The following is a summary of the key federal, state, and local transportation and circulation-related rules, policies, and agreements that potentially apply to the Project.

Federal

Title 36 CFR. The provisions listed in the following paragraphs apply to all lands administered by the Park Service within the boundaries of Channel Islands National Park, and are subject to further discretionary authority by the Superintendent of Channel Islands National Park per 36 CFR (NPS 2007).

36 CFR Section 1.5 Visiting Hours, Public Use Limit, Closures, and Area Designations for Specific Use or Activities. The following uses or activities are prohibited, except as authorized by the Superintendent:

- Park roads are closed to private motor vehicle use except for the following activities:
  - Use reserved under rights of use and occupancy;
  - Use in accordance with deeded easements;
  - Use under special use permit authorizations; and
  - Use under concessioner contracts or permits.

  The islands are inherently separate from mainland vehicle traffic. Closure to private vehicle use preserves the character of the islands. The administrative vehicle traffic permitted on the islands is the minimum traffic necessary for management of the islands. Additionally, the island road systems are not engineered to be safely navigated by those without local knowledge of the islands.

- Park roads are closed to bicycle use.

  Closure to bicycles is similar to the rationale for closure to motor vehicles. Additionally, park roads are not designed or maintained with bicycle use in mind, and are for administrative use only. The Park Service is phasing out the use of many roads on the islands, but not necessarily at Scorpion Pier.

36 CFR Section 4.10 Travel of Park Roads and Designated Routes. Operating a motor vehicle is prohibited except on park roads, in parking areas, and on routes and areas designated for off-road motor vehicle use.

36 CFR Section 4.20 Right of Way. An operator of a motor vehicle shall yield the right of way to pedestrians, saddle and pack animals, and vehicles drawn by animals. Failure to yield the right of way is prohibited.

36 CFR Section 4.21(a) Speed Limits. Park area speed limits are as follows:

1. 15 miles per hour in school zones, campgrounds, picnic areas, parking areas, utility areas, business or residential areas, other places of public assemblage, and at emergency scenes
2. 25 miles per hour on sections of park road under repair or construction
3. 45 miles per hour on all other park roads

36 CFR Section 4.30(a) Bicycles. Park roads and parking areas are closed to bicycle use. No routes have been established for bicycle use because the park is closed to bicycles.

36 CFR Section 5.6(c) Activities that Require a Permit. Use of commercial vehicles on park area roads (the Superintendent shall issue a permit to access private lands within or adjacent to the park when access is otherwise not available).

State and Local

Unless specifically addressed in NPS regulations, traffic and vehicle use in a park area is governed by state law. There are no applicable state or local laws, ordinances, or regulations pertaining to traffic and transportation on Channel Islands National Park.

AIR QUALITY

This section discusses the air quality conditions in the study area. The study area for this resource topic is defined as Santa Cruz Island and the Santa Barbara Channel. Air quality conditions are described as related to the construction and operation of the two pier alternative locations (the current pier location [Alternative 1] and the central portion of the beach [Alternative 2]) and roadway.

EXISTING CONDITIONS

This section evaluates the existing regional and local air quality conditions from both stationary and mobile emissions sources. This section was developed based on a review of existing air quality conditions in the region, air quality regulations from USEPA, the California Air Resources Board (CARB), SBAPCD, and information related to the proposed Project. Each of these agencies develops rules, regulations, policies, and/or goals to comply with applicable legislation. The Project area is located in the South Central Coast Air Basin on the Channel Islands in the Pacific Ocean, just north of the South Coast Air Basin, which includes the Los Angeles urban area. Santa Cruz Island is located approximately 25 miles south of Santa Barbara and 20 miles east of Ventura. Potential air quality impacts associated with the proposed Project would be in the local jurisdiction of SBAPCD.

Regional Climate and Meteorology

Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. There are few emission sources on or near the islands, except for passing ships, recreational and commercial boats, and a small number of vehicles and generators located on developed areas of the islands (NPS 1984). Normally, sea breezes blow toward the mainland keeping air pollutants at low levels on the Channel Islands. However, strong east winds known as "Santa Anas" can carry mainland-based pollutants several hundred miles offshore and affect the air quality at the Channel Islands. Santa Anas occur periodically in late autumn through the winter. Other atmospheric patterns, such as "Catalina eddies" and eastern Pacific high pressure systems, can also introduce air pollutants from the Los Angeles air basin onto the islands.

The Channel Islands have a Mediterranean climate that is characterized by warm, dry summers and cool, moist winters. Fog is common throughout the year. The climate is largely controlled by the ocean currents, which are driven by the prevailing northwesterly winds. As the ocean currents flow south around Point Conception, where the coast of California turns eastward, the force of the winds and the current strikes Santa Cruz Island. Almost all of the island's rainfall occurs in the winter and early spring (November through April). Summer precipitation is rare.

Criteria Air Pollutants Ambient Air Quality

USEPA establishes the National Ambient Air Quality Standards (NAAQS). For a region to be considered in NAAQS attainment, maximum concentrations for most pollutants must neither exceed an NAAQS more than once per year nor exceed the annual standards. CARB establishes the California Ambient Air Quality Standards (CAAQS), which are generally more stringent and include more pollutants than the NAAQS. For a region to be considered CAAQS attainment, maximum pollutant concentrations must not equal or exceed CAAQS. These standards represent the allowable atmospheric concentrations at which the public health and welfare are protected and as such include a reasonable margin of safety to protect the more sensitive individuals in the population.

Pollutants that have corresponding NAAQS and CAAQS are known as criteria pollutants. The criteria pollutants of primary concern in this air quality assessment are ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter with particle diameter less than 10 microns (PM_{10}), and particulate matter with particle diameter less than 2.5 microns ($PM_{2.5}$). Criteria pollutants contribute directly to regional health issues. The known adverse effects associated with these criteria pollutants are shown in Table 6.

Of the criteria pollutants of concern, O_3 is unique because it is not directly emitted from project-related sources. Rather, O_3 is a secondary pollutant, formed from the precursor pollutants volatile organic compounds (VOCs) and nitrogen oxides (NO_x). VOC and NO_x react to form O_3 in the presence of sunlight through a complex series of photochemical reactions. As a result, unlike inert pollutants, O_3 levels usually peak several hours after the precursors are emitted and many miles downwind of the source. Because of the complexity and uncertainty in predicting photochemical pollutant concentrations, O_3 impacts are indirectly addressed in this study by comparing Project-generated emissions of VOC and NO_x to daily emission thresholds set by SBAPCD and by comparing pollutant concentrations to NAAQS and CAAQS.

Air quality at a given location can be characterized by the concentration of various pollutants in the air. Units of concentration are generally expressed as parts per million (ppm) on a volume basis or micrograms per cubic meter ($\mu g/m^3$) of air. The significance of a pollutant concentration is determined by comparing the concentration to an appropriate NAAQS or CAAQS.

TABLE 6. ADVERSE EFFECTS ASSOCIATED WITH CRITERIA POLLUTANTS

Pollutant	Sources	Adverse Effects
Ozone (O_3)	Atmospheric reaction of organic gases with NO_x in sunlight.	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals and (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage.
Carbon Monoxide (CO)	Incomplete combustion of fuels and other carbon-containing substances, such as motor vehicle exhaust; natural events, such as decomposition of organic matter.	(a) Aggravation of some coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible birth defects.
Nitrogen Dioxide (NO_2)	Motor vehicle exhaust; high temperature stationary combustion; atmospheric reactions.	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration.

Pollutant	Sources	Adverse Effects
Sulfur Dioxide (SO_2)	Combination of sulfur-containing fossil fuels; smelting of sulfur-bearing metal ore; industrial processes.	(a) Broncho-constriction accompanied by symptoms that may include wheezing, shortness of breath, and chest tightness during exercise or physical activity in persons with asthma.
Suspended Particulate Matter (PM_{10} and $PM_{2.5}$)	Combustion of fuels; construction activities; industrial processes; atmospheric chemical reactions.	(a) Excess deaths from short-term and long-term exposures; (b) excess seasonal declines in pulmonary function, especially in children; (c) asthma exacerbation and possibly induction; (d) adverse birth outcomes including low birth weight; (e) increased infant mortality; (f) increased respiratory symptoms in children such as cough and bronchitis; and (g) increased hospitalization for both cardiovascular and respiratory disease (including asthma)[1]
Lead[2]	Metal processing.	Behavioral and hearing disabilities in children; nervous system impairment.

Source: CARB 2009a
Notes:
1. More detailed discussions on the health effects associated with exposure to suspended particulate matter can be found in the following documents: California Office of Environmental Health Hazard Assessment, Particulate Matter Health Effects and Standard Recommendations (www.oehha.ca.gov/air/toxic_contaminants/PM10notice.html#may), May 9, 2002 (OEHHA 2002); and USEPA, Air Quality Criteria for Particulate Matter, October 2004.
2. CAAQS have also been established for lead, sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. They are not shown in this table because they are not pollutants of concern for the proposed Project.

USEPA designates all areas of the United States according to whether they meet NAAQS. A nonattainment designation means that a primary NAAQS has been exceeded more than once per year in a given area. States with nonattainment areas prepare a State Implementation Plan (SIP) that demonstrates how those areas will come into attainment.

The South Central Coast Air Basin is classified by CARB as being in nonattainment for O_3 and PM. Santa Barbara County was designated unclassifiable/attainment for the 2008 federal 8-hour O_3 standard on April 30, 2012 (the 1-hour federal O_3 standard was revoked for Santa Barbara County; Table 7). The County violates the state 8-hour O_3 standard and the state standard for PM_{10}. The County is unclassifiable/attainment for the federal $PM_{2.5}$ standard and unclassified for the state $PM_{2.5}$ standard (SBAPCD 2014). Federal and state O_3 standards have not been exceeded on Santa Rosa Island, approximately 5 miles east of Santa Cruz Island, where ambient O_3 has been monitored since 1997 and the Channel Islands are designated as in attainment for O_3 (CARB 2013).

TABLE 7. SANTA BARBARA COUNTY
ATTAINMENT/NONATTAINMENT CLASSIFICATION SUMMARY 2013

Pollutant	Averaging Time	California Standards		National Standards	
		Concentration	Attainment Status	Concentration	Attainment Status
Ozone (O_3)	8 hour	0.070 ppm	N	0.075 ppm	U/A*
	1 hour	0.09 ppm (180 µg/m^3)	N	--	--
Carbon	8 hour	9.0 ppm (10 mg/m^3)	A	9.0 ppm (10 m/m^3)	A

Pollutant	Averaging Time	California Standards		National Standards	
		Concentration	Attainment Status	Concentration	Attainment Status
Monoxide (CO)	1 hour	20.0 ppm (23 mg/m^3)	A	35.0 ppm (40 µg/m^3)	A
Nitrogen Dioxide (NO_2)***	Annual average	0.030 ppm (56 µg/m^3)	A	53 ppb	U/A
	1 hour	0.18 ppm (338 µg/m^3)	A	100 ppb	U/A
Sulfur Dioxide (SO_2)	Annual average	--	--	Revoked	--
	24 hour	0.04 ppm (105 µg/m^3)	A	Revoked	--
	1 hour	0.25 ppm (655 µg/m^3)	A	75 ppb	****
Particulate Matter (PM_{10})	Annual arithmetic mean	20 µg/m^3	N	revoked	A
	24 hour	50 µg/m^3	N	150 µg/m^3	A
Particulate Matter – Fine ($PM_{2.5}$)	Annual arithmetic mean	12 µg/m^3	U	12.0 µg/m^3	U/A
	24 hour	--	--	35 µg/m^{3**}	U/A
Sulfates	24 hour	25 µg/m^3	A		
Lead	Calendar quarter	--	--	1.5 µg/m^3	A
	30-day average	1.5 µg/m^3	A	--	--
	Rolling 3-month average	--	--	0.15 µg/m^3	U
Hydrogen Sulfide	1 hour	0.03 ppm (42 µg/m^3)	A	--	--
Vinyl Chloride (chloroethene)	24 hour	0.010 ppm (26 µg/m^3)		--	--
Visibility Reducing Particles	8 hour (1,000 to 1,800 PST)		A	--	--

Notes:
A – Attainment
N – Nonattainment
U – Unclassified
U/A – Unclassifiable/Attainment

mg/m^3 – milligrams per cubic meter
ppb = parts per billion
ppm=parts per million
µg/m^3=micrograms per cubic meter
-- = No Standard

* USEPA strengthened the 8-hour O_3 standard from the 1997 level of 0.08 ppm to 0.075 ppm on May 27, 2008, but delayed implementation of the standard. Designations for the 2008 standard were finalized on April 30, 2012.

** USEPA strengthened the 24-hour fine particle standard from the 1997 level of 65 µg/m^3 to 35 µg/m^3 on September 21, 2006. The annual standard was strengthened from 15 to 12.0 µg/m^3 on January 15, 2013.

*** The state Nitrogen Dioxide ambient air quality standard was amended on February 22, 2007, to lower the 1-hour standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. On January 22, 2010, USEPA set a new 1-hour NO_2 standard of 100 ppb. They also retained the annual NO_2 standard of 53 ppb.

**** USEPA has not yet made final designations on attainment status.

Source: SBAPCD 2014

Toxic Air Contaminants

Toxic air contaminants are air pollutants that may lead to serious illness or increased mortality, even when present in relatively low concentrations. Toxic air contaminants are identified and their toxicity is studied by the California Office of Environmental Health Hazard Assessment. Toxic air contaminants include air pollutants that can produce adverse human health effects, including carcinogenic effects, after short-term (acute) or long-term (chronic) exposure.

Sensitive Receptors

Air quality does not affect all individuals in a given population in the same way; some groups may be more sensitive than others to adverse health effects. The impact of air emissions on sensitive members of the population is a special concern. Sensitive receptor groups include children, the elderly, and the acutely and chronically ill. Land uses and facilities such as schools, children's day care centers, hospitals, and nursing and convalescent homes are considered to be more sensitive than the general public to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress. Residential areas are considered more sensitive to air quality conditions compared to commercial and industrial areas because people generally spend longer periods of time at their residences, with associated greater exposure to ambient air quality conditions. Parks and playgrounds are considered moderately sensitive to poor air quality because persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. However, exposure times are generally far shorter in parks and playgrounds than in residential locations and schools. Because the Project is located approximately 25 miles from the closest residential area, and the island does not house any sensitive land uses, the Project is not expected to affect sensitive receptor groups. The Project is located in a National Park, which may attract sensitive receptors or visitors engaged in recreational activities involving exercise, but any potential exposure would be limited in duration.

Greenhouse Gas Emissions

Gases that trap heat in the atmosphere are called GHGs. GHGs are emitted by natural processes and human activities. Examples of GHGs that are produced both by natural processes and industry include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydrofluorocarbons and perfluorocarbons) and sulfur hexafluoride.

Scientific evidence indicates a trend of increasing global temperatures near the earth's surface over the past century due to increased human-induced levels of GHGs. According to the Intergovernmental Panel on Climate Change (IPCC 2007), the atmospheric concentration of CO_2 in 2005 was 379 ppm compared to the pre-industrial levels of 280 ppm. In addition, the Fourth U.S. Climate Action Report concluded, in assessing current trends, that CO_2 emissions increased by 20% from 1990 to 2004, while CH_4 and N_2O emissions decreased by 10% and 2%, respectively. Studies suggest a close relationship between the increased concentration of GHGs in the atmosphere and global temperatures.

GHGs differ from criteria pollutants in that GHG emissions do not cause direct adverse human health effects. Rather, the direct environmental effect of GHG emissions is the increase in global temperatures, which in turn has numerous indirect effects on the environment and humans. For example, some observed changes include shrinking glaciers, thawing permafrost, later freezing and earlier break-up of ice on rivers and lakes, a lengthened growing season, shifts in plant and animal ranges, and earlier flowering of trees. Other, longer-term environmental impacts of global warming may include sea level rise, changing weather patterns with increases in

the severity of storms and droughts, changes to local and regional ecosystems including the potential loss of species, and a significant reduction in winter snow pack. Data suggest that in the next 25 years, California could experience longer, more frequent and more extreme heat waves, longer dry periods, an increase in wildfires, and sea level rise.

The 2009 California Climate Adaptation Strategy (Cal-Adapt) is a multi-sector strategy with the objective to guide California's efforts in adapting to climate change impacts. Cal-Adapt projects the following changes in the proposed Project vicinity (Cal-Adapt 2013):

- Temperature rise of approximately 3.2 to 5.5 °F by the end of the century.
- Decrease of approximately 1 to 5 inches in annual precipitation by the end of the century.
- Increase of 26% in areas in threat of inundation during an extreme flood event (100-year flood).
- Cal-Adapt has not assigned wildfire risk or snow pack change to the area.

REGULATIONS AND POLICIES

The federal Clean Air Act of 1969 and its subsequent amendments established air quality regulations and NAAQS, and delegated enforcement of these standards to the states. In California, CARB is responsible for enforcing air pollution regulations. CARB has, in turn, delegated the responsibility of regulating stationary emission sources to the local air agency, which for this Project is SBAPCD. The following is a summary of the key federal, state, and local air quality rules, policies, and agreements that potentially apply to the Project.

Federal

2006 NPS Management Policies, 4.7.1 Air Quality. The Park Service has a responsibility to protect air quality under both the 1916 Organic Act and the Clean Air Act. Accordingly, the Park Service will seek to perpetuate the best possible air quality in parks to (1) preserve natural resources and systems; (2) preserve cultural resources; and (3) sustain visitor enjoyment, human health, and scenic vistas. Vegetation, visibility, water quality, wildlife, historic and prehistoric structures and objects, cultural landscapes, and most other elements of a park environment are sensitive to air pollution and are referred to as "air quality related values." The Park Service will actively promote and pursue measures to protect these values from the adverse impacts of air pollution. In cases of doubt as to the impacts of existing or potential air pollution on park resources, the Park Service will err on the side of protecting air quality and related values for future generations.

NPS Climate Friendly Parks Program. A joint program of USEPA and the Park Service, the Climate Friendly Parks Program helps parks reduce GHG emissions by developing alternative transportation systems, designing and constructing sustainable facilities, and developing plans to reduce energy and water use (NPS 2015b).

NPS Pacific West Region Directive PW-047, October 31, 2006. This directive provides policies pertaining to on-site generated renewable energy. Specifically, the conversion to renewable sources of energy is encouraged, and purchasing of Green Power (including wind, solar, biomass, and geothermal) is allowed when on-site renewable energy systems are not feasible. Alternatively, purchasing Green Power Tags is also permitted (NPS 2015b).

State Implementation Plan. The South Central Coast Air Basin is classified by CARB as being in nonattainment for O_3 and PM. Santa Barbara County was designated unclassifiable/attainment for the 2008 federal 8-hour O_3 standard on April 30, 2012 (the 1-hour federal O_3 standard was revoked for Santa Barbara County; Table 7). The County violates the state 8-hour O_3 standard and the state standard for PM_{10}. The County is unclassifiable/attainment for the federal $PM_{2.5}$ standard and unclassified for the state $PM_{2.5}$

standard (SBAPCD 2014). SBAPCD has been preparing air plans since 2001; the most recent plan is the Draft 2013 Clean Air Plan (CAP), a multi-pollutant plan that provides an integrated control strategy to reduce O_3, PM, toxic air contaminants, and GHGs.

Federal and state O_3 standards have not been exceeded on Santa Rosa Island, approximately 5 miles east of Santa Cruz Island, where ambient O_3 has been monitored since 1997 and the Channel Islands are designated as in attainment for O_3 (CARB 2013).

Emission Standards for Non-road Diesel Engines. To reduce emissions from off-road diesel equipment, USEPA established a series of increasingly strict emission standards for new off-road diesel engines. Tier 1 standards were phased in from 1996 to 2000 (year of manufacture), depending on the engine horsepower category. Tier 2 standards were phased in from 2001 to 2006. Tier 3 standards were phased in from 2006 to 2008. Tier 4 standards, which require add-on emission control equipment to be attained, are being phased in between 2008 to 2015. These standards apply to Project-related off-road construction equipment, based on year of engine manufacture (USEPA 2014).

Emission Standards for Marine Diesel Engines. To reduce emissions from Category 1 (greater than 50 horsepower, less than 5 liters per cylinder displacement) and Category 2 (between 5 and 30 liters per cylinder displacement) marine diesel engines, USEPA established emission standards for new engines, referred to as Tiers 2, 3, and 4 marine engine standards. Tier 2 standards were phased in between 2004 and 2007, depending on the engine size. Tier 3 standards were phased in from 2009 to 2014. The after-treatment-based Tier 4 standards are being phased in between 2014 and 2017. These standards apply to Project-related ferries and construction vessels, depending on year of engine manufacture.

Emission Standards for On-road Trucks. To reduce emissions from on-road, heavy-duty diesel trucks, USEPA established a series of increasingly strict emission standards for new truck engines. The 1988 to 2003 emission standards applied to trucks manufactured between 1988 and 2003. In 1997, USEPA adopted new emission standards for model year 2004 and later heavy-duty trucks. The goal of the 1997 regulation was to reduce NO_x engine emissions to approximately 2.0 grams per brake horsepower. In 2000, USEPA adopted PM, NO_x and nonmethane hydrocarbon standards for model year 2007 and later heavy-duty highway engines and a 15 ppm limit on the sulfur content of diesel fuel. The NO_x and nonmethane hydrocarbon standards were phased in from 2007 to 2010; the PM standard applies to 2008 and newer engines. These standards apply to some supply delivery trucks used during Project operation.

Non-road Diesel Fuel Rule. With the non-road diesel fuel rule, USEPA set sulfur limitations for non-road diesel fuel, including marine vessels. For the proposed Project, this rule affects construction equipment and harbor craft, as well as ferries used during proposed Project operation, although the California Diesel Fuel Regulations (described under the "State" regulations section) generally pre-empt this rule. Under this rule, the diesel fuel used by off-road equipment and harbor craft was limited to 500 ppm sulfur content prior to June 2007; and further limited to 15 ppm sulfur content (ultra low sulfur diesel) starting January 2010, for non-road fuel, and June 2012 for marine fuels.

Highway Diesel Fuel Rule. With this rule, USEPA set sulfur limitations for on-road diesel fuel to 15 ppm starting June 1, 2006.

General Conformity Rule. Section 176(c) of the Clean Air Act states that a federal agency cannot support an activity unless the agency determines that the activity will conform to the most recent USEPA-approved SIP. This means that projects using federal funds or requiring federal approval must not: (1) cause or contribute to any new violation of a NAAQS; (2) increase the frequency or severity of any existing violation; or (3) delay the

timely attainment of any standard, interim emission reduction, or other milestone. In an area with a SIP (an area in non-attainment of a NAAQS), conformity can be demonstrated in one of four of the following ways:

- By showing that the emission increases caused by an action are included in the SIP
- By demonstrating that the state agrees to include the emission increases in the SIP
- Through offsets
- Through mitigation

CEQ NEPA Guidance on Consideration of Effects of Climate Change and GHG Emissions. In February 2010, CEQ released a guidance memorandum on the ways in which federal agencies can improve their consideration of the effects of GHG emissions and climate change in their evaluation of proposals for federal actions under NEPA. The guidance was intended to help explain how agencies of the federal government should analyze the environmental effects of GHG emissions and climate change when they describe the environmental effects of a proposed agency action in accordance with Section 102 of NEPA and the CEQ.

Regulations for Implementing the Procedural Provisions of NEPA, 40 CFR parts 1500-1508. The guidance affirmed the requirements of the statute and regulations and their applicability to GHGs and climate change impacts. CEQ advised federal agencies that they should consider opportunities to reduce GHG emissions caused by proposed federal actions and adapt their actions to climate change impacts throughout the NEPA process and to address these issues in their agency NEPA procedures.

The guidance advised federal agencies to consider whether analysis of the direct and indirect GHG emissions from their proposed actions may provide meaningful information to decision makers and the public. Specifically, if a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of carbon dioxide equivalent (CO_2e) GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. The guidance identified a "reference point" of 25,000 metric tons of direct CO_2e GHG emissions as an indicator that the proposed federal action's anticipated GHG emissions warrant detailed consideration in a NEPA review. For indirect GHG emissions (i.e., GHG emissions that have a causal nexus to, but are not directly emitted by, or the direct result of, the proposed action), the guidance did not propose a reference point indicating when such indirect emissions are significant and cautioned that any consideration of indirect GHG emissions needed to recognize the limits of feasibility in evaluating upstream and downstream effects of proposed federal actions.

The guidance did not propose this reference point as an indicator of a level of GHG emissions that may significantly affect the quality of the human environment, but rather as a minimum standard for reporting emissions under the Clean Air Act.

State

California Clean Air Act. The California Clean Air Act of 1988, as amended in 1992, outlines a program to attain CAAQS by the earliest practical date. Because CAAQS are more stringent than NAAQS, attainment of CAAQS requires more emissions reductions than what would be required to show attainment of NAAQS. Consequently, the main focus of attainment planning in California has shifted from federal to state requirements. Similar to the federal system, the state requirements and compliance dates are based upon the severity of the ambient air quality standard violation in a region.

California Diesel Fuel Regulations. With the California Diesel Fuel Regulations, CARB set sulfur limitations for diesel fuel sold in California for use in on-road and off-road motor vehicles. Harbor craft were originally

excluded from the rule, but were later included by a 2004 rule amendment. Under this rule, diesel fuel used in motor vehicles except harbor craft has been limited to 500 ppm sulfur since 1993. The sulfur limit was reduced to 15 ppm on September 1, 2006.

CARB Statewide Portable Equipment Registration Program. The Portable Equipment Registration Program establishes a uniform program to regulate portable engines and portable engine-driven equipment units. Once registered in the program, engines and equipment units may operate throughout California without the need to obtain individual permits from local air districts. The Portable Equipment Registration Program applies to off-road construction equipment that would be used during Project construction.

CARB In-use Off-road Diesel Vehicle Regulation. In 2007, CARB adopted a rule that requires owners of off-road mobile equipment powered by diesel engines 25 horsepower or larger to meet the fleet average or Best Available Control Technology requirements for NO_x and PM emissions by March 1 of each year (California Code of Regulations [CCR] Title 13, Section 2449). The rule is structured by fleet size: large, medium and small fleets. The regulation was adopted in April 2008 and subsequently amended to delay the turnover of Tier 1 equipment for meeting the NO_x performance requirements of the regulation, and then to delay overall implementation of the equipment turnover compliance schedule in response to the economic downturn in 2008 and 2009.

In September 2013, CARB received authorization from USEPA to enforce the In-use Off-road Diesel Vehicle Regulation, including the regulation's performance requirements, such as turnover requirements and restrictions on adding older, dirtier Tier 0 and 1 vehicles. Enforcement of the restrictions on adding Tier 0 and 1 vehicles will begin January 1, 2014. Enforcement of the first fleet average requirements for large fleets (greater than 5,000 total fleet horsepower) will begin on July 1, 2014. This regulation was assumed to apply to construction activities.

CARB On-Road Heavy-Duty Diesel Vehicles (In-use) Regulation – Truck and Bus Regulation. In December 2011, CARB amended the 2008 Statewide Truck and Bus Regulation to modernize in-use heavy-duty vehicles operating throughout the state. The regulation applies to nearly all privately and federally owned diesel fueled trucks and buses with a gross vehicle weight rating greater than 14,000 pounds. Heavier trucks must be retrofitted with PM filters beginning January 1, 2012, and older trucks must be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent. This regulation was assumed to apply to construction trucks and tour buses.

CARB Regulation to Reduce Emissions from Diesel Engines on Commercial Harbor Craft. In November 2007, CARB adopted a regulation to reduce diesel particulate matter and NO_x emissions from new and in-use commercial harbor craft. Under CARB's definition, commercial harbor craft include tug boats, tow boats, ferries, excursion vessels, work boats, crew boats, and fishing vessels. The regulation implemented stringent emission limits on harbor craft auxiliary and propulsion engines. In 2010, CARB amended the regulation to add specific in-use requirements for barges, dredges, and crew/supply vessels.

The regulation requires that all in-use, newly purchased, or replacement engines meet USEPA's most stringent emission standards per a compliance schedule set forth by CARB. The compliance schedule as listed in the 2007 regulation for in-use engine replacement was supposed to begin in 2009, but was not enforced until August 2012, after USEPA approved CARB's regulation (CARB 2011). This regulation was assumed to apply to harbor craft used during construction and ferries used during operation.

Executive Order S-3-05. Executive Order S-3-05 set forth state-wide GHG emission

reduction targets as follows: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80% below 1990 levels.

AB 32 – California Global Warming Solutions Act of 2006. The purpose of Assembly Bill (AB) 32 is to reduce statewide GHG emissions to 1990 levels by 2020. This enactment instructs CARB to adopt regulations that reduce emissions from significant sources of GHGs and establish a mandatory GHG reporting and verification program by January 1, 2008. AB 32 required CARB to adopt GHG emission limits and emission reduction measures by January 1, 2011, both of which became effective on January 1, 2012. CARB also established a market-based cap and trade system. AB32 does not identify a significance level of GHG for NEPA purposes.

Local

Santa Barbara County Air Pollution Control District. SBAPCD monitors air quality and regulates stationary emission sources in Santa Barbara County. As a responsible agency under the California Environmental Quality Act (CEQA), SBAPCD reviews and approves environmental documents prepared by other lead agencies or jurisdictions to reduce or avoid impacts on air quality and to ensure that the lead agency's environmental document is adequate under CEQA. As a concerned agency, the SBAPCD comments on environmental documents and suggests mitigation measures to reduce air quality impacts under NEPA.

County of Santa Barbara Clean Air Plan. SBAPCD and the Santa Barbara County Association of Governments are responsible for formulating and implementing the CAP for Santa Barbara County. The schedule for plan development is outlined by state and federal requirements, and is influenced by regional air quality. CAP influences a range of activities outside the district including transportation planning, and air quality Project funding allocations. The 2010 CAP is the 3-year update required by the state to show how SBAPCD plans to meet the state 8-hour O_3 standard. The 2010 CAP satisfies both state and federal planning requirements.

NOISE AND VIBRATION

This section discusses the existing noise and vibration conditions in and adjacent to the alternatives, and identifies sensitive receptors that may be affected by Project-related noise and vibration. The study area for this resource topic is defined as Santa Cruz Island and the Santa Barbara Channel. Noise and vibration conditions are described as related to the construction and operation of the two pier alternative locations (the current pier location [Alternative 1] and the central portion of the beach [Alternative 2]) and roadway.

Impacts to archeological resources are analyzed in the "Cultural and Historic Resources" section of this chapter. Similarly, impacts to biological resources are discussed in the "Aquatic Biological Resources" and "Terrestrial Biological Resources" sections of this chapter.

EXISTING CONDITIONS

Concepts and Terminology

Noise. Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise is defined as unwanted or undesired sound caused by humans. Whether a noise is considered unpleasant (e.g., due to quality, intensity, or repetition) depends on the individual listening to that noise, as well as what that individual is doing when that noise is heard (i.e., working or sleeping). The absence of all noise is often referred to as natural quiet or ambient sound.

Sound can be characterized using multiple parameters, with the most common being sound pressure (amplitude), which describes deviations in ambient sound caused by noise. In air, sound pressure can be measured by a microphone in decibels (dB), a logarithmic loudness scale, with 10 dB corresponding roughly to the threshold of human hearing (e.g., listening to human breathing), and 120 to 140 dB corresponding to the threshold of human pain (e.g., standing beside a jet engine). However, when assessing potential impacts on the environment, sound pressure is typically measured in A-weighted decibels (dBA), a frequency weighting that better reflects human sensitivity to sound in regards to extremely high and low frequencies. Noise is often a byproduct of desirable activities or machines, and can be generated by both mobile (i.e., cars) and stationary (i.e., operational machinery) sources. Mobile sources typically attenuate at a rate of 3.0 to 4.5 dBA per doubling of distance, depending on the ground surface and obstructions between the noise source and the receiver. Hard and flat surfaces, such as concrete or asphalt, typically have an attenuation rate of 3.0 dBA per doubling of distance. Soft surfaces, such as uneven or vegetated terrain, typically have an attenuation rate of 4.5 dBA per doubling of distance. Noise generated by stationary sources typically attenuates at a rate of 6.0 to 7.5 dBA per doubling of distance.

In general, noise-sensitive land uses include those uses where noise exposure could result in human health risks (e.g., sleep disturbances in a residential zone), as well as uses where minimal sound is essential to their intended purpose (i.e., cemeteries or libraries). Noise levels can be reduced by placing barriers between the noise source and the receiver. Solid barriers, such as buildings and concrete walls, are generally more effective than soft barriers, such as wooden fences or foliage.

The most commonly used noise descriptors include the following:

- L_{max} (Maximum Noise Level). The maximum instantaneous noise level measured during a specified time period, also referred to as the "peak noise level."
- L_{min} (Minimum Noise Level). The minimum instantaneous noise level measured during a specified time period.
- L_{eq} (Equivalent Noise Level). The equivalent noise level used to describe

the average noise exposure level over a specified period of time.
- L_{dn} (Day-Night Noise Level). The average noise level over a 24-hour period, with a penalty of 5 or 10 dBA added if noise is generated during the evening hours of 7:00 and 10:00 p.m. or nighttime hours of 10:00 p.m. to 7:00 a.m., respectively.

Vibration. In its simplest form, vibration is the oscillation or repetitive motion of an object from its original position. Vibrating objects can radiate their energy through the ground upon contact; if the object is large or close enough to an observer, ground vibrations can be perceived. As such, environmental impact analyses typically study vibration as it relates to building damage and human annoyance. However, because ground vibration generated by manmade activities typically attenuates rapidly from the source of vibration, manmade vibration issues are usually confined to short distances, such as 500 feet or less from the source (FTA 2006).

The peak particle velocity (PPV) is a common descriptor used to identify the maximum peak of vibration. Because ground shaking speeds are typically very slow, PPV is measured in inches per second and is generally used to measure vibration impacts on fragile buildings. Another useful descriptor is known as vibration decibels (VdB) and is commonly used to measure human response to vibrations. Human response to vibration is not usually significant unless the vibration exceeds 70 VdB (FTA 2006).

Ambient Noise Level

The GMP/Wilderness Study/EIS states that no scientific studies have been conducted on the terrestrial soundscape of the Channel Islands (NPS 2015a). However, the park is generally considered a relatively quiet place that is rich in natural sounds (NPS 2015a). One of the primary sources of human-caused noise in the study area is boat traffic at the dock (NPS 2015a), especially during landing/loading and maintenance activities. Other common noise sources include the historic ranch site and campground to the west where many visitors concentrate; administrative park operations (i.e., "weed-eaters" and mowers on trails); and sounds from the natural environment (i.e., bird calls, wind, and waves).

Sensitive Receptors

For purposes of this analysis, nearby receptors sensitive to potential noise and vibration impacts from the Project include the following (Figure 10):

- **Visitors seeking solitude.** While many visitors engage in noise-producing recreational activities, some visitors prefer to experience the natural ambient sounds (or "natural quiet") of the park. These visitors are assumed to concentrate in backcountry or wilderness areas (NPS 2015a). Based on NPS zoning of Santa Cruz Island, the study area is bordered to the northwest and southwest by backcountry.
- **Overnight campers at the Scorpion Ranch Campground.** The Lower Campground is located approximately 1,100 feet from the study area and has a maximum capacity of 240 people per night. Quiet hours are between 10:00 p.m. and 6:00 a.m. Camping during any consecutive 30-day period is limited to 14 days.
- **Scorpion Ranch historic structures**. The structures that remain today include a well and windmill, two in-ground storage caves, and four freestanding buildings, the largest of which is the two-story Scorpion Ranch House which hosts a visitor center on the first floor and NPS staff offices on the second floor. The nearest cave to the study area is located approximately 140 feet away, while the nearest building is approximately 280 feet away. Renovations and seismic retrofitting of the Scorpion Ranch House were completed in 2009. The windmill was also reconstructed in 2012 for historic preservation.

- **Ranger residences.** These residences are located approximately 1,500 feet from the study area. At least one ranger resides on the island at any given time.

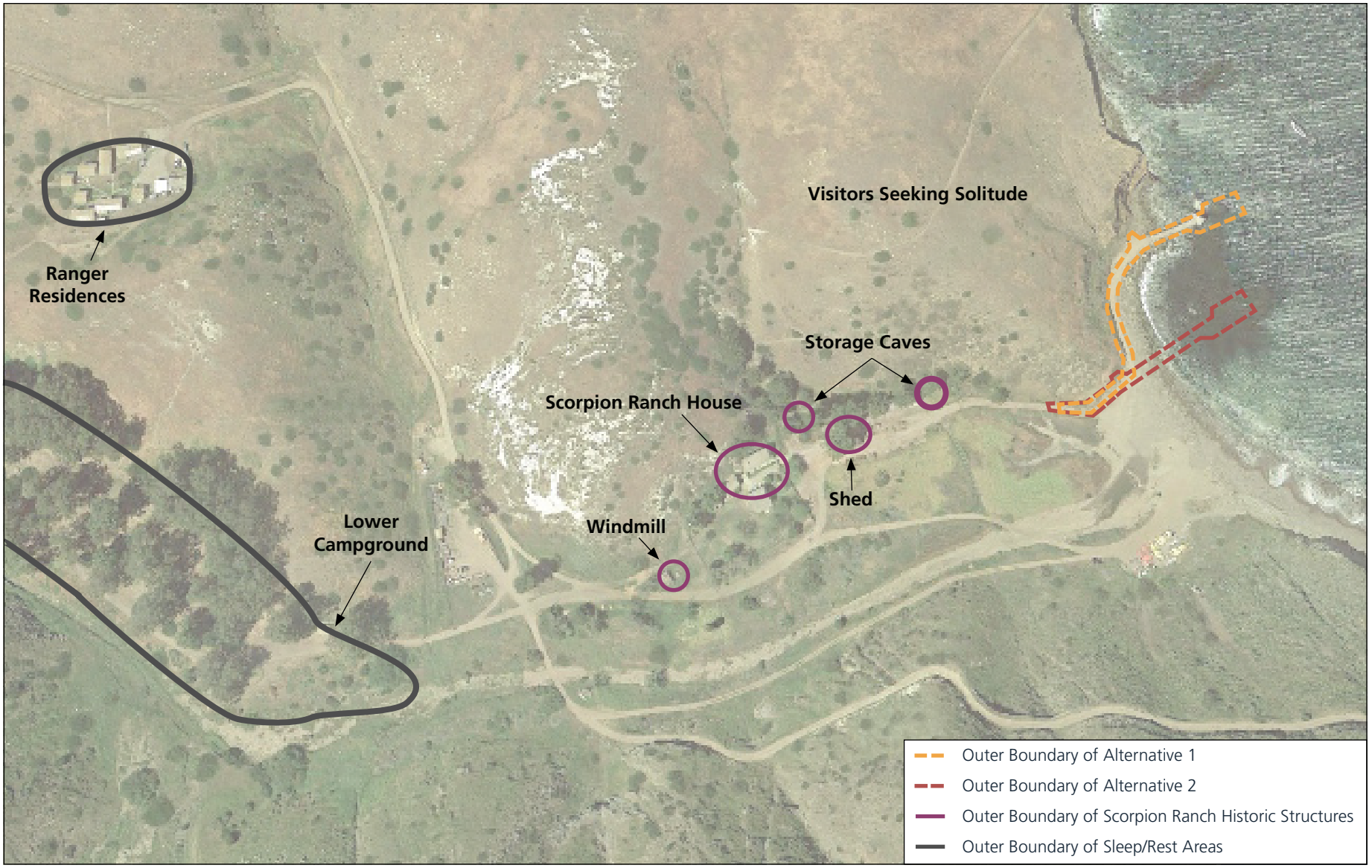


FIGURE 10

PROXIMITY OF SENSITIVE RECEPTORS TO CONSTRUCTION NOISE

Channel Islands National Park

National Park Service/U.S. Department of the Interior

Draft - August 2015

REGULATIONS AND POLICIES

The following is a summary of the key federal and state noise and vibration-related rules, policies, and agreements that potentially apply to the Project.

Federal

NPS Management Policies. The Park Service does not identify an accepted maximum noise level for the proposed alternatives in its management policies; however, the Park Service does require that the natural soundscapes be preserved or restored, should they become degraded by unnatural sounds. The Park Service will monitor noise adjacent to the parks, and will take action, as needed, to eliminate, minimize, or mitigate all noise that adversely affects the soundscape or other park resources or values, or noise that exceeds acceptable or appropriate levels for visitor uses.

DO-47: Soundscape Preservation and Noise Management. As a supplement to the NPS Management Policies, DO-47 outlines 11 guidelines that require, to the fullest extent possible, the protection, maintenance, or restoration of NPS natural soundscapes in a condition unimpaired by inappropriate or excessive noise sources (NPS 2000).

Federal Transit Administration (FTA) Transit Noise and Vibration Guidance. The FTA's *Transit Noise and Vibration Impact Assessment* (FTA 2006) provides criteria for maximum-acceptable noise levels for different types of land uses. In addition to noise criteria, the FTA also provides criteria for maximum-acceptable vibration levels for fragile buildings (defined as "buildings extremely susceptible to vibration damage").

Regional and Local

GMP/Wilderness Study/EIS. The GMP/Wilderness Study/EIS does not quantify accepted maximum noise levels for the park. It does, however, identify land uses (or "zones") and corresponding qualitative noise level expectations as shown in Table 8.

TABLE 8. ACCEPTED NOISE LEVELS BY ZONE

Terrestrial Zone	Noise Level (Qualitative)
Backcountry	Low
Cultural Landscape	Moderate
Frontcountry	High
Administrative	High

The study area, in particular the entire trail (North Scorpion Valley Road) that connects Scorpion Anchorage to the Upper Campground, is zoned as Frontcountry or developed land, with the exception being Scorpion Ranch which is zoned as Cultural Landscape. Most of the surrounding land is zoned as Backcountry with some Administrative zones.

While most of the park is generally considered relatively quiet and rich in natural sounds (NPS 2015a), Frontcountry zones (i.e., the study area) typically experience higher levels of visitor recreational and educational activities. Times of high noise levels and large concentrations of people are expected in both Frontcountry and Administrative zones (NPS 2015a). In Cultural Landscape zones, visitation and noise levels are expected to be moderate.

GEOLOGY, SOILS, AND SEISMICITY

This section analyzes the geological conditions of the study area. The study area for this resource topic is defined as the Scorpion Pier Anchorage and beach area, which includes the two pier alternative locations (the current pier location [Alternative 1] and the central portion of the beach [Alternative 2]) and road alignment area; beach and Scorpion Creek floodplain area; adjacent hillside; and intertidal to shallow subtidal ocean waters.

EXISTING CONDITIONS

Regional Geology

Geologic and seismic conditions in the study area are governed by the overall geologic and tectonic characteristics of Southern California and the Channel Islands. Unlike the typical offshore islands and underwater banks and ridges that trend distinctively northwest-southeast in the Continental Borderland offshore of Southern California, the four Channel Islands generally trend east-west, following the same trend as the Transverse Ranges of Southern California. This east-west trend marks a distinct change locally in the structural relationship between the North American and Pacific Plate boundary.

Faults and Seismicity. Santa Cruz Island is located in a seismically active region of Southern California that is subject to significant hazards from moderate to large earthquakes. Ground shaking and surface rupture have occurred in this region in very recent times. This region is considered one of the most tectonically active areas in the world, with measured uplift rates near Ventura of 30 inches per 100 years (TerraCosta Consulting Group 2010).

Although there are many active fault zones throughout the Southern California region, there are four fault zones that are most likely to affect the site. The Channel Islands Thrust Fault, Santa Cruz Island Fault, Anacapa-Dume Fault, and Oak Ridge (Blind Thrust Offshore) Fault are all located less than 7 miles from the site. Each of these faults is estimated to be capable of producing between a 7.0 and 7.5 maximum magnitude earthquake and peak site accelerations of greater than 0.5 g (gravitational acceleration; TerraCosta Consulting Group 2010).

The U.S. Geological Survey's 2009 Probable Seismic Hazard Analysis Program indicates that there is a 90 to 100% probability that a greater than 5.0 magnitude earthquake will occur within 50 km (31 miles) affecting the site within the next 50 years, and that there is a 20% probability of a 7.0 or greater earthquake occurring within 50 years (TerraCosta Consulting Group 2010).

Site Geology

Geological Conditions. The site is located at the easterly end of Santa Cruz Island adjacent to the mouth of a small alluviated valley. Terrain on the island is relatively rugged with deeply incised canyons inland and vertical bluffs along the coastline.

Geologic maps of the area prepared by the California Division of Mines and Geology map the area around Scorpion Pier as being underlain by Miocene-age volcanic rocks. These rocks generally consist of interbedded agglomerates, flow breccias, flow tuffs, volcanic sandstones, and andesitic and basaltic flows. Exposed on the higher elevations locally (as well as much of the isthmus further west) are middle Miocene marine sedimentary rocks. It is reported that marine sedimentary rocks are exposed in the roadway from Scorpion Ranch up to Cavern Point, and locally consist of diatomaceous earth. Also mapped in the area at higher elevations are Pleistocene marine and marine terrace deposits. These soils are described as consisting of sand, silt, and calcareous sediments (CDMG 2001).

Soils and Underlying Materials. Soils mapped by the Natural Resources Conservation Service along the existing approach roadway and pier alignment fall under the classifications Beaches-Abaft complex (0 to 5% slopes; NRCS 2013), while those along and adjacent to the roadway and adjacent creek bed are classified as Typic Xerofluvents-Riverwash complex (0% to 8% slopes; NRCS 2013). The hillside north of the alignment is mapped as containing soils of the classification Lodestone-Ballast-Halyard complex. These soil classifications are not prime farmland and have little agricultural viability. A site-specific geotechnical investigation was completed to identify underlying materials in the Project area (Figure 11).

Jet probing of the bottom offshore and on the beach indicated that 0 to 10+ feet of interbedded sands exist overlying bedrock. Deeper sand thicknesses are limited to deeper waters well beyond the existing pier, with little if any sand cover within approximately 100 feet of the shoreline. Soils encountered at the beach and mouth of Scorpion Creek consist of alluvial sands, gravels, cobble, and boulders. These deposits are estimated to range from 0 to 8 feet in thickness at the beach. A hard bedrock surface was locally noted on the hillsides and below the offshore sand deposits that likely underlie the cobble to boulder overburden at shallow depths. The rocks and soils observed in the site area generally consist of Miocene volcanic rocks overlain by colluvium and slopewash soils, relatively recent alluvial deposits, beach deposits, and locally derived fill soils (TerraCosta Consulting Group 2010). These soil and rock types are described as follows:

- Miocene-age volcanic rocks observed locally generally consist of the interbedded agglomerate flow breccias, flow tuffs, and volcanic sandstones, as well as andesitic and basaltic flows, as mentioned above. These rocks are locally highly weathered, faulted, fractured, and contain numerous zones or beds with cavities and voids.
- Pleistocene-age marine terrace deposits are present in the hillside above the pier access road. These deposits consist of a boulder and cobble conglomerate in a clayey sand matrix.
- Colluvial/slopewash soils cover the surrounding hillsides. These soils generally consist of gray-brown clayey sand to sandy clay, with gravel, cobble, and occasional boulders.
- Alluvial soils cover the valley bottom. These soils consist of a mix of interbedded silty sands to sandy clays, with gravels, cobbles, and occasional boulders.
- Beach deposits generally consist of gravel, cobble, and boulder deposits, with a sand matrix. Sandier deposits were observed on the easterly side of the canyon.
- Fill soils were placed to create the access roadway to the pier. Fill soils generally consist of well-drained sandier material, likely derived from the alluvial or beach deposits. The soils are estimated to range from 3 to 5 feet in thickness at the landside pier abutment down to 1-foot thick along the pathway.

Surface Fault Rupture. Surface fault rupture is defined as slip on a fault plane that has propagated to the earth's surface and caused a rupture or disturbance. Fault rupture almost always follows pre-existing faults, which are zones of weakness. The nearest fault to the Project site is the Santa Cruz Island Fault, located approximately 4 miles south, which trends west-northwest for 13 miles across the center of Santa Cruz Island (University of California Davis 2011; Figure 12). There is a very low potential for fault rupture at any of the alternative sites because no active faults cross the study area.

Ground Shaking. Strong ground shaking from earthquakes is considered a seismic hazard in the Channel Islands. Ground shaking can be described in terms of acceleration, velocity, and displacement of the ground. Greater movement can be expected at sites on poorly consolidated material such as alluvium, at sites on compressible material

such as bay mud or non-engineered fill, at sites that are in proximity to the causative fault, or in response to an event of great magnitude. A significant seismic event along the four faults located in proximity to the site could result in ground shaking in the Project area.

Liquefaction. Liquefaction is the transformation of a granular material (sediments or soils) from a solid into a liquefied state, often resulting from strong seismic ground shaking in areas with susceptible soils. Factors known to affect the liquefaction potential of soils are the characteristics of the materials, such as grain size distribution, relative density, and degree of saturation; the initial stresses acting on the soils; and the characteristics of the earthquake, such as the intensity and duration of the ground shaking. Low density sandy soils may be susceptible to liquefaction. In the Project area, these soil types are present immediately offshore, at the beach and mouth of Scorpion Creek, and in fill soils placed to create the roadway to the pier (TerraCosta Consulting Group 2010). Volcanic bedrock is present at shallow depths in the alignment, and these materials would not be susceptible to liquefaction.

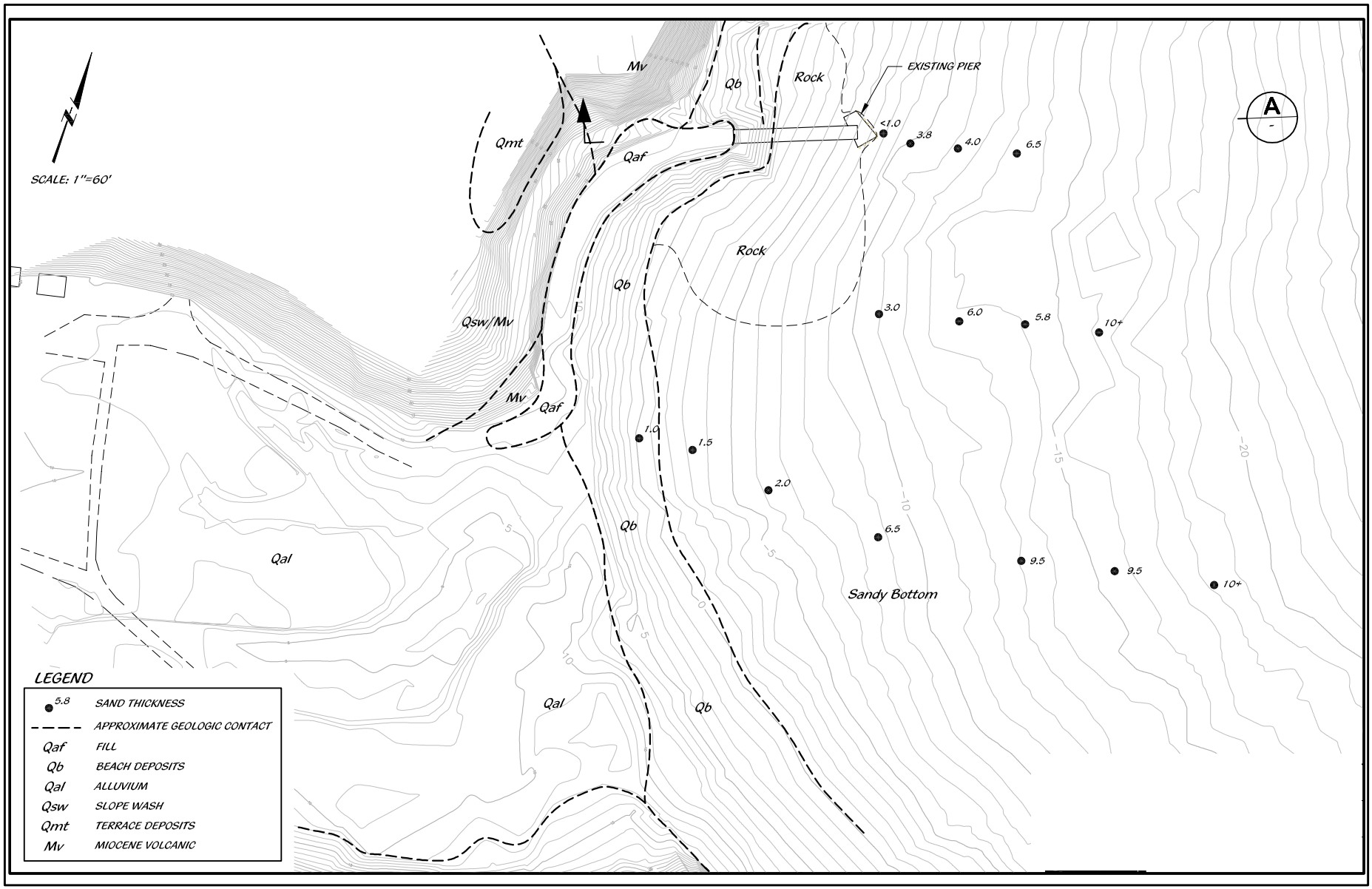
Shoreline Erosion. The relatively steep coastal bluffs will continue to yield a small amount of rock associated with the occasional storm-induced surficial failures, in large part associated with the ongoing near-surface weathering. Debris from these failures contributes cobble- to boulder-sized material to the beach. The relatively hard bedrock underlying the beach and coastal bluffs is almost immune to erosion, including the increased erosion that can occur as a result of sea level rise (TerraCosta Consulting Group 2010).

Locally, the small northerly trail fill pad may, from time to time, experience a small amount of erosion during high storm surf and more so as sea level rises. The existing access road, comprised primarily of gravels and cobbles, is subject to erosion during storm surges, and has necessitated repeated repair to the damage caused by wind and waves. This constant rebuilding of the road exacerbates erosion of the toe of the adjacent hillside, which is a sensitive archeological area.

Subsidence and Settlement. Subsidence involves a sudden sinking or gradual settling and compaction of soil and other surface material with little or no horizontal motion. Land surface subsidence can result from both natural and manmade phenomena, including tectonic deformation, consolidation, hydro compaction, collapse of underground cavities, oxidation of organic-rich soils, rapid sedimentation, and the withdrawal of groundwater. Expansive soils and materials are more susceptible to subsidence, including estuarine sediments, organic rubbish, or thick organic deposits. Areas underlain by bedrock, dense fill, and dune sand have a low susceptibility to subsidence.

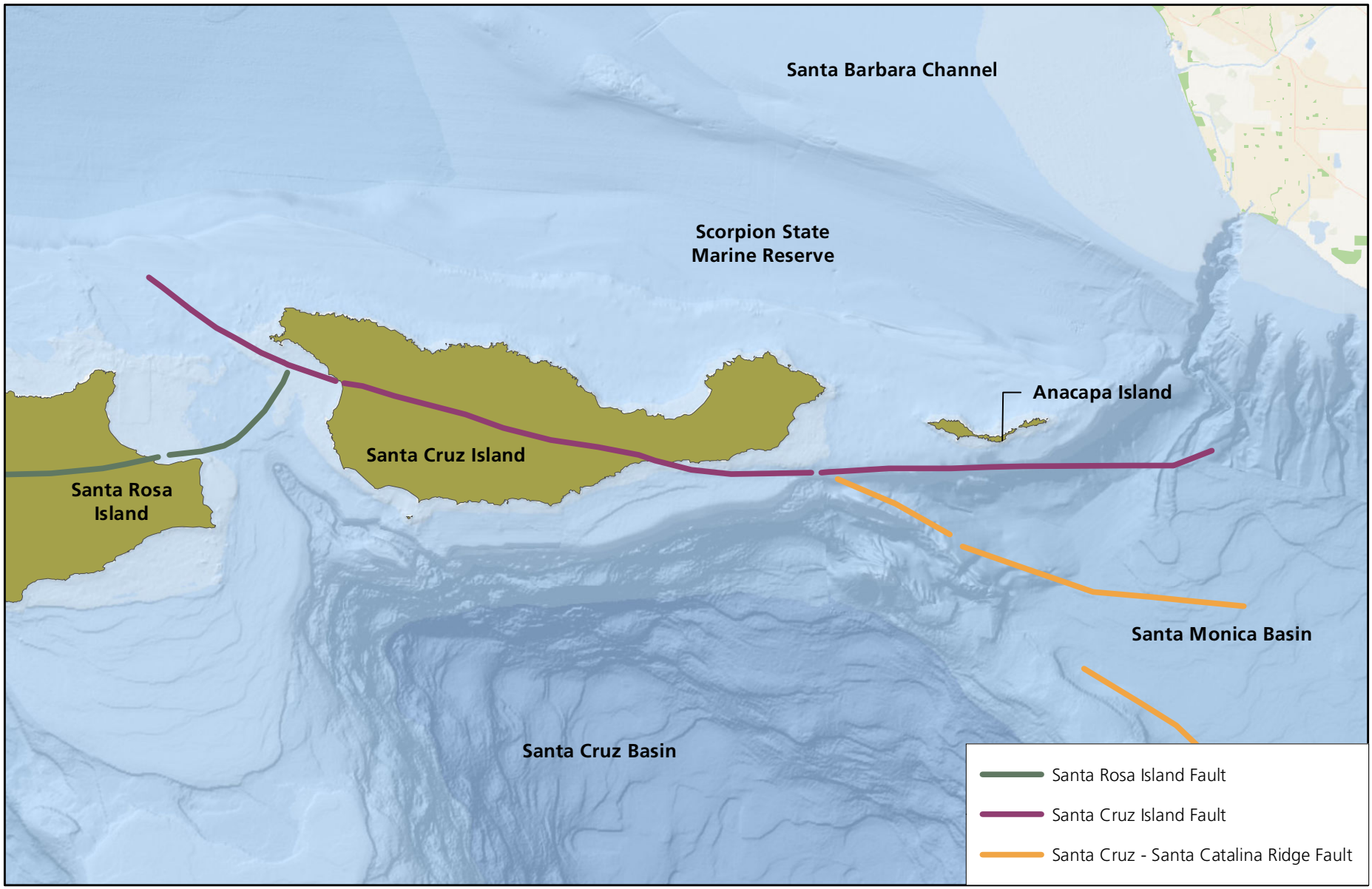
Settlement occurs when ground shaking reduces the amount of pressure existing between soil particles, resulting in a reduction of the volume of the soil. Areas are susceptible to differential settlement if they are underlain by compressible sediments, such as poorly engineered artificial fill. Differential settlement can damage structures, pipelines, and other subsurface entities. Earthquakes and seismic activity can accelerate and accentuate settlement.

Fill soils present along the roadway to the pier may be susceptible to settlement. Mechanical compaction, as commonly occurs when constructing roadways, can increase soil density and reduce settlement potential, particularly in areas underlain with hard rock formations such as occurs throughout the Project site.



Source: TerraCosta 2010

FIGURE 11
SOIL TYPES
Channel Islands National Park
National Park Service/U.S. Department of the Interior
Draft - August 2015



0 6 Miles

Source: USGS 2013; USGS 2014

FIGURE 12
REGIONAL FAULTS
Channel Islands National Park
National Park Service/U.S. Department of the Interior
Draft - August 2015

Slope Failure and Slope Stability. Earthquakes can cause significant slope stress, potentially resulting in earthquake-induced landslides. Landslides most commonly occur in areas with steep slopes, or in slide-prone geologic units that contain excessive amounts of water. Other factors that affect slope stability include site geology, climate, and human activity.

While portions of Santa Cruz Island are composed of soft Monterey Formation units which are susceptible to storm or seismic-induced lateral movement, and Santa Cruz Island has numerous large active and stabilized landslides, the relatively steep coastal bluff adjacent to the pier and roadway is composed of very hard Santa Cruz Island Volcanics (University of California Davis 2011). While the bluffs will continue to yield a small amount of rock associated with occasional storm-induced weathering, underlying volcanic rock materials are relatively stable.

Expansive Soils. Expansive soils are high in clay content and increase and decrease in volume upon wetting and drying, respectively. The change in volume exerts stress on buildings and other loads placed on these soils. Expansive soils are common throughout California and can cause damage to foundations and slabs unless properly treated during construction. Often, grading, site preparations, and backfill operations associated with subsurface structures can eliminate the potential for expansion. In the Project area, clay rich soils are present in colluvial/slopewash soils that cover the surrounding hillsides, in alluvial soils in the valley bottom, and in fill soils placed to create the access roadway to the pier (TerraCosta Consulting Group 2010). These areas do not contain structures that would be susceptible to damage from expansive soils.

Tsunamis and Seiches. Tsunamis (seismic sea waves) are long-period waves that are typically caused by underwater seismic disturbances, volcanic eruptions, or submerged landslides. Tsunamis can travel across oceanic basins and cause damage several thousand miles from their sources. Low-lying coastal areas that are at or near sea level are generally the most susceptible to tsunami inundation. A seiche is caused by oscillation of the surface of an enclosed body of water due to an earthquake or large wind event. Seiches can result in long-period waves that cause run-up or overtopping of adjacent landmasses, similar to tsunami run-up.

Extreme tsunami events have been known to generate waves of 50 or even 100 feet—on the coasts of Japan, South America, Alaska, and Hawaii. These wave heights are associated with very rapid shallowing of the ocean bottom toward the coast. No such abrupt shallowing of the ocean toward the coast exists in Southern California, and there is no oceanic trough off the coast of the Channel Islands. Consequently, effects of tsunami waves due to distant earthquakes have been limited to a rise of a few feet (County of Santa Barbara Planning and Development 2010). The most recent local and significant tsunami event occurred in March 2011, when a tsunami originating in Japan caused modest swells throughout the coast of southern California.

The Channel Islands are not included in the state's tsunami inundation maps, although the Park Service identifies the Channel Islands as within a tsunami hazard zone. The Channel Islands National Park website provides tsunami safety tips and reference to additional tsunami educational materials (NPS 2013a). NOAA operates a tsunami warning system that serves all coastal states including California and the Channel Islands.

REGULATIONS AND POLICIES

The following is a summary of the key federal and state seismic-related rules, policies, and agreements that potentially apply to the Project.

Federal

2006 NPS Management Policies. The policies on geologic resource management state, "the Park Service will preserve and protect geologic resources as integral components of park natural systems. As used here, the term 'geologic resources' includes both geologic features and geologic processes. The Park Service will (1) assess the impacts of natural processes and human activities on geologic resources; (2) maintain and restore the integrity of existing geologic resources; (3) integrate geologic resource management into Park Service operations and planning; and (4) interpret geologic resources for park visitors" (NPS 2006a).

International Building Code. The International Building Code addresses the design and installation of building systems through requirements that safeguard public health and safety. The code establishes minimum regulations for building systems, using prescriptive and performance-related provisions. The International Building Code is available for adoption and use by jurisdictions internationally. The California Building Code is based on the International Building Code.

State

Alquist-Priolo Earthquake Fault Zoning Act. The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. According to the act, buildings for human occupancy cannot be constructed in regulatory "earthquake fault zones" established and mapped around the surface traces of active faults. This typically includes areas within approximately 200 to 500 feet of major fault lines. The construction of habitable structures is not proposed as part of the Project, and the study area is not in an earthquake fault zone as defined by the act (CDMG 2001); as such, this act would not apply to the Project.

Seismic Hazards Mapping Act. The Seismic Hazards Mapping Act of 1990 was developed to reduce threats to public health and safety and to minimize property damage caused by earthquakes, including the effects of ground-shaking, liquefaction, landslides, other ground failure, and other hazards. The act directs the California Geological Survey to identify and map seismic hazard zones for the purpose of assisting cities, counties, and other local permitting agencies to regulate certain development projects in these zones. Before a development permit may be granted for a site in a seismic hazard zone, a geotechnical investigation of the site must be conducted, and appropriate mitigation measures must be incorporated into the project's design.

California Building Code. The California Building Code contains the minimum standards for design and construction in California. The standards provide requirements for general structural design and include means for determining earthquake loads, as well as other loads (flood, snow, wind, etc.), for inclusion into building codes. The provisions of the California Building Code apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California. This code would apply to construction of the Project.

WATER QUALITY AND HYDROLOGY

This section analyzes the water quality and hydrology of the study area. The study area is defined as the Scorpion Anchorage waterfront, which includes the two pier alternative locations (the current pier location [Alternative 1] and the central portion of the beach [Alternative 2]), as well as the approach roadway adjacent to Scorpion Creek and associated wetlands.

EXISTING CONDITIONS

Environmental Setting

Coastal Waters. Santa Cruz Island is located approximately 20 miles southwest of coastal Santa Barbara. The ocean area between Santa Barbara and the Channel Islands is known as the Santa Barbara Channel; coastal waters in the Project area are influenced by Santa Barbara Channel conditions and circulation patterns. In the Santa Barbara Channel, currents follow a general counterclockwise circulation. Along the northern edge of Santa Cruz Island and in the Project area, the current enters from the west and flows easterly along the coast (CA WRCB 1979). Offshore, warm southern waters mingle with cold currents from the north. Two distinctly different oceanic water masses meet just off the shores of the Channel Islands: northern waters cooled by the upwelling common along the West Coast of the United States meet the warm southern waters characteristic of oceanic conditions along the Baja and Southern California coast (NPS 2010b).

Surface seawater temperatures around the Channel Islands generally range from 55 degrees Fahrenheit (°F; 13 degrees Celsius [°C]) in winter to 65°F (18°C) in summer. Salinity ranges on the north side of Santa Cruz Island and the Channel Islands in general are slightly lower than on the south side. Turbidity is generally higher on the north side of the islands and downcurrent to the east. Localized turbidity is affected by wind, rain, waves, and shore types. While water quality around the Channel Islands is generally good, oil and tar pollution from natural seeps and ship traffic is present, particularly along the north coasts (CA WRCB 1979).

Climate and Precipitation. Santa Cruz Island exhibits a Mediterranean climate typical of coastal California. Approximate average annual precipitation on Santa Cruz Island is 20 inches (NPS 2006b). Rainfall is heaviest between November to March with seasonal droughts between late May and October. The shallow marine layer creates atmospheric humidity and fog which partially offsets the impact of summer drought conditions, as moisture from fog accumulates on vegetation and falls as fog-drip precipitation. Climate regimes are influenced by the El Niño Southern Oscillation, a cyclical global circulation pattern that affects oceanic processes in the Eastern Pacific. This 3- to 7-year cycle alternates between the El Niño stage of wetter than normal winters, increased risk of flooding, and elevation of sea temperatures; and the La Niña stage of cool, dry winters (NPS 2010b).

Santa Cruz Island Watershed. Santa Cruz Island watersheds are characterized by steep, highly dissected subdrainages which typically have V-shaped valley bottoms. Streams occur in numerous canyons on the island. The largest watershed is the Central Valley, which runs east to west and drains to the north shore at the base of the isthmus at Prisoners Harbor (NPS 2006b). Some drainages expire on gravel beaches at canyon mouths, while others outlet from ocean cliffs directly into the sea. The larger drainages with beach outlets are typically low gradient and U-shaped. Most drainages on Santa Cruz Island have only intermittent above ground stream flow. In addition, there are many freshwater seeps and springs throughout the island, although no substantial bedrock aquifers are known to exist (NPS 2010a; 2002b).

Scorpion Creek. In the study area, Scorpion Creek extends immediately south of the

existing approach roadway. It is a seasonally intermittent channel with U-shaped morphology near its confluence with the ocean (NPS 2010b). Scorpion Creek drains a small portion of the north side of the easternmost tip of Santa Cruz Island (NPS 1997). The creek channel transitions to estuarine/intertidal/emergent wetland habitat near its confluence with the beach at Scorpion Anchorage. Longshore currents and intertidal exchange create and maintain a cobble beach and bar along the shoreline and at the end of the stream channel, which reduces intertidal exchange between the creek and estuarine wetlands (NPS 2003b).

The lower end of the Scorpion Creek riverine wetland channel, including part of the estuarine wetland, has been dramatically altered by dredging over the past 100 years. Flows are confined to a 35-foot wide, 800-foot-long channel (NPS 2003b). Prior to grazing and channelization, the stream channel likely meandered back and forth across the entire valley floor through a series of braided channels. In that pre-disturbance situation, the riverine and palustrine wetlands likely extended across the entire valley floor (NPS 2003b). Much of the original floodplain and estuary has filled with sediment, or was graded by previous settlers (NPS 2006b). In recent years, the Park Service has twice excavated a portion of the channel to restore some flow capacity to the channel following flood events (NPS 2015a).

Intense frontal storms are characteristic of the study area, and the Scorpion Creek watershed is steep and highly dissected. These conditions contribute to rapid runoff, erosion, and debris flows, which combine to produce large flow events. Significant flood events recently occurred at Scorpion Creek in 1997 and 2010. During these events, significant sedimentation transport and deposition occurred, and in 1997, structures at Scorpion Ranch were inundated.

Water Quality

Water quality in the study area, and more broadly in the Channel Islands and Santa Barbara Channel, is affected by ocean circulation patterns and inputs of waterborne and airborne constituents from coastal watersheds in or near the Sanctuary. Depending on the degree of offshore transport, terrestrial runoff and airborne particulates from the mainland coast of the Santa Barbara Channel and from coastal portions of Los Angeles County may potentially affect water quality in the Sanctuary (Santa Barbara Channelkeeper and Engle 2010). Other point source sources of pollution which may affect water quality in the study area include offshore oil development in the Santa Barbara Channel; vessel discharges associated with shipping traffic transiting the Santa Barbara Channel; and a former radioactive waste dump approximately 30 miles south of Santa Cruz Island (CA WRCB 1979).

Marine water pollution is virtually unstudied in Channel Islands waters. Concentrations of synthetic organic compounds and trace elements in seawater at the Channel Islands have not been measured (NPS 2006b). In the Channel Islands, there are no point source discharges to the ocean, no harbors or marinas, and no dredging that takes place in coastal areas (NPS 2010b). Apart from indirect mainland coastal or Santa Barbara Channel sources, potential sources of anthropogenic water pollution in Sanctuary waters are limited to discharges from private or commercial vessels (i.e., sewage, fuel, bilge water; NPS 2006b). Terrestrial runoff from Santa Cruz Island may also affect water quality in coastal Sanctuary waters.

Minimal documentation exists as to water chemistry (nutrients or animal waste) monitoring in the streams of Santa Cruz Island. Although previously subjected to intensive agriculture, at the present time the vast majority of the watershed is in a near natural state. Consequently, surface water chemistry is primarily affected by precipitation, soils, biota, and bedrock. It is

unlikely that high concentrations of metals, organics, or other contaminants ever occur. Coastal drainages, including the intermittent creek at the Project site, are likely marine influenced with occasional overwash potentially increasing salinity levels to slightly brackish for surface and shallow groundwater (NPS 2010b; Santa Barbara Channelkeeper and Engle 2010).

Given the incised nature of drainage channels on Santa Cruz Island, and declining vegetation conditions associated with historic ranching, sedimentation above natural sediment rates is a concern for water quality. Local topography, geology, and land use all determine the sediment load entering the ocean, with runoff following storm events potentially contributing high levels of sediment to Sanctuary waters. While sediment can reduce water clarity, smother habitats, and carry particulates including bacteria and heavy metals, terrestrial island sources are unlikely to be an issue for coastal Sanctuary waters (NPS 2010b; Santa Barbara Channelkeeper and Engle 2010).

Floodplain Risk

The Scorpion Creek floodplain includes the entire lower valley, from canyon wall to wall. This area is susceptible to flood risk; the steep and dissected drainage, intense frontal storms, altered floodplain, and historic agricultural grazing all contribute to these conditions (NPS 2015a).

Large flood events occurred in 1997 and 2010 (Photos 5 and 6). These events transported and deposited massive amounts of sediment and the 1997 flood event damaged facilities along the creek. Discharge calculations made following the 1997 flood suggest that the storm approximated a 100-year return-period runoff event. The lower 700 to 800 feet of Scorpion Creek, located within the study area, did not fill significantly during the 1997 storm. However, this area remains vulnerable to filling during small flood events, particularly prior to breaching of the cobble berm (NPS 2003b). Severe tidal events may further exacerbate these conditions.

Photo 5.
View of Scorpion Creek following 1997 flood event.

Photo 6.
View of Scorpion Creek following 2010 flood event.

Improvements along Scorpion Creek remain vulnerable to large flow events. Periodic excavation of sediment from the channel may restore some flow capacity to the channel, and these efforts have been completed by the Park Service following flood events. However, the excavated channel is subject to increased deposition and filling with sediment (NPS 1998, 2015a). In addition, the unpaved road that currently provides access to the existing pier is subject to inundation and erosion during the occasional flooding of Scorpion Creek, and requires periodic maintenance and reconstruction.

Wave Climate, Sea Level Rise, and Coastal Engineering Analysis

A coastal engineering analysis for the proposed Project was completed in 2011 (Coast and Harbor Engineering 2011). The coastal engineering analysis consisted of the following elements:

- Bathymetric/topographic data compilation and analysis
- Coastal conditions evaluation (tides, sea level rise, winds, and waves)
- Wave loading on marine structures (piles and deck)
- Coastal flooding evaluation (wave runup and overtopping)
- Shore protection design criteria (stable rock size)

Site conditions and the coastal engineering analysis indicate that the design wave climate at the Project site is energetic and likely to have an impact on replacement pier design (Photos 7 and 8). The coastal engineering analysis report provides design recommendations related to design wave force effects on pile diameters and pier deck elevations, coastal flooding zone effects associated with existing conditions and sea level rise, and median size of rock for use in erosion control at the shoreline for a range of revetment slopes.

The coastal engineering analysis was used for information concerning sea level rise and wave climates. The report indicates a sea level rise of 1.1 foot by 2050 for both the low and high projections, while projections beyond 2050 vary. This is approximately the median of the sea level rise estimates for the area (1.2 feet) for 2050 published by CCC (CCC 2015). Wave heights in 2050 are expected to be similar to existing conditions (assuming that the 50-year wind speeds will not change significantly by 2050 compared to 2015 conditions), but will cause impacts at higher elevations due to the 1.1 foot increase in mean sea levels by that time. In addition, the depth-limited wave breaking location shifts landward accordingly to reach the shallow water required to trigger breaking; wind generated waves break (generally) in water depths approximately 1.2 times their height (USACE 2002). In 2050, the 5- and 10-year maximum wave height (1.8 times higher than the average of the highest 1/3 of the waves in the sea state) would strike the pile caps of the existing pier structure (Ashton Engineering 2014).

Sea level rise will also affect wave runup elevations in the vicinity of the existing access road. When taking into account the predicted 3.2-foot sea level rise by the year 2100, the maximum upland wave runup elevation cause by extreme storms at mean higher high water was determined to be 14.8 feet along a transect intersecting the middle segment of the existing access road. Sea level rise estimates for 2100 published by CCC range from 17 inches to 66 inches for 2100 (CCC 2015); the modeled range is therefore within the middle of the CCC estimates.

In addition, the site-specific geotechnical investigation determined that high storm surf events may result in approach roadway erosion, the effects of which would be exacerbated by sea level rise. The Channel Islands are also within a tsunami hazard zone, and Scorpion Anchorage could be exposed to seismic induced tsunamis or seiches (NPS 2013a). The potential for roadway erosion and seismic induced tsunamis and seiches are described in further detail in the "Geology, Soils, and Seismicity" section of this chapter.

Photo 7.
View of Scorpion Pier during a king tide.

Photo 8.
View of Scorpion Pier and wave action from Santa Ana winds.

REGULATIONS AND POLICIES

The following is a summary of the key federal and state water quality rules, policies, and agreements that potentially apply to the Project.

Federal

Clean Water Act (CWA). The CWA is the principal statute governing water quality on a national level. The CWA sets water quality standards and regulates discharge of pollutants into the nation's waters. The act employs a variety of regulatory and non-regulatory tools to reduce pollutant discharges into waterways. It mandates permits for wastewater and stormwater discharges, regulates publicly owned works that treat municipal and industrial wastewater, requires states to establish site-specific water quality standards for navigable bodies of water, and regulates other activities that affect water quality. USEPA has delegated responsibility for implementation of portions of CWA, including water quality control planning and programs, in California to the State Water Resource Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs). The following CWA sections are relevant to the Project:

- **Sections 301 and 402.** These sections establish National Pollutant Discharge Elimination System (NPDES) permit requirements for discharge of pollutants from point sources, including ferry vessels. NPDES permits are not required for discharges incidental to the normal operation of a vessel, such as sewage, gray water, and effluent from properly functioning marine engines. The USEPA currently regulates discharges incidental to the normal operation of commercial vessels greater than 79 feet in length and operating as a means of transportation primarily through the vessel general permit. The vessel general permit regulates discharges incidental to the normal operation of vessels operating in a capacity as a means of transportation. The vessel general permit includes general effluent limits applicable to all discharges; general effluent limits applicable to 26 specific discharge streams; narrative water-quality based effluent limits; inspection, monitoring, recordkeeping, and reporting requirements; and additional requirements applicable to certain vessel types. Regulations prohibit discharges into waters of the United States unless the discharge is in compliance with an NPDES permit regulating stormwater and industrial discharges. Specific to stormwater, SWRCB has elected to adopt one statewide construction stormwater general permit that will apply to most stormwater discharges associated with construction activities. The Project would proceed in compliance with NPDES requirements under authorization of the construction stormwater general permit.
- **Section 311.** Under Section 311 of CWA, the discharge of fuel, oil, oily wastes, and hazardous substances is prohibited into or upon the navigable waters of the United States or the waters of the contiguous zone, if such discharge causes a film or sheen upon, or discoloration of the surface of the water, or causes a sludge or emulsion beneath the surface of the water. If a discharge occurs, the violating party is responsible for control and cleanup, as well as costs

incurred. Oil and chemical spills need to be reported to both the National Response Center and the state. A placard displaying discharge restrictions is required for all vessels 26 feet or longer.

- **Section 312.** Section 312 of CWA prohibits discharge of untreated sewage in navigable waters. This section of CWA is implemented jointly by the U.S. Coast Guard (USCG) and USEPA. Section 312 also establishes effluent standards for marine sanitation devices (i.e., onboard sewage treatment), including acceptable fecal coliform and suspended solid levels. Onboard systems must have a USCG certification label.
- **Section 303(d) and Total Maximum Daily Loads.** States must present USEPA with a list of "impaired water bodies," defined as those waterbodies that do not meet state water quality standards for identified pollutants. CWA requires the development of total maximum daily loads for impaired waters and their source pollutants. Implementation of this program in the study area is conducted by the Central Coast RWQCB.
- **Section 401.** Section 401 of CWA requires compliance with state water quality standards for actions in state waters. Activities that may result in a discharge to a waterbody must obtain a Water Quality Certification that the proposed activity will comply with state water quality standards. The Project would comply with these water quality standards and obtain a Water Quality Certification from RWQCB.
- **Section 404.** CWA Section 404 establishes the program that regulates the discharge of dredged and fill material into waters of the United States. The U.S. Army Corps of Engineers (USACE) is responsible for enforcement and individual permit decisions, while USEPA develops environmental criteria used in evaluating applications. Any discharge of fill associated with the Project would occur under authorization of a Standard Individual Permit from USACE.

Rivers and Harbors Act. The Rivers and Harbors Act of 1899 prohibits discharge of refuse matter into navigable waters or tributaries thereof of the United States without a permit. Permits are also required for any activities that excavate, fill, or alter the course, condition, or capacity of any port, harbor, channel, or other areas covered by the act. Many of these activities are additionally regulated by CWA. Project alternatives would obtain approval under the Rivers and Harbors Act through authorization of a Standard Individual Permit from USACE.

CZMA and Amendments. The CZMA of 1972, as amended, provides for management of the nation's coastal resources. In 1990, the U.S. Congress passed the coastal zone act reauthorization amendments to address nonpoint source pollution problems in coastal waters. In the study area, CCC has authority for implementation of CZMA. CWA and CZMA require that the state develop coastal nonpoint source pollution control programs that incorporate required management measures to reduce or prevent polluted runoff to coastal waters from specific sources. The Park Service will document consistency with CZMA requirements.

Executive Order 11988 and DO-77-2, Floodplain Management. Executive Order 11988 and DO-77-2 require the Park Service to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Per Procedural Manual 77-2: Floodplain Management, the Park Service is required to prepare a formal Statement of Findings for actions sited in a regulatory floodplain which cannot be located to non-floodplain sites. The Project area has not been included in any Federal Emergency Management Agency maps, and is therefore not within the delineated 100-year floodplain. Nonetheless, flooding has historically occurred in the

Project area. A Floodplain SOF has been prepared for the project (Appendix C).

Channel Islands National Marine Sanctuary. The National Marine Sanctuary program (USC Section 1431b) establishes prohibitions in the Sanctuary related to water quality. This includes prohibitions on discharges of substances; alteration of, or construction on, the seabed; and limits on commercial vessel access. Transport of persons or supplies is permitted, and discharge exceptions are allowed for routine vessel maintenance (e.g., deck wash down) and engine exhaust.

State

CZMA and California Coastal Act. With the Park Service acting as the federal lead agency, the Project would comply with CZMA requirements by preparing a CZMA Consistency Determination. If the state of California concurs with the Park Service's consistency determination, it would transmit its formal concurrence and that letter would be published in the Final EIS.

Porter-Cologne Water Quality Control Act (Porter-Cologne Act). The Porter-Cologne Act (Division 7 of the California Water Code) is the primary state regulation that addresses water quality standards. Under the act, SWRCB has the ultimate authority over water rights and water quality policy. The act also established nine RWQCBs to oversee water quality on a day-to-day basis at the regional level. The state and regional boards regulate all pollutant or nuisance discharges that may affect either surface water or groundwater. The study area is under the jurisdiction of the Central Coast RWQCB. Under oversight by USEPA, SWRCB, and Central Coast RWQCB have the responsibility for establishing regulatory standards and objectives for water quality in the Central Coast Region; developing total maximum daily loads for impaired waterbodies; and issuing CWA NPDES permits. Approval for Project activities subject to the Porter-Cologne Act would be obtained through the water quality certification/waste discharge requirements issued by the Central Coast RWQCB. The study area is not within an impaired waterbody.

California Health and Safety Code. California law prohibits dumping any garbage into the navigable waters of the state (California Health and Safety Code, Sections 117475-117500). In addition, it is illegal to deposit human excreta in the navigable waters from any vessel tied to any dock, slip, or wharf that has toilet facilities available for the use of persons on the vessel (California Health and Safety Code, Division 104, Part 13, Section 117515).

California Fish and Game Code Section 1600. California Fish and Game Code, Section 1600 requires that a Lake or Streambed Alteration Agreement be obtained for any activity that will substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank (which may include associated riparian resources) of a river, stream or lake, or use material from a streambed.

California Fish and Game Code Section 5650. California Fish and Game Code, Section 5650 prohibits discharge of harmful materials to water of the state. It is unlawful to deposit in, permit to pass into, or place where it can pass into California waters any petroleum, acid, coal or oil tar, lampblack, aniline, asphalt, bitumen, or residuary product of petroleum; any carbonaceous material or substance; any refuse, liquid or solid, from a refinery, gas house, tannery, distillery, chemical works, mill, or factory of any kind; any sawdust, shavings, slabs, or edgings; any factory refuse, lime, or slag; any cocculus indicus; or any substance or material deleterious to fish, plant, mammal, or bird life. Section 5655 of the code requires that parties responsible for polluting waters of the state pay for removal costs and environmental damages.

SMR. Per PRC Section 36710(a), in a SMR, "the area shall be maintained to the extent practicable in an undisturbed and unpolluted state." The preferred alternative is consistent with California Regulation Public Safety (Title 14 Section 632(a)(10)). Public safety activities, including installation, maintenance, and/or seasonal placement and removal of safety-related artificial structures, including but not limited to lifeguard towers, are allowed in any MPA classification pursuant to any required federal, state and local permits, or as otherwise authorized by the department. Accordingly, the proposed Project is permissible in the SMR.

AQUATIC BIOLOGICAL RESOURCES

This section analyzes aquatic biological resources in the study area. The study area for this resource topic is defined as the adjacent shoreline and aquatic environment of the Scorpion Anchorage waterfront at the two pier alternative locations (the current pier location [Alternative 1] and the central portion of the beach [Alternative 2]), and Scorpion Creek, adjacent to the access road.

EXISTING CONDITIONS

Regional Setting

Santa Cruz Island is located in the Pacific Ocean, separated from the mainland by the Santa Barbara Channel. Waters surrounding the Island, from the mean high tide line to 6 nautical miles offshore, are in the Sanctuary (Figure 1). The study area is also located within the Scorpion SMR (Figure 1). Freshwater resources in the study area include Scorpion Creek and adjacent wetlands. Aquatic biota potentially found in the study area are representative of species assemblages associated with nearshore coastal areas, freshwater streams, and wetland habitats in the Channel Islands.

Santa Cruz Island lies in the transition area between two major biogeographic provinces, the cooler Oregonian Province and the warmer Californian Province, resulting in high species diversity, and substantial differences in species composition over short distances (i.e., east/west sides of islands). Rocky shores are the dominant coastal habitat type on the Channel Islands, with approximately 60 to 70% of the total shoreline of each island classified as bedrock. Interspersed among rocky shores are boulder/cobble/sandy beaches, and a few small coastal wetlands (UCSC 2012a).

Site Settings

Marine habitats in Scorpion Anchorage adjacent to the pier locations in Alternatives 1 and 2 include intertidal and subtidal waters and substrates. Water depths at the seaward ends of the alternative locations are approximately -11 to -10 feet MLLW, within the nearshore subtidal zone (Photo 9). The Scorpion Pier access road extends adjacent to Scorpion Creek, an intermittent stream that outlets at the Scorpion Anchorage beach. Wetlands are present at the mouth of Scorpion Creek (Figure 13). This section describes the intertidal, nearshore subtidal, creek, and wetland habitats within the study area, including their associated species. While deeper water shelves and slopes occur in the Channel Islands, these habitats are not present in the Project area.

Photo 9.
View of Scorpion Anchorage from Scorpion Beach.

0 75 Feet

Source: NPS 2003

FIGURE 13
WETLANDS RESOURCES
Channel Islands National Park
National Park Service/U.S. Department of the Interior
Draft - August 2015

MARINE COMMUNITIES AND AQUATIC RESOURCE HABITATS

Intertidal Habitat and Associated Species. Intertidal habitat includes areas that lie between low and high tides. Benthic substrates in the intertidal area of the Channel Islands may consist of fine muds, sand, gravel, cobble, boulders, and bedrock. The intertidal area at Scorpion Anchorage is primarily rocky with some mixed sand and gravel beaches (Marine Conservation Institute 2014). Scorpion Pier piles and hard structures may also provide intertidal habitat to encrusting organisms.

In the Channel Islands, rocky intertidal habitat supports surfgrass and macroscopic crusts and turfs of green, brown, and red algae. Sessile invertebrates include mussels, barnacles, limpets, and abalone. Mobile invertebrates include snails, crabs, and sea stars. Acorn barnacles (*Chthamalus fissus* and *Balanus glandula*) generally dominate the upper rocky intertidal zone, and are commonly accompanied by other barnacles, such as *Balanus glandula* and *Tetraclita rubescens*. The next lower zone is dominated by a turf-like red alga (*Endocladia muricata*). The lowest zone is typified by the California mussel (*Mytilus californianus*). Only six fish are common inhabitants of the intertidal zone: wooly sculpin (*Clinocottus analis*), reef finspot (*Paraclinius integrippinus*), rockpool blenny (*Hypsoblennius gilberti*), spotted kelpfish (*Gibbonsia elegans*) and California clingfish (*Gobiesox rhessodon;* NPS 2006b).

It is anticipated that intertidal species composition in the study area would be similar to conditions typical of the Channel Islands, as supported by site-specific surveys at similar sites on Santa Cruz Island. The Multi-Agency Rocky Intertidal Network, a large consortium of research groups, has completed long-term monitoring at Scorpion Rock, located on the northwest side of Santa Cruz Island less than 1 mile southeast of Scorpion Anchorage, and biodiversity surveys at Prisoners Harbor, located on the north side of Santa Cruz Island approximately 8 miles southwest of Scorpion Anchorage. Intertidal habitat at Scorpion Rock includes of a mixture of consolidated bedrock, while Prisoners Harbor intertidal habitat includes consolidated bedrock and sandy beach (UCSC 2012a). These habitats are similar to the intertidal area at Scorpion Anchorage, and intertidal species assemblages should therefore be similar.

At Scorpion Rock, significant coverage of acorn barnacles, turfweed (*Endocladia muricata),* olive rockweed *(Hesperophycus californicus)*, California mussel, and pink barnacle (*Tetraclita rubescens)* were observed (UCSC 2012a). During the most recent comprehensive survey at Prisoners Harbor, the following species were observed: California mussel (10.21% cover), turfweed (9.56% cover), acorn barnacles (*Chthamalus fissus* and *C. dalli* spp.; 8.53% cover), red seaweed (*Chondracanthus canaliculatus;* 7.29% cover), acorn barnacles (*Balanus glandula*; 5.32% cover), red seaweed (*Corallina* sp.; 5.18% cover), polychaete worms (1.31% cover), encrusting coralline (less than 1% cover), Japanese wireweed (*Sargassum muticum;* less than 1% cover), olive rockweed (less than 1% cover), pink barnacle (less than 1% cover), starburst anemone (*Anthopleura sola*; less than 1% cover), non-coralline crust (less than 1% cover), golden rockweed (*Silvetia compressa;* less than 1% cover), sea lettuce green algae (*Ulva* spp.; less than 1% cover), and aggregating anemone (*Anthopleura elegantissima*; less than 1% cover). Mobile invertebrates observed include sea snail (*Littorina keenae*; 442 individuals per square meter [442/m^2] density), sea snail (*L. plena* and *L. scutulata* spp.; 262/m^2 density), rough limpet (*Lottia scabra* and *L. conus;* 56/m^2 density), ribbed limpet (*L. austrodigitalis and Lottia digitalis;* 41/m^2 density), sea snails (*Ocenebra* spp.; 11/m^2 density), volcano limpet (*Fissurella volcano;* 10/m^2 density), purple sea urchin *(Strongylocentrotus purpuratus;* 8/m^2 density), sea snails (*Acanthinucella* spp.; 8/m^2 density), northern kelp crab (*Pugettia producta*; 3/m^2 density), plate limpet (*L. scutum;* 3/m^2 density), striped shore crab (*Pachygrapsus crassipes;* 3/m^2 density; UCSC 2012a). It is anticipated that intertidal species

communities in the study area would be similar.

Nearshore Subtidal Habitat and Associated Species. Nearshore subtidal habitat refers to areas that are below the low tide line and are always submerged, extending to a depth of 30 meters (98 feet; Photo 10). In the Channel Islands, this zone includes both soft sediment and hard substrate areas. Hard substrates include natural features, such as gravel, cobble, and bedrock, as well as artificial structures, such as submerged piles. Nearshore soft bottom habitats in the Channel Islands consist mostly of sand (NPS 2006b). Jet probing of the nearshore bottom at Scorpion Anchorage indicated that 0 to 10 or more feet of interbedded sands exist overlying bedrock, with a cobble to boulder overburden at shallow depths (TerraCosta Consulting Group 2010).

Photo 10.
View of intertidal and nearshore subtidal habitat adjacent to Scorpion Pier.

Rocky Reef. The Park Service performs annual kelp surveys at Scorpion Anchorage, which includes surveys of the rocky reef substrate in the nearshore subtidal zone (at depths of 4 to 8 meters [13 to 26 feet]). During the 2012 survey sea urchins were observed as the dominant subtidal species; *Strongylocentrotus franciscanus* had a density of 5.7/m^2, *S. purpuratus* had a density of 82.2/m^2, and *Lytechinus anamesus* had density of 0.0014/m^2. Encrusting coralline algae cover was high at 58.3%, with bare substrate cover at 30%. Green algae had a cover of 0.33%. Miscellaneous red algae had a cover of 0.83%. Brown algae (*Desmarestia* spp.) was also observed but did not have recorded cover. Miscellaneous plants, consisting mostly of filamentous diatoms, had a cover of 2.8%. Invasive seaweed (*Sargassum horneri*) was not observed during the 2012 surveys, but has been recorded in past years. Kelp species were not observed at Scorpion Anchorage (NPS 2013b).

Miscellaneous invertebrate cover was 7.7%, dominated by the Christmas tree worm (*Spirobranchus spinosus).* Other species observed include barnacles, golf ball sponge (*Tethya aurantia*), strawberry anemone (*Corynactis californica*), corals (*Astrangia lajollaensis, Balanophyllia elegans,* and *Lophogorgia chilensis*), giant sea star (*Pisaster giganteus*), bat star (*Patiria miniata*), sunflower sea star (*Pycnopodia helianthoides*), purple sea star (*P. ochraceus*), and warty sea cucumber (*Parastichopus parvimensis*), red abalone (*Haliotis rufescens),* chestnut cowrie (*Cypraea spadicea),* sea snail (*Megastraea undosa* and *Kelletia kelletii),* great keyhole limpet *(Megathura crenulata),* giant rock scallop *(Crassedoma giganteum),* California sea slug *(Aplysia californica),* and California spiny lobster *(Panulirus interruptus*; NPS 2013b).

Sandy Soft-bottom. Benthic studies at the California Channel Islands have focused on rocky reef kelp forests, leaving nearshore soft-bottom communities relatively unexplored. Epifauna adapted to shifting sand include sea pens, sea pansies, sand crabs, moon snails, sand dollars, sand stars, bottom dwelling sharks and rays, and flatfishes. Infauna include worms, crustaceans, snails, and clams (NPS 2006b).

Many sandy habitats at the Channel Islands have relatively steep slopes. Stable sand habitats with fine grain sediments are generally limited to sheltered coves at canyon mouths, such as those found at Scorpion Anchorage. These protected shallow sandy soft-bottom areas frequently contain eelgrass.

Fish. Within the Channel Islands, the composition of reef fish assemblages is influenced by the physical characteristics of

the reef (Ebeling et al. 1980a, 1980b; Larson and DeMartini 1984) and by water temperatures (Stephens and Zerba 1981; Stephens et al. 1984). Shelter-seeking species such as blacksmith (*Chromis punctipinnis*), garibaldi (*Hypsypops rubicundus*), grass rockfish, (*Sebastes rastrelliger*), brown rockfish (*S. auriculatus*), and gopher rockfish (*S. carnatus*) are abundant on high-relief reefs, but they are rare or absent on low-relief reefs (Larson and DeMartini 1984). As described, fish species commonly associated with sandy-soft bottom habitats in the Channel Islands include flatfishes. Rays and sharks also commonly occur (NPS 2006b).

Fish communities in the shallow subtidal area of Scorpion Anchorage were recorded via rover diving fish counts during the 2012 kelp survey. Species observed include black and yellow rockfish (*Sebastes* spp.), black surfperch (*Embiotoca jacksoni*), blackeye goby (*Rhinogobiops nicholsii*), blacksmith, blue rockfish (*S. mystinus*), brown rockfish, California sheephead (*Semicossyphus pulcher*), fringehead spp. (*Neoclinus* spp.), garibaldi, halfmoon (*Medialuna californiensis*), horn shark (*Heterodontus francisci*), kelp bass (*Paralabrax clathratus*), kelp rockfish (*S. atrovirens*), olive rockfish (*S. serranoides)*, yellowtail rockfish (*S. flavidus*), opaleye (*Girella nigricans*), painted greenling (*Oxylebius pictus*), pile perch (*Rhacochilus vacca*), rock wrasse (*Halichoeres semicinctus*), rubberlip surfperch (*Rhacochilus toxotes)*, señorita (*Oxyjulis californica*), treefish (*S. serriceps*), and zebra goby (*Lythrypnus zebra*; NPS 2013b).

Creek and Riparian Corridor. Scorpion Creek is a seasonally intermittent channel that outlets at Scorpion Anchorage (Photos 11 and 12). There is little available information regarding in-stream biota for the Channel Islands. Invertebrate sampling occurred on Santa Cruz Island during the 1980s, but species lists were not published (NPS 2006b). There are no recorded occurrences of special status species in Scorpion Creek (CDFW 2014). More information is available on amphibian communities associated with creeks and streams, as discussed in the "Terrestrial Biological Resources" section of this chapter.

Native herbaceous plant species commonly associated with streams and riparian corridors on the Channel Islands include Mexican rush (*Juncus mexicanus*), common threesquare (*Scirpus pungens*), smooth scouring rush (*Equisetum laevigatum*), sticky baccharis (*Baccharis douglasii*), saltgrass (*Distichlis spicata*), California bulrush (*Scirpus californicus*), brown-head rush (*Juncus phaeocephalus*), California maidenhair (*Adiantum jordanii*), mule fat (*B. salicifolia*), toad rush (*J. bufonius*), common monkey flower (*Mimulus guttatus*), rabbitsfoot grass (*Polypogon monspeliensis*), and cattail (*Typha domingensis*). Common nonnative herbaceous plant species include water bent grass (*Agrostis viridis*) and Australian brass buttons (*Cotula australis*). Commonly occurring native woody vegetation includes arroyo willow (*Salix lasiolepis*), black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), Mexican elderberry (*Sambucus mexicana*), and coast live oak (*Quercus agrifolia*; NPS 2006b).

Photo 11.
View of Scorpion Creek near outlet at Scorpion Anchorage.

Photo 12.
View of seasonally dry Scorpion Creek from creek bed toward Scorpion Anchorage.

Special Status Species and Habitats

Special Aquatic Sites. Certain waters of the United States that are recognized as having unique ecological value have been designated "special aquatic sites." This includes sanctuaries and refuges, mudflats, wetlands, vegetated shallows, eelgrass bed, coral reefs, and riffle and pool complexes. Special aquatic sites may be afforded additional protection or consideration under federal regulations. Within Scorpion Anchorage, eelgrass and wetlands are present, which are considered special aquatic sites.

Eelgrass. Eelgrass has been afforded special management considerations by CDFW, U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), USEPA, and CCC. NMFS considers eelgrass beds to be a Habitat Area of Particular Concern. Eelgrass typically inhabits shallow, soft-bottom substrates of bays and estuaries along the California coast. Eelgrass beds often accrete sediments and function ecologically as substrate for epifauna and nursery habitat for juvenile fish. In the Channel Islands, the diversity of conspicuous plant, invertebrate, and fish epibiota has been found to be nearly twice as high within eelgrass beds as on surrounding sand habitats, and some species are obligate dependents on eelgrass (NPS 2006b).

An eelgrass survey of the study area was performed on July 25, 2014. Five small eelgrass beds were observed at depths of 4.5 to 5.5 meters (14.8 to 18 feet), in addition to a larger continuous bed extending into deeper water to an estimated depth of at least 13 meters (43 feet; Figure 14; NPS 2014b). A 2008 survey of Scorpion Anchorage identified eelgrass beds west of the existing Scorpion Pier, away from the two alternative alignments (NPS 2008a). Past surveys have identified eelgrass in Scorpion Anchorage as occurring between depths of approximately 5 to 9 meters (16 to 30 feet), although eelgrass has been observed at depths between 3 and 22 meters (10 to 72 feet) within the greater Channel Island offshore area (Engle and Miller 2005).

Wetlands. Wetland habitats have been afforded special management considerations by CDFW, RWQCB, CCC, and USACE. Three types of wetlands exist at the mouth of Scorpion Creek above the low tide limit of Scorpion Cove: marine/intertidal/rocky shore, estuarine/intertidal/emergent, and riverine/lower perennial/rock bottom (NPS 2015a).

The marine/intertidal/rocky shore and the riverine/lower perennial/rock bottom wetlands have little or no vegetation. The riverine/lower perennial/rock bottom wetlands are scoured frequently, receive sand and gravel from upstream sources during storms, and have little or no vegetation. The estuarine/intertidal/emergent wetland area is flooded on an irregular basis.

0 100 Feet

Source: NPS 2014

FIGURE 14
2014 EELGRASS SURVEY
Channel Islands National Park
National Park Service/U.S. Department of the Interior
Draft - August 2015

Common native species in the estuarine/intertidal/emergent wetland areas near Scorpion Ranch include saltgrass, annual beard grass (*Polypogon monspeliensis)*, sweet clover (*Melilotus indica)*, morning glory (*Cressa truxillensis)*, frankenia *(Frankenia salina*), sea-blite *(Suaeda taxifolia*), California saltbush (*Atriplex californica)*, Coulter's saltbush (*A. coulteri*), Brewer's saltbush (*A. lentiformis*), sand-spurry (*Spergularia macrotheca*), and salt sand-spurry (*S. marina*). Nonnative plants include: foxtail (*Hordeum murinum*), sicklegrass (*Parapholis incurva*), kikuyu grass (*Pennisetum clandestinum*), Australian saltbush (*A. semibaccata*), sea rocket (*Cakile maritima*), goosefoot (*Chenopodium murale*) and Boccone's sand-spurry (*S. bocconii*; NPS 2003b).

Essential Fish Habitat (EFH). The study area at Scorpion Anchorage is within designated EFH for assorted fish managed through the Pacific Groundfish Fisheries Management Plan (FMP), and within the Scorpion EFH Conservation Area and Scorpion Habitat Area of Particular Concern (NOAA 2014).

The Pacific Coast Groundfish FMP manages at least 89 species over a large, ecologically diverse area covering the entire West Coast of the continental United States; 58 species managed under this FMP have species distributions within Channel Islands National Park. Species for which EFH has been designated that are likely to exist in the study area are listed in Table 9. There may be additional groundfish species occurring in Channel Island waters that are not listed in Table 9.

TABLE 9. PACIFIC GROUNDFISH FMP SPECIES RECORDED IN CHANNEL ISLANDS NATIONAL PARK

Common Name	Scientific Name	Where Found
Sharks, Skates, and Rays		
Big skate	*Raja binoculata*	Deeper water: 3 – 867 m
California skate	*Raja inornata*	Nearshore: common <20 m, but may occur to 733 m
Leopard shark	*Triakis semifasciata*	Nearshore: most common in intertidal to 5 m, in kelp beds, sandy bottoms near rocky reefs and surf zone on sandy beaches
Longnose skate	*Raja rhina*	Deeper water: 27 – 750 m
Spiny dogfish	*Squalus acanthias*	Nearshore
Ratfish		
Ratfish	*Hydrolagus colliei*	Nearshore
Roundfish		
Cabezon	*Scorpaenichthys marmoratus*	Nearshore: intertidal – 76 m
Kelp greenling	*Hexagrammos decagrammus*	Nearshore: intertidal – 50 m, common 3 – 20 m
Lingcod	*Ophiodon elongatu*	Nearshore: mostly 10 – 110 m
Pacific whiting (hake)	*Merluccius productus*	Deeper water
Sablefish	*Anoplopoma fimbria*	Deeper water: 400 – 1,400 m
Rockfish		
Bank rockfish	*Sebastes rufus*	Deeper water: deep water offshore
Black rockfish	*Sebastes melanops*	Nearshore: intertidal – 91 m, kelp canopy
Black and yellow rockfish	*Sebastes chrysomelas*	Nearshore: intertidal – 36 m
Blackgill rockfish	*Sebastes melanostomus*	Deeper water: deep water offshore

Common Name	Scientific Name	Where Found
Blue rockfish	*Sebastes mystinus*	Nearshore: intertidal – 91 m, kelp canopy
Bocaccio	*Sebastes paucispinis*	Deeper water: adults caught on rocky reefs 83 – 250 m, kelp beds are nurseries
Brown rockfish	*Sebastes auriculatus*	Nearshore: 3 – 55 m, subtidal reefs
Calico rockfish	*Sebastes dallii*	Nearshore: 20 – 280 m
Canary rockfish	*Sebastes pinniger*	Deeper water: common only to 166 m
Chilipepper	*Sebastes goodei*	Deeper water: deep offshore
China rockfish	*Sebastes nebulosos*	Nearshore: 9 – 90 m
Copper rockfish	*Sebastes caurinus*	Nearshore: 3 – 182 m
Cowcod	*Sebastes levis*	Deeper water: deep offshore on rocky habitat
Flag rockfish	*Sebastes rubrivinctus*	Deeper water: 0 – 302 m, rocky bottom
Gopher rockfish	*Sebastes carnatus*	Nearshore: 9 – 36 m, reefs
Grass rockfish	*Sebastes rastrelliger*	Nearshore: intertidal – 6 m
Greenblotched rockfish	*Sebastes rosenblatti*	61 – 396 m, demersal
Greenspotted rockfish	*Sebastes chlorostictus*	Deeper water: 49 – 201 m
Halfbanded rockfish	*Sebastes semicinctus*	Deeper water
Kelp rockfish	*Sebastes atrovirens*	Nearshore: 5 – 15 m, water column in kelp
Longspine thornyhead	*Sebastolobus altivelis*	Deeper water: 600 – 1,000 m
Olive rockfish	*Sebastes serranoides*	Nearshore: 1 – 121 m
Pink rockfish	*Sebastes eos*	Deeper water: 76 – 366 m, demersal
Quillback rockfish	*Sebastes maliger*	Nearshore: 23 – 273 m
Redbanded rockfish	*Sebastes babcocki*	Deeper water: 49 – 625 m, soft bottom
Rosethorn rockfish	*Sebastes helvomaculatus*	Deeper water: 25 – 549 m, demersal, soft bottom
Rosy rockfish	*Sebastes rosaceus*	Deeper water
Shortbelly rockfish	*Sebastes jordani*	Deeper water: mostly at 133 – 233 m over smooth bottom
Shortspine thornyhead	*Sebastolobus alascanus*	Deeper water: 600 – 1,000 m
Speckled rockfish	*Sebastes ovalis*	Deeper water: 30 – 366 m, rocky reefs
Splitnose rockfish	*Sebastes diploproa*	Deeper water: 0 – 800 m, bathydemersal
Squarespot rockfish	*Sebastes hopkinsi*	Deeper water: 18 – 183 m, reefs
Starry rockfish	*Sebastes constellatus*	Deeper water: 24 – 274 m, rocky reefs
Stripetail rockfish	*Sebastes saxicola*	Deeper water
Treefish	*Sebastes serriceps*	Nearshore: 3 – 45 m
Vermilion rockfish	*Sebastes miniatus*	Deeper water: shallow subtidal to 466 m
Widow rockfish	*Sebastes entomelas*	Deeper water: 0 – 549 m, pelagic
Whitebelly rockfish	*Sebastes vexilaris*	Nearshore
Yelloweye rockfish	*Sebastes ruberrimus*	Deeper water
Yellowtail rockfish	*Sebastes flavidus*	Deeper water: deep reefs near shelf break, down to 600 m

Common Name	Scientific Name	Where Found
Flatfish		
Curlfin sole	*Pleuronichthys decurrens*	Deeper water: shallow to 1,000 m
Dover sole	*Microstomus pacificus*	Deeper water: 60 – 1,600 m on mud bottoms
Pacific sanddab	*Citharichthys sordidus*	Nearshore: sand, mud 9 – 550 m
Petrale sole	*Eopsetta jordani*	Deeper water: 20 – 500 m
Rex sole	*Glyptocephalus zachirus*	Deeper water
Sand sole	*Psettichthys melanostictus*	Deeper water: shallow to 1,000 m
Starry flounder	*Platichthys stellatus*	Nearshore: down to 300 m, but usually more shallow, especially in bays

Source: NPS 2006b.

Endangered Species Act (ESA) and California Endangered Species Act (CESA) listed Aquatic Species. According to a search of the California Natural Diversity Database (CNDDB), the federally endangered black abalone (*Haliotis cracherodii)* is the only ESA-listed species that may occur within the study area. Black abalone have been observed at several locations surrounding Santa Cruz Island, including at Scorpion Rock approximately 0.5 mile west of the Project area (NPS 2010c). However, there are no recorded occurrences of this species at Scorpion Anchorage, and this species was not observed during the 2012 kelp survey (CDFW 2014; NPS 2013b). There are no CESA-listed marine species with recorded occurrences in the Project vicinity.

Two terrestrial species with recorded occurrences in the Project quadrangle have close associations with the aquatic environment. This includes the California red-legged frog (*Rana draytonii;* federally threatened and state species of special concern) and the western snowy plover (*Charadrius alexandrinus nivosus*; federally threatened and state species of special concern; CDFW 2014; NPS 2010b). These species are discussed in greater detail in the "Terrestrial Biological Resources" section of this chapter.

Marine Mammals. Marine mammals that may be present in Scorpion Anchorage include species associated with the nearshore environment that commonly occur in the Sanctuary. At least 33 species of cetaceans have been recorded in the Sanctuary, and six species of pinnipeds haulout on Channel Islands beaches and use park waters (Table 10). Southern sea otters have also historically occurred (NPS 2006b).
While whale and select dolphin species may frequent deep waters of the Sanctuary, they are unlikely to occur in shallow waters at the Project site. Seven species of dolphin and porpoise are commonly seen in the Sanctuary, either during certain seasons or year-round, and may occur within Scorpion Anchorage. This includes the long-beaked common dolphin (*Delphinus capensis*), the short-beaked common dolphin (*D. delphis*), bottlenose dolphin (*Tursiops truncatus*), Risso's dolphin (*Grampus griseus*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), northern right whale dolphin (*Lissodelphis borealis*), and Dall's porpoise (*Phocoenoides dalli*; NPS 2006b).

Of the six pinniped species that haulout on park beaches and use park waters, the three most abundant and most likely to occur at Scorpion Anchorage are the California sea lion (*Zalophus californianus)*, northern elephant seal (*Mirounga angustirostris)*, and Pacific harbor seal (*Phoca vitulina richardsi)*. While the northern fur seal (*Callorhinus ursinus)* is abundant in park waters, its rookeries are limited to San Miguel Island and

it forages in offshore pelagic waters (Ugoretz 2002). They rarely come ashore except during pupping and breeding, and are almost never seen on beaches unless they are sick (Marine Mammal Center 2014). Northern (Steller) sea lions (*Eumetopias jubata*) and Guadalupe fur seals (*Arctocephalus townsendi*) are observed very infrequently in association with San Miguel Island, and ribbon seals (*Histriophoca fasciata*) have been rarely observed in the Sanctuary.

California sea lions are commonly found year-round in Sanctuary waters, and several haulout sites exist on Santa Cruz Island. Their main rookeries at the Channel Islands are at San Miguel and San Nicolas Islands (Ugoretz 2002). Northern elephant seals have been reported at Santa Cruz Island but have not established rookeries there. There are two large rookeries on San Miguel and San Nicolas Islands (Ugoretz 2002). The Pacific harbor seal is well distributed in California, with 400 to 500 haulout sites along the mainland coast, and within the Channel Islands. The most animals can be seen ashore at the Channel Islands during the molting season, which peaks from late May to early June (Ugoretz 2002).

Southern sea otters were once common in the Sanctuary, but were hunted to local extinction by the end of the 1800s. From 1987 to 2001, USFWS managed a southern sea otter relocation project, and relocated all sea otters in the Channel Islands area to waters offshore of Santa Cruz and Moss Landing to the north, and San Nicolas Island to the south. The relocation program ended on October 5, 2005, and southern sea otters have been allowed to recolonize naturally (NPS 2006b). Southern sea otters are occasionally observed in the Sanctuary, but none have been recorded in Scorpion Anchorage or within the Project quadrangle (CDFW 2014).

TABLE 10. MARINE MAMMALS OCCURRING IN CHANNEL ISLAND WATERS

Common Name	Scientific Name	Protected Status	Relative Abundance in Channel Island Waters	Seasonality	Normal Habitat
Cetaceans					
Long-beaked common dolphin	*Delphinus capensis*	N/A	Common	Year round	Coastal – up to 300 nautical miles offshore
Short-beaked common dolphin	*Delphinus delphis*	N/A	Common	Year round	Coastal – up to 50 nautical miles offshore
Bottlenose dolphin (Offshore stock)	*Tursiops truncatus*	N/A	Common	Year round	Shelf, slope, and offshore
Bottlenose dolphin (Coastal stock)	*Tursiops truncatus*	N/A	Common	Year round	Surf zone up to 1 km offshore

Common Name	Scientific Name	Protected Status	Relative Abundance in Channel Island Waters	Seasonality	Normal Habitat
Pacific white-sided dolphin	*Lageno-rhynchus obliquidens*	N/A	Sporadically abundant	Usually summer and fall	Shelf to farther offshore
Rough-toothed dolphin	*Steno bredanensis*	--	Known only from a few strandings	Undefined	Pelagic
Striped dolphin	*Stenella coeruleoalba*	--	Undefined	Undefined	Pelagic
Long-snouted spinner dolphin	*Stenella longirostris*	--	Undefined	Undefined	Pelagic
Spotted dolphin	*Stenella attenuata*	--	Undefined	Undefined	Pelagic
Northern right whale dolphin	*Lissodelphis borealis*	N/A	Sporadically abundant	Winter and spring	Continental shelf and slope
Risso's dolphin	*Grampus griseus*	N/A	Common	Year round	Shelf, slope and offshore
Short-finned pilot whale	*Globicephala macrorhynchus*	N/A	Uncommon	Most often summer and fall	Shelf, slope and offshore
Orca or Killer whale	*Orcinus orca*	N/A	Uncommon	Year round	Shelf, slope and offshore
False killer whale	*Pseudorca cressidens*	N/A	Rare	Undefined	Shelf to offshore and pelagic
Northern right whale	*Eubalaena glacialis*	FE, DEP, SS	Uncommon	Winter and spring	Shelf to well offshore
Dall's porpoise	*Phocoenoids dalli*	N/A	Uncommon	Winter and spring	Shelf to well offshore
Harbor porpoise	*Phocoena*	SS	Uncommon	Undefined	Shallow coastal
Sperm whale	*Physeter macrcephalus*	FE, DEP, SS	Rare	April to mid-June and August to mid-November	Deep sea
Pygmy sperm whale	*Kogia breviceps*	--	Uncommon	Undefined	Deep sea, pelagic
Dwarf sperm whale	*Kogia simus*	--	Known from three strandings	Undefined	Deep sea, pelagic
California gray whale	*Eschrichtius robustus*	N/A	Common	December through May; occasionally rest of year	Coastal
Blue whale	*Balaenoptera musculus*	FE, DEP, SS	Common in season	June to September; occasionally through November	Shelf and slope

Common Name	Scientific Name	Protected Status	Relative Abundance in Channel Island Waters	Seasonality	Normal Habitat
Fin Whale	*Balaenoptera physalus*	FE, DEP, SS	Uncommon	Summer, fall; possible year-round	Shelf and slope
Sei whale	*Balaenoptera borealis*	FE, DEP, SS	Very rare	Undefined	Undefined
Bryde's whale	*Balaenoptera edeni*	N/A	Rare	Undefined	Shelf and slope
Minke whale	*Balaenoptera acutorostrata*	N/A	Uncommon	Year-round; Most abundant in summer and fall	Coastal to slope
Humpback whale	*Megaptera novaeangliae*	FE, DEP, SS	Common in season	May to September	Shelf and slope
Pinnipeds					
California sea lion	*Zalophus californianus*	N/A	Common	Year round	Undefined
Northern (Steller) sea lion	*Eumetopias jubata*	FT, DEP, SS	Now extremely rare	Undefined	Undefined
Northern fur seal	*Callorhinus ursinus*	N/A	Uncommon	May to November	Pelagic
Guadalupe fur seal	*Arctocephalus townsendi*	FT, ST, SS, PRO	Extremely rare	Undefined	Pelagic
Northern elephant seal	*Mirounga angustirostris*	PRO	Common in season	Undefined	Pelagic, highly migratory
Pacific harbor seal	*Phoca vitulina richardsi*	N/A	Common	Undefined	Coastal
Ribbon seal	*Histriphoca*l *fasciata*	N/A	Extremely rare	Undefined	Undefined
Other					
Southern sea otter	*Enhydra lutris nereis*	FE, FP	Most abundant in spring	Year round	Coastal

Notes:
a. All pinnipeds and cetaceans are protected under the Marine Mammal Protection Act of 1972.
FE – Federally listed as endangered under ESA
FT – Federally listed as threatened under ESA
DEP – Listed as a depleted stock under the Marine Mammal Protection Act
N/A – Not applicable
SS – Listed as a strategic stock under the Marine Mammal Protection Act
ST – State listed as threatened under the CESA
PRO – Fully protected mammal under California Department of Fish and Game Code 4700

Source: NPS 2006b.

REGULATIONS AND POLICIES

The following is a summary of the key federal and state rules, policies, and agreements related to aquatic biological species that potentially apply to the Project.

Federal

Federal ESA (16 USC 1531-1544). Under the ESA, the Secretary of the Interior and the Secretary of Commerce jointly have the authority to list a species as threatened or endangered (16 USC 1533(c)). Pursuant to the requirements of ESA, an agency reviewing a proposed Project in its jurisdiction must determine whether any federally listed threatened or endangered species may be present in the study area and determine whether the proposed Project may affect or "take" such species. Taking is defined by ESA (Section 3(19)) as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." An incidental take of a listed species requires consultation with USFWS or NMFS to determine whether the Project is likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat designated for such species (16 USC 1536(3)).

Fish and Wildlife Coordination Act (16 USC 661-667e). This act requires consultation with USFWS, NMFS, and state agencies responsible for fish and wildlife resources for all proposed federal undertakings and nonfederal actions needing a federal permit or license that would impound, divert, deepen, or otherwise control or modify a stream or waterbody, and to make mitigation and enhancement recommendations to the involved federal agency.

Magnuson-Stevens Fishery Conservation and Management Act (M-SFCMA; 16 USC 1801-1882). The primary purpose of this act is conservation and management of fishery resources in the United States, development of domestic fisheries, and phasing out foreign fishing activities in federal waters (the 200-mile limit extending from the edge of state waters). The amended M-SFCMA, also known as the Sustainable Fisheries Act (Public Law 104-297), requires all federal agencies to consult with the Secretary of Commerce on proposed Projects authorized, funded, or undertaken by that agency that may adversely affect EFH. The main purpose of the EFH provisions of the Sustainable Fisheries Act is to avoid loss of fisheries due to disturbance and degradation of the fisheries habitat.

Marine Mammal Protection Act (MMPA). MMPA was enacted on October 21, 1972, and was reauthorized by the MMPA amendments of 1994 (Public Law 103-238). Under MMPA, all species of marine mammals are protected. MMPA prohibits, with certain exceptions, the take of marine mammals. Under MMPA, "take" is defined as "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill." Harassment is defined as, "any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild; or 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, sheltering." Sections 101(a)(5)(A) and (D) of the MMPA (16 USC 1361 et seq.) allow incidental take of marine mammals during specified activities under authorization of the Secretary if the total take would have a negligible impact on the species.

Channel Islands National Marine Sanctuary Program. The primary purpose of the National Marine Sanctuary program is resource protection (USC Section 1431b). Prohibitions in the Sanctuary that are relevant to aquatic resources in the park are presented in the "Relevant Policies and Plans" section of the "Purpose and Need for Action" chapter.

State

CESA (California Fish and Game Code 2050-2116). Similar to ESA, CESA (along with

the native plant protection act) authorizes the California Fish and Game Commission to designate, protect, and regulate the taking of special-status species in the state of California. CESA defines endangered species as those whose continued existence in California is jeopardized. State-listed threatened species are those not presently threatened with extinction, but which may become endangered if their environments change or deteriorate. Any proposed projects that may adversely impact state-listed threatened or endangered species must formally consult with CDFW. Section 2080 of the California Fish and Game Code prohibits the taking of state listed plants and animals. CDFW also designates fully protected or protected species as those that may not be taken or possessed. Species designated as fully protected or protected may or may not be listed as endangered or threatened.

In addition to state-listed, special-status species, CDFW also maintains a list of species of special concern, most of which are species whose breeding populations in California may face extirpation. To avoid the future need to list these species as endangered or threatened, CDFW recommends consideration of these species, which do not as yet have any legal status, during analysis of the impacts of proposed projects.

There are no state-listed species in the study area.

California Fish and Game Code Section 1600. California Fish and Game Code, Section 1600 requires that a Lake or Streambed Alteration Agreement be obtained for any activity that will substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank (which may include associated riparian resources) of a river, stream or lake, or use material from a streambed.

State Marine Reserve. Per PRC Section 36710(a), in a SMR, "it is unlawful to injure, damage, take, or possess any living, geological, or cultural marine resource, except under a permit or specific authorization from the managing agency for research."

California Eelgrass Mitigation Policy. The California Eelgrass Mitigation Policy (CEMP), as implemented by NMFS, establishes a standardized and consistent policy for mitigating adverse impacts to eelgrass resources. Eelgrass vegetated areas are recognized as important ecological communities in shallow bays and estuaries because of their multiple biological and physical values. To encompass fluctuating eelgrass distribution and functional influence around eelgrass cover, CEMP defines eelgrass habitat as including areas of vegetated eelgrass cover bounded by a 5-meter-wide (16-foot-wide) perimeter of unvegetated area. CEMP includes protocol for eelgrass surveys, as well as options for mitigation. Compensatory mitigation options include comprehensive management plans, in-kind mitigation, mitigation banks and in-lieu-fee programs, and out-of-kind mitigation. This policy supersedes the Southern California Eelgrass Mitigation Policy, which previously addressed potential eelgrass impacts in the Project area.

Caulerpa Control Protocol. CDFW jointly manages (with NMFS) the implementation of the Caulerpa Control Protocol, which calls for performance of a survey for Caulerpa before any bottom-disturbing activities (Caulerpa is a species of algae native to tropical areas that threatens native algae species in coastal areas).

TERRESTRIAL BIOLOGICAL RESOURCES

This section analyzes terrestrial biological resources in the study area, including common and special status wildlife and plant species and their associated habitats. The study area is defined as the terrestrial habitat in and adjacent to the two pier alternative locations (the current pier location [Alternative 1] and the central portion of the beach [Alternative 2]) and the approach road alignments.

EXISTING CONDITIONS

Regional Setting

The terrestrial study area is located in Channel Islands National Park. The Channel Islands support many rare, relict, and endemic terrestrial species, as well as many nonnative species. Vegetative communities on the islands vary due to climate, microhabitats, topography, geology, soils, plant colonization history, isolation, land use history, and island size. Native vegetative communities on the islands have been altered by people and the introduction of nonnative species, and are in various stages of recovery. The major vegetative community types on the islands include coastal bluff, coastal sage scrub, grasslands, chaparral, island oak woodlands, mixed hardwood woodlands, pine stands, and riparian areas. Less common but significant vegetation communities include coastal dune, baccharis scrub, caliche scrub, and wetlands. On Santa Cruz Island, large portions of the east end are currently grassland dominated, with remnant areas of coastal bluff scrub, chaparral, coastal sage scrub, coyote-brush scrub, woodlands, and various types of wetlands (NPS 2015a).

Site Settings

The pier site alternatives would extend from waters of Scorpion Anchorage onto the rocky unvegetated beachfront. For Alternatives 1 and 2, the approach roadway alignments would be located between steep hillsides to the north, and wetlands of Scorpion Creek to the south. The floodplain for Scorpion Creek extends from valley wall to valley wall. The approach roadway is barren, although shrubs, trees, and other vegetation abut the roadway. Alternative 1 would include a longer approach roadway between the beachfront and hillside (Figure 8), while Alternative 2 would include a short length of pier traversing the beachfront (Figure 9).

Habitat Types

Terrestrial habitat types in the study area were identified through site visits and review of existing records. The existing pier abutment is lined with rocks and devoid of vegetation, as is the approach roadway which is maintained to serve the pier and to convey NPS staff and visitors inland. Adjacent areas include a patchwork of grassland, coastal scrub, bluff scrub, beach and dune, and wetland habitats. The study area is generally devoid of trees, although there are a handful of cypress trees adjacent to the approach roadway at the entrance to Scorpion Ranch. The following paragraphs describe habitats and associated terrestrial plants, as identified through site visits (Anchor QEA 2013) and information from the GMP/Wilderness Study/EIS (NPS 2015a).

Photo 13.
View of grasslands and coastal scrub (foreground), and beach and dune habitats (background).

Grasslands. In the study area, grasslands occur abutting the north and south sides of the approach roadway (Photo 13). Grasslands occur interspersed with coastal scrub habitat, and adjacent to wetlands south of the approach roadway. The prevalent grassland species observed during site visits were nonnative ripgut brome (*Bromus diandrus)* and California brome (*B. carinatus*; Anchor QEA 2013*)*. Other species that commonly occur in grasslands on Santa Cruz Island include nonnative annual grasses such as soft-chess (*B. hordeaceus*), red brome (*B. madritensis* ssp. *rubens*), wild oats (*Avena fatua, A. barbata*), ryegrass (*Lolium multiflorum*), and foxtail barley (*Hordeum murinum*); and perennial native grasses such as purple needlegrass (*Nassella pulchra*) and California barley (*H. brachyantherum* ssp. *californicum*; NPS 2015a).

Coastal Scrub. Coastal scrub habitat largely occurs along the north side of the approach roadway at the foot of the hillside and on the hill face, interspersed with grassland areas (Photo 13). Common coastal sage scrub species observed during site visits include California sagebrush (*Artemisia californica),* coast sunflower (*Encelia californica),* prickly pear cactus (*Opuntia* sp.*),* redflower buckwheat (*Eriogonum grande),* coyote brush *(Baccharis pilularis),* and lemonade berry *(Rhus integrifolia*); and common coastal bluff scrub species observed include California morning glory (*Calystegia macrostegia),* Dudleya (*Dudleya* sp.), and cliff aster (*Malacothrix saxatilis*). Wild mustard (*Brassica* sp.) was also observed, as were gourd species (*Cucurbita* sp.), potentially planted as part of Scorpion Ranch operations (Anchor QEA 2013). Other species commonly associated with coastal sage scrub and bluff scrub habitats in the Channel Islands include island paintbrush (*Castilleja lanata* ssp. *hololeuca*), Santa Cruz Island buckwheat (*Eriogonum arborescens*), California brittlebush (*Encelia californica*), sawtooth goldenbush (*Hazardia squarrosa*), and black sage (*Salvia mellifera*; NPS 2015a).

Patches of coastal bluff scrub vegetation also occur on the steep eroded bluff face facing Scorpion Anchorage, and solitary shrubs occur scattered throughout the grasslands south of the approach roadway (Anchor QEA 2013).

Beach and Dune. The study area includes the Scorpion Anchorage beachfront. The beach surface is composed of cobblestones and medium sized rocks. The existing pier abutment and a portion of the approach roadway are armored with larger boulders. The rocky beach area above the high tide line is entirely devoid of vegetation. The beach area transitions to marine/intertidal/rocky shore and riverine/lower perennial/rock bottom wetlands at the outlet of Scorpion Creek (Photos 14 and 15). Sandy dune species were observed in these transition areas, including saltgrass, saltbush (*Atriplex* sp.), and frankenia (*Frankenia* sp.; Anchor QEA 2013). Intertidal beach communities are described in the "Aquatic Biological Resources" section of this chapter.

Photo 14.
View of rocky beach area.

Photo 15.
View of Scorpion Creek outlet at Scorpion Anchorage.

Terrestrial Wildlife

Because of their isolation and remote location, the Channel Islands support fewer native terrestrial wildlife species than similar habitats on the mainland. Among the Channel Islands, Santa Cruz Island supports the most terrestrial wildlife species, due to its size and greater diversity of vegetation. Santa Cruz Island is known to support five reptile species, three amphibian species, fifteen mammal species, and at least sixty land bird species and ten shorebird species—many of which are endemic to the Channel Islands or Santa Cruz Island. All of the native vertebrate species on Santa Cruz Island are known across the island (NPS 2015a; NPS 2010b). These species are listed in Appendix A. The invertebrate fauna of Santa Cruz Island is not well studied (NPS 2015a).

Special Status Species

Special status species are plants and animals that are legally protected under state and federal regulations. This EIS considers all federal ESA-listed species, in addition to other state and locally rare and sensitive species including the following:

1. Species considered threatened, endangered, species of special concern, or fully protected species by CDFW
2. Plant species considered rare, threatened, or endangered by the California Native Plant Society (CNPS; a California Rare Plant Rank 1 or 2 species)
3. Species that are candidates for listing as threatened or endangered under federal or state law
4. Bird species protected by the federal Migratory Bird Treaty Act (MBTA) or California Fish and Game Code Sections 3503, 3503.5, or 3513

Special status species with the potential to inhabit the study area and immediate vicinity were identified from the following sources:

- Species records in CNDDB for the 7.5-minute U.S. Geological Survey quadrangle for the study area and adjacent quadrangles, including Santa Cruz Island D, Santa Cruz Island C, and Anacapa Island, including California Rare Plant Rank 1 or 2 species (CDFW 2014)
- Bird Survey completed for the Prisoners Harbor Coastal Wetland Restoration Project (NPS 2010b)
- Species lists compiled for the GMP/Wilderness Study/EIS (NPS 2015a)

Special status species that have been noted to inhabit the vicinity of the study area are presented in Appendix A, (federal and state endangered, threatened, fully protected, and species of special concern), including a description of their habitat associations and potential to inhabit the study area. Most of the species are not expected to inhabit the study

area because their required habitat is not present. Additional California Rare Plant Rank 1 or 2 plant species are listed in Appendix A, Table A-1.

Federal Status Plants. The study area includes coastal scrub habitat that is potentially suitable for eight federal-status plant species, although there are no recorded occurrences of federal status plants in the study area (CDFW 2014). The eight federal status plants are: island barberry (*Berberis pinnata* ssp. *insularis*), Hoffmann's rockcress *(Boechera hoffmannii),* box bedstraw (*Galium buxifolium*), island rush-rose *(Helianthemum greenei),* Santa Cruz Island malacothrix *(Malacothrix indecora),* island malacothrix *(M. squalida),* Santa Cruz Island dudleya (*Dudleya nesiotica*), Santa Cruz Island winged-rockcress *(Sibara filifolia),* and Santa Cruz Island fringepod (*Thysanocarpus conchuliferus*). Rare plant surveys were completed on Santa Cruz Island from 2003 through 2006 by the U.S. Geological Survey; no individuals of these species were observed in the study area. Most rare plant populations were reported as small and isolated, occupying native-dominated habitat patches in a highly fragmented and invaded landscape, and not expanding beyond the edges of their habitat patches. Populations of island barberry, Hoffmann's rockcress, Santa Cruz Island dudleya, and Santa Cruz Island fringepod have only been observed on the western portion of Santa Cruz Island on land owned by TNC. The nearest population of box bedstraw was recorded approximately 6 miles west of the study area near Canada del Agua. The nearest population of Island rush-rose was recorded approximately 1.2 miles southwest of the study area near High Mount, while the nearest population of Santa Cruz Island malacothrix and island malacothrix were recorded approximately 1.9 miles west near Potato Harbor (McEachern et al. 2010). Island rock cress is presumed extirpated from Santa Cruz Island (CDFW 2014). Therefore, federal status plants are not expected to occur in the study area.

Federal Status Wildlife. Three federal-status wildlife species have recorded occurrences on Santa Cruz Island, the terrestrial Santa Cruz Island fox (*Urocyon littoralis santacruzae*) and the western snowy plover, and the amphibious California red-legged frog. The Scripps's murrelet (*Synthliboramphus hypoleucus*), a federal candidate species for listing, has also been observed (CDFW 2014; NPS 2015a). Federally listed species with the potential to occur in the study area are listed in Appendix A, Table A-2. Among these species, only the Santa Cruz Island fox is likely to occur in the study area.

The Santa Cruz Island fox occurs in virtually every habitat on Santa Cruz Island, but prefers shrubby or wooded areas such as chaparral, coastal scrub, and oak woodlands (NPS 2014c). The Santa Cruz Island fox has been observed at Scorpion Ranch, and the study area is within its projected habitat range (CDFW 2014). On Santa Cruz Island, where the fox population declined to 50 to 60 individuals by 2001, captive breeding and releases began in 2002. Trapping data from 2010 yielded population estimates of greater than 1,000 adults on Santa Cruz Island. Primary threats to Santa Cruz Island foxes include golden eagle predation, vehicle collisions, susceptibility to diseases and parasites, feral cat displacement, and extinction from random, natural events, such as droughts or wildfires (NPS 2015a). Efforts to remove the golden eagle, and control disease vectors, have helped to address these threats. Santa Cruz Island foxes have been known to establish dens within stockpiled construction materials and equipment such as pipes (Coonan 2015).

Western snowy plover breeding and wintering populations were present at Santa Rosa and San Miguel islands during the 1990s, but numbers have declined precipitously since that time. Some of these birds have also been observed on the western portion of Santa Cruz Island, on land owned by TNC. Their preferred coastal nesting habitats are sand spits, dune-backed beaches, unvegetated beach strands, open areas around estuaries, and beaches at river mouths. Their nests typically are shallow scrapes or depressions on the ground on flat, open areas with sandy or saline substrates, where vegetation and

driftwood is sparse or absent. Beach habitat at Scorpion Anchorage is mostly rocky, and therefore not suitable for western snowy plover nesting. In addition, nesting snowy plovers are sensitive to disturbance (NPS 2015a); it is anticipated that existing pier operations and visitation would preclude their presence. Given the lack of recorded observations at the project site and western portion of Santa Cruz Island, and the low-suitability of habitat, it is unlikely that western snowy plovers occur in the study area.

Although creek and riparian habitats may be suitable for the California red-legged frog, there is only a single recorded occurrence of this species on Santa Cruz Island in the vicinity of Pelican Bay, as recorded in the 1920s. There are no records of this species occurring in the study area or in NPS lands on the west side of the island (CDFW 2014). Furthermore, Scorpion Creek is intermittent and frequently dry, and experiences brackish conditions that are not suitable for the California red-legged frog. Therefore, this species is not believed to be present in the Project area.

MBTA Protected Species. Birds protected under MBTA may nest in trees, shrubs, or buildings in the study area. Santa Cruz Island is sited on one of the great migratory corridors of the continent, the Pacific Flyway. During the spring and fall months, numerous bird species arrive at Santa Cruz Island to rest, feed, and in some cases overwinter (NPS 2010b). All migratory bird species are protected by MBTA.

State Special Status Plants. In addition to the federally listed plant species described in the previous paragraphs, which also have state special status species designations, CNDDB identifies five CNPS list special status plant species (California Rare Plant Rank 1 or 2) with historic ranges in the vicinity of the study area: Coulter's saltbush (*Atriplex coulteri),* round-leaved filaree (*California macrophylla),* candleholder dudleya (*Dudleya candelabrum*), island alumroot (*Heuchera maxima),* and Mexican malacothrix (*Malacothrix similis).* The state endangered Santa Cruz Island bird's-foot trefoil *(Acmispon argophyllus var. niveus)* has also been observed (CDFW 2014). The study area includes coastal scrub, bluff scrub, and grassland habitat suitable for some or all of these species. Additional California Rare Plant Rank 1 or 2 species recorded in the project and surrounding quadrangles are listed in Appendix A, Tables A-2 and A-3. No special status plants were observed during the site visit, although focused surveys were not performed (Anchor QEA 2013).

State Special Status Wildlife. This section addresses state of California-listed special status wildlife species, including state-listed rare, threatened, or endangered species as identified by CDFW. State-listed wildlife species that are also listed as federally endangered or threatened are discussed in the "Federal Status Wildlife" subsection of this section. California-listed special status wildlife species include the threatened Scripps's murrelet and endangered bald eagle (*Haliaeetus leucocephalus*; CDFW 2014; NPS 2010b). As of August 2012, Scripps's murrelet has been split into two distinct species: the Scripps's murrelet (*Synthliboramphus scrippsi*) and Guadalupe murrelet (*S. hypoleucus*). However, species records from CNDDB and other sources do not distinguish between these species. For the purpose of this analysis, these species are discussed together as one species.

Scripps's murrelets have been observed in waters offshore of Santa Cruz Island (CDFW 2014). They come ashore only to breed, remaining at sea the rest of the year (NPS 2014d). During the breeding season, they lay their eggs on the steep slopes and cliffs of Anacapa, Santa Barbara, and San Clemente islands. They prefer areas with sufficient vegetation for cover. Away from the breeding season, the birds move far out to sea, preferring the deep waters beyond the continental shelf (NPS 2014d). Nesting populations are not known to occur in the study area.

Recent records identify seven active bald eagle nests on Santa Cruz Island, at Canada de Malva Real, Sauces Canyon, Cueva Valdez,

Los Pinos del Sur, Fraser Point, and Fry's Harbor (UCSB 2014). Santa Cruz Island once supported stable permanent populations of bald eagles; however, in the by the mid-20th century, the pesticide DDT had brought the species to the brink of extinction. Bald eagles were reintroduced to Santa Cruz Island beginning in 2002. No nesting populations are known in the study area.

In addition to ESA- and CESA-listed species, CNDDB lists five state species of special concern with occurrences in the project and surrounding quadrangles: the pallid bat (*Antrozous pallidus*), Townsend's big-eared bat (*Corynorhinus townsendii*), island spotted skunk (*Spilogale gracilis amphiala*), Anacapa Island deer mouse (*Peromyscus maniculatus anacapa*), and ashy storm-petrel (*Oceanodroma homochroa*; CDFW 2014). The Ancacapa Island deer mouse only occurs on Anacapa Island, and is therefore not discussed further. Along with the CNDDB list species, the GMP/Wilderness Study/EIS (NPS 2015a) reports an additional five state species of special concern as occurring on Santa Cruz Island: the western mastiff bat (*Eumops perotis),* golden eagle (*Aquila chrysaetos),* black storm-petrel (*Oceanodroma melania*), double crested cormorant *(Phalacrocorax auritus)* and Cassin's auklet (*Ptychoramphus aleuticus*; NPS 2015a).

The historic masonry building at Scorpion Ranch on Santa Cruz Island supports one of the few remaining known maternity colonies for Townsend's big-eared bats in California, and the only known colony on the islands. If the building was made unavailable or unusable for the bats, it is almost certain that the species would be lost from the islands as appropriate alternative sites currently do not exist (NPS 2015a). Townsend's big-eared bats may be sensitive to disturbance, particularly during the breeding and rearing season of April 1 through November 30 (Coonan 2015). This includes disturbance from vehicle traffic on adjacent roadways.

Pallid bats are permanent, year-round residents of Santa Cruz Island (NPS 2015a). They are primarily a crevice roosting species, and select daytime roosting sites where they can retreat from view. Common roost sites are rock crevices, old buildings, bridges, caves, mines, and hollow trees habitats (Photo 16). On Santa Cruz Island, pallid bats have also roosted in rock crevices and buildings (CDFG 1998). Western mastiff bats have similar roosting habitat requirements, and may also be found on Santa Cruz Island (CDFG 1998; NPS 2015a).

Photo 16.
View of roosting bat habitat at Scorpion Ranch.

Island spotted skunks are only present on Santa Cruz and Santa Rosa islands, where they are widely distributed. Island spotted skunks on Santa Cruz Island show preference for chaparral-grassland, open grassland, fennel-grassland, and ravines. They have also been recorded in or under human dwellings and ranch outbuildings. They are nocturnal, and nest in cavities, burrows, and other natural crevices during the day. The species has experienced a strong recovery in recent years, although they remain listed as a state species of special concern (NPS 2014e).

Although listed as a state species of special concern, golden eagles arrived at Santa Cruz Island from the mainland and are considered a nuisance species on Santa Cruz Island, as they are the primary threat to endangered island fox populations. Restoration of Santa Cruz Island has included relocating golden eagles to the mainland, and no golden eagles have nested on the island since 2006 (TNC 2014).

Santa Cruz Island supports seven nesting seabird species, including one of the most

important breeding colonies of ashy storm-petrels in southern California. Santa Cruz Island also has several small cormorant colonies, and auklets breed on some of the rocks offshore (as cited in NPS 2015a). Scorpion Rock, located off of Santa Cruz Island approximately 0.5 miles east of Scorpion Anchorage, is an important nesting islet for burrow-nesting seabirds in California (NPS 2014f). Nesting bird colonies on the Channel Islands tend to be in areas relatively free from disturbance, often inaccessible bluffs and cliffs and ledges in dry sea caves (NPS 2015a). These habitats are not present in the study area, and the study area has a high level of activity relative to the rest of Santa Cruz Island. Therefore, it is unlikely that the study area supports nesting seabirds.

REGULATIONS AND POLICIES

The following is a summary of the key federal and state rules, policies, and agreements related to terrestrial biological species that potentially apply to the Project.

Federal

Federal ESA. Under the federal ESA, the Secretary of the Interior and the Secretary of Commerce have the joint authority to list a species as threatened or endangered (16 USC 1533(c)). Pursuant to the requirements of ESA, an agency reviewing a proposed project in its jurisdiction must determine whether any federally listed threatened or endangered species may be present in the study area, and determine whether the proposed project may affect or "take" such species. "Take" is defined by ESA (Section 3(19)) to mean "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." An incidental take of a listed species requires consultation with the USFWS or NMFS to determine whether the project is likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC 1536(3)).

MBTA. MBTA of 1918 (16 USC 703-711) is the primary legislation in the United States to conserve migratory birds. It implements the United States' commitment to four bilateral treaties, or conventions, for the protection of a shared migratory bird resource. MBTA prohibits the taking, killing, trading, or possessing of migratory birds. This includes disturbance that causes nest abandonment and/or loss of reproductive effort (e.g., killing or abandonment of eggs or young).

Channel Islands National Park Biosecurity Protocols. The Park Service maintains and implements biosecurity protocols to avoid the introduction of non-native and invasive species to the Channel Islands. The naturally small biologic populations found on islands can be easily driven to extinction by new species introductions and, therefore, islands are unusually vulnerable to the impacts of new invaders. The Channel Islands National Park Biosecurity Protocols include specific protocols related to personal gear, equipment and supplies, lumber and wood products, waste, dumpsters, ground vehicles, vessels, planes, soil and gravel, and education designed to avoid introduction of non-native species.

State

CESA. Under CESA, CDFW is responsible for maintaining a list of threatened, endangered, and candidate species (California Fish and Game Code Section 2070). CDFW also designates fully protected or protected species as those that may not be taken or possessed. Species designated as fully protected or protected may or may not be listed as endangered or threatened. CDFW also tracks species of special concern, which are animal species whose populations have diminished and may be considered for listing if declines continue. Pursuant to the requirements of CESA, an agency reviewing a proposed project in its jurisdiction must determine whether any state-listed endangered or threatened species may be present in the study area and determine whether the proposed project would have a potentially significant

impact on such species. "Take" of a species, under CESA, is defined as an activity that would directly or indirectly kill an individual of a species. The CESA definition of "take" does not include "harm" or "harass," as is included in ESA. As a result, the threshold for a take under CESA may be higher than under ESA because habitat modification is not necessarily considered take under CESA. CDFW may issue incidental take permits when adequate minimization measures are met, and issuance of the permit will not jeopardize the continued existence of a state-listed species. Should the project applicant receive authorization to take federally listed species under ESA, take authorization may also be sought as a consistency determination from CDFW under Section 2080.1 of CESA.

California Native Plant Protection Act. The California Native Plant Protection Act (Fish and Game Code Sections 1900–1913), natural communities conservation planning act, and CESA provide guidance on the preservation of plant resources. Vascular plants listed as rare or endangered by CNPS, but which may have no designated status or protection under federal or state endangered species legislation, are defined as follows:

- Rank 1A: Plants presumed to be extirpated in California and either rare or extinct elsewhere.
- Rank 1B: Plants rare, threatened, or endangered in California and elsewhere.
- Rank 2A: Plants presumed to be extirpated in California, but more common elsewhere.
- Rank 2B: Plants rare, threatened, or endangered in California, but more common elsewhere.
- Rank 3: Plants about which more information is needed—a review list.
- Rank 4: Plants of limited distribution—a watch list.

In general, plants listed as California Rare Plant Rank 1A, 1B, 2A, or 2B also meet the definition of Section 1901, Chapter 10 of the Native Plant Protection Act, and Sections 2062 and 2067 (CESA) of the California Fish and Game Code. As discussed in the "Existing Conditions" section of this chapter, CNDDB identifies three special status plant species (California Rare Plant Rank 1 or 2 species) with historic ranges in the vicinity of the study area. However, suitable habitat or microhabitat conditions specific to these species do not exist at the Project sites. Therefore, there are not expected to be any state protected plant species affected by the Project.

Fish and Game Code Sections 3503, 3511, 3513, 4700, 5050, and 5515. Provisions of MBTA are adopted through the Fish and Game Code. Under Section 3503, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or related regulations. Section 3513 prohibits take or possession of any designated migratory nongame bird or any part of such migratory nongame bird. The state code offers no mechanism for obtaining an incidental take permit for the loss of nongame, migratory birds.

The California Fish and Game Code strictly prohibits the incidental or deliberate take of fully protected species. CDFW cannot issue a take permit for fully protected species, except under narrow conditions for scientific research or the protection of livestock; therefore, avoidance measures may be required to avoid a take (Section 3511 birds, Section 4700 mammals, Section 5050 reptiles and amphibians, and Section 5515 fish).

VISUAL RESOURCES

This section discusses visual resources in the study area. The study area for this resource topic is defined as the Scorpion Anchorage waterfront and adjacent areas of Santa Cruz Island in which views may be affected by the design proposals for each alternative.

EXISTING CONDITIONS

In the study area, representative viewpoints were selected to illustrate the existing conditions and potential impacts from each of the proposed alternatives. Daytime photographs are provided for representative viewpoints from the in-water ferry approach, Scorpion Beach, Scorpion Ranch, and south of Scorpion Beach from Smugglers Road. Nighttime photographs are not provided, as the existing pier does not provide lighting and the proposed alternatives would not create any new sources of light. The following sections present and describe the locations and the visual character from representative viewpoints for the alternatives under evaluation.

Photo 17.
View of Scorpion Beach and existing Scorpion Pier (right side of shore) from ferry.

The foreground view includes waters of Scorpion Anchorage (Photo 17). The beach, visible in the mid-ground, includes a continuous band of sand and cobblestones which transitions relatively seamlessly to rock riprap along the right center portion of Photo 17. The existing Scorpion Pier is visible at the rightmost (northern) terminus of the beach, adjacent to the bluff face. The pier, approach roadway, and rock riprap are visible as a narrow band between the water and adjacent hillside. The background consists of rolling hills with natural vegetation. Green trees and shrubs punctuate the mid-ground and background. The dominant terrestrial colors are brown, beige, orange, and green—a palette commonly associated with the natural environment. Scorpion Pier, the existing rock riprap, and the approach roadway are colored in various tones of grey, beige, and brown—blending in with the adjacent natural landscape at this distance.

Photo 18.
Secondary view of Scorpion Pier and approach roadway from ferry.

From a closer vantage point, the condition of Scorpion Pier becomes more apparent (Photo 18). The corroded gangway, degraded piles, and weathered structure become more visible. The pier and roadway's linear and angular forms contrast more visibly with the adjacent natural topography.

Photo 19.
View of Scorpion Beach from north end.

Scorpion Beach includes a band of sand and cobblestone rock, which transitions to rock armoring in the foreground (Photo 19). The northern portion of the beach, as visible in the foreground of Photo 19) is bordered by the dirt approach roadway, which is protected by rock armoring. The outlet of Scorpion Creek is visible in the background. Natural tones of brown, orange, beige, grey, and green dominate the landscape. Manmade features including the approach roadway and rock riprap echo these tones—although the approach roadway contains a more homogenous tone and texture. The kayak storage area in the background provides a strong contrast of yellows and reds. Waters of Scorpion Anchorage reflect the afternoon sun, and the shore break creates a band of white against the blue waters.

Photo 20.
View of Scorpion Beach from Scorpion Ranch.

The foreground view includes the approach roadway and adjacent grasslands and shrubs (Photo 20). The approach roadway continues to a vanishing point masked by adjacent shrubs. Grasses and shrubs continue to dominate the view space throughout the mid-ground, which also includes a single cypress tree and wooden table with benches. The approach roadway bisects the view between grasses and shrubs in the floodplain and the adjacent hillside. Scorpion Beach is visible in the background, followed by the blue waters of Scorpion Anchorage. Natural colors and textures dominate the landscape. Readily visible manmade features include the approach roadway and table with benches, both of which include colors that blend with the landscape.

Photo 21.
View of Scorpion Pier, Scorpion Beach, Scorpion Anchorage, and Scorpion Ranch from Smugglers Road on hillside south of study area.

Viewed from the heights of adjacent hillsides, Scorpion Pier extends noticeably into the waters of Scorpion Anchorage (Photo 21). The pier and rock riprap protrude near perpendicular to the natural shoreline. South of the pier and approach roadway, the Scorpion Beach shoreline appears natural and uninterrupted. The approach roadway creates a distinct line of separation between the north hillside and valley floodplain. Existing paths in the floodplain further create a patchwork mosaic of grasslands in the floodplain. Trees appear distinctly linear along the approach roadway. The white façade of the Scorpion Ranch building and bright colors of kayaks along the beach stand in contrast to the natural tones of the landscape. Viewpoints from other adjacent hillsides, including from

the Cavern Point Loop trail to the north, would be similar.

Photo 22.
View of historic docking location at Scorpion Beach.

Prior to construction of the existing Scorpion Pier, vessel access to Scorpion Beach occurred via a small pier located at the central portion of the beach (Photo 22). Historic photos show the view of this dock in operation as viewed from the south side of Scorpion Beach. The historic dock would have been visible from each of the viewpoints described previously.

REGULATIONS AND POLICIES

The following is a summary of the key federal visual resource-related rules, policies, and agreements that potentially apply to the Project.

Federal

NPS Organic Act of 1916. The organic act of 1916 established the Park Service and directs the agency, "to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (NPS 1916). As such, the conservation of visual resources or the scenery is established through the Park Service's mission.

NPS Management Policies. This document provides the latest guidance for managing NPS lands as a whole. Specific policies for each NPS unit are provided in individual management plans, such as the GMP/Wilderness Study/EIS. Visual resources are generally addressed throughout this document. The underlying principles of unit management are based on the agency's mission, and include preventing the impairment of resources and values of each park to pass on to future generations these desired resources, and to improve opportunities for resource enjoyment over time.

GMP/Wilderness Study/EIS. The GMP/Wilderness Study/EIS identifies the measures to protect scenic resources and aesthetics. Relevant measures include the following:

- Where appropriate, use facilities such as boardwalks and fences to route visitors away from sensitive natural and cultural resources, while still permitting access to important viewpoints.
- Design, site, and construct facilities to avoid or minimize visual intrusion into the natural landscape.
- Development projects (e.g., buildings, facilities, utilities, roads, bridges, and trails) or reconstruction projects (e.g., road reconstruction, building rehabilitation, and utility upgrades) should be designed to work in harmony with the surroundings, particularly in historic districts.

CULTURAL AND HISTORIC RESOURCES

This section discusses the cultural resources, including historic structures, archeological resources, and cultural landscapes in the study area. The study area includes the Scorpion Anchorage on Santa Cruz Island's eastern end, in and adjacent to the Scorpion Creek estuary (Figure 15). The boundary of the cultural resources study area was determined based on the following potential impacts:

- Direct effects to archeological sites at areas of ground disturbance
- Indirect effects to archeological sites where changes in land use could affect erosion at sites.

Because there are no changes to any components of the built environment or their setting, there is no potential for direct or indirect effects to historic buildings and structures.

In addition, impacts to cultural resources are analyzed separately and concurrently under Section 106 of the NHPA.

EXISTING CONDITIONS

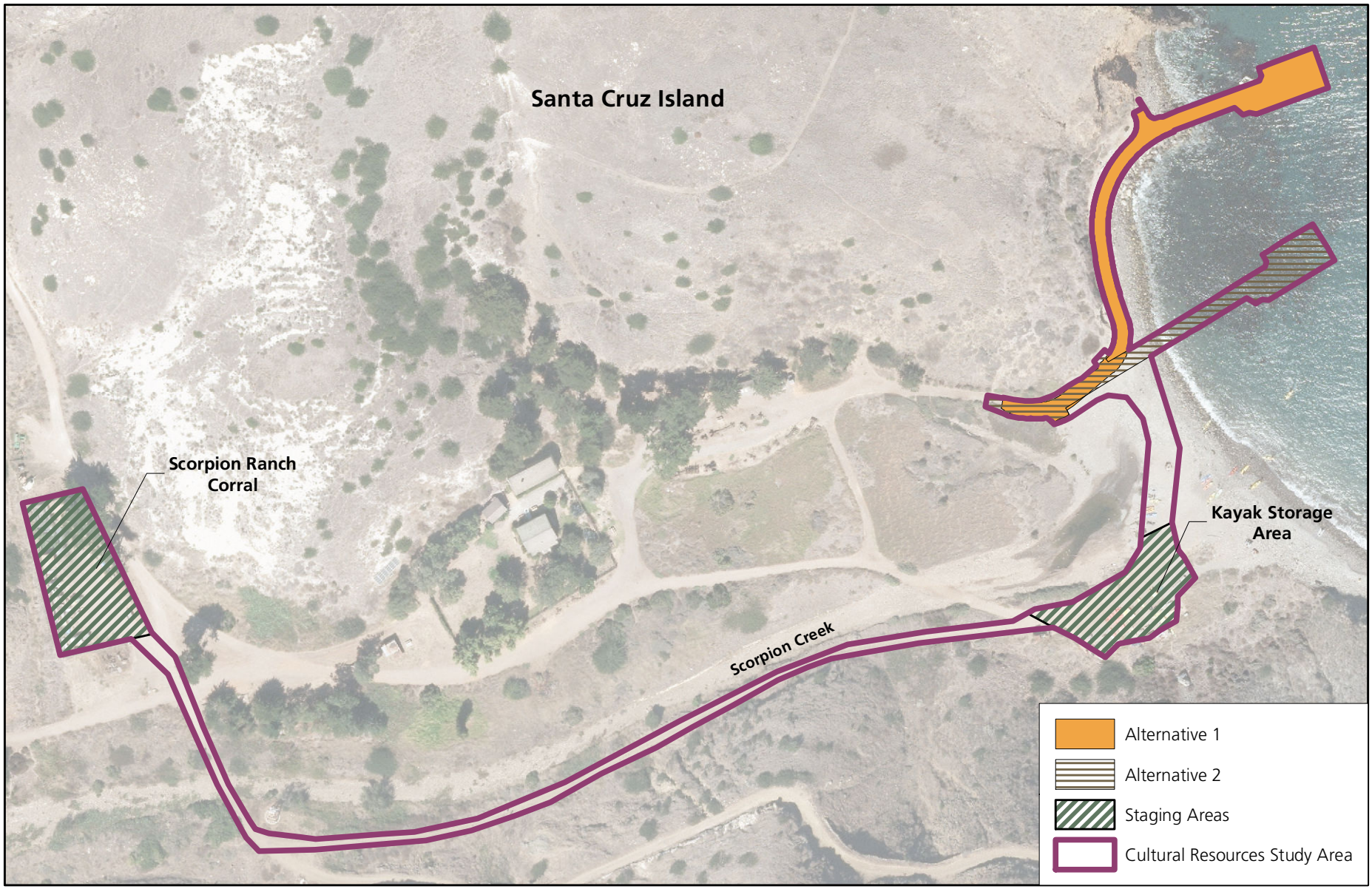
Environmental Setting

A review of the environmental setting in the past and present accomplishes the following:

- Provides information on what resources may have been available to communities in the study area in the past.
- Indicates where and how sites may be preserved.
- Contributes to the significance of the data that sites contain.

The Channel Islands rose from the ocean about 5 million years ago, a result of movements of the Pacific and North American plates. Geological and tectonic forces created the distinctive transverse (east-west) island chain, as well as the ridge and valley topography of Santa Cruz Island. During the last glacial maximum, sea level was about 400 feet lower than it is today, and the northern Channel Islands were one island. As ice sheets to the north melted, the continental plate tended to rise as the weight of the ice decreased, while sea level also rose. Sometime between 19,000 and 10,000 years ago, relative sea level rose enough to separate the four islands. Sea level stabilized around 6,000 years ago. This complicated history means that some ancient shorelines are now submerged, while others are found above modern sea level. Changes to the general topography of the study area after that time would have been primarily related to erosion and deposition (such as colluvial activity on steep slopes, and wave action along the coast; Braje et al. 2010; NPS 2014i; Kiver and Harris 1999).

Due to the complex geological history, soils in the northern Channel Islands "range widely in texture, natural drainage, and other characteristics" (NRCS 2007). On Santa Cruz Island, soils have formed in aeolian, colluvial, alluvial, and uplifted marine materials, and display significant spatial variability. In alluvial environments, such as the Scorpion Creek valley, "multiple buried soils are common" (Butterworth et al. 1993). Alluvial soils in valley bottoms have probably been aggrading since the late Pleistocene era (Braje et al. 2010).



0 150 Feet

FIGURE 15
CULTURAL RESOURCE STUDY AREA
Channel Islands National Park
National Park Service/U.S. Department of the Interior
Draft - August 2015

In addition to geological and glacial changes, there has been significant environmental variation during the human occupation of the northern Channel Islands. This has been documented through studies of the sea surface temperature (based on information from marine shell from middens, as well as fossil foraminifera from in-water sediment cores), vegetation communities (based on pollen records), and vertebrate communities (based on skeletal remains in both natural and archeological context). These studies reveal that resource availability would have had relatively dramatic fluctuations throughout prehistory (Braje et al. 2010). Rapid change also occurred with European contact, which brought introduced species and diseases, as well as direct modifications to landforms.

The environment in the Project vicinity currently consists of grassland, coastal scrub, and beach and dune environments. Observable historic landform modifications include road construction and areas where the ground surface has been cut and filled to create level uplands around the ranch complex. The study area is a dynamic environment, with storm swells constantly reworking the beach, and periodic floods scouring the valley and pushing through the beach berms. In 1997, a major flood moved structures off their foundations at the Scorpion Ranch complex (Photo 23).

Photo 23.
Structure pushed off its foundation by floodwaters in 1997.

Cultural Setting

A review of the cultural setting accomplishes the following:

- Generates expectations for site locations and contents.
- Provides a basis for analyzing site significance.
- Emphasizes connections between past and present Chumash communities.
- Explains disturbances to sites and landforms in the area, both recently and in the past.

The setting is described extensively in the *Channel Islands National Park Archaeological Overview and Assessment* (Braje et al. 2010). Its findings are briefly summarized in the following paragraphs.

The human history of the Channel Islands stretches back 12,000 years. It has been divided and described in various ways throughout the last near-century of archeological research. The recent *Channel Islands National Park Archaeological Overview and Assessment* (Braje et al. 2010) proposed using four chronological periods to describe its history.

The earliest of these four periods is the Terminal Pleistocene and Early Holocene, dating to about 13,000 to 7,000 years ago. Although many sites have undoubtedly been lost to natural and cultural processes, the Channel Islands still contain "more evidence of occupation [...] during this period than in most other areas of comparable size elsewhere in California or North America as a whole" (Braje et al. 2010). The opportunity to study cultural change from the earliest occupation of North America is one of the reasons that Channel Islands archeological sites are particularly significant. Sites dating to the Terminal Pleistocene and Early Holocene period are characterized by chipped stone artifact assemblages and small or diffuse middens. Some sites later in the period contain Olivella (*Olivella biplicata*) shell beads, cordage, and bone fishhooks. Unlike many other early Holocene sites and cultures in

North America, there is evidence of "a permanent and relatively sedentary occupation" in the Channel Islands, as well as a distinctive maritime orientation (Braje et al. 2010).

The Earlier Middle Holocene period follows, dating to about 7,000 to 5,000 years ago. The earlier part of the period is characterized by evidence of small, mobile populations, perhaps due to adverse environmental conditions. Later, red abalone middens are present, along with increasing evidence of villages. Shellfishing appears to be increasingly supplemented by fishing and sea mammal hunting. The first asphaltum (tar), associated with waterproofing basketry, appears during this period, as well as digging stick weights and mortars and pestles. Towards the end of the period, red abalone decreases in importance, and settlement appears to decrease.

The Middle to Late Holocene Period dates to about 5,000 to 1,000 years ago. Like the preceding period, it includes a number of shifts in technology, settlement, and sociopolitical organization. In general, though, "changes in technology, subsistence, and settlement from the Middle to Late Holocene reflect an increasingly maritime orientation related to intensified fishing and regional exchange" (Braje et al. 2010). The use of a number of subsistence foods appears or intensifies, including carbohydrate sources such as acorns and various roots and tubers, as well as vertebrate species that require more processing or require specialized technologies to acquire. New technologies include net sinkers and weights, new varieties of fishhooks, and plank canoes.

The fourth period is the Late Holocene, which is the time period after about 1,000 years ago. Like the preceding periods, there were shifts in culture and lifeways during the period, likely corresponding to environmental changes. However, there are some distinctive archeological correlates that are characteristic of the period. These include the proliferation of the trade in shell beads (and associated microblade tradition) and other ornaments, an increasing focus on off-shore fishing, circular and evidence of feasting. Developments on the Channel Islands during this period influenced the larger regional culture, underscoring the significance of Late Holocene sites. Also, sites from this time period often correlate with historically and ethnographically described Chumash villages. Santa Cruz Island, called *Limuw* by the Chumash, contained at least 10 and possibly 12 historic Chumash villages. One of those villages, *Swaxil*, was probably located at Scorpion Anchorage (Glassow 2013; Kennett et al. 2000).

The traditional territory of Chumash people "encompassed 7,000 square miles that spanned from the beaches of Malibu to Paso Robles. The tribe also inhabited inland to the western edge of the San Joaquin Valley" (Santa Ynez Band of Chumash Mission Indians 2009). The first recorded European contact with the Island Chumash came in 1542, by Juan Rodriguez Cabrillo. Early contact was sporadic in the Channel Islands, with missions only gaining a foothold in the early nineteenth century. However, introduced diseases likely had devastating effects on the Island Chumash population during the early contact period (Santa Ynez Band of Chumash Mission Indians 2009; Erlandson and Bartoy 1995).

Mission San Buenaventura was established across the Santa Barbara channel at present-day Ventura in 1782. Gradually, Island Chumash people began to travel to the mission. Most moved to the mainland between 1814 and 1816 due to "economic and social instabilities related to depopulation, active recruitment by missionaries, collapse of cross-channel exchange, and perturbations in marine and terrestrial environments" (Kennett et al. 2000). By 1822, there were no longer Island Chumash communities in the Channel Islands. However, Chumash communities have re-established their connection to the islands, including paddling traditional *tomols* (plank canoes) to the islands from the mainland.

The Channel Islands became part of Mexico after the war of independence from Spain ended in 1821. Over the next decades, the islands were granted by the Mexican government to various favored people. Andres Castillero was granted Santa Cruz Island in 1838, and the first permanent structures were ranch buildings built in the central valley of the island in 1852. Castillero retained title after the Mexican-American war and passed it to a business associate in 1858. Shortly thereafter, sheep were introduced to the ranch operation. The island was sold to a group of investors in 1869, who incorporated as the Santa Cruz Island Company. One investor, Justinian Caire, took full ownership of the company by 1886. Caire implemented a plan to operate a multi-faceted commercial operation run from a series of settlements on the island, based at the main ranch in the island's central valley. Scorpion Ranch was an outpost dedicated to sheep-shearing and bread-baking (Chiles 2011; Braje et al. 2010).

Caire's descendants became embroiled in legal conflicts in the early 1900s after Caire's widow dispersed some of her stock in the company to her adult children. After decades of litigation, Santa Cruz Island was partitioned among Caire's heirs. By 1932, the eastern end of the island, including Scorpion Ranch, was owned by Maria and Ambrose Gherini, Caire's granddaughter and grandson-in-law (the remainder of the island was sold by the other Caire descendants to an unrelated businessman named Edwin Stanton in 1937; eventually his portion of the island was sold to TNC). The Gherini family continued to own and operate the eastern extent of the island, including Scorpion Ranch. Sheep ranching continued through the 1980s. After ranching became uneconomical, it was replaced by a guided bow-and-arrow hunt for feral sheep. In 1980, Santa Cruz Island was designated part of Channel Islands National Park. NPS gained control of the Gherini property through congressional authorization in 1996, though the Gherini family retains some rights to use of the Scorpion Ranch structures. The last feral sheep were removed, and feral pigs killed, in 1999, ending nearly 150 years of grazing impacts on the island (NPS 2014j; Chiles 2011; Braje et al. 2010).

A number of different piers were constructed at Scorpion Anchorage throughout its history. Early iterations appear to have been primarily constructed mid-beach, at or near the location proposed for Alternative 2 (Photo 24). Beginning in the 1940s, a number of successive pier structures were built on the west side of the anchorage, at the location of the current pier (Photo 25). The current pier structure was built in the 1990s by the Park Service.

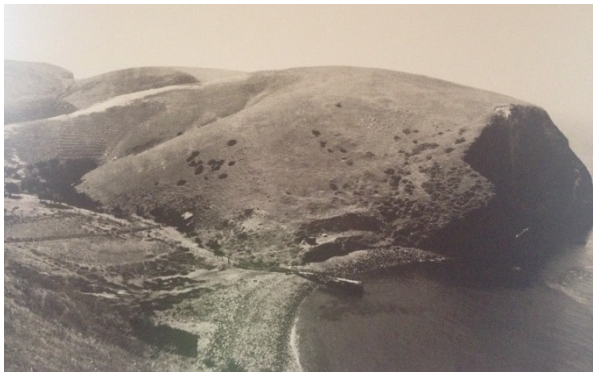


Photo 24.
Scorpion Ranch and Pier around 1930.

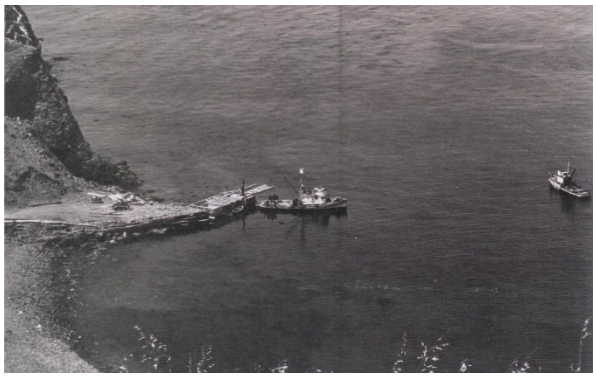


Photo 25.
Scorpion Ranch and Pier in 1942.

Recorded Cultural Resources

A number of cultural resources are recorded in and adjacent to the study area. Two recorded archeological sites are partially in the study area, CA-SCrI-423 and CA-SCrI-507. Both sites are part of the Santa Cruz Island Archeological District, a district listed

in the national register. The Scorpion Ranch structures, called the Caire-Gherini Ranch Historic District, are a component of the Santa Cruz Island Ranching District. The Santa Cruz Island Ranching District is documented in the Historic American Buildings Survey (HABS) and is eligible for listing in the national register (HABS 2013). The Santa Cruz Island Ranching District is documented in the HABS and is eligible for listing in the national register.

Site CA-SCrI-423. This is an extensive precontact site on the west side of Scorpion Creek. The site includes at least two loci of intact shell midden, probable house pits, extensive lithic debitage, and several caves/rock shelters. Human remains have been encountered at both midden loci. It may be the location of the historic Chumash village of *Swaxil*. The oldest radiocarbon date for the site is about 2,245 years ago, and historic artifacts indicate that occupation continued into the historic era (Kennett et al. 2000). The site "probably had substantial deposits, but ranching activities and intense flooding events down Scorpion Canyon, at the mouth of which the village is located, have resulted in removal of most of its habitation deposits" (Glassow 2013). The site is currently being disturbed by wave-action erosion at its northern extent, and has been recently impacted by road maintenance activities (Photo 26).

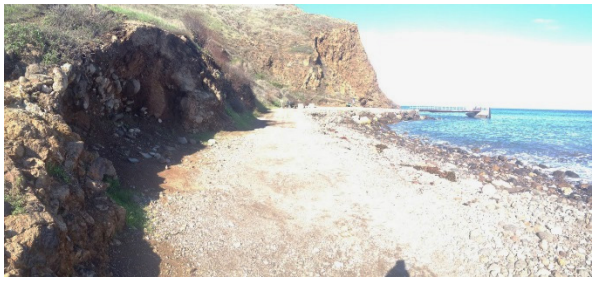


Photo 26.
Erosion at site CA-SCrI-423.

As currently mapped, the site boundary overlaps with the cultural resources study area. The limits of intact deposits have been estimated by surface indications and limited testing, but have not been fully verified. In particular, intact deposits may be present under areas of disturbed sediments, particularly in areas where alluvial deposition occurs. Archeological fieldwork conducted for the Project revealed that previously mapped boundaries may not capture the actual boundaries of intact and disturbed deposits. Further, even deposits in secondary context may have both scientific and cultural value.

Regardless of where its boundaries are drawn, the site is individually significant, because it contains intact cultural deposits that have the potential to yield important information on prehistory and history. It is also significant as part of the Santa Cruz Island Archeological District, because it is part of the island's unusually long and complete archeological record. The site also has cultural and religious significance for traditionally associated American Indian peoples.

Site CA-SCrI-507. Prior to fieldwork for the present Project, this was described as a small intact midden site on the east side of Scorpion Creek. A historic road traverses the site, with intact deposits on either side. Debitage, including microblades associated with the Late Holocene period, have been documented on the surface. A single radiocarbon date of about 255 years ago (A.D. 1695) indicates historic era occupation as well (Kennett et al. 2000). Human remains have been encountered at the site. The site may be part of *Swaxil*, given the proximity and overlapping dates.

As mapped prior to 2014 fieldwork, the site is in the study area boundary in the northeast portion of the primary Project staging area where kayaks and other concessioner gear is currently stored. However, fieldwork revealed a stratum of lithics visible in the eastern cutbank of Scorpion Creek, about 20 meters (67 feet) west of the midden. The lithics appear be present throughout the approximately 30- to 50-cm (11.8- to 19.7-inch) deep exposure, but slumping at the cutbank makes it difficult to assess. It is possible that the lithics stratum continues to the east and is related to the site deposits (contiguous with or underlying them). A

hand-excavated subsurface archeological test unit was excavated at the area where kayaks are currently staged, southwest of the previously understood site boundary. The test revealed disturbed sediments with modern debris (plastic, etc.) combined with potentially historic materials (nails and glass) and lithic debitage and tools to at least 30 cm (1 foot) below the surface. It appears that flooding, along with use and maintenance of the staging area, created a surface layer of recently disturbed sediments of an undetermined depth. However, intact archeological deposits—perhaps associated with site CA-SCrI-507 or site CA-SCrI-423—may be present at depths 30 cm (1 foot) below the surface or deeper, below the existing kayak staging area.

Like site CA-SCrI-423, site CA-SCrI-507 is both individually significant, and significant as part of the Santa Cruz Island Archeological District. The site also has cultural and religious significance for traditionally associated American Indian peoples. If further research expands site boundaries, this would not diminish significance.

Caire-Gherini Ranch Historic District. This is both a collection of historic built environment features and a documented cultural landscape (Figure 16). It includes the buildings extant from the ranch's historic period of significance, as well as roads, trails, agricultural terracing and other structures. A small portion of the complex is in the study area, primarily roads that would be used for materials transport, as well as the secondary staging area (Figure 15). The complex is significant for its association with historical developments on Santa Cruz Island, its surviving examples of vernacular French Alps architecture, and its association with important historical figures (HABS 2013). It is also a contributing part of the Santa Cruz Island Historic Ranching District, because of its relation to the other Caire ranches under the organized commercial production system.

REGULATIONS AND POLICIES

The following is a summary of the key federal rules, policies, and agreements pertaining to cultural and historic resources that potentially apply to the Project.

Federal

American Antiquities Act (1906). The antiquities act (16 USC 431-433) established the ability of the President to identify national monuments, and criminalized unpermitted excavation or vandalism of archeological resources. The act is relevant to the Project because it gives federal agencies jurisdiction over cultural resources on their lands, and the Project area includes lands owned by the Park Service.

NHPA, as amended (1966). NHPA (16 USC 470 et seq.) establishes key aspects of the federal historic preservation program. Section 106 of NHPA requires federal agencies to take into account the effects of their undertakings on national-register-eligible historic properties. Agencies must afford the Advisory Council on Historic Preservation and the SHPO an opportunity to comment on any undertaking that may affect historic properties, and must also consult with interested and affected Indian tribes, other interested parties, and the public.

NHPA is relevant to the Project because the Project is an undertaking as defined in 36 CFR 800.16(y) and the Project area includes lands owned by the Park Service, and there are historic properties in the Project area.

Although Section 106 consultation and review is being conducted separately, this NEPA documentation is being used to fulfill Section 106 requirements to consult with the public.

0 350 Feet

Source: ESRI 2015; HABS 2013

FIGURE 16
CAIRE-GHERINI RANCH COMPLEX
Channel Islands National Park
National Park Service/U.S. Department of the Interior

Draft - August 2015

Archaeological and Historic Preservation Act, as Amended (1974). The Archaeological and Historic Preservation Act (16 USC 469-469c) requires that federal agencies preserve or recover significant historical or archeological resources, and authorizes agencies to fund these preservation or recovery activities. The act is relevant to the Project because significant historical and archeological resources are present in the study area.

American Indian Religious Freedom Act (1978). The American Indian Religious Freedom Act (42 USC 1996 et seq.) protects the rights of Native Americans (American Indians, Eskimos, Aleuts, and Native Hawaiians) to practice and express their traditional religion, access sacred sites, and possess sacred objects. American Indian Religious Freedom Act regulations are found at 43 CFR 7. The act would be applicable to the Project if any sacred sites, traditional religious locations, or objects are discovered in the Project area.

Archaeological Resources Protection Act (1979). The Archaeological Resources Protection Act (16 USC 470) is the primary law that protects archeological resources on federal lands. In contrast to NHPA, archeological resources are defined in the Archaeological Resources Protection Act as "any material remains of human life or activities which are of archaeological interest" and "at least 100 years of age." The act provides for permitting of archeological investigations, and criminalizes unpermitted excavation or vandalism. The act would be applicable to the Project if any archeological resources would be impacted, and those effects mitigated through scientific excavation.

Abandoned Shipwreck Act (1987). The Abandoned Shipwreck Act (43 USC 2101) claims federal ownership of certain shipwrecks in navigable state-controlled waters. Federally owned shipwrecks do not belong to the finder (as they otherwise would under maritime law) and may not be salvaged by private parties. The act would apply to the Project if any shipwrecks are found to be present in the Project area.

Native American Graves Protection and Repatriation Act (1990). The Native American Graves Protection and Repatriation Act (25 USC 3001 et seq.) applies to human remains, funerary objects, sacred objects, and objects of cultural patrimony (together called "cultural items") related to Native Americans or Native Hawaiians. It describes the rights of lineal descendants, Indian tribes, and Native Hawaiian organizations regarding treatment, repatriation, and disposition of cultural items. The act applies to inadvertent discoveries on federal or Indian lands. It would apply to the Project if any cultural items were encountered on NPS-owned lands in the Project area.

RECREATION AND VISITOR USE

This section discusses the recreational opportunities, including visitor use and experience, located in and adjacent to the study area. The study area is defined as the areas of Santa Cruz Island immediately surrounding and connecting to the two pier alternative locations (the current pier location [Alternative 1] and the central portion of the beach [Alternative 2]) and roadway.

EXISTING CONDITIONS

Santa Cruz Island provides a variety of recreational opportunities for visitors. Some of the main recreational opportunities include hiking, camping, water sports, fishing, and wildlife viewing (NPS 2014h). The island is also rich in cultural history with more than 10,000 years of American Indian habitation and more than 150 years of European exploration and ranching (NPS 2014h); exhibits related to the island's history are accessible to visitors at the Scorpion Ranch Visitor Center. Fishing is not allowed in the Scorpion SMR, although fishing is permitted in other areas on the island.

Scorpion Pier serves as one of only two access points for recreational visitors to Santa Cruz Island. The island is only accessible by park concessioner or by private boats. Piers are available at Scorpion Anchorage and Prisoners Harbor. Public boat transportation is available year-round by the park concessioner Island Packers (NPS 2014h). Private boaters may land throughout the year, although there are no public moorings or all-weather anchorages around the island (NPS 2014h).

Recreational Opportunities in the Study Area

Hiking. Several trails and roads traverse eastern Santa Cruz Island, providing visitors with hiking opportunities. These trails and roads range from the maintained, relatively flat, signed trails of Scorpion Valley to the unmaintained, rugged, mountainous paths of the Montañon area. While visitors may explore park property on Santa Cruz Island, no hiking is allowed beyond its boundary. The boundary is the property line (marked by a fence line) between Prisoners Harbor and Valley Anchorage. Destinations available via hiking trail from Scorpion Beach include the historic Scorpion Ranch, Cavern Point Loop, Potato Harbor, Scorpion Canyon Loop, Smugglers Cove, and Montañon Ridge. Other trails and destinations are accessible from Smugglers Cove and from Prisoners Harbor (NPS 2013c).

Camping. Santa Cruz Island has 31 campsites available to visitors year-round. Amenities are limited, and visitors must carry all their gear to and from the campgrounds. Because concessioner boats fill to capacity much faster than campground limits are met, campers must first secure transportation for an overnight trip to Santa Cruz Island. Limited backcountry camping is also available at Del Norte, approximately 12 miles from Scorpion Anchorage. No camping is allowed on the western 76% of the island owned by TNC (NPS 2014h). Private vessels are allowed to drop off passengers but may not tie off to the pier or moor in the park boundaries.

Water Sports. Scorpion Beach provides easy access for swimming, diving, snorkeling, and kayaking (Photo 27). For snorkeling and diving, the easiest kelp beds to access are the ones near the pier and those to the eastern end of the bay. Kayaking east towards Scorpion Rock or west towards Cavern Point provides access to wildlife viewing and sea caves. Visitors may kayak on their own, or with kayak guides approved by NPS Commercial Use Authorizations. Beach access is also available at Prisoners Harbor and by hiking over to Smugglers Cove. Several locations on Santa Cruz Island offer good surfing, although they are best accessed by private boat (NPS 2014h).

Photo 27.
View of Scorpion Anchorage and kayak storage area.

Fishing. Scorpion Anchorage is in the Scorpion SMR and fishing is therefore not permitted. To fish in areas of Santa Cruz Island outside of the SMRs, possession of a valid California state fishing license with an ocean enhancement stamp is required (NPS 2014h).

Boating. Visitors may boat on their own or with a park authorized commercial service operator. There are no public moorings or all-weather anchorages around the islands. Boaters may land on the eastern 24% of Santa Cruz Island without a permit. This area is owned by the Park Service and is east of the property line between Prisoners Harbor and Valley Anchorage. The shoreline between Arch Point (northwest of Scorpion Anchorage) and the east boundary of Potato Harbor is closed to landing to protect nesting seabirds. A permit to land on the other 76% of Santa Cruz Island is required from TNC (NPS 2014h).

Wildlife Viewing. Santa Cruz Island and the surrounding waters support a wide variety of wildlife and vegetation, many of which are rare or endemic. The island provides recreational visitors the opportunity to observe seabirds, land birds, marine mammals, wildflowers, and tidepools. Viewing opportunities are available from the land and from concessioner and private boats (NPS 2014h).

Scorpion Ranch Visitor Center. The Park Service opened the Scorpion Ranch Visitor Center in 2009 (Photo 28). The visitor center, located in the historic Scorpion Ranch house, serves as an information, orientation, and interpretive center for more than 50,000 visitors to Scorpion Valley each year. The visitor center features the geologic history of the Channel Islands, history of the Chumash Native Americans, and accounts of island ranching. The historic bakery and blacksmith shop are also accessible to visitors (NPS 2014h).

Photo 28.
View of Scorpion Ranch from approach roadway.

REGULATIONS AND POLICIES

The following is a summary of the key federal recreation-related rules, policies, and agreements that potentially apply to the Project.

Federal

NPS Management Policies. These policies stipulate that the primary purpose of all parks is to enhance the enjoyment of park resources and values by the people of the United States. The Park Service is dedicated to providing recreational opportunities that enhance visitor use experience at national parks (NPS 2006a). According to the Management Policies, the national park setting is not suitable for all potential forms of recreation, and therefore, the Park Service shall strive to do the following (NPS 2006a):

- Offer recreational opportunities that enrich the natural and cultural resources found in the local area.
- Defer to local, state, and other federal agencies and other nongovernmental entities to service a greater range of recreational demands that are not suitable for a national park setting.

The Park Service may permit other forms of recreation that do not meet all the criteria specified in this section if the recreational activities are relevant to the fundamentals for which the park was established and that would support the preservation of park resources or values (NPS 2006a).

GMP/Wilderness Study/EIS. The GMP/Wilderness Study/EIS contains three alternatives for the management and use of Channel Islands National Park and Santa Cruz Island. Each management alternative includes management strategies for visitor uses, access facilities, and services; cultural resources; as well as natural-cultural Resources. NPS management of these resources would be guided based on the management alternative identified (NPS 2015a).

Scorpion SMR. As described previously, Scorpion Anchorage is in the Scorpion SMR and fishing is therefore not permitted. In addition, in SMRs access and use for activities including, but not limited to, walking, swimming, boating, and diving may be restricted to protect marine resources.

PUBLIC HEALTH AND SAFETY

This section discusses public health and safety conditions in the study area. The study area for this resource topic is defined as the areas in and adjacent to two pier alternative locations (the current pier location [Alternative 1] and the central portion of the beach [Alternative 2]) and roadway. Public health and safety conditions related to seismic hazards and unstable soils are discussed in the "Geology, Soils, and Seismicity" section of this chapter; while public health and safety conditions related to water quality and flood hazards are discussed in the "Water Quality and Hydrology" section of this chapter.

EXISTING CONDITIONS

Scorpion Pier and Approach Roadway

The existing Scorpion Pier structure does not meet NPS goals and requirements for safe visitor access. The embarkation process requires passengers to climb—one person at a time, often while carrying heavy cargo—a single unsteady ladder that is not compliant with ABA standards for accessible design (Photos 29 and 30). Furthermore, the boats are not moored or tied up to the dock during this process, because wave action generally makes the boat unsteady; instead, boat operators thrust into contact with the dock during loading and unloading of passengers and cargo. Any adverse swells or surges can easily cause dangerous situations to develop—boat operators are sometimes required to quickly power vessels away from the pier to avoid potential damage or injury. Once on the pier, individuals must walk along the narrow 9-foot-wide deck that lacks adequate handrails (which are especially needed to maintain balance during severe wind and wave conditions). These issues introduce considerable risk of injury, and a combined risk to human lives, especially for children, the elderly, and those with disabilities. Increased wave activity or a simple misstep could lead to serious injuries. Harsh weather is common in the area, including high winds and adverse swells or surges, exacerbates these issues.

Photo 29.
View of Scorpion Pier's deterioration, narrow walkway, and inadequate railings.

Photo 30.
View of Scorpion Pier's existing pier ladder and embarkation process from bow of concessioner ferry boat.

In addition, the pier in its current condition displays corrosion of all metal parts and components (Photos 31 to 33). The main beams, cross-members, bottom framing, and anchorage (bearing areas) are exposed to saltwater in the form of splash water during adverse weather conditions. The guardrail/posts and anchorage system are composed of vertical posts that are attached to the steel pier frame by a welded connection. At isolated locations, the welded connection is fractured and is compromised. Concrete end supports exhibit localized deterioration (exposed rebar ends), and minor cracking is apparent in isolated locations. The pier will

continue to deteriorate without repairs and continued maintenance. In its current condition, the pier can most likely be used for 3 to 5 additional years without repairs and continued maintenance (WJE 2012).

Photo 31.
View of Scorpion Pier corroded exterior stringer at shore abutment.

Photo 32.
View of Scorpion Pier fractured weld connection at guardrail post base.

Photo 33.
View of Scorpion Pier crack at concrete abutment wall.

The existing access road also poses a safety risk. Once on land, visitors must traverse the 400-foot-long, rough, coarsely graded gravel access road (which is also not ABA compliant) to Scorpion Ranch; the road surface is composed primarily of sand, gravel, and rocks up to 10 inches in diameter. Because of these surface conditions, the access road can be difficult to negotiate, especially for older individuals and visitors with mobility disabilities, or while carrying bags, packs, and other gear. In addition, the access road must be repaired and re-graded several times per year due to impacts from storms, wave erosion, and the flooding of Scorpion Creek.

The current height of the pier cannot accommodate safe use during high and low tides, and sea level rise will worsen these conditions. Under existing conditions, it is not safe for boats to approach or dock when tides are low or when wave heights are greater than 1 or 2 feet (Photo 34). Current predictions for sea level rise range from 0.33 foot to 1.1 foot by the year 2050, and 0.74 foot to 3.2 feet by 2100. Under these predicted conditions, existing safe access issues would be worsened. Sea level rise would also likely lead to increased erosion of the approach roadway (Ashton Engineering 2014).

Photo 34.
Strong wave conditions at Scorpion Pier.

Hazardous Materials within the Study Area

The term "hazardous material" is defined in the state's Health and Safety Code (Chapter 6.95, Section 25501(o)) as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment. In the study area, it is unlikely that hazardous materials are present in building materials, structures, or soils underlying the sites and may be exposed during construction. Handling of potentially hazardous materials associated with facility operation occurs in compliance with appropriate regulations.

There is no history of hazardous material use in the study area. Scorpion Ranch formerly functioned as the base for sheep ranching on Santa Cruz Island. The ranch and surrounding area are now historic and natural attractions in the national park system. There are no hazardous materials associated with existing or historic site operations. Although Santa Cruz Island did provide a military function during World War II, there are no structures in the study area associated with this use (NPS 2014b). Given the site's existing and historic functions, it is unlikely that any hazardous materials underlie the study area, including in soils that may be disturbed during construction.

It is unlikely that hazardous building materials would be encountered during demolition or improvements to the existing pier or approach roadway. Pier and roadway construction occurred relatively recently, in compliance with modern day hazardous materials regulations. Therefore, it is highly unlikely that these structures would contain any hazardous materials, including but not limited to asbestos, lead-based paint, polychlorinated biphenyls, di(2-ethylhexyl)phthalate, mercury, and creosote.

Vessel operations typically require some degree of boat maintenance (general mechanical repairs and hull treatments) and fueling activities, as well as sewage and bilge water pumpout that could affect public health and safety if improperly operated. Refueling and other operations involving the handling of potentially harmful products and materials are carried out under strict USACE and USEPA regulations prohibiting water pollution. Regulations related to materials handling are presented in detail in the "Water Quality and Hydrology" section of this chapter.

REGULATIONS AND POLICIES

Construction activities and operation of ferries at the Scorpion Pier site would require compliance with a number of federal, state, and local regulations to support public health and safety and environmental protection. This includes handling, transport, and disposal of hazardous materials. State and local agencies often have either parallel or more stringent rules than federal agencies. In most cases, state law prevails over federal law, and enforcement of these laws is the responsibility of the state or a local agency to which enforcement powers are delegated.

The following is a summary of the key federal and state public safety-related rules, policies, and agreements that potentially apply to the Project.

Federal

ABA Accessibility Standards. Standards issued under the ABA apply to facilities designed, built, altered, or leased with certain federal funds. The law applies to federal buildings, including NPS facilities. Four agencies establish ABA standards according to guidelines issued by the U.S. Access Board: the General Services Administration, the U.S. Department of Defense, the Department of Housing and Urban Development, and the U.S. Postal Service. The latest editions of the ABA Accessibility Standards are substantively the same and replace the earlier Uniform Federal Accessibility Standards. These standards contain scoping and technical requirements for accessibility to sites,

facilities, buildings, and elements by individuals with disabilities.

American Society of Civil Engineers Minimum Design Loads for Buildings and Other Structures (ASCE/SEI 7-10). *ASCE/SEI 7-10* provides requirements for general structural design and includes means for determining dead, live, soil, flood, snow, rain, atmospheric ice, earthquake, and wind loads, as well as their combinations. Standard ASCE/SEI 7 is an integral part of building codes in the United States.

DO-42. The procedures in DO-42 give detailed guidance based on the minimum requirements for accessibility set forth in laws, rules, and regulations. In addition, the fundamental principal of DO-42 is for the Park Service to provide the highest level of accessibility that is reasonable, and not simply provide the minimum level that is required by law. The five objectives of DO-42 are to achieve the following:

1. Incorporate the long range goal of providing the highest level of accessibility that is reasonable for people of all abilities in all facilities, programs, and services, instead of providing separate or special programs.
2. Implement this goal within the daily operation of the Park Service, its policies, organizational relationships, and implementation strategies
3. Provide further guidance and direction regarding the Park Service interpretation of laws and policies
4. Establish a framework for the effective implementation of actions necessary to achieve the highest level of accessibility that is reasonable
5. Ensure the implementation of universal design principles within the national park system.

Occupational Safety and Health Act of 1970. The Occupational Safety and Health Act sets standards for safe workplaces and work practices, including the reporting of accidents and occupational injuries.

State

California Occupational Safety and Health Regulations (8 CCR). In California, workplace safety regulations are developed and enforced by the California Department of Industrial Relations Division of Occupational Safety and Health. California Occupational Safety and Health regulations mandate accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Hazard communication program regulations require appropriate labeling and communication of hazardous substances and their handling, including preparation and the availability of Materials Safety Data Sheets.

Environmental Consequences

INTRODUCTION

This chapter presents the analyses of potential resource-specific environmental consequences, or impacts, of the No Action and action alternatives.

This section introduces the general methodology (and terminology) used to assess impacts, as well as the approach used to assess cumulative impacts. Resource-specific impact assessment methodologies are presented in subsequent sections of this chapter.

GENERAL METHODOLOGY FOR ASSESSING IMPACTS

Potential impacts are generally described in terms of context, duration, intensity, and type, which are generally defined in the following paragraphs, as appropriate.

Context describes the area or location (site-specific, local, parkwide, or regional) in which the impact would occur. The following resource-specific sections define the appropriate study area for each analysis.

Duration describes the length of time that an impact would occur, either short- or long-term. Short-term impacts are those caused by construction activities (from the start to the end of the construction period) or short-term changes in operations, and impacted resources would return to or resume their previous conditions following these activities. Long-term impacts would last well beyond the construction period or the operational change, and impacted resources may not resume their previous condition.

Intensity describes the degree, level, or strength of an impact. Intensity levels can be categorized as follows:

- Negligible: The impact would occur at or below the lowest levels of detection
- Minor: The impact would be slight, but detectable
- Moderate: The impact would be readily apparent
- Major: The impact would be substantial

Impact types can be either beneficial or adverse. A beneficial impact would be a positive change in the condition of the resource or a change that would move a resource toward a desired condition. An adverse impact would be a change that would move the resource away from a desired condition or would detract from its condition.

NPS policy and NEPA also require that direct and indirect impacts be considered, but not specifically identified. A direct impact would occur at the same time and place as the action. An indirect impact would be caused by an action but would be later in time or farther removed in distance, but would still be reasonably foreseeable in the general vicinity of the study area.

APPROACH TO PROPOSING MITIGATION

Where typical or feasible mitigation measures could be identified to reduce impacts—regardless of intensity, duration, or type—caused by the alternatives under evaluation, the Park Service has proposed undertaking such mitigation measures. This conservative approach ensures that all impacts are mitigated to be as minimal as feasible in all instances. A table summarizing all mitigation measures proposed in this Draft EIS is included at the end of this chapter.

CUMULATIVE IMPACT SCENARIO

CEQ regulations that implement the provisions of NEPA require that cumulative impacts be assessed in the decision-making process for federal projects. Cumulative impacts are defined by CEQ regulations 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 nonfederal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. DO-12 states that, "a complete picture of forces already acting upon a particular environmental resource is essential in making reasonable decisions about the management of that resource."

Cumulative impacts can result in unintended adverse environmental effects despite efforts to mitigate for individual actions' specific direct and indirect impacts. The purpose of a cumulative impacts analysis is thus to identify the potential for incremental increased environmental effects caused by a series of actions.

Similar to the scope of analysis for the Project, the geographic boundaries used for the cumulative impacts analyses vary by resource. In general, the scopes of the cumulative impact analyses are consistent with the study areas defined for each resource. The cumulative impact analyses include consideration of the past, present, and reasonably foreseeable future actions.

Projects and actions that could contribute to cumulative effects could occur as part of NPS and TNC activities in Santa Cruz Island and the Channel Islands Park system, and as a result of activities outside the park. Projects and actions that may affect the Channel Islands were identified and summarized in the GMP/Wilderness Study/EIS (NPS 2015a). Past, present, and future projects and actions relevant to Santa Cruz Island and the proposed Project are summarized in the following paragraphs. The actions and projects are present or foreseeable future actions, unless otherwise noted.

Actions and projects inside the park that could contribute to cumulative effects are as follows:

- Other approved ecosystem restoration efforts (e.g., nonnative vegetation removal on all islands).
- Possible establishment of new populations of listed plant species on the islands and seed collections.
- Management of fish populations and fisheries by the state and federal governments.
- Management of MPAs.
- Management/maintenance of roads and trails.
- Efforts to establish new populations of listed plant species on the islands and to establish seed collections.
- Continued management of resources by TNC on Santa Cruz Island.
- Restoration of native plant communities through removal of nonnative plants and planting of native plants.
- Restoration of the wetlands in the Prisoners Harbor area.
- Continuing permitted scientific research, inventory, and monitoring of natural and cultural resources.
- Commercial and sport fishing in waters in the park boundary.
- Increased number of kayakers at Scorpion Pier.
- Replacement-in-kind of island infrastructures (e.g., piers, docks, cranes, housing, and utility systems).

Actions and projects outside the park that could contribute to cumulative effects are as follows:

- Revision of the Channel Islands National Marine Sanctuary Plan (past action).
- Drilling for oil and gas and continuing exploration for oil and gas.
- Continuing use of the Santa Barbara Channel by large vessel north-south traffic.

- Continuing military use of the Santa Cruz Navy base.
- Expanding testing and training operations at the Naval Air Warfare Center's Point Mugu Sea Range.
- Federal and state governments managing fish populations and fisheries.

Cumulative impacts were evaluated by comparing the impacts of the alternatives under evaluation, including the No Action Alternative, with those of the past, present, and reasonably foreseeable future actions listed in this section.

In this chapter, resource-specific cumulative impact analyses are presented alongside an alternative's direct and indirect impacts. The analyses do not specifically call out each action from the list in this section unless the impacts of the alternative under evaluation, combined with those of the action, are cumulatively major.

TRANSPORTATION AND CIRCULATION

METHODOLOGY AND THRESHOLDS

The methodology for assessing transportation and circulation impacts compared conditions of the Project alternatives to baseline conditions using specific significance thresholds to determine Project impacts. The proposed measurement indices (i.e., significance thresholds) used to evaluate impacts to these topic areas are based on the proposed Project's consistency with applicable regional and local regulations and guidance.

An alternative would be considered to have a major impact if, as compared to baseline conditions, it would exceed established regulatory guidance or contribute substantially to facilities that already exceed established regulatory guidance under the baseline conditions and the effect of the deficiency or contribution to an existing deficiency would be an area-wide issue. An alternative that caused conditions to exceed established regulatory guidance or contributed substantially to deficient baseline conditions, but where the deficiency was isolated to a single location and not likely to have a large effect on the regional transportation network, would be considered moderate. An alternative would be considered to have a minor impact if its impacts would not cause conditions to exceed established regulatory guidance or would not contribute substantially to deficient baseline conditions.

IMPACTS OF THE NO ACTION ALTERNATIVE

The No Action Alternative assumes that the existing Scorpion Pier and approach roadway would continue to provide NPS and concessioner access to Santa Cruz Island. No construction or permanent modifications to the existing Scorpion Pier or approach roadway would occur under the No Action Alternative, and the existing pier and access roadway would continue to be maintained by the Park Service. However, as stated previously, the existing pier is degrading and will eventually become unsafe and unusable.

The No Action Alternative assumes no change in concessioner operations bringing visitors to Santa Cruz Island. Although the number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity, visitation to the island is primarily controlled by the concessioner contract, weather, and park rules and regulations (i.e., the GMP/Wilderness Study/EIS and Park Superintendent's public use limits for island; NPS 2014a). The No Action Alternative assumes continuation of existing concessioner contracts and no change to ferry vessel capacities or number of crossings.

Impact Analysis

There would be no construction in the No Action Alternative. Therefore, the No Action Alternative would have no construction-related impacts.

NPS operations, including continued maintenance of the access road and pier, would not affect the local off-island transportation network; conflict with an applicable plan, ordinance, or policy; or conflict with an applicable congestion management program.

Currently, the existing pier cannot be accessed by all NPS vehicles due to size restrictions. Inclement weather and tides also limit vehicle access. Existing access disruptions would increase over time as the pier and access road continue to degrade until it eventually becomes unusable. Therefore, operation of the No Action Alternative would result in long-term, major, adverse impacts to transportation and circulation.

Cumulative Impact Analysis

There would be major impacts to existing transportation resources from the No Action Alternative due to the eventual loss of access to the pier. Therefore, the incremental contribution of the No Action Alternative on transportation and circulation would be major.

Mitigation

No mitigation is proposed. The No Action Alternative would result in major impacts to transportation resources, which could only be alleviated by upgrading the existing pier and roadway.

Conclusion

Under the No Action Alternative, the existing pier would continue to degrade until it becomes unsafe and unusable. This would result in a long-term, major, adverse impact to transportation.

IMPACTS OF ALTERNATIVE 1

Alternative 1 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier, oriented nearly parallel to the existing pier and extended farther into deeper water. An improved 435-foot-long elevated access road would connect the new pier terminus to North Scorpion Valley Road. The improved road would be supported by a new steel sheetpile retaining wall, and additional protective rock armoring would be installed along the shoreline to protect the road. Alternative 1 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

Marine vessels would access this site via the Santa Barbara Channel. Construction would include limited round-trip marine vessel service to deliver materials and workers. Once on-island, construction vessels and equipment would remain on-island until construction was completed. Construction workers would also stay primarily on-island for the duration of the construction project. Therefore, construction would not affect the local off-island transportation network; conflict with an applicable plan, ordinance, or policy; or conflict with an applicable congestion management program.

Construction of the pier, however, would temporarily disrupt NPS on-island access while the new pier and access road are constructed. Short-term construction impacts would result in the need for small boat launches to take visitors and goods from the ferry to the beach while the pier and access road are constructed. This temporary disruption would result in a short-term, moderate, adverse impact compared to the No Action Alternative.

Construction of the pier and access road would reduce existing access hazards resulting from the design of the existing pier, and would increase the performance and safety of NPS facilities. The new pier would also increase NPS vehicle and the crane truck's access to the end of the pier. Therefore, Alternative 1 would result in beneficial long-term impacts on the transportation network compared to the No Action Alternative.

Cumulative Impact Analysis

There would be moderate short-term impacts to existing transportation resources on Santa Cruz Island during construction and beneficial long-term impacts on the local transportation network from Alternative 1. Therefore, the incremental contribution of Alternative 1 on transportation and circulation would not be major.

Mitigation

No mitigation is proposed.

Conclusion

Alternative 1 may cause short-term, moderate, adverse impacts to on-island transportation resources during construction. However, Alternative 1 would result long-term beneficial impacts to transportation resources on Santa Cruz Island and improved transportation conditions compared to existing conditions. This alternative would have no impact on local transportation resources.

IMPACTS OF ALTERNATIVE 2

Alternative 2 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier approximately 300 feet south of the existing pier. A steel sheetpile retaining wall and rock armoring would be constructed to support and protect the approximately 110-foot-long access road that would connect the new pier terminus to North Scorpion Valley Road. Alternative 2 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

Marine vessels would access the site via the Santa Barbara Channel. Construction would include limited round-trip marine vessel service to deliver materials and workers. Once on-island, construction vessels and equipment would remain on-island until construction was completed. Construction workers would also stay primarily on-island for the duration of the construction project. Therefore, construction would not affect the local off-island transportation network; conflict with an applicable plan, ordinance, or policy; or conflict with an applicable congestion management program.

Construction of the pier would not affect on-island resources, as the existing pier and access road would continue to be used while the new pier and access road are constructed. Construction of the pier and access road would reduce existing access hazards resulting from the design of the existing pier, and would increase the performance and safety of NPS facilities. The new pier would also increase NPS vehicle and the crane truck's access to the end of the pier. Therefore, Alternative 2 would result in beneficial long-term impacts on transportation resources compared to the No Action Alternative.

Cumulative Impact Analysis

There would be beneficial long-term impacts and no adverse impacts on existing transportation resources on Santa Cruz Island and the local transportation network from Alternative 2. Therefore, Alternative 2 would not result in any cumulative impacts.

Mitigation

No mitigation is proposed.

Conclusion

Alternative 2 would result long-term beneficial impacts to transportation resources on Santa Cruz Island and improved transportation conditions compared to the No Action Alternative. Alternative 2 would have no impact on local transportation resources.

AIR QUALITY

METHODOLOGY AND THRESHOLDS

Construction

Sources of construction emissions would include tugs, barges, off-road construction equipment, and on-road vehicles. The following assumptions were made in assessing construction emissions:

- Construction equipment includes pile installation equipment, a crew boat that transports the crew to and from the island, a boat and barge to haul equipment to and from the island, a pickup truck on the island to transport equipment and demolition material to and from the stockpile area, chain saws, a compressor, and a generator.
- Construction of Alternative 1 would require 30 weeks. Construction of Alternative 2 would require 26 weeks.
- SBAPCD recommends that the basic construction mitigation measures shown in Table 11 be applied to all projects, regardless of whether construction emissions exceed significance thresholds (SBAPCD 2014). This analysis considers the basic construction mitigation measures as applicable as part of the Project and not as mitigation measures.

TABLE 11. BASIC CONSTRUCTION MITIGATION MEASURES

PM_{10} (Dust): These measures are required for all projects involving earthmoving activities regardless of the project size or duration. The measures are based on policies adopted in the 1979 Air Quality Action Plan for Santa Barbara County. Proper implementation of these measures is assumed to fully mitigate fugitive dust emissions.
• During construction, use water trucks or sprinkler systems to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. At a minimum, this should include wetting down such areas in the late morning and after work is completed for the day. Increased watering frequency should be required whenever wind speed exceeds 15 mph. Reclaimed water should be used whenever possible. However, reclaimed water should not be used in or around crops for human consumption. • Not applicable to the proposed Project given the location and lack of potable water on the island.
• Minimize the amount of disturbed area and reduce on site vehicle speeds to 15 mph or less.
• If importation, exportation, and stockpiling of fill material is involved, soil stockpiled for more than 2 days shall be covered, kept moist, or treated with soil binders to prevent dust generation. Trucks transporting fill material to and from the site shall be tarped from the point of origin.
• After clearing, grading, earth moving, or excavation is completed, treat the disturbed area by watering or revegetating, or by spreading soil binders until the area is paved or otherwise developed so that dust generation would not occur.
• The contractor or builder shall designate a person or persons to monitor the dust control program and to order increased watering, as necessary, to prevent the transport of dust off site. Their duties shall include holiday and weekend periods when work may not be in progress. The name and telephone number of such persons shall be provided to SBAPCD prior to land use clearance for map recordation and land use clearance for finish grading of the structure.

• Prior to land use clearance, the applicant shall include, as a note on a separate informational sheet to be recorded with map, these dust control requirements. All requirements shall be shown on grading and building plans.
Equipment Exhaust: The following is a list of regulatory requirements and control strategies that should be implemented to the maximum extent feasible. Measures shall be shown on grading and building plans, and shall be adhered to throughout grading, hauling and construction activities.
The following are required by state law:
• All portable diesel-powered construction equipment shall be registered with the state's portable equipment registration program OR shall obtain an SBAPCD permit.
• Fleet owners of mobile construction equipment are subject to CARB Regulation for In-use Off-road Diesel Vehicles (Title 13 CCR, Chapter 9, Section 2449), the purpose of which is to reduce diesel PM and criteria pollutant emissions from in-use (existing) off-road diesel-fueled vehicles. For more information, please refer to the CARB website at www.arb.ca.gov/msprog/ordiesel/ordiesel.htm.
• All commercial diesel vehicles are subject to Title 13 CCR, Section 2485, limiting engine idling time. Idling of heavy-duty diesel construction equipment and trucks during loading and unloading shall be limited to 5 minutes; electric auxiliary power units should be used whenever possible.
• The following measures are recommended:
• Diesel construction equipment meeting CARB Tier 1 emission standards for off-road, heavy-duty diesel engines shall be used. Equipment meeting CARB Tier 2 or higher emission standards should be used to the maximum extent feasible.
• Diesel powered equipment should be replaced by electric equipment whenever feasible.
• If feasible, diesel construction equipment shall be equipped with selective catalytic reduction systems, diesel oxidation catalysts and diesel particulate filters as certified and/or verified by the USEPA or the state of California.
• Catalytic converters shall be installed on gasoline-powered equipment, if feasible.
• All construction equipment shall be maintained in tune per the manufacturer's specifications.
• The engine size of construction equipment shall be the minimum practical size.
• The number of construction equipment operating simultaneously shall be minimized through efficient management practices to ensure that the smallest practical number is operating at any one time.
• Construction worker trips should be minimized by requiring carpooling and by providing for lunch on site.

Notes:
SBAPCD – Santa Barbara Air Pollution Control District
CARB – California Air Resources Board
CCR – California Code of Regulations
mph – miles per hour
PM – particulate matter

Operations

Sources of operational emissions would include marine ferries and limited on-road vehicles. There would be no changes in operations as a result of the Project; therefore, no new emissions are assumed.

Thresholds

SBAPCD developed guidelines to assist lead agencies in complying with requirements of CEQA (SBAPCD 2014). These guidelines provide reference thresholds for considering whether a project would have a significant air quality impact and also provide recommended procedures for evaluating potential air quality impacts during the environmental review process. Although the SBAPCD guidelines were developed to assist with the CEQA process, they are often used in NEPA analyses for projects in the air basin.

SBAPCD has not set thresholds for air emissions from short-term construction activities (SBAPCD 2013). However, standard dust control measures must be implemented for any discretionary project involving earth-moving activities. Some projects have the potential for construction-related dust to cause a nuisance. Because Santa Barbara County violates the state standard for PM_{10}, dust mitigation measures are required for all discretionary construction activities regardless of the significance of the fugitive dust impacts based on the policies in the 1979 Air Quality Attainment Plan.

Federal Conformity

Section 176(c) of the Clean Air Act prohibits federal entities from taking actions in nonattainment or maintenance areas which do not conform to the SIP for the attainment and maintenance of NAAQS. Therefore, the purpose of conformity is to (1) ensure federal activities do not interfere with the budgets in the SIPs; (2) ensure actions do not cause or contribute to new violations, and (3) ensure attainment and maintenance of NAAQS. Construction of Alternative 1 would require 30 weeks. Construction of Alternative 2 would require 26 weeks. The construction equipment and associated construction activities would be well below the levels that would trigger a conformity analysis.

GHG Emissions

GHG emissions were qualitatively assessed for construction activities and compared the incremental emissions to the CEQ reference point of 25,000 metric tons per year.

Odors

The potential for odors at sensitive receptors in the vicinity of the proposed alternatives was assessed qualitatively.

Impact Classification

The Park Service assesses impacts in terms of type, context, duration, intensity, and whether the impact is direct or indirect as summarized in Table 12.

TABLE 12. NPS AIR QUALITY IMPACT CLASSIFICATION

Classification	Description
Type	Impacts can be either beneficial or adverse. A beneficial impact would be a positive change in air quality or a change that would move air quality toward a desired condition. An adverse impact would be a change that would move air quality away from a desired condition or would detract from its condition.
Duration	Duration describes the length of time over which an impact would occur. Short-term impacts are those caused by construction activities or temporary changes in operations; air quality would return to conditions prevalent prior to the commencement of these activities, once these activities have ceased. Long-term impacts would last well beyond the construction period or the temporary operational change, and air quality may not return to previous conditions.
Intensity	Intensity describes the degree, level, or strength of an impact. Intensity levels used in this air quality standard are based on USEPA's Air Quality Index that correlates criteria pollutant concentrations to associated health concern categories. The NPS 2011 Air Quality Guidance (NPS 2011c) recommends the use of the Air Quality Index methodology and NAAQS thresholds for characterizing impact levels for assessing human health. Because SBAPCD is the air quality district of authority in the Project area, the thresholds for Project alternatives are based, for the most part, on the Air Quality Index methodology and the SBAPCD thresholds. Intensity levels are categorized as follows: • Negligible: The impact would occur at or below the lowest levels of detection and for the purposes of this air quality standard, is defined as no change from existing conditions. • Minor: The impact would be slight, but detectable. For the purposes of this air quality standard, an alternative would result in minor impacts if emissions are less than 50% of applicable air quality thresholds • Moderate: The impact would be readily apparent. For the purposes of this air quality standard, an alternative would result in moderate impacts if emissions are between 51% and 99% of applicable air quality thresholds. • Major: The impact would be substantial. For the purposes of this air quality standard, a major impact would equal or exceed applicable air quality thresholds.

Source: NPS 2011c

IMPACTS OF THE NO ACTION ALTERNATIVE

The No Action Alternative assumes that the existing Scorpion Pier and approach roadway would continue to provide NPS and concessioner boat access to Santa Cruz Island. No construction of permanent modifications to the existing Scorpion Pier or approach roadway would occur under the No Action Alternative. Given the temporary nature of the existing roadway and the deteriorated state of the existing pier (estimated lifespan of 3 to 5 years absent repairs; WJE 2012), there would likely be a continuation of emergency and short-term repair and maintenance activities to preserve use of the existing pier and roadway. However, the scope and scale of those repairs is not known and not considered in this EIS.

The No Action Alternative assumes no change in concessioner operations bringing visitors to Santa Cruz Island. Although the number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity, visitation to the island is primarily controlled by the concessioner contract, weather, and park rules and regulations (i.e., the GMP/Wilderness Study/EIS and Park Superintendent's public use limits for island;

NPS 2014a). The No Action Alternative assumes continuation of existing concessioner contracts and no change to ferry vessel capacities or number of crossings.

Impact Analysis

The No Action Alternative does not propose construction or changes to existing operations. Therefore, the No Action Alternative would not result in impacts related to air quality or climate change.

Cumulative Impact Analysis

The No Action Alternative would result in no impacts related to existing air quality or climate change; therefore, there would be no cumulative impacts.

Mitigation

No mitigation is proposed.

Conclusion

The No Action Alternative proposes air quality conditions consistent with existing conditions, as well as federal regulations that govern the site. Therefore, the No Action Alternative would result in no impacts to air quality.

IMPACTS OF ALTERNATIVE 1

Alternative 1 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier, oriented nearly parallel to the existing pier and extended farther into deeper water. An improved 435-foot-long elevated access road would connect the new pier terminus to North Scorpion Valley Road. The improved road would be supported by a new steel sheetpile retaining wall, and additional protective rock armoring would be installed along the shoreline to protect the road.

Alternative 1 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

Construction of the pier is estimated to take approximately 30 weeks. Construction would consist of the following phases:

1. Demolition of the existing pier
2. Pile installation (pier, and indicator piles) installing 24 each 18-inch-diameter steel piles, 9 each 16-inch-diameter steel berthing piles, and 19 each 12-inch-diameter fiberglass fender piles
3. Construction of the pier as described in the "Design Criteria" section
4. Excavation to accommodate the improved access road
5. Construction of the steel sheetpile retaining wall and rock armoring
6. Grading and improvement of the access road

Demolition, pile installation, and pier deck construction would occur sequentially, with construction of the access road occurring after pier construction. Construction would occur Monday through Saturday for 8 hours each day within normal working hours (7:00 a.m. to 7:00 p.m.).

Construction of Alternative 1 would result in localized, short-term, minor, adverse impacts compared to the No Action Alternative. No changes to existing operations are proposed; therefore, Alternative 1 would not result in operational air quality impacts.

Air Conformity Analysis. NEPA requires preparation of an air conformity analysis for all projects. Alternative 1 would result in localized, minor, short-term air quality impacts during construction. These impacts would be below all applicable air quality standards; therefore, a conformity analysis would not be required.

Odors and Sensitive Receptors. Construction of the proposed Project would

not create objectionable odors. There are no schools, hospitals, or other sensitive receptors located near the Project locations; therefore, no impacts would occur to sensitive receptors. There would be no impacts from odor or impacts on sensitive receptors.

GHG Emissions. Construction would result in emissions of combustion-related pollutants. This would be the only source of GHG emissions as a result of Alternative 1 and would be below the CEQ reference point of 25,000 metric tons per year. Therefore, GHG impacts resulting from Alternative 1 would be localized, short-term, and minor compared to the No Action Alternative.

Cumulative Impact Analysis

There would be short-term, minor, adverse air quality and GHG impacts from Alternative 1. Because these impacts would be limited to construction, there would be no cumulative impacts.

Mitigation

No mitigation is proposed.

Conclusion

Alternative 1 would result in localized, short-term, minor impacts on air quality compared to the No Action Alternative.

IMPACTS OF ALTERNATIVE 2

Alternative 2 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier approximately 300 feet south of the existing pier. A steel sheetpile retaining wall and rock armoring would be constructed to support and protect the approximately 110-foot-long access road that would connect the new pier terminus to North Scorpion Valley Road. Alternative 2 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

Construction of the pier is estimated to take approximately 26 weeks. Construction would consist of the following phases:

1. Demolition of the existing pier
2. Pile installation (pier, and indicator piles) installing 38 each 18-inch-diameter steel piles, 9 each 16-inch-diameter steel berthing piles, and 19 each 12-inch-diameter fiberglass fender piles
3. Construction of the pier as described in the "Design Criteria" section
4. Excavation to accommodate the improved access road
5. Construction of the steel sheetpile retaining wall and rock armoring
6. Grading and improvement of the access road

Demolition, pile installation, and pier deck construction would occur sequentially, with construction of the access road overlapping pier construction. Construction would occur Monday through Saturday for 8 hours within normal working hours (7:00 a.m. to 7:00 p.m.).

Because of the overlapping geographic boundaries and similar (though reduced) required construction activities of Alternatives 2 and 1, the impacts of construction with respect to air quality that would occur as a result of Alternative 2 would be equivalent to those of Alternative 1. Neither alternative would result in operational impacts.

The impact analysis and cumulative impact analysis determinations, mitigation measures, and conclusions for Alternative 2 would be the same as those of Alternative 1.

NOISE AND VIBRATION

METHODOLOGY AND THRESHOLDS

Potential noise and vibration impacts from construction of the Project were analyzed in compliance with NPS management policies, DO-47, and the GMP/Wilderness Study/EIS, as well as the FTA's *Noise and Vibration Impact Assessment* (FTA 2006). The Project does not propose to alter the availability or capacity of existing land uses or park operations at Scorpion Anchorage. As such, potential impacts from long-term operation of the Project are not anticipated and therefore were not quantified because the long-term operational noise and vibration levels proposed by the Project are anticipated to remain the same as baseline conditions.

The measurement index used to evaluate construction noise and vibration impacts was based on an alternative's consistency with noise and vibration thresholds identified in these guidance documents. An alternative was considered to have a major impact if it exceeded the thresholds.

Assessment Criteria for Construction Impacts

FTA defines noise levels for different types of land uses, including:

- Category 1: Tracts of land where quiet is an essential element to their intended purpose.
- Category 2: Residences and buildings where people normally sleep.
- Category 3: Institutional land uses with primarily daytime and evening use.

Specifically, FTA requires that noise levels from construction be maintained below 100 dBA at 50 feet from the source in commercial/institutional zones, and below 90 dBA in residential zones. Table 13 depicts how these quantitative noise levels correspond to receptors sensitive to noise and vibration levels. The qualitative noise levels identified by the Park Service for these receptors are also depicted in Table 13.

TABLE 13. NOISE LEVELS APPLICABLE TO NEARBY SENSITIVE RECEPTORS

Receptor		FTA		NPS	
Description	Reason for Potential Sensitivity	Category	Noise Level (Quantitative)	Zone	Noise Level (Qualitative)
Visitors seeking solitude	Desire for quiet	1	100 dBA	Backcountry	Low
Scorpion Ranch historic structures	Structurally fragile	3	100 dBA	Cultural Landscape	Moderate
Lower Campground overnight campers	Susceptible to sleep disturbances	2	90 dBA[1]	Frontcountry	High
Ranger residences	Susceptible to sleep disturbances	2	90 dBA[2]	Administrative	High

Notes:
1. The Park Service identifies Frontcountry zones as areas with high noise levels due to heavy visitor traffic. However, because overnight campers at the Lower Campground are expected to treat the campground as a temporary residence, this analysis applies an FTA noise level of 90 dBA (instead of the standard 100 dBA for commercial/institutional zones) for this specific receptor to more accurately reflect the FTA noise threshold for residences. The remainder of the Frontcountry areas are analyzed assuming the FTA noise level maximum of 100 dBA.
2. The Park Service identifies Administrative zones as areas specific to NPS operations. The potential for high noise levels is expected due to the operation of loud maintenance equipment. However, because the ranger residences are

expected to provide temporary residence for one or more rangers, this analysis applies an FTA noise level of 90 dBA (instead of the standard 100 dBA for commercial/institutional zones) for this specific receptor to more accurately reflect the FTA noise threshold for residences. The remainder of the Administrative areas are analyzed assuming the FTA noise level maximum of 100 dBA.

While the Park Service does not provide specific guidance for ground vibration, the FTA suggests that maintaining a safe level of 0.12 PPV or below at 25 feet from the source is appropriate for construction occurring near fragile buildings. This analysis assumed that the source of construction vibration would be construction equipment along the outer boundary of the proposed sites.

To evaluate each alternative's consistency with governing regulations, noise and vibration impacts from short-term construction were assessed using the following:

- **Proximity of Sensitive Receptors to Construction Noise.** For this analysis, construction equipment was assumed to be the source of construction noise. Per FTA guidance regarding fixed facilities spread over a large area, the distance from sensitive receptors to construction equipment was measured from the outer boundary of the receptor to the outer boundary of the proposed site where construction activities are likely to occur (FTA 2006). These boundaries are depicted in Figure 10.
- **Noise and Vibration Levels of Proposed Construction Equipment.** Using data and formulas provided by FTA, noise and vibration levels were calculated for the Project's proposed construction equipment, as summarized in the following paragraphs.

Table 14 depicts the typical noise levels for proposed construction equipment based on noise data published by the FTA (FTA 2006). Similarly, Table 15 depicts typical vibration levels.

TABLE 14. TYPICAL NOISE LEVELS OF PROPOSED CONSTRUCTION EQUIPMENT

Equipment	Noise Level (dBA)[1] At 50 feet	At 100 feet
Roller	74	68
Pump	76	70
Saw	76	70
Backhoe	80	74
Air Compressor	81	75
Generator	81	75
Compactor	82	76
Concrete Pump	82	88
Shovel	82	76
Mobile Crane	83	77
Scarifier	83	77
Concrete Mixer	85	79
Dozer	85	79
Grader	85	79
Impact Wrench	85	79
Loader	85	79
Jackhammer	88	82
Truck	88	82
Paver	89	83
Scraper	89	83
DTH Hammer Drill[2]	93	87
Vibratory Pile Driver	96	90
Impact Pile Driver	101	95

Notes:
1. The typical noise levels of construction equipment at 50 feet are based on data provided in Table 12-1 of the FTA's 2006 *Transit Noise and Vibration Impact Assessment*. Per FTA guidance, the noise levels of proposed construction equipment at other distances (e.g., 100 feet) were calculated assuming an attenuation rate of 6 dBA per doubling of distance (or Ni = No – 30 (log Di/Do), where Ni = the attenuated noise level and No = the reference noise level).
2. Noise data for the DTH hammer drill was unavailable from FTA and subsequently obtained from the Health and Safety Executive (HSE 1993).
DTH = down the hole

TABLE 15. TYPICAL VIBRATION LEVELS OF PROPOSED CONSTRUCTION EQUIPMENT

Equipment	Vibration Level (PPV)[1]			
	At 10 feet	At 25 feet	At 50 feet	At 100 feet
Small Bulldozer	0.012	0.003	0.001	0.000
Jackhammer	0.138	0.035	0.012	0.004
Loaded Trucks	0.300	0.076	0.027	0.010
Large Bulldozer/ Drilling	0.352	0.089	0.031	0.011
Pile Driver, Vibratory	0.672	0.170	0.060	0.021
Pile Driver, Impact	2.546	0.644	0.228	0.081

Note:
1. The typical vibration levels (PPV) of construction equipment at 25 feet are based on data provided in Table 12-2 of the FTA's 2006 *Transit Noise and Vibration Impact Assessment*. Per FTA guidance, the vibration levels of proposed construction equipment at other distances (i.e., 10, 50, and 100 feet) were calculated using the following equation: PPV at Distance D = PPV (at 25 feet) x ($[25/D]^{1.5}$).

To calculate noise levels generated by the proposed construction equipment, this analysis used FTA's recommended assessment "for projects in an early stage when the equipment roster and schedule are undefined" (FTA 2006). Based on this type of assessment, noise levels were calculated assuming a 50-foot emission level of the two noisiest pieces of proposed equipment during full power operation over a 1-hour time period because "most construction equipment operates continuously for periods of one hour or more at some point in the construction period." Additionally, this 1-hour period was assumed to occur exclusively between the daytime hours of 7:00 a.m. to 7:00 p.m. and along the outer boundary of the proposed sites (shown in Figure 10). Free-field conditions were also assumed, and ground effects were ignored. From the list of proposed construction equipment shown in Table 14, the impact and vibratory pile drivers are anticipated to generate the loudest noise with a combined dBA of 102 at 50 feet from the source (or outer boundary of the proposed sites) and an attenuation rate of 6 dBA per doubling of distance (see Appendix B for detailed logarithmic calculations).

To calculate vibration emitted from proposed construction equipment, this analysis evaluated impacts based on the 25-foot emission level of the most significant source of vibration, as instructed by the FTA. Based on the proposed construction equipment for this Project, the impact pile driver is anticipated to generate the highest PPV of 0.644 at 25 feet from the source (or proposed site's outer boundary).

IMPACTS OF THE NO ACTION ALTERNATIVE

The No Action Alternative assumes that the existing Scorpion Pier and approach roadway would continue to provide NPS and concessioner access to Santa Cruz Island. No construction or permanent modifications to the existing Scorpion Pier or approach roadway would occur under the No Action Alternative, and the existing pier and access roadway would continue to be maintained by the Park Service.

The No Action Alternative assumes no change in concessioner operations bringing visitors to Santa Cruz Island. Although the number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity, visitation to the island is primarily controlled by the concessioner contract, weather, and park rules and regulations (i.e., the GMP/Wilderness Study/EIS and Park Superintendent's public use limits for island; NPS 2014a). The No Action Alternative assumes continuation of existing concessioner contracts and no change to ferry vessel capacities or number of crossings.

Impact Analysis

The No Action Alternative does not propose construction or changes to existing operations. Therefore, the No Action Alternative would not result in impacts to the existing noise and vibration levels.

Cumulative Impact Analysis

Because there would be no impacts of the No Action Alternative to existing noise or vibration levels, there would also be no cumulative impacts.

Mitigation

No mitigation is proposed.

Conclusion

The No Action Alternative proposes noise and vibration levels consistent with existing conditions, as well as federal regulations that govern the site. Therefore, the No Action Alternative would not result in impacts to noise and vibration.

IMPACTS OF ALTERNATIVE 1

Alternative 1 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier, oriented nearly parallel to the existing pier and extended farther into deeper water. An improved 435-foot-long elevated access road would connect the new pier terminus to North Scorpion Valley Road. The improved road would be supported by a steel sheetpile retaining wall, and protective rock armoring would be installed along the shoreline to protect the road. Alternative 1 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

This alternative would require using equipment (listed in Table 15) during different phases of construction that could increase noise and vibration levels at the four sensitive receptors in the vicinity of Alternative 1. Following FTA guidance, the potential exposure of these receptors to construction noise was calculated assuming an attenuation rate of 6 dBA per doubling of distance from the construction equipment assumed to occur along the outer boundary of the proposed site (see Figure 10).

The results of these calculations (detailed in Appendix B) and their consistency with FTA regulations are presented in Table 16.

TABLE 16. ALTERNATIVE 1 CONSTRUCTION NOISE AT SENSITIVE RECEPTORS

Receptor	Visitors Seeking Solitude	Lower Campground Overnight Campers	Scorpion Ranch Historic Buildings	Ranger Residences
Applicable FTA Daytime Construction Noise Criterion (dBA)	90	100	100	90
Distance from Outer Boundary of Receptor to Outer Boundary of Alternative Site (feet)	0	1,110	140	1,500
Existing Noise Level without Project (dBA, L_{dn})	Unknown			
L_{max} Contribution from Construction (dBA)	108	0	91	0
Exceeds Applicable FTA Criteria?	Yes	No	No	No

Notes:
dBA – A-weighted decibels
FTA – Federal Transit Administration
L_{dn} – Day-Night Noise Level
L_{max} – Maximum Noise Level

The maximum noise contribution from the simultaneous operation of the two loudest pieces of equipment is anticipated to be 102 dBA at 50 feet from site's outer boundary. Assuming an attenuation rate of 6 dBA per doubling of distance, noise from this alternative's construction activities would not be anticipated to exceed the FTA's maximum daytime construction noise level (of 100 dBA for commercial/industrial uses and 90 dBA for residential uses) at nearby receptors. The only exception would be for visitors seeking solitude adjacent to the Project site (essentially zero feet from the boundary). However, this exceedance reflects a worst-case scenario in which the two loudest pieces of construction equipment would be operated simultaneously.

Additionally, it is important to note that, when searching for areas that provide the quiet needed for solitude, it can be assumed that visitors would avoid active construction activities proposed by Alternative 1 and instead navigate to other nearby backcountry/wilderness areas (i.e., farther north or south along the shoreline or inland toward Scorpion Canyon). The majority of Santa Cruz Island is zoned as Backcountry land. Assuming the worst-case scenario of a 108 dBA noise level during construction at 0 feet from the source, visitors would need to remain no more than 70 feet away to perceive 100 dBA (threshold for Category 1 and 3 land uses) or 150 feet away to perceive 90 dBA (threshold for Category 2 land uses). Therefore, with the implementation of mitigation measure Noise-MM-1, Alternative 1 would result in negligible impacts to off-site receptors and short-term, moderate, adverse impacts to receptors directly adjacent to construction activities.

Regarding vibration impacts during construction, the FTA suggests a level of 0.12 PPV or less be maintained at buildings extremely susceptible to vibration damage (i.e., historic buildings or vibration-sensitive manufacturing facilities). Based on the PPV levels of the proposed construction equipment, FTA's criteria for even the most fragile of buildings would be anticipated to be maintained so long as these buildings are 80 feet or more from the vibration source or alternative site's outer boundary. As such, there would be no vibration impacts at sensitive receptors resulting from Alternative 1, as the closest historic structure is 140 feet away. Impacts to historic structures and archeological resources under Section 106 of the NHPA are considered in the "Cultural and Historic Resources" section of this chapter.

Alternative 1 assumes no Project-related increase in visitation numbers to Santa Cruz Island. Therefore, there would be no new operational impacts under Alternative 1.

Cumulative Impact Analysis

Construction-related noise and vibration levels are anticipated to remain within acceptable levels at off-site receptors and would therefore cause no cumulative impact at these locations. Construction-related noise may exceed recommended thresholds for visitors seeking solitude adjacent to the study area. However, due to the temporary nature of construction and the implementation of mitigation measure Noise-MM-1, there would not be any cumulative impacts to noise and vibration.

Mitigation

The recommended potential mitigation measure is described in the following paragraphs.

Noise-MM-1. The Park Service would ensure that the contractor does the following, to the extent feasible:

- When feasible, install noise mufflers to stationary equipment and impact tools that are no less effective than those provided by the manufacturer
- Install barriers around particularly loud activities at the construction site to eliminate the line of sight between the source of noise and nearby sensitive receptors
- Surround the air compressors powering the DTH hammer with a noise wall or shroud on three sides to help shield visitors, staff, and biota from any noise from the compressors
- When feasible, use construction equipment with low noise emission ratings
- Locate equipment, materials, and staging areas as far as practicable from sensitive receptors
- Prohibit unnecessary idling of vehicles or equipment
- Require applicable construction-related vehicles or equipment to use designated truck routes to access the Project site
- Restrict construction activities between 7:00 a.m. to 7:00 p.m. Monday through Saturday
- Prohibit visitor access to no less than 70 feet from active construction equipment that exceeds 90 dBA

Conclusion

Following the implementation of mitigation measure Noise-MM-1, Alternative 1 would result in negligible construction impacts to off-site receptors and potential short-term, moderate, adverse impacts to visitors located directly adjacent to the Project site during construction compared to the No Action Alternative. Any impacts would be short-term, and there are no long-term operational or cumulative impacts.

IMPACTS OF ALTERNATIVE 2

Alternative 2 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier approximately 300 feet south of the existing pier. A steel sheetpile retaining wall and rock armoring would be constructed to support and protect the approximately 110-foot-long access road that would connect the new pier terminus to North Scorpion Valley Road. Alternative 2 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

Because of the overlapping geographic boundaries and similar (though reduced) required construction activities of Alternative 2 and Alternative 1, the incremental impacts of construction with respect to noise and vibration that would occur as a result of Alternative 2 would be equivalent to those of Alternative 1.

As such, the impact analysis and cumulative impact analysis determinations, mitigation measures, and conclusions would be the same as those of Alternative 1.

GEOLOGY, SOILS, AND SEISMICITY

METHODOLOGY AND THRESHOLDS

Impacts to or associated with geological conditions were qualitatively evaluated based on the potential for the alternatives to temporarily or permanently alter the geology of the study area. In addition, because geological hazards such as earthquakes happen independently of the Project, the potential for damage to proposed structures or increased risk of injury due to geologic and seismic hazards were also qualitatively evaluated. The geology, soils, and seismicity analysis was based upon existing information available for Santa Cruz Island.

The measurement index for evaluating impacts associated with geology, soils, or seismicity is risk to the public or the environment from geologic processes. An alternative would be considered to have a major impact if it would result in substantial changes in risks to the public and the environment throughout the study area.

The analysis considered the potential for an alternative to expose people or structures to potential substantial risks due to geologic hazards, including fault rupture, ground shaking, liquefaction, subsidence and settlement, landslide or slope failure, expansive soils, tsunamis, and seiches.

Based on the environmental setting of the study area and the features of the alternatives, there would be no adverse impacts specific to the following issues:

- *Impacts from ground rupture from a known earthquake fault.* As discussed in the "Affected Environment" chapter, no active or potentially active faults cross the study area. While strong ground shaking at any of the alternatives' locations could occur as a result of regional fault activity, ground rupture is highly unlikely. Therefore, ground rupture along a known earthquake fault would not represent a hazard to the study area.
- *Construction impacts associated with geology, soils, and seismicity*. Construction of the alternatives could require soil surface disturbance, resulting in erosion. During construction, erosion control measures would be implemented that use best management practices to avoid or minimize soil erosion and off-site transport. Construction would proceed in adherence with all applicable regulations, including NPDES permit and Stormwater Pollution Prevention Plan (SWPPP) requirements. Although the likelihood of a strong earthquake occurring during construction is very low due to the short duration of construction, the existing California Occupational Safety and Health requirements sufficiently address these potential hazards. In addition, construction hazards would not affect the public, as construction sites would be restricted from public access. As a result, implementation of the alternatives would not result in construction-related adverse impacts associated with geology, soils, and seismicity.

IMPACTS OF THE NO ACTION ALTERNATIVE

The No Action Alternative assumes that the existing Scorpion Pier and approach roadway would continue to provide NPS and concessioner access to Santa Cruz Island. No construction or permanent modifications to the existing Scorpion Pier or approach roadway would occur under the No Action Alternative, and the existing pier and access roadway would continue to be maintained by the Park Service.

The No Action Alternative assumes no change in concessioner operations bringing visitors to

Santa Cruz Island. Although the number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity, visitation is primarily controlled by the concessioner contract, weather, and park rules and regulations (i.e., the GMP/Wilderness Study/EIS and Park Superintendent's public use limits for island; NPS 2014a). The No Action Alternative assumes continuation of existing concessioner contracts and no change to ferry vessel capacities or number of crossings.

Impact Analysis

The Scorpion Pier and approach roadway area would experience ground shaking in the event of a large seismic event along the Santa Cruz Island, Anacapa-Dume, or Oak Ridge faults (modeled as producing peak site acceleration of greater than 0.5 g in the event of a magnitude 7.0 to 7.5 earthquake). In addition, the low density sandy soils of the approach roadway may be susceptible to seismically induced liquefaction. Although the existing pier is supported by piles and concrete caps underlain with hard rock Miocene volcanic foundations, the on and offshore abutments have experienced some minor cracking and abrasion, which may compromise their ability to support the pier. Seismic-induced ground shaking may result in structural damage to the approach roadway and pier and possible injury or loss of life. Potential seismic induced hazards are common throughout the tectonically active Southern California and Channel Islands area, and the No Action Alternative would result in relatively minimal hazard exposure relative to developments in urban environments. The expected damage or potential harm would constitute a long-term, moderate, adverse impact under the No Action Alternative.

The steep bluff face adjacent to the pier may be susceptible to erosion or surface soil landslides. While the bluffs underlying volcanic rock materials are relatively stable, softer surface soils may be susceptible to storm or seismic-induced surficial failures. Therefore, there would be a long-term, minor, adverse impact associated with erosion or landslide under the No Action Alternative.

The approach roadway fill pad is subject to erosion during storm surges, and has necessitated repeated regrading of the road to repair damage caused by wind and waves. As sea level rises, the frequency of erosion-induced failures will increase. Shoreline erosion of the approach road would constitute a long-term, minor, adverse impact under the No Action Alternative.

Fill materials that underlie the approach roadway may be susceptible to settling and subsidence. However, because of the site's relative age, most fill compression has likely occurred as a result of natural compression and its use as a roadway. In the event of a large seismic event, there may be some localized settlement associated with liquefaction. Impacts from No Action Alternative associated with settling and subsidence would be long-term, minor, and adverse.

Clay rich soils often have expansive properties that can change volume upon wetting and drying, and thereby exert stress on buildings or other loads placed on these soils. In the Project area, clay rich soils are present in colluvial/slopewash soils that cover the surrounding hillsides, in alluvial soils in the valley bottom, and in fill soils placed to create the access roadway to the pier. These areas do not support structures that would be susceptible to damage from expansive soils. Therefore, impacts of the No Action Alternative due to expansive soils would be negligible.

The Scorpion Pier area is in a tsunami inundation area as identified by the Park Service. In Southern California, effects of tsunami waves due to distant earthquakes have been limited to a rise of a few feet (County of Santa Barbara Planning and Development 2010). Based on the low likelihood of a significant seiche or tsunami event at the Scorpion Pier area, and taking into consideration NOAA's tsunami warning

system, impacts from seiche or tsunami would be negligible under the No Action Alternative.

Cumulative Impacts

Santa Cruz Island is in a seismically active region, with geologic, soil, and seismic conditions that vary substantially within short distances. Because the No Action Alternative would be unchanged from present conditions with respect to geologic and seismic hazards, there would be no cumulative impacts related to these issues as a result of this alternative.

Mitigation

No mitigation is proposed.

Conclusion

Under the No Action Alternative, Scorpion Pier and the approach roadway would continue to be subject to long-term, moderate, adverse impacts as a result of ground shaking and liquefaction; long-term, minor, adverse impacts with respect to erosion, landslides, and seismically induced settlement; and negligible impacts with respect to expansive soils and tsunami and seiche events.

IMPACTS OF ALTERNATIVE 1

Alternative 1 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier, oriented nearly parallel to the existing pier and extended farther into deeper water. An improved 435-foot-long elevated access road would connect the new pier terminus to North Scorpion Valley Road. The improved road would be supported by a new steel sheetpile retaining wall, and additional protective rock armoring would be installed along the shoreline to protect the road. Alternative 1 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

Alternative 1 would demolish the existing pier and replace it with a new longer and wider pier in the same location. The replacement pier would be supported by steel piles installed into up to 8 feet of bedrock, and fiberglass fender piles installed into 2 feet of bedrock. An improved 435-foot-long access road would connect the new pier terminus to North Scorpion Valley Road. Rock riprap would be installed to armor the shoreline, and an extensive steel sheetpile retaining wall would be installed to protect the access road. The surface of the access road would be finished with an even layer of crushed rock.

The design and construction of these improvements would proceed in adherence with applicable laws and policies related to seismic safety requirements for design and construction. The improved roadway and replacement pier structure would have improved performance in terms of withstanding a seismic event.

Alternative 1 would be located in an area susceptible to ground shaking and possible liquefaction, which could potentially damage structures or cause injury during a large seismic event. The design of Alternative 1 has been informed in part on input from geotechnical and coastal engineers regarding wind, tides, and waves at the site. Design of the selected structure would meet vertical live loading criteria as well as lateral loading criteria due to wind, waves, and seismic events. The integrity of on-site structures including the approach road and pier would be improved as compared to existing conditions, and seismic standards for design and construction would reduce the potential for damage to structures or harm to people resulting from ground shaking and liquefaction. In the event of a major seismic event, a long-term, moderate, adverse impact could still occur. However, with implemented retrofits and improvements, Alternative 1 would have less potential for a moderate impact than under the No Action Alternative.

Alternative 1 would be located in the same area as the No Action Alternative. The approach road and pier would remain situated adjacent to the relatively steep bluff face. Surface soils above hard volcanic rock formations may be susceptible to storm or seismic-induced surficial failures, although underlying volcanic rock materials would likely be more stable. Impacts associated with landslides and bluff erosion would constitute a long-term, minor, adverse and unchanged impact as compared to the No Action Alternative.

The approach roadway fill pad may experience a small amount of erosion during high storm surf. However, the composition of the road fill, itself containing gravels and cobbles, is relatively erosion resistant and has a very low potential for shoreline erosion. Slope armoring and installation of a crushed rock surface layer would further minimize access road erosion as compared to existing conditions. These improvements would additionally protect the roadway from increased erosion potential as a result of sea level rise. Impacts associated with shoreline erosion of the approach roadway would be negligible and reduced as compared to the No Action Alternative.

Fill materials that underlie the approach roadway may be susceptible to settling and subsidence. However, because of the site's relative age, most fill compression has likely occurred as a result of natural compression and its use as a roadway. Furthermore, proper compaction techniques would be employed during construction to minimize the potential for settling and subsidence. In the event of a large seismic event, there may be some localized settlement associated with liquefaction. Impacts from Alternative 1 associated with settling and subsidence would be long-term, minor, and adverse. Based on retrofits and improvements to the access roadway, impacts due to settling and subsidence would be reduced as compared to the No Action Alternative.

Fill materials underlying the proposed replacement pier are not expected to have expansive properties, and damage due to soil expansion is unlikely. Potential expansion of fill materials underlying the approach roadway would not be expected to result in structural damage or hazard to users. Therefore, impacts from Alternative 1 due to expansive soils would be negligible and unchanged from the No Action Alternative.

Potential impacts from seiche or tsunami inundation would be similar to other Channel Island sites fronting the ocean. Based on historic records, it is anticipated that a tsunami or seiche event would result in small swells at the Project site. Taking into consideration NOAA's tsunami warning system, and the fact that the Project is being designed to account for increased wave action and sea level rise, any potential impacts from seiche or tsunami as a result of Alternative 1 would be negligible and unchanged from the No Action Alternative.

Cumulative Impacts

Because coastal Southern California is a seismically active region with highly localized geological and soil conditions, the alternative's incremental contribution to any cumulative impacts from exposing people or structures to geologic hazards, soils, and/or seismic conditions would not be major, and would be considered unchanged from the No Action Alternative.

Mitigation

No mitigation is proposed.

Conclusion

Under Alternative 1, the Scorpion Pier site would be subject to long-term, moderate, adverse impacts with respect to ground shaking and liquefaction; long-term, minor, adverse impacts with respect to bluff erosion, landslides, settling, and subsidence; and negligible impacts with respect to roadway fill pad erosion, expansive soils, and tsunami and

seiche hazard. Implementation of this alternative would reduce potential impacts to the pier and roadway and the public from seismic hazards as compared to the No Action Alternative.

IMPACTS OF ALTERNATIVE 2

Alternative 2 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier approximately 300 feet south of the existing pier. A steel sheetpile retaining wall and rock armoring would be constructed to support and protect the approximately 110-foot-long access road that would connect the new pier terminus to North Scorpion Valley Road. Alternative 2 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

Alternative 2 would include the replacement of a longer, wider pier approximately 300 feet south of the existing pier. The replacement pier would be supported by steel piles installed into up to 8 feet of bedrock, and fiberglass fender piles installed into 2 feet of bedrock. A shorter approach road connecting to Scorpion Canyon North Road would provide access to the replacement pier. The approach road slopes would be armored with a steel sheetpile retaining wall and rock armoring, and the road surface would be finished with an even layer of crushed rock.

The Alternative 2 alignment partially overlaps with the Alternative 1 alignment. The incremental impacts of Alternative 2 with respect to subsidence, settlement, landslides, and seismic hazards would be consistent with those described for Alternative 1. Under Alternative 2, the approach roadway would be shortened and the pier would be located away from the steep bluff face, thereby marginally reducing exposure to erosion or landslides relative to the No Action Alternative and Alternative 1. Nonetheless, the impact analysis and cumulative impact analysis determinations, as well as the conclusions, would be the same as those of Alternative 1.

WATER QUALITY AND HYDROLOGY

METHODOLOGY AND THRESHOLDS

Impacts on or associated with water quality and hydrology were qualitatively evaluated based on the potential for in-water and land-based construction activities, as well as future operations to be noncompliant with applicable federal, state, and local water quality and stormwater management regulations and policies.

The proposed measurement index for evaluating an alternative's water quality impacts is its consistency with these regulations and policies. An alternative would be considered to have a major impact if construction or operational activities are found to be potentially inconsistent with applicable regulations and policies.

The analysis considered the potential for an alternative to do the following:

- Violate any water quality standards or waste discharge requirements
- Create or contribute runoff water that would provide substantial additional sources of polluted runoff
- Otherwise substantially degrade water quality
- Place structures that would impede or redirect flood within the 100-year flood hazard area
- Expose people or structures to potential substantial hazards due to wave action

Based on the environmental setting of the study area and the features of the alternatives, there would be no adverse impacts specific to the following water quality and hydrology issues:

- **Substantially deplete groundwater supplies or interfere with groundwater recharge.** The Project does not involve excavation to depths that would affect aquifer systems or groundwater movement. They would not involve the construction of substantial new impervious surfaces that would impede groundwater recharge. Therefore, no long-term impacts related to groundwater would occur and these effects are not discussed further.
- **Expose people or structures to a significant risk of loss, injury, or death involving mudflow, failure of a levee, or failure of a dam.** The study area is not located near geologic conditions that would generate mudflow, in an area where there are levees and dam, or in a dam inundation zone. Therefore, exposure to these risks is not applicable to the alternatives under evaluation and these effects are not discussed further.
- **Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other authoritative flood hazard delineation map.** The Project would not construct any housing. Therefore, exposure to these risks is not applicable to the alternatives under evaluation and these effects are not discussed further.

Related potential impacts associated with water quality and hydrology are also discussed in the context of other resources sections in this chapter, including the following:

- Expose people or structures to potential substantial risks due to tsunamis and seiches; discussed in the "Geology, Soils, and Seismicity" section of this chapter
- Loss or degradation of wetlands; discussed in the "Aquatic Biological Resources" section of this chapter

IMPACTS OF THE NO ACTION ALTERNATIVE

The No Action Alternative assumes that the existing Scorpion Pier and approach roadway

would continue to provide NPS and concessioner access to Santa Cruz Island. No construction or permanent modifications to the existing Scorpion Pier or approach roadway would occur under the No Action Alternative, and the existing pier and access roadway would continue to be maintained by the Park Service.

The No Action Alternative assumes no change in concessioner operations bringing visitors to Santa Cruz Island. Although the number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity, visitation is primarily controlled by the concessioner contract, weather, and park rules and regulations (i.e., the GMP/Wilderness Study/EIS and Park Superintendent's public use limits for island; NPS 2014a). The No Action Alternative assumes continuation of existing concessioner contracts and no change to ferry vessel capacities or number of crossings.

Impact Analysis

Because no construction is proposed, the No Action Alternative would result in no impacts related to water quality or hydrology from construction.

Maintenance and operation of the existing pier has the potential to impact water quality from potential pollutant discharges of hazardous materials. Pier operations would continue to occur in adherence with plans and policies designed to address potential water quality impacts. Therefore, water quality impacts from operational use of potentially hazardous materials under the No Action Alternative would be negligible.

The study area is susceptible to inundation during a large flood event, as occurred in 1997 and 2010. These events transported and deposited massive amounts of sediment, and the 1997 event damaged facilities along the creek. Under the No Action Alternative, improvements along Scorpion Creek would remain vulnerable to damage from large flow events. The level of flood risk is partially determined by the nature of the facility; NPS and concessioner operations under the No Action Alternative would be for planned recreational purposes. If flooding were to occur, ferry patrons and employees would avoid this area. Nonetheless, periodic maintenance of the existing roadway and potentially other structures would be needed to maintain safe operating conditions. Therefore, impacts related to the alternative's siting in a flood hazard area would be long-term, moderate, and adverse under the No Action Alternative.

The effects of sea level rise, including increased tidal inundation along the shoreline and landward progression of the surf zone (i.e., breaking wave location), could exacerbate existing safety hazards from wave action. This includes hazardous conditions encountered by employees and visitors during disembarkation. Sea level rise will also affect wave runup elevations in the vicinity of the existing access road, potentially leading to increased erosion and the need for more frequent maintenance. Therefore, impacts related to exposure to substantial hazards due to wave action would be long-term, moderate, and adverse under the No Action Alternative.

Cumulative Impact Analysis

Because the No Action Alternative would be unchanged from present conditions with respect to water quality and hydrology, there would be no cumulative impacts related to these issues as a result of this alternative.

Mitigation

No mitigation is proposed.

Conclusion

The No Action Alternative would result in no water quality impacts from construction; negligible water quality impacts from

operations; and long-term, moderate, adverse impacts from flood hazards and sea level rise.

IMPACTS OF ALTERNATIVE 1

Alternative 1 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier, oriented nearly parallel to the existing pier and extended farther into deeper water. An improved 435-foot-long elevated access road would connect the new pier terminus to North Scorpion Valley Road. The improved road would be supported by a new steel sheetpile retaining wall, and additional protective rock armoring would be installed along the shoreline to protect the road. Alternative 1 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

Construction would occur using the techniques described in the "Design Criteria" section. Waste materials from the pile drilling process would be extracted, contained, and treated. Waste water would be filtered, treated, and discharged back to the ocean. Rock waste and other solid debris would be transported off site by the contractor and disposed of in an appropriate location. There would be no use of drilling muds. Only rock debris and seawater are expected byproducts of this operation. Any potential impacts on water quality would be short-term, and conditions would quickly return to baseline levels after pile installation activities are completed. In addition, this alternative would comply with all local, state, and federal permit requirements, including any agency-required water quality monitoring requirements that may be imposed during the permitting process. Given the localized nature of impacts, construction methods, and compliance with all laws and regulations, construction impacts would represent a negligible impact compared to the No Action Alternative.

Fuels and other chemicals used during construction, as well as debris generated during demolition, could potentially degrade water quality if improperly handled or spilled. Although improvements would require minimal excavation, disturbed soils could also be conveyed to the Scorpion Anchorage via stormwater runoff. In accordance with the requirements of the Project's NPDES permit, the Park Service would be required to prepare and implement a SWPPP to minimize construction water quality impacts. The SWPPP would identify pollutant sources in the construction area and provide site-specific best management practices regarding control of sediments in runoff, avoidance measures to minimize turbidity, and storage and use of hazardous materials to prevent discharge of pollutants into stormwater. Accordingly, construction of Alternative 1 would result in negligible impacts associated with hazardous materials compared to the No Action Alternative.

Alternative 1 assumes no Project-related increase in visitation numbers to Santa Cruz Island. Therefore, long-term operational impacts resulting from this alternative would be unchanged from the No Action Alternative.

Maintenance and operation of the proposed pier by the Park Service and concessioners would proceed in adherence with a site-specific Spill Prevention Control and Countermeasure Plan or equivalent plan(s) that would address protecting water quality through implementation of best management practices, hazardous materials storage and handling protocols, and spill prevention and cleanup procedures. Operations would also occur in compliance with applicable federal, state, and local regulations. These operations would be unchanged from the No Action Alternative, and water quality impacts from operations would therefore be negligible and unchanged from the No Action Alternative.

New construction and other improvements would be designed and constructed with drainage infrastructure that complies with stormwater regulations. There would be no changes to land-based sewage collection, and

the increased number of visitors at the site would not be expected to notably increase trash generation. Therefore, Scorpion Pier operations under Alternative 1 would have no impact on water quality compared to the No Action Alternative.

The Alternative 1 pier and approach roadway would be susceptible to inundation during large flood events. Alternative 1 includes pier and roadway improvements that would address existing safety hazards, as well as the hydrological effects of sea level rise. In addition, Alternative 1 improvements would reinforce the roadway and address structural deficiencies in the existing pier, thereby reducing their susceptibility to damage by waves and storms. The need for roadway maintenance following flood events would also be reduced. Therefore, impacts related to flood risk and wave damage as a result of Alternative 1 would be long-term, moderate, and beneficial as compared to the No action Alternative.

Cumulative Impact Analysis

Because Alternative 1 would result in negligible impacts on this resource, the incremental contribution of Alternative 1 to any cumulative impacts on water quality would not be major. Alternative 1 would have a long-term, cumulative, beneficial impact to protection from sea level rise, inundation, and flooding.

Mitigation

No mitigation is proposed.

Conclusion

Alternative 1 would result in negligible water quality impacts from construction and operations; and long-term, moderate, beneficial impacts associated with reduced flood risk and sea level rise.

IMPACTS OF ALTERNATIVE 2

Alternative 2 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier approximately 300 feet south of the existing pier. A steel sheetpile retaining wall and rock armoring would be constructed to support and protect the approximately 110-foot-long improved access road that would connect the new pier terminus to North Scorpion Valley Road. Alternative 2 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

Construction would occur using the techniques described in the “Design Criteria” section. Alternative 2 would be located in the same area as portions of Alternative 1. The operational impacts Alternative 2 would be equivalent to those of Alternative 1. Alternative 2 would require an increased number of piles (66) be installed as compared to Alternative 1 (52); however, due to the similarities in construction activities, construction-related impacts to water quality and hydrology under Alternative 2 would be consistent with those of Alternative 1. As such, the impact analysis and cumulative impact analysis determinations, as well as the conclusions, for Alternative 2 would be the same as those of Alternative 1.

AQUATIC BIOLOGICAL RESOURCES

METHODOLOGY AND THRESHOLDS

Impacts on aquatic resources, including marine habitats, wetlands, fish, marine mammals, and other aquatic species, were qualitatively evaluated based on the habitat preferences for various species known or suspected to be in the study area, as well as the quantity and quality of existing habitat. Potential impacts were analyzed using recent CDFW and NMFS lists for special status species with the potential to inhabit the study area, literature reviews, and professional expertise and judgment in evaluating how the alternatives could interact with and impact aquatic biological resources.

The proposed measurement indices used to evaluate impacts on biological resources include impacts on aquatic species and/or their habitat. An alternative would be considered to have a major impact if it would be inconsistent with applicable regulations and policies protecting aquatic resources.

The analysis considered the potential for an alternative to do the following:

- Result in changes to aquatic biological community size, continuity, or integrity
- Result in changes to the amount, distribution, connectivity, or integrity of special-status aquatic species populations
- Result in changes to the amount, distribution, connectivity, or integrity of any sensitive natural communities identified in local or regional plans, policies, or regulations
- Result in changes to the amount, distribution, connectivity, or integrity of any native aquatic wildlife nursery sites
- Substantially interfere with the movement of migratory fish or other aquatic wildlife species with established migratory corridors

Based on the environmental setting of the study area and the features of the alternatives, there would be no adverse impacts specific to the following issues:

- **ESA- or CESA-listed species.** ESA- or CESA-listed species do not occur in the study area.
- **Invasive and non-native species.** Invasive aquatic organisms are most commonly introduced via ballast water discharge from shipping vessels that travel between waterbodies. Other methods of introduction include fouling organisms on ship hulls, accidental releases from the aquarium trade or food industry, and intentional introduction. NPS and concessioner operations would occur entirely between Ventura and the Channel Islands, and the risk for introducing invasive nonnative species is extremely low.

Potential water quality impacts from construction, which may affect aquatic biological resources, are discussed in additional detail in the "Water Quality and Hydrology" section of this chapter.

ESA, CESA, EFH, and MMPA Impact Determinations

In addition to NEPA impact determinations, this section includes the Park Service's effects determinations specific to the M-SFCMA and the MMPA. ESA and CESA impact determinations are not provided, as ESA- or CESA-listed species do not occur in the study area.

M-SFCMA Impact Determinations. NMFS uses the following definitions for potential impacts on EFH (50 CFR 600.810):

- *Temporary and minimal effects* means temporary impacts are those that are limited in duration and that allow the

particular environment to recover without measurable impact. Minimal impacts are those that may result in relatively small changes in the affected environment and insignificant changes in ecological functions (62 CFR 66538).

- *Adverse effect* means any impact that reduces quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of or injury to benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from actions occurring within or outside of EFH, and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

MMPA Impact Determinations. Per the 1994 amendments to MMPA, harassment is statutorily defined as any act of pursuit, torment, or annoyance, which amended the following (16 USC 1371(a)(5)):

- *Level A Harassment* has the potential to injure a marine mammal or marine mammal stock in the wild
- *Level B Harassment* 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, but does not have the potential to injure a marine mammal or marine mammal stock in the wild

IMPACTS OF THE NO ACTION ALTERNATIVE

The No Action Alternative assumes that the existing Scorpion Pier and approach roadway would continue to provide NPS and concessioner access to Santa Cruz Island. No construction or permanent modifications to the existing Scorpion Pier or approach roadway would occur under the No Action Alternative, and the existing pier and access roadway would continue to be maintained by the Park Service.

The No Action Alternative assumes no change in concessioner operations bringing visitors to Santa Cruz Island. Although the number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity, visitation to the island is primarily controlled by the concessioner contract, weather, and park rules and regulations (i.e., the GMP/Wilderness Study/EIS and Park Superintendent's public use limits for island; NPS 2014a). The No Action Alternative assumes continuation of existing concessioner contracts and no change to ferry vessel capacities or number of crossings.

Impact Analysis

Because there would not be any permanent construction to the existing Scorpion Pier and approach roadway under the No Action Alternative, there would be no construction-related impacts to aquatic resources. While there is potential for emergency and ongoing repair or maintenance to create impacts in the future, the scope and scale of which are unknown and not considered in this EIS.

Invertebrates and Marine Vegetation. There would be no change in the use or configuration of the pier, or in ongoing operations. Therefore, the No Action Alternative would have no impact on invertebrates or marine vegetation.

Fish. There would be no change in the use or configuration of the pier, or in ongoing operations. Therefore, the No Action Alternative would have no impacts on fish.

Wetlands. There would be no change in the use or configuration of the pier, or in ongoing operations. Therefore, the No Action Alternative would have no impact on wetlands.

EFH. There would be no change in the use or configuration of the pier, or in ongoing operations. As such, the No Action Alternative would have no impact on designated EFH.

Eelgrass. There would be no change in the use or configuration of the pier, or in ongoing operations. As such, the No Action Alternative would have no impact on eelgrass.

Marine Mammals. There would be no change in the use or configuration of the pier, or in ongoing operations. Therefore, the No Action Alternative would have no impact on marine mammals.

NOAA Channel Islands National Marine Sanctuary. The No Action Alternative would not include improvements or changes to operations in the Sanctuary. Existing NPS and concessioner activities at Scorpion Pier do not conflict with Sanctuary prohibitions. Therefore, the No Action Alternative would have no impact on the Sanctuary.

Scorpion SMR. The No Action Alternative would not include improvements or changes to operations in the Scorpion SMR. Existing NPS and concessioner activities at Scorpion Pier do not conflict with SMR regulations. Therefore, the No Action Alternative would have no impact on the Scorpion SMR.

Cumulative Impact Analysis

Because the No Action Alternative would be unchanged from present conditions with respect to this resource, there would be no incremental contribution to cumulative impacts related to aquatic biological resources.

Mitigation

No mitigation is proposed.

Conclusion and Determinations Under the M-SFCMA, and MMPA

The No Action Alternative would result in no impacts on aquatic invertebrates, marine vegetation, fish, wetlands, EFH, marine mammals, the NOAA Channel Islands National Marine Sanctuary, and the Scorpion SMR; and no effect on any designated EFH or marine mammals under the MMPA. There is potential for emergency and ongoing repair or maintenance to create impacts in the future. However, the scope and scale of those repairs is not known and not considered in this EIS.

IMPACTS OF ALTERNATIVE 1

Alternative 1 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier, oriented nearly parallel to the existing pier and extended farther into deeper water. An improved 435-foot-long elevated access road would connect the new pier terminus to North Scorpion Valley Road. The improved road would be supported by a new steel sheetpile retaining wall, and additional protective rock armoring would be installed along the shoreline to protect the road. Alternative 1 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Construction would occur using the techniques described in the "Design Criteria" section. Specific construction activities that could affect aquatic biological resources would include completely removing the existing pier; installing 24 each 18-inch-diameter steel piles, 9 each 16-inch-diameter steel berthing piles, and 19 each 12-inch-diameter fiberglass fender piles; installing the pier; and placing rock-armor in the inter-tidal zone. The amount of excavation required to construct the retaining wall, roadway, and rock armoring would be approximately 7,200 cy, and the amount of rock armoring required would be approximately 4,400 cy. Of this amount, there would be approximately 1,320 cy of permanent fill (rock riprap) below the mean high tide line. There would also be

impacts to 0.30 acre of wetlands, as described in the following paragraphs.

Impact Analysis

Invertebrates and Marine Vegetation. Removal of existing piles and in-water structures and excavation below the mean high tide line as part of Alternative 1 could temporarily impact nearshore invertebrate and marine plant communities through removal of existing flora and fauna. The placement of rock armoring, including 1,320 cy of permanent fill (rock riprap) below the mean high tide line, would result in the loss of a small amount of benthic habitat for invertebrates and marine vegetation, which would be offset by the potential for organisms to attach to new piles and rock riprap. Invertebrates and marine vegetation would be expected to rapidly recolonize new in-water structures, such as the pier piles and intertidal rock riprap habitat in the pier and rock armoring footprint. The permanent fill of intertidal waters would be addressed through mitigation measures Aquatic-MM-1 and Aquatic-MM-2, which entail obtaining permits and constructing any required mitigation for these impacts. Therefore, Alternative 1 would have residual long-term, moderate, adverse impacts on invertebrates and marine vegetation as compared to the No Action Alternative, after implementation of mitigation measures Aquatic-MM-1 and MM-2.

Marine vegetation may be affected by decreased light transmission as a result of shading from larger overwater structures and from increased turbidity or direct impacts during pile installation. Alternative 1 would result in 4,732 square feet of shading from the replacement pier. Compared to the overwater coverage of 1,057 square feet from the existing railroad car and offshore concrete, this represents an increase of 3,675 square feet of shading from the No Action Alternative. Long-term shading impacts on marine vegetation would be insignificant due to the relative size of the increased shading area and the abundance of suitable neighboring habitat. Therefore, Alternative 1 would have negligible impacts from shading on marine vegetation compared to the No Action Alternative.

Fish. Pile installation may temporarily disturb benthic sediments and increase suspended sediment levels in the immediate vicinity of Alternative 1 during construction. As described in the "Water Quality and Hydrology" section, water and rock waste from the drilling process would be collected and filtered prior to discharge of treated water. Discharges would be subject to any monitoring imposed during the resource agency permitting process.

While temporary increases in suspended sediment may cause clogging of gills and feeding apparatuses of fish and filter feeders, if present; however, studies have shown that projects involving similar but larger-scale sediment and benthos disturbance (e.g., dredging) did not have long-term adverse effects on fish populations (Chambers Group 1998). Therefore, Alternative 1 would have negligible impacts on fish from increased suspended sediment levels during construction compared to the No Action Alternative.

Underwater sound pressure or noise generated by construction operations, including pile installation may temporarily affect fish behavior. Fish are likely to be temporarily disturbed or leave the immediate Project area during certain phases of construction. Due to the temporary nature and limited area of in-water work activities, as well as the enclosed nature of the drilling operation, noise impacts during construction are not expected to have notable or lasting impacts on fish. Installing up to 33 new steel piles and 19 fiberglass piles would likely occur over no more than several days, and mitigation measures Aquatic-MM-1 and Aquatic-MM-3, which involve obtaining and complying with permits, and implementing construction-related avoidance and minimization measures, would be implemented under this alternative to reduce impacts. Therefore, Alternative 1 would have residual short-term, minor, adverse impacts

on fish from underwater sound pressure resulting from pile installation during construction compared to the No Action Alternative, after implementing mitigation.

Long-term overwater shading from docks and piers has historically been viewed as relatively neutral with respect to fish communities (NAVFACSW/Unified Port of San Diego 2011); seasonal variance would likely have a much stronger effect on fish community composition compared to relatively minor changes in light gradients from gangways and floats. The addition of manmade hard substrates (i.e., additional piles and rock riprap) may minimally increase habitat area for encrusting organisms on which fish feed. Therefore, Alternative 1 would have no impact on fish from overwater shading compared to the No Action Alternative.

Alternative 1 assumes no Project-related increase in visitation numbers to Santa Cruz Island. Risk from entrainment and turbidity from vessel wake would therefore be unchanged from the No Action Alternative. Therefore, Alternative 1 operations would have no impacts on fish compared to the No Action Alternative.

Wetlands. Permanent loss of 13,128 square feet (0.30 acre) of wetlands would occur resulting from construction of the retaining wall and rock armoring (Figure 17). In the long term, the retaining wall and rock armoring would benefit existing wetlands by minimizing roadway erosion and reducing inputs of sediment. The loss of wetlands would be addressed through mitigation measures Aquatic-MM-1 and Aquatic-MM-2, which entail complying with all required resource agency permit conditions and constructing mitigation for wetland losses. The Park Service would request permits from and coordinate mitigation with the resource agencies for these impacts, as required. Therefore, after implementation of required mitigation, Alternative 1 would have residual short-term, minor, adverse impacts from temporary loss of wetlands compared to the No Action Alternative.

EFH. Potential construction impacts on EFH would include temporary minor increased suspended sediment levels and turbidity relative to background conditions, and the potential for temporary behavioral disturbance due to increased underwater sound pressure levels from pile installation. With implementation of mitigation measures Aquatic-MM-1 and Aquatic-MM-3, Alternative 1 would result in residual negligible impacts to EFH from construction. Although Alternative 1 would result in permanent shading of 4,732 square feet (increase of 3,675 square feet of shading compared to No Action Alternative), the new piles and rock riprap could increase invertebrate habitat and species diversity, thereby increasing foraging opportunities for fish. Long-term shading impacts on EFH as a result of Alternative 1 would be insignificant due to the relative size of the increased shading area and the abundance of suitable neighboring habitat in the area. Therefore, Alternative 1 would have no impact on EFH from overwater shading compared to the No Action Alternative.

Alternative 1 assumes no Project-related increase in visitation numbers to Santa Cruz Island. Risk from entrainment and turbidity from vessel wake would therefore be unchanged from the No Action Alternative. Therefore, Alternative 1 operations would have no impacts on EFH compared to the No Action Alternative.

Therefore, for effects to EFH under M-SFCMA, including the Pacific Groundfish FMP, all impacts from construction and operations of Alternative 1 would be *temporary and minimal*. The Park Service has requested concurrence from NMFS with its findings under M-SFCMA.

Eelgrass. Eelgrass does not occur in the footprint of Alternative 1, as shown on Figure 18. The Project would comply with the CEMP, including pre-construction surveys and mitigation for loss of eelgrass as described in mitigation measure Aquatic-MM-4, should any eelgrass be identified during the pre-construction survey. Therefore, with

implementation of mitigation measure Aquatic-MM-4, construction of Alternative 1 would have no impacts to eelgrass compared to the No Action Alternative. If eelgrass were to be found, residual impacts would be short-term, minor, and adverse with implementation of mitigation.

Marine Mammals. Pinnipeds, including California sea lion, northern elephant seal, and Pacific harbor seal, may haulout on Scorpion Beach, and other marine mammal species may be infrequent transient visitors to Scorpion Anchorage waters. Any marine mammals present in the general vicinity of the site during construction would be able to detect the increased underwater sound pressure levels resulting from pile installation, and may temporarily avoid the construction area. Installation of steel piles as described in the "Design Criteria" section may produce sound pressures that reach Level A harassment in the local vicinity of the Project. Marine mammals have large home ranges, and therefore are capable of avoiding use of some areas for short periods of time. Given the limited use of the immediate Project area by these animals, as well as the short duration of construction, the alternative would be unlikely to adversely affect marine mammals.

Nonetheless, there remains a low likelihood for Project construction to harass mammals, as defined under MMPA. Project-related disturbance would be expected to have no more than a minor effect on individual animals' range and no effect on migration, breathing, nursing, breeding, feeding, sheltering, or populations of these species, and the Park Service would implement mitigation measure Aquatic-MM-2 to reduce impacts. Any effects experienced by individual marine mammals are anticipated to be limited to short-term disturbance of normal behavior or temporary displacement of animals near the noise source. Therefore, for impacts on marine mammals under MMPA, the Park Service has determined there should be no more than incidental harassment resulting from Alternative 1. The Park Service has requested an Incidental Harassment Authorization and concurrence from NMFS with its findings under MMPA.

Cumulative Impact Analysis

Alternative 1 would result in negligible to moderate impacts with respect to marine biological resources. Therefore, its incremental contribution to cumulative impacts on aquatic biological resources would be minor to moderate.

Mitigation

Recommended potential mitigation measures are described in the following paragraphs.

Aquatic-MM-1. The Park Service would obtain and comply with all required resource agency permit conditions, including any required work windows.

Aquatic-MM-2. The Park Service would ensure that sensitive wetland habitats and biota (i.e., marine/intertidal/rocky shore, estuarine/intertidal/emergent, and riverine/lower perennial/rock bottom wetlands) would be mapped prior to the initiation of construction and mitigation/replacement. Plans would be developed and approved by resource agencies, as required through the permitting process completed in Aquatic-MM-1, to mitigate for impacts. If habitat improvement or replacement is required, every attempt would be made to construct those habitats in the Scorpion Anchorage area. Likewise, transplant/translocation of sensitive species would be completed prior to the initiation of construction in the specified area and in accordance with agency-approved plans.

Aquatic-MM-3. The Park Service would ensure the following:

- Contractor shall maintain a 500-meter (1,640-foot) safety zone (as is typically required by NMFS for Incidental Harassment Authorizations) around sound sources in the event that the

sound level is unknown or cannot be adequately predicted.
- Contractor shall bring loud mechanical equipment online slowly.
- The Park Service shall employ a NMFS-approved protected species observer to conduct marine mammal monitoring during in-water construction.
- The protected species observer shall halt work activities when a marine mammal enters the 500-meter (1,640-foot) safety zone.

Aquatic-MM-4. The Park Service would ensure that pre-construction (within 60 days prior to construction) and post-construction (within 30 days following construction) surveys are conducted for eelgrass and Caulerpa as required by CEMP (NMFS 2014) and the Caulerpa Control Protocol (NMFS 2008). If eelgrass is observed in the impact area, monitoring and mapping would be required to identify potential impacts from construction. Monitoring and mapping would include pre- and post-project transects to map the extent of eelgrass. Any decrease in eelgrass (i.e., pre-project versus post-project) would constitute an impact and would be mitigated for pursuant to CEMP (NMFS 2014).

Conclusion and Determinations Under the M-SFCMA and MMPA

Alternative 1 would result in long-term, moderate impacts on invertebrates and marine vegetation; short-term, minor, adverse impacts on wetlands and marine mammals; negligible to minor, short-term, adverse impacts to fish; negligible impacts on EFH; and no impact to eelgrass. Based on the analysis presented in this section, including implementing mitigation measures Aquatic-MM-1 through Aquatic-MM-4, Alternative 1 would result in *temporary and minimal effects* to EFH; and may result in incidental harassment of marine mammals.

IMPACTS OF ALTERNATIVE 2

Alternative 2 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier approximately 300 feet south of the existing pier. A steel sheetpile retaining wall and rock armoring would be constructed to support and protect the approximately 110-foot-long access road that would connect the new pier terminus to North Scorpion Valley Road. Alternative 2 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Construction would occur using the techniques described in the "Design Criteria" section. Construction activities that could affect aquatic biological resources would include completely removing the existing pier; installing 38 each 18-inch-diameter steel piles, 9 each 16-inch-diameter steel berthing piles, and 19 each 12-inch-diameter fiberglass fender piles; installing the pier; and placement of rock-armor in the inter-tidal zone.

The amount of excavation required to construct the retaining wall, roadway, and rock armoring would be approximately 1,800 cy, and the amount of rock armoring required would be approximately 920 cy. No fill would be required below the mean high tide line. Alternative 2 would result in only 0.04 acre of wetland impact, compared to 0.30 acre under Alternative 1.

Impact Analysis

The habitat types and associated communities are generally the same between the two alternatives. Project activities, including construction and operations, are similar in scope. Permanent and temporary impacts associated with Alternative 2 would be equivalent to those of Alternative 1 except where reduced as described below.

Consistent with Alternative 1, eelgrass was not observed in the pier footprint (Figure 20). Mitigation measure Aquatic-MM-4 would still be implemented, and if eelgrass is observed, it

would be mitigated pursuant to CEMP. While Alternative 2 would result in marginal increases in shading area and pile counts relative to Alternative 1, these increases would not affect associated impact determinations. Alternative 2 would, however, require substantially less shoreline armoring compared to Alternative 1 (1,800 cy of riprap for Alternative 2, compared to 4,400 cy of riprap for Alternative 1), and would not require fill bellow the mean high tide line. Alternative 2 would also require substantially less wetland fill (0.04 acre for Alternative 2 [Figure 19], compared to 0.30 acre for Alternative 1 [Figure 17]). Due to these differences, Alternative 2 would result in decreased residual impacts compared to Alternative 1.

Although Alternative 2 would result in a marginal increase in shading relative to Alternative 1, shading impacts would remain insignificant due to the relative size of the increased shading area and the abundance of suitable neighboring habitat. Similarly, while Alternative 2 would require a greater number of piles (66 piles total including steel structural piles and fiberglass fender piles) compared to Alternative 1 (52 piles total), the additional piles would provide encrusting habitat for marine species, and construction impacts would be mitigated for as need through implementation of measures Aquatic-MM-1 and Aquatic-MM-3. Therefore, residual impacts to aquatic biological resources resulting from increased overwater shading and pile counts would remain unchanged compared to Alternative 1.

Alternative 2 does not include fill below the mean high tide line to install the rock armoring and retaining wall, and would not result in loss of invertebrate and marine vegetation habitat. Therefore, Alternative 2 is expected to result in only residual negligible impacts on invertebrates and marine vegetation compared to the No Action Alternative. This is in contrast to Alternative 1, which would result in long-term, moderate, adverse impacts on invertebrates and marine vegetation as a result of its greater shoreline armoring needs and proposed placement of 1,320 cy of permanent fill (rock riprap) below the mean high tide line.

Alternative 2 would also result in reduced wetland resource impacts compared to Alternative 1. Alternative 2 would result in a loss of wetland resources totaling only 1,798 square feet (0.04 acre). Mitigation measures Aquatic-MM-1 and Aquatic-MM-3, which entail obtaining permits and constructing any required mitigation for these impacts, would apply. Therefore, with mitigation, Alternative 2 is expected to result in only residual negligible impacts from temporary loss of wetlands compared to the No Action Alternative. This represents reduced impacts compared to Alternative 1, which would result in a loss of 13,128 square feet (0.30 acre) of wetland resources constituting a residual short-term, minor, adverse impact from temporary loss of wetlands.

Cumulative Impact Analysis

Alternative 2 would also have reduced cumulative impacts as compared to Alternative 1. The incremental contribution to cumulative impacts on aquatic biological resources of Alternative 2 would be minor.

Conclusion and Determinations Under the M-SFCMA and MMPA

Alternative 2 would result in negligible impacts on invertebrates, marine vegetation, wetlands, and EFH; short-term, minor, adverse impacts on fish and marine mammals; and no impact to eelgrass. Based on the analysis presented in this section, including implementing mitigation measures Aquatic-MM-1 through Aquatic-MM-4, Alternative 2 would result in *temporary and minimal effects* to EFH; and may result in incidental harassment of marine mammals.

0 75 Feet

Source: NPS 2003

FIGURE 17
ALTERNATIVE 1 WETLANDS RESOURCE IMPACTS
Channel Islands National Park
National Park Service/U.S. Department of the Interior
Draft - August 2015

0 100 Feet

Source: NPS 2014

FIGURE 18
ALTERNATIVE 1 EELGRASS IMPACTS
Channel Islands National Park
National Park Service/U.S. Department of the Interior
Draft - August 2015

0 75 Feet

Source: NPS 2003

FIGURE 19
ALTERNATIVE 2 WETLANDS RESOURCE IMPACTS
Channel Islands National Park
National Park Service/U.S. Department of the Interior
Draft - August 2015

0 100 Feet

Source: NPS 2014

FIGURE 20
ALTERNATIVE 2 EELGRASS IMPACTS
Channel Islands National Park
National Park Service/U.S. Department of the Interior
Draft - August 2015

TERRESTRIAL BIOLOGICAL RESOURCES

METHODOLOGY AND THRESHOLDS

Potential impacts on terrestrial biological resources were qualitatively evaluated based on the potential for the alternatives to temporarily or permanently alter or impact terrestrial biological resources in the study area. The terrestrial biological resource analysis was based upon existing database records maintained by the CDFW and CNPS, as well as literature review.

The proposed measurement indices used to evaluate impacts on biological resources include impacts on terrestrial species and/or their habitat. An alternative would be considered to have a major impact if it would be inconsistent with applicable regulations and policies protecting terrestrial biological resources.

The analysis considered the potential for an alternative to do the following:

- Result in changes in plant community size, continuity, or integrity
- Result in changes to the amount, distribution, connectivity, or integrity of wildlife habitat or populations
- Result in changes to the amount, distribution, connectivity, or integrity of special status wildlife habitat or populations

This analysis is limited to terrestrial vegetation, wildlife, and special status species with the potential to be affected by the Project. Impacts on marine biological resources, including wetlands, are addressed in the "Aquatic Biological Resources" section of this chapter.

ESA Impact Determinations

In addition to NEPA impact determinations, this section includes the Park Service's effects determinations specific to Section 7 of ESA and CESA. The following sections define the various impact terminologies for these regulations.

ESA Section 7 Impact Determinations. USFWS and NMFS use the following terminology to assess impacts on federally listed species under Section 7 of the ESA (USFWS/NMFS 1998):

- *No effect* means that the proposed action and its interrelated and interdependent actions would not directly or indirectly affect listed species or destroy or adversely modify designated critical habitat. Formal Section 7 consultation is not required when the no effect conclusion is reached.
- *May affect, but not likely to adversely affect* means that effects to the species or critical habitat are expected to be beneficial, discountable, or insignificant. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or habitat. Insignificant effects relate to the size of the impact (and should never reach the scale where take occurs), while discountable effects are those that are extremely unlikely to occur.
- *May affect, and likely to adversely affect* means that adverse effects to listed species or critical habitat may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable or insignificant (see the definition of "may affect, but not likely to adversely affect"). In the event that the overall effect of the proposed action is beneficial to the listed species or critical habitat, but may also cause some adverse effect on individuals of the listed species or segments of the critical habitat, then the determination should be "may affect, and likely to adversely affect." Such a determination requires formal Section 7 consultation.

CESA Impact Determinations. Section 2080 of the Fish and Game Code prohibits take of any CESA-listed species. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects, through issuance of Incidental Take permits.

IMPACTS OF THE NO ACTION ALTERNATIVE

The No Action Alternative assumes that the existing Scorpion Pier and approach roadway would continue to provide NPS and concessioner access to Santa Cruz Island. No construction or permanent modifications to the existing Scorpion Pier or approach roadway would occur under the No Action Alternative, and the existing pier and access roadway would continue to be maintained by the Park Service.

The No Action Alternative assumes no change in concessioner operations bringing visitors to Santa Cruz Island. Although the number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity, visitation to the island is primarily controlled by the concessioner contract, weather, and park rules and regulations (i.e., the GMP/Wilderness Study/EIS and Park Superintendent's public use limits for island; NPS 2014a). The No Action Alternative assumes continuation of existing concessioner contracts and no change to ferry vessel capacities or number of crossings.

Impact Analysis

Vegetation. Vegetation removal under the No Action Alternative would be limited to that needed to maintain the existing Scorpion Pier approach roadway. This includes trimming and removal of grassland and coastal scrub plant species that occur in the study area. These species are not a valuable resource, and roadway maintenance would not affect survivorship of vegetation communities. Therefore, there would be negligible impacts on vegetation under the No Action Alternative.

Common Wildlife Species. Common wildlife species likely to be present in the study area are expected to continue to tolerate NPS and concessioner operations at the pier and roadway. Because no construction would occur, there would be no impacts on wildlife under the No Action Alternative.

Special Status and Protected Species. The Santa Cruz Island fox (federally endangered; state threatened) has been observed at Scorpion Ranch, and the study area is in its projected habitat range (CDFW 2014). This species is habituated to NPS and concessioner operations in the study area, and recreational use of Santa Cruz Island is not among the primary threats to this species. Furthermore, the Park Service and TNC have ongoing programs to encourage recovery of island foxes. Under the No Action Alternative, no construction would occur and operations would not change. Therefore, there would be no impact to the Santa Cruz Island fox under the No Action Alternative.

Townsend's big eared bat is known to inhabit the historic masonry building at Scorpion Ranch, and pallid bats and western mastiff bats may also roost in trees or buildings in the study area (NPS 2015a; CDFW 2014). Bats are nocturnal species, and would not be affected by NPS and concessioner operations at Scorpion Pier. The island spotted skunk, which may also occur in ranch outbuildings, crevices or burrows at the Project site, is similarly nocturnal. Under existing conditions, no construction would occur; therefore, there would be no impact to special status bat species or the island spotted skunk under the No Action Alternative.

Scripps's murrelets, bald eagles, and birds protected under MBTA may frequent the Project area, but nesting habitat is not present. Ongoing NPS and concessioner operations at Scorpion Pier would not affect these species.

Therefore, there would be no impact to special status or protected bird species.

Non-native or Invasive Species. The naturally small populations found on islands can be easily driven to extinction by new introductions and, therefore, islands are unusually vulnerable to the impacts of new invaders. Under the No Action Alternative, the Park Service would continue to implement the Channel Islands National Park Biosecurity Protocols to avoid the introduction of non-native and invasive species. Therefore, there would be no impact related to non-native or invasive species.

Cumulative Impact Analysis

Because there would be negligible impacts to terrestrial biological resources from the No Action Alternative, there would be no cumulatively major impacts of the No Action Alternative.

Mitigation

No mitigation is proposed.

Conclusion and Determination Under ESA

The No Action Alternative would result in negligible impacts on vegetation and no impacts on terrestrial common wildlife species, special status and protected species, and non-native or invasive species, and would have no effect on any ESA-listed terrestrial species. Similarly, the No Action Alternative would not result in the take of any CESA-listed terrestrial species.

IMPACTS OF ALTERNATIVE 1

Alternative 1 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier, oriented nearly parallel to the existing pier and extended farther into deeper water. An improved 435-foot-long elevated access road would connect the new pier terminus to North Scorpion Valley Road. The improved road would be supported by a new steel sheetpile retaining wall, and additional protective rock armoring would be installed along the shoreline to protect the road. Alternative 1 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

Vegetation. Construction of the new elevated road, steel sheetpile retaining wall, and protective rock armoring would displace existing vegetation along the proposed alignment. Existing vegetation in this area consists of grasses and shrubs associated with grassland, coastal scrub, and beach and dune habitats. Removal of this vegetation would result in no impacts because of the non-sensitive nature of plant species present, and because of the small area of impact and abundance of adjacent habitat. Roadway armoring would reduce erosion that could damage vegetation. Ongoing NPS and concessioner operations would not result in any greater impacts on vegetation. Therefore, Alternative 1 would result in no impacts on vegetation compared to the No Action Alternative.

Common Wildlife Species. The majority of the improvements associated with Alternative 1 would be constructed on existing developed areas. Displacement of grassland, coastal scrub, and beach and dune habitat potentially frequented by common wildlife species would occur resulting from construction of the improved elevated road, steel sheetpile retaining wall, and protective rock armoring. This loss of habitat would constitute a negligible impact compared to the No Action Alternative, particularly considering the abundance of adjacent habitat.

Construction and operation of Alternative 1 would not require tree removal or trimming, and would not adversely affect buildings,

caves, or other structures that may be used by birds or bats. While common wildlife species are expected to withstand noise levels generated by NPS and concessioner operations, if present, they may be temporarily disturbed by construction-related noise, particularly from pile installation activities. Implementation of mitigation measure Noise-MM-1, which involves methods for reducing construction-related noise, would reduce the magnitude of this impact. Therefore, construction of Alternative 1 would result in residually negligible impacts on common wildlife species compared to the No Action Alternative.

Special Status Species. The Santa Cruz Island fox has been observed at Scorpion Ranch, and the study area is in its projected habitat range (CDFW 2014). Operational and construction noise effects from Alternative 1 would have minimal noise impacts on upland habitats potentially frequented by the Santa Cruz Island fox. This species is expected to withstand activity consistent with NPS and concessioner operations, and would be expected to avoid the area during construction. Construction would require additional vehicle trips compared to the No Action Alternative, and vehicle collisions are a known cause of Santa Cruz Island fox mortality on the Channel Islands (NPS 2015a). Implementation of mitigation Terrestrial-MM-1, which includes methods for preventing vehicle collisions, staging area inspections, and other best management practices would reduce the magnitude of this impact. Therefore, Alternative 1 would have negligible impacts to the Santa Cruz Island fox during construction compared to the No Action Alternative. Project construction *may affect, but is not likely to adversely affect* Santa Cruz Island Fox. The Park Service is requesting concurrence from USFWS with this determination.

Townsend's big eared bat is known to inhabit the historic masonry building at Scorpion Ranch, and pallid bats and western mastiff bats may also roost in trees or buildings in the study area (NPS 2015a; CDFW 2014). Operations associated with Alternative 1 would not adversely affect buildings, trees, or structures that may be used by special status bat species. Temporary impacts would be limited to increased noise levels during construction, the most significant of which would occur from pile installation. The historic masonry building is located approximately 650 feet from the Alternative 1 pier location, at a sufficient distance to attenuate noise from Project construction. Construction staging and site access would avoid the historic masonry building and adjacent roadway. These construction measures would avoid disturbing Townsend's big-eared bats and therefore, there would be no impacts to the species to as a result of Alternative 1.

There is, however, limited building and tree habitat in the area that may be impacted by noise. Although unlikely, construction-related noise may temporarily affect pallid bats and western mastiff bats (*Lasiurus blossevillii*), if present. Mitigation measure Noise-MM-1 would be implemented to reduce potential noise impacts during construction. Therefore, there could be negligible impacts on pallid bats and western mastiff bats associated with construction of Alternative 1 compared to the No Action Alternative.

Island spotted skunks may inhabit grassland habitat in the study area. Loss of grassland habitat resulting from Alternative 1 would be minimal, and abundant high quality habitat is available on the island. This species is expected to withstand activity consistent with NPS and concessioner operations, and would be expected to avoid the area during construction. Furthermore, island spotted skunks have experienced a strong recovery in recent years (NPS 2014e). Therefore, construction and operations associated with Alternative 1 would have no impact on the island spotted skunk compared to the No Action Alternative.

Scripps's murrelets, bald eagles, and birds protected under the MBTA may frequent the Project area, but nesting habitat is not present. Construction would include pile installation, which could increase turbidity in the area

immediately around the pier, and affect foraging opportunities for protected bird species. Such impacts would likely be minimal, localized, and negligible in comparison with existing site conditions. Construction noise levels at trees, shrubs, or buildings in the study area could be increased. Mitigation measure Noise-MM-1 would be implemented to reduce potential noise impacts during construction. Given these conditions, while there may be an intermittent increase in noise levels during construction, owing to the temporary nature of construction, Alternative 1 is anticipated to result in negligible impacts to CESA and MBTA protected bird species during construction compared to the No Action Alternative.

Non-native or Invasive Species. Construction of Alternative 1 would require transport, storage, and use of equipment and materials originating from outside the Channel Islands, and construction would occur employing outside contractors living on Santa Cruz Island. These activities could result in introduction of non-native or invasive species if improperly managed. Under Alternative 1, the Park Service would continue to implement the Channel Islands National Park Biosecurity Protocols to avoid the introduction of non-native and invasive species. Therefore, Alternative 1 is anticipated to result in no impacts related to non-native or invasive species, compared to the No Action Alternative.

Cumulative Impact Analysis

Because Alternative 1 would result in negligible impacts with respect to this resource, its incremental contribution to cumulative impacts on terrestrial biological resources would not be major.

Mitigation

Recommended potential mitigation measures are described in the following paragraphs.

Noise-MM-1. The Park Service would ensure that the contractor does the following, to the extent feasible:

- When feasible, install noise mufflers to stationary equipment and impact tools that are no less effective than those provided by the manufacturer
- Install barriers around particularly loud activities at the construction site to eliminate the line of sight between the source of noise and nearby sensitive receptors
- Surround the air compressors powering the DTH hammer with a noise wall or shroud on three sides to help shield visitors, staff, and biota from any noise from the compressors
- When feasible, use construction equipment with low noise emission ratings
- Locate equipment, materials, and staging areas as far as practicable from sensitive receptors
- Prohibit unnecessary idling of vehicles or equipment
- Require applicable construction-related vehicles or equipment to use designated truck routes to access the Project site
- Restrict construction activities between 7:00 a.m. to 7:00 p.m. Monday through Saturday
- Prohibit visitor access to no less than 70 feet from active construction equipment that exceeds 90 dBA

Terrestrial-MM-1. The Park Service would ensure that construction traffic, parking, and laydown areas would occur within previously disturbed lands to the extent feasible. Wildlife exclusion fencing would be installed and maintained around the perimeter of construction corridors and staging areas. To the extent feasible, roadside vegetation in the construction area would be maintained at short height to increase visibility of foxes if present. Equipment and vehicle travel would be limited to existing roads or construction corridors during construction. Vehicular speed would be limited to 15 miles per hour. Best management practices would be used by

the construction contractor to minimize impacts on wildlife including not permitting pets, containing garbage, and not permitting the feeding of wildlife by construction crews that may be housed on the island. On-site open water sources that serve as wildlife attractants would not be created or maintained. Project construction would occur only during daylight hours. All employees and contractors working in the field would be required to complete environmental awareness training prior to working on site. Training would include information regarding sensitive biological resources, restrictions, protection measures, individual responsibilities associated with the Project, and the consequences of noncompliance.

If the Santa Cruz Island fox is observed within the immediate vicinity of the pier, Park Service staff would stop pier construction and operation activities. NPS biologists would be notified immediately to determine the potential impacts that could result from the attendant human activity. Mitigation measures would then be developed to best avoid or minimize impacts on the Santa Cruz Island fox. Mitigation could include, but is not limited to, restricting park operations or visitor use within the active den area or relocating individual foxes to more remote areas of the island.

Staging areas would be thoroughly inspected by the construction contractor to ensure no foxes have taken refuge within stockpiled materials or equipment. If a fox is found and does not leave on its own accord, NPS biologists would be informed and the fox would be removed in a manner determined by the biologist that would cause the least amount of harm and stress to the animal.

Conclusion and Determination Under ESA

Alternative 1 would result in no impacts on vegetation and non-native or invasive species; negligible impacts on common wildlife species and habitats, Santa Cruz Island fox, pallid bats, western mastiff bats, and CESA and MBTA protected bird species; and no impacts on Townsend's big eared bat and island spotted skunk. Based on the analysis presented in this section, the Park Service has made the determination that this Project element *may affect, but is not likely to adversely affect*, the Santa Cruz Island fox.

IMPACTS OF ALTERNATIVE 2

Alternative 2 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier approximately 300 feet south of the existing pier. A steel sheetpile retaining wall and rock armoring would be constructed to support and protect the approximately 110-foot-long access road that would connect the new pier terminus to North Scorpion Valley Road. Alternative 2 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

Because of the overlapping geographic boundaries and similar (though reduced) required construction activities and operations of Alternative 2 and Alternative 1, the incremental impacts of construction and operations with respect to terrestrial biological resources that would occur as a result of Alternative 2 would be equivalent to those of Alternative 1.

As such, the impact analysis and cumulative impact analysis determinations, mitigation measures, conclusions, and determinations under ESA for Alternative 2 would be the same as those of Alternative 1.

VISUAL RESOURCES

METHODOLOGY AND THRESHOLDS

The potential visual resource impacts associated with the Project were evaluated qualitatively based on the alternatives' effects on visual resources. The indices used to evaluate impacts on visual resources are changes to viewpoints and views. An alternative would be considered to have a major impact if it would cause severe changes to views from representative viewpoints. Nighttime view impacts would not occur, as the existing pier does not include lighting and the proposed alternatives would not create any new sources of light or glare. Negligible or minor impacts do not constitute an adverse effect, while moderate and major impacts do.

Daytime Views

Daytime view photos were taken at representative locations shown on Figure 21. Daytime view photos from these locations are provided in the "Affected Environment" chapter.

FIGURE 21
VIEWPOINTS IN THE STUDY AREA
Channel Islands National Park
National Park Service/U.S. Department of the Interior
Draft - August 2015

IMPACTS OF THE NO ACTION ALTERNATIVE

The No Action Alternative assumes that the existing Scorpion Pier and approach roadway would continue to provide NPS and concessioner access to Santa Cruz Island. No construction or permanent modifications to the existing Scorpion Pier or approach roadway would occur under the No Action Alternative, and the existing pier and access roadway would continue to be maintained by the Park Service.

The No Action Alternative assumes no change in concessioner operations bringing visitors to Santa Cruz Island. Although the number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity, visitation to the island is primarily controlled by the concessioner contract, weather, and park rules and regulations (i.e., the GMP/Wilderness Study/EIS and Park Superintendent's public use limits for island; NPS 2014a). The No Action Alternative assumes continuation of existing concessioner contracts and no change to ferry vessel capacities or number of crossings.

Impact Analysis

Because there would be no construction or modifications to structures or uses in the study area under the No Action Alternative, there would be no construction-related impacts on visual resources.

The No Action Alternative does not include operational changes, and there would be no additional structural changes to the visual landscape. Therefore, there would be no impacts on visual resources as a result of the No Action Alternative.

Cumulative Impact Analysis

Because the No Action Alternative would be unchanged from present conditions with respect to visual resources, there would be no cumulative impacts as a result of this alternative.

Mitigation

No mitigation is proposed.

Conclusion

The No Action Alternative would result in no impacts on visual resources.

IMPACTS OF ALTERNATIVE 1

Alternative 1 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier, oriented nearly parallel to the existing pier and extended farther into deeper water. An improved 435-foot-long elevated access road would connect the new pier terminus to North Scorpion Valley Road. The improved road would be supported by a new steel sheetpile retaining wall, and additional protective rock armoring would be installed along the shoreline to protect the road. Alternative 1 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

During construction, barges and other vessels would operate in Scorpion Anchorage. Earthmoving equipment such as trucks, excavators, and bulldozers would operate on land. The primary staging area for construction would be located at the existing kayak storage area inland of Scorpion Beach and south of Scorpion Creek, while secondary staging for construction contractor housing and passive use would be located at the existing corral approximately 0.25 mile inland. Scorpion Anchorage vessel traffic typically includes concessioner, NPS, and recreational vessels, while on-land traffic is limited to trucks and construction equipment necessary for general maintenance of existing

infrastructure. In-water vessel and on-land equipment activity would be increased during the construction period. Construction operations would be visible from viewpoints throughout the study area, resulting in negligible impacts to visual resources.

Changes that may affect viewpoints in the study area include replacement and expansion of the pier; elevation of the access road by 3 feet; and addition of a 7-foot-thick layer of rock armoring covering 7,360 square feet of shoreline, beach, and access road adjacent to the Scorpion Creek floodplain. Vegetation removal would be limited to grubbing grasses and shrubs to construct the elevated access road and installation of the rock armoring. Rehabilitation of the existing degraded pier may improve the aesthetic appeal from viewpoints where the existing pier is visible. Consistent with the GMP/Wilderness Study/EIS, designs and materials would be selected that work in harmony with the surroundings, to the extent practicable.

View from Ocean Approach. Photos 17 and 18 illustrate the existing view of Scorpion Anchorage from the ocean approach (Figure 21), including the area of change. Each of the above-listed improvements would be visible from this viewpoint. These visual impacts would affect a narrow band in the approach viewpoint; rock armoring would be visible for the length of the improved access road, and the larger pier would appear more prominently. This would constitute a long-term, moderate, adverse impact to views from the ocean approach compared to the No Action Alternative. The southern portion of the beach and hillside views would be maintained.

View of Scorpion Beach. Photo 19 illustrates the existing view of Scorpion Beach looking south from the north edge of Scorpion Beach (Figure 21). Changes to the access road and rock armoring would be visible from this view. Rock armoring would be visible for the length of the improved access road. The pier expansion, which would extend into Scorpion Anchorage and would not be visible from the north end, but would be visible from farther south on Scorpion Beach if looking north. These changes would constitute a long-term, moderate, adverse impact to views of Scorpion Beach compared to the No Action Alternative. The view of Scorpion Beach south of the improved access road would be unaffected.

View from Scorpion Ranch Entrance. Photo 20 illustrates the existing view of Scorpion Beach, the Scorpion Creek floodplain, and Scorpion Anchorage looking east from the entrance to Scorpion Ranch (Figure 21). Changes to the west end of the access road would be visible from this location. Rock armoring in the Scorpion Creek floodplain would be visible, displacing a small area of grassland and shrub vegetation. Additional grubbing of vegetation may be required on the north side of the approach road. These changes would constitute a long-term, moderate, adverse impact to views from Scorpion Ranch compared to the No Action Alternative. The view of Scorpion Beach and Scorpion Anchorage would be unaffected.

View from Smugglers Road. Photo 21 illustrates the existing view of Scorpion Anchorage, Scorpion Pier, Scorpion Beach, Scorpion Creek and Scorpion Ranch from Smugglers Road on the southern hillside (Figure 21). All improvements associated with this alternative would be visible from this viewpoint. Improvements would be located in the same general location as existing conditions. Alternative 1 would include a larger pier structure that extends farther into Scorpion Anchorage waters; and a greater area of rock armoring extending from the pier, across the beach, and along the access road adjacent to the Scorpion Creek floodplain. These changes would affect a small but notable area in this view. Alternative 1 would have similar effects on views from the northern hillside, including viewpoints from Cavern Point Loop trail. These changes would constitute a long-term, moderate, adverse impact to views from Smugglers Road compared to the No Action Alternative.

Cumulative Impact Analysis

Alternative 1 would result in negligible impacts on visual resources during construction, which would not be considered cumulatively major. Long-term impacts of Alternative 1 would be adverse and moderate due to the addition of rock armoring, the pier expansion, and construction of the improved access road. These impacts would not be considered cumulatively major.

Mitigation

No mitigation is proposed.

Conclusion

Alternative 1 would result in negligible impacts during construction, and long-term, moderate, adverse impacts on visual resources.

IMPACTS OF ALTERNATIVE 2

Alternative 2 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier approximately 300 feet south of the existing pier. A steel sheetpile retaining wall and rock armoring would be constructed to support and protect the approximately 110-foot-long access road that would connect the new pier terminus to North Scorpion Valley Road. Alternative 2 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

Short-term construction-related impacts would be identical to Alternative 1, although there may be negligible difference in the duration of construction. Long-term effects to visual resources in the study area would be similar but reduced compared to Alternative 1. Key differences with Alternative 2 compared to Alternative 1 include a shorter approach roadway, less rock armoring, and location of the pier in the more visually prominent central portion of Scorpion Beach. The shorter approach roadway and reduced rock armoring would result in proportionally reduced visual resource impacts at viewpoints throughout the study area. Under Alternative 2, the replacement pier would be visible from the entrance to Scorpion Ranch and throughout Scorpion Beach, effectively bisecting the view of Scorpion Beach. This central beach location was historically used for vessel docking, although Alternative 2 would entail a larger and more prominent pier. Therefore, Alternative 2 would result in long-term, minor, adverse impacts on visual resources due to the new, larger pier being more prominently positioned in the middle of the cove. Construction of Alternative 2 is anticipated to require 4 weeks less than for Alternative 1. These impacts would be reduced compared to Alternative 1 as a result of the shortened access road and reduced rock armoring.

Cumulative Impact Analysis

Alternative 2 would result in negligible impacts on visual resources during construction. Long-term impacts of Alternative 2 would be adverse and minor due to construction of the larger pier in the central portion of Scorpion Beach. These impacts would not be considered cumulatively major.

Mitigation

No mitigation is proposed.

Conclusion

Alternative 2 would result in negligible impacts during construction; and long-term, minor, adverse impacts on visual resources.

CULTURAL AND HISTORIC RESOURCES

METHODOLOGY AND THRESHOLDS

Cultural resources can be broadly divided into the following three categories:

- Historic structures that have an association with historical events or important people, or their exhibition of distinctive characteristics of type, period, and method of construction
- Archeological resources (districts and sites) that have the potential to yield information important to prehistory or history
- Cultural landscapes and traditional cultural properties related to use of the landscape by peoples in either precontact or historic times. The assessment of impacts on these properties can include consideration of impacts on archeological resources, ethnographic resources, and historic or prehistoric structures.

A major impact to a cultural resource is one that removes or significantly diminishes its historic significance or appearance. A minor impact is one that makes a change to the resource but does not diminish its historic significance or appearance.

IMPACTS OF THE NO ACTION ALTERNATIVE

The No Action Alternative assumes that the existing Scorpion Pier and approach roadway would continue to provide NPS and concessioner access to Santa Cruz Island. No construction or permanent modifications to the existing Scorpion Pier or approach roadway would occur under the No Action Alternative, and the existing pier and access roadway would continue to be maintained by the Park Service.

The No Action Alternative assumes no change in concessioner operations bringing visitors to Santa Cruz Island. Although the number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity, visitation to the island is primarily controlled by the concessioner contract, weather, and park rules and regulations (i.e., the GMP/Wilderness Study/EIS and Park Superintendent's public use limits for island; NPS 2014a). The No Action Alternative assumes continuation of existing concessioner contracts and no change to ferry vessel capacities or number of crossings.

Impact Analysis

Historic Structures. The historic structures in the study area are associated with the Caire-Gherini Ranch Complex, which is part of the Santa Cruz Island Historic Ranching District. No modifications to structures would occur beyond regular maintenance and repair. Such activities are not known and are not considered in this EIS. Views and uses are expected to stay the same. Therefore, there would be no impacts to historic structures associated with the No Action Alternative.

Archeological Sites. There is no ground disturbance associated with the No Action Alternative, and therefore there are no direct impacts to archeological sites. To the extent that the road to the current pier is maintained through the placement and maintenance of shoreline armoring, it is likely providing some protection from erosion at the north side of site CA-SCrI-423. However, it is not known whether and how the road would be maintained, so the No Action Alternative would also have no indirect impacts or benefits to archeological sites.

Cultural Landscapes. Components of the cultural landscape associated with the Caire-Gherini Ranch complex that are in the study area include the historic-era roads. No changes are proposed or expected to the condition of the roads as a result of the No

Action Alternative. Therefore, there would be no impacts to the cultural landscape.

Cumulative Impact Analysis

Because there would be no impacts of the No Action Alternative to cultural resources, there would be no cumulative impacts of the No Action Alternative.

Mitigation

No mitigation is proposed.

Conclusion

The No Action Alternative would result in no impacts on cultural resources.

IMPACTS OF ALTERNATIVE 1

Alternative 1 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier, oriented nearly parallel to the existing pier and extended farther into deeper water. An improved 435-foot-long elevated access road would connect the new pier terminus to North Scorpion Valley Road. The improved road would be supported by a new steel sheetpile retaining wall, and additional protective rock armoring would be installed along the shoreline to protect the road. Alternative 1 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

Historic Structures. None of the structures associated with the Caire-Gherini Ranch Complex would be removed or modified under Alternative 1. Views and uses are expected to stay the same. Alternative 1 would introduce a new non-historic pier into the historic landscape; however, the new pier would be in the same location as the existing pier, resulting in little change to the historic landscape. Therefore, there would be no impacts to historic structures associated with Alternative 1.

Archeological Sites. Impacts to archeological sites that are significant for their potential to yield data, as well as their historic properties with cultural and religious significance to traditionally associated American Indian peoples, could occur at locations of ground disturbance, as follows:

- **Locations where pier support piles would be installed.** Most of the piles are subtidal and intertidal on a high energy beach, where little to no potential exists for intact archeological materials. However, tribal representatives expressed concern about potential submerged resources. The CHIS Park Archeologist conducted an underwater survey with the help of Coastal Maritime Archaeological Resources. The survey area included the reported footprints of Alternatives 1 and 2. No prehistoric materials were encountered within the survey area. A small piece of marine wreckage believed to be part of a World War II era minesweeper was located nearby, but not within the footprint of either alternative. It would not be affected by either alternative. The piles nearer to shore would be in what historic photographs show to be fairly recent fill. The fill likely came from nearby beach and uplands, and probably contains artifacts derived from site CA-SCrI-423. However, these artifacts would be out of context, and unlikely to yield useful data about the site. Installations of pier support piles would have no impacts to cultural resources, and would be unchanged from the No Action Alternative.
- **Access road construction and armoring.** Site CA-SCrI-423 includes intact deposits that are present on the surface and in erosion cuts in the area of construction and armoring. Some areas are in the process of actively slumping and would probably be disturbed even

if materials are only placed on or in front of the surfaces. This disturbance would impact the intact portions of the site. However, elevating the road (thereby reducing the need for repeated harmful grading) and armoring the shoreline would significantly protect the site from further erosion. Although some impacts would occur during construction, Alternative 1 would probably have net benefit to site CA-SCrI-423. Mitigation measures Cultural-MM-1 and Cultural-MM-2 would be required to minimize disturbance during construction.

- **Construction staging activities.** Most of the materials staging and stockpiling would occur on an offshore barge. However, two upland areas were identified for staging (primary and secondary). Activities at these areas could include installation of trailers for the crew, laydown of materials, and parking of equipment. The three areas are as follows:

  - **Primary staging.** The current kayak storage area near site CA-SCrI-507. This area is currently used for staging, and has at least 30 cm (1 foot) of recently disturbed and mixed sediments near the center of the area where an archeological test was conducted. However, the site boundary extends into the staging area, and intact midden is present just to the northeast of the staging area. A road/trail passes through the midden from the staging area to the beach. This staging area could be used without impacts to the site, if mitigation measure Cultural-MM-2 is implemented to ensure that staging activities occur in a limited area where disturbed sediments are demonstrated to exist above intact deposits, and access across the archeological site is prohibited.
  - **Secondary staging.** The current corral area to the west of the ranch buildings. This area is currently used for staging activities, and the surface is quite compacted. There are, however, artifacts on the surface, along with modern debris. There is another area immediately north of the corral, where heavy equipment is currently parked. It has been recently created, and sediments are not as compacted as those in the corral. This area contains many surface artifacts, and intact deposits are probably present at or near the surface. This staging area could be used without impacts to the site, if mitigation measure Cultural-MM-2 is put in place to ensure that staging activities occur avoid ground disturbance and restrict access to the area north of the corral.

- **Construction traffic.** In some areas, such as in and immediately adjacent to the archeological sites, intact site deposits may be present near the roadway surface. This is especially likely to be true in depositional environments where flooding in Scorpion Creek deposits fine-grained sediments (for example, Scorpion Canyon North Road approaching the ranch complex). Driving heavy equipment across these areas, especially after wet weather events, could impact shallowly buried archeological materials, if they are present. Mitigation measure Cultural-MM-2 would be required to determine if any such deposits are present, and if so, avoid impacts to them.

None of the impacts are likely to eliminate the significance of any archeological sites, because they generally involve small areas of much larger sites. Therefore, Alternative 1 could impact archeological sites, but these impacts are not major and can be minimized and mitigated. With implementation of mitigation measures Cultural-MM-1 and Cultural-MM-2, the residual impact of Alternative 1 on archeological sites would be short-term, minor, and adverse compared to the No Action Alternative.

Cultural Landscapes. Components of the cultural landscape associated with the Caire-Gherini Ranch complex that are in the study area include the historic-era roads. No changes are proposed or expected to the condition of, or view from, the roads as a result of Alternative 1. Therefore, there would be no impacts to the cultural landscape compared to the No Action Alternative.

Cumulative Impact Analysis

Because Alternative 1 would result in minor impacts to cultural resources after mitigation measures are implemented, its incremental contribution to cumulative impacts on cultural resources would not be major. If mapping the extent of intact and disturbed resources in the study area is included as a mitigation measure, it would likely have ongoing benefits for management of archeological resources. Armoring at site CA-SCrI-423 would also likely benefit the archeological resources in the long term.

Mitigation

The Park Service would develop mitigation measures through the Section 106 process. CHIS would continue consultations with traditionally associated American Indian tribes and groups and the State Office of Historic Preservation. These consultations would inform development and implementation of site-specific mitigation measures. Recommended potential mitigation measures are described in the following paragraphs.

Cultural-MM-1. Potential mitigation for impacts to site CA-SCrI-423 from access road construction and armoring would include evaluating the extent of potential ground disturbance as design advances, and developing a mitigation strategy. Recommended mitigation includes fieldwork to determine the boundaries of intact and disturbed deposits, as well as data recovery where intact deposits would be impacted.

Cultural-MM-2. Potential mitigation for activities at staging areas and for construction traffic would include requirements that the activities be conducted in such a way that surface and shallowly buried archeological deposits would not be disturbed. This would likely include mapping the horizontal and vertical extent of those deposits, and restricting access to areas where deposits may be damaged. Requirements may also include preparing all or part of the staging area surface (for example, by laying down geotextile) to avoid disturbance.

Conclusion

Alternative 1 would result in short-term, minor, adverse impacts to archeological sites after mitigation measures are implemented, and would result in no impact to historic structures or cultural landscapes.

IMPACTS OF ALTERNATIVE 2

Alternative 2 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier approximately 300 feet south of the existing pier. A steel sheetpile retaining wall and rock armoring would be constructed to support and protect the approximately 110-foot-long access road that would connect the new pier terminus to North Scorpion Valley Road. Alternative 2 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

Historic Structures. None of the structures associated with the Caire-Gherini Ranch Complex would be removed or modified under Alternative 2. Uses of the complex are expected to stay the same. The view would change in some areas, but the central beach pier location is the same as past historic piers and would not diminish the historic feel and appearance of the ranch.

Therefore, there would be no impacts to historic structures or cultural landscapes associated with Alternative 2 compared to the No Action Alternative.

Archeological Sites. Impacts to archeological sites that are significant for their potential to yield data, as well as their historic properties with cultural and religious significance to traditionally associated American Indian peoples, could occur at locations of ground disturbance, as follows:

- **Locations where pier support piles would be installed.** Most of the piles are subtidal and intertidal on a high energy beach, where little to no potential exists for intact archeological materials. However, tribal representatives expressed concern about potential submerged resources. The CHIS Park Archeologist conducted an underwater survey with the help of Coastal Maritime Archaeological Resources. The survey area included the reported footprints of Alternatives 1 and 2. No prehistoric materials were encountered within the survey area. A small piece of marine wreckage believed to be part of a World War II era minesweeper was located nearby, but not within the footprint of either alternative. It would not be affected by either alternative. The piles nearer to shore, however, may be installed in intact or disturbed deposits related to site CA-SCrI-423. The upper portion of the beach berm and the portion Scorpion Canyon North road where it runs southeast of the site contain disturbed sediments where modern debris is mixed with artifacts. However, moving towards the ranch where the road turns and runs south of the site, the depth of disturbance has not been determined. Installing piles in this area could impact buried archeological materials, if they are present. Mitigation measure Cultural-MM-3 would be required to determine the extent of any intact deposits, and minimize or mitigate any impacts.
- **Approach road and retaining wall construction.** This construction occurs in the mapped boundary of site CA-SCrI-423. Intact deposits are not visible in the road surface here, but may be buried. The approach road area is in a depositional environment that may have protected archeological deposits during historic and modern use. Mitigation measure Cultural-MM-3 would be required to determine the extent of any intact deposits, and minimize or mitigate any impacts.
- **Construction staging activities and construction traffic.** These impacts would be the same as described for Alternative 1, and mitigation measure Cultural-MM-2 would be implemented to minimize these potential impacts.
- **Indirect effects.** Under Alternative 2, the segment of the road along the east-facing portion of the site would not be maintained. Maintenance currently includes placing large boulders on the beach east of the road to reduce wave energy and frequency. This likely provides some protection to the site. Mitigation Measure Cultural-MM-4 would be required to minimize or mitigate impacts.

None of the impacts are likely to eliminate the significance of any archeological sites, because they generally involve small parts of much larger sites. Therefore, Alternative 2 could impact archeological sites, but these impacts are not major and can be minimized and mitigated. With implementation of mitigation measures Cultural-MM-2 and Cultural-MM-3, the residual impact of Alternative 2 on archeological sites would be short-term, minor, and adverse compared to the No Action Alternative.

The footprint of ground disturbance at SCrI-423 is probably smaller for Alternative 2 than Alternative 1. This is because the construction of armoring along the east-facing part of the site under Alternative 1 could require some excavation (depending on design). However, the armoring, even with its associated impacts, would provide protection to the site.

Cultural Landscapes. Effects to cultural landscapes occur when changes impact or obscure the landscape's character and integrity. The landscape's character depends on the presence of contributing aspects, and integrity depends on the extent to which historic character is evident and changes are reversible.

Contributing aspects of the Caire-Gherini Ranch cultural landscape are natural systems and features, spatial organization, vegetation, circulation, buildings and structures, cluster arrangement, and small-scale features. Alternative 2 would introduce a new feature to the landscape, though past historic piers were present at the Alternative 2 location. The aspects of circulation and spatial organization would be modified. However, Alternative 2 would not introduce any irreversible changes to the landscape, and would not diminish the historic character of the landscape.

Mitigation measure Cultural-MM-5 would be required to minimize or eliminate impacts to the cultural landscape. Therefore, there would be short-term, minor, adverse impacts to cultural landscapes associated with Alternative 2 compared to the No Action Alternative.

Cumulative Impact Analysis

Because Alternative 2 would result in minor impacts to cultural resources after mitigation measures are implemented, its incremental contribution to cumulative impacts on cultural resources would not be major. If mapping the extent of intact and disturbed resources in the study area is included as a mitigation measure, it would likely have ongoing benefits for management of archeological resources.

Mitigation

The Park Service would develop mitigation measures through the Section 106 process. CHIS would continue consultations with traditionally associated American Indian tribes and groups and the State Office of Historic Preservation. These consultations would inform development and implementation of site-specific mitigation measures. Recommended potential mitigation measures are described in the following paragraphs.

Cultural-MM-2. Potential mitigation for activities at staging areas and for construction traffic would include requirements that the activities be conducted in such a way that surface and shallowly buried archeological deposits would not be disturbed. This would likely include mapping the horizontal and vertical extent of those deposits, and restricting access to areas where deposits may be damaged. Requirements may also include preparing part or all of the staging area surface (for example, by laying down geotextile) to avoid disturbance.

Cultural-MM-3. Potential mitigation for impacts to site CA-SCrI-423 from pier, approach road, and retaining wall construction would include evaluating the extent of potential ground disturbance as design advances, and developing a mitigation strategy. Recommended mitigation includes fieldwork to determine the boundaries of intact and disturbed deposits, as well as data recovery where intact deposits would be impacted.

Cultural-MM-4. Potential mitigation for indirect impacts could include additional research and testing to determine the extent of impacts, or the development of alternative mitigation in consultation with the Santa Ynez Band of Chumash Mission Indians.

Cultural-MM-5. Potential impacts to the Caire-Gherini Ranch Complex cultural landscape could be avoided or mitigated by designing new features to ensure their compatibility with the historic district and cultural landscape.

Conclusion

Alternative 2 would result in short-term, minor, adverse impacts to archeological sites after mitigation measures are implemented, and there would be no impact to historic structures or cultural landscapes.

RECREATION AND VISITOR USE

METHODOLOGY AND THRESHOLDS

Potential impacts on recreation, including visitor use and experience, refers to the duration, degree, and type of impacts that would affect visitor numbers at potential embarkation sites, the quality of the Santa Cruz Island visitor experience and the experience at the Scorpion Pier site, and other existing recreational opportunities in the study area. The potential change to recreational opportunities and visitor use and experience associated with the proposed alternatives was qualitatively evaluated by identifying projected changes in the ability of the Park Service to adequately serve visitors, NPS employees, and other users of Santa Cruz Island. Other specific impacts evaluated include the availability and quality of existing recreational opportunities, such as hiking, camping, water sports, fishing, boating, wildlife viewing, and enjoyment of cultural resources.

The measurement indices to evaluate recreational impacts include visitor usage, the quality of the Santa Cruz Island experience, and recreational opportunities. An alternative would be considered to have a major impact if it caused substantial change in visitor use or the quality of the Santa Cruz Island visitor experience, or resulted in prolonged interruption to existing recreational opportunities.

The analysis considered the potential for an alternative to do the following:

- Cause a substantial change in the number of visitors
- Change the quality of the Santa Cruz Island visitor experience
- Interrupt an existing recreational opportunity in the study area
- Conflict with NPS policies for park accessibility

IMPACTS OF THE NO ACTION ALTERNATIVE

The No Action Alternative assumes that the existing Scorpion Pier and approach roadway would continue to provide NPS and concessioner access to Santa Cruz Island. No construction or permanent modifications to the existing Scorpion Pier or approach roadway would occur under the No Action Alternative, and the existing pier and access roadway would continue to be maintained by the Park Service.

The No Action Alternative assumes no change in concessioner operations bringing visitors to Santa Cruz Island. Although the number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity, visitation to the island is primarily controlled by the concessioner contract, weather, and park rules and regulations (i.e., the GMP/Wilderness Study/EIS and Park Superintendent's public use limits for island; NPS 2014a). The No Action Alternative assumes continuation of existing concessioner contracts and no change to ferry vessel capacities or number of crossings.

Impact Analysis

There would be no modification to existing infrastructure at the existing Scorpion Pier under the No Action Alternative. Because no construction is proposed, the No Action Alternative would result in no construction-related impacts on recreational resources. The existing pier, which is degraded and does not meet Project objectives, would continue to be used for visitor access.

Existing safety hazards at Scorpion Pier may disproportionately affect older individuals, children, or visitors with mobility disabilities. This is in conflict with NPS policies for park accessibility.

Under existing conditions, Scorpion Pier cannot be used during certain weather and tide conditions due to hazards associated with the embarkation and disembarkation processes that are exacerbated by adverse weather conditions. Use of the roadway has also been impaired by storm surges that cause erosion and require road repair. If left unaddressed, these effects would be intensified by sea level rise. These existing deficiencies at Scorpion Pier and the approach roadway limit visitor and NPS employee access to Santa Cruz Island.

The existing pier structure displays corrosion and cracking. In its current condition, the pier can most likely be used for 3 to 5 additional years (WJE 2012). The No Action Alternative assumes a continuation of emergency and short-term repair and maintenance activities to preserve use of the existing pier and roadway. Absent maintenance, Scorpion Pier could become no longer operational and access to Santa Cruz Island would only be available from the pier at Prisoners Harbor and via private boats.

While the Park Service has managed to accommodate NPS and concessioner operations at Scorpion Pier, existing conditions fail to provide a visitor experience that achieves the desired quality of recreation identified as a Project purpose. Under the No Action Alternative, safety hazards would be left unaddressed, equal accessibility goals would not be achieved, access during certain weather and tide conditions would remain impaired, and structural weaknesses would remain, limiting the safety and life of the pier. Each of these deficiencies adversely affects public enjoyment of recreational opportunities available at Santa Cruz Island. Therefore, the No Action Alternative would result in potentially long-term, major, adverse impacts on recreation.

Cumulative Impact Analysis

The number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity. Assuming such maximum usage, visitor circulation at Scorpion Pier under the No Action Alternative could become compromised, reducing the quality of the experience and contributing to a potentially major cumulative impact on recreational activities in Santa Cruz Island.

Mitigation

No mitigation is proposed.

Conclusion

Under the No Action Alternative, recreational resources would continue to be compromised by existing deficiencies at the pier and approach roadway. Without improvements to the site, these conditions will worsen with continued degradation of the pier and as a result of sea level rise. Therefore, the No Action Alternative would result in potentially long-term, major, adverse impacts to recreation.

IMPACTS OF ALTERNATIVE 1

Alternative 1 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier, oriented nearly parallel to the existing pier and extended farther into deeper water. An improved 435-foot-long elevated access road would connect the new pier terminus to North Scorpion Valley Road. The improved road would be supported by a new steel sheetpile retaining wall, and additional protective rock armoring would be installed along the shoreline to protect the road. Alternative 1 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

During construction, access to the park by visitors or employees would occur via park

and concessioner skiffs because the existing pier would need to be demolished before most construction of the new pier can begin. This would significantly increase the time required to load and unload passengers and to transfer cargo to and from vessels, and further limit the conditions under which passengers would be able to access the area. Access to Santa Cruz Island from the pier at Prisoners Island and via private vessels would remain available. The concessioner estimates roughly half of all visitors considering a trip to Santa Cruz Island would be willing to take skiffs to the island, for an estimated period of up to 6 months (NPS 2014a). Skiff use would be further limited by tides and weather. Access limitations during construction would proportionately reduce available access to hiking trails, camping sites, fishing sites, the Scorpion Ranch Visitor center, the existing kayak staging area, the Scorpion Ranch Corral, and other Santa Cruz Island amenities. Movement of construction equipment, materials, and personnel between the secondary and primary staging areas would occur via the staging access route south of Scorpion Creek, thereby minimizing associated recreational impacts during construction. In addition, there may be temporary loss or relocation of mooring buoys in the Bay during construction. Therefore, construction of Alternative 1 would result in a short-term, major, adverse impacts to recreation compared to the No Action Alternative.

The longer pier and new configuration would provide deeper drafts and more maneuvering and docking options for vessels, which combined with the improved configuration would allow visitors to disembark via a gangway connected to the pier, rather than via ladder, as would occur under the No Action Alternative. The wider approach pier, adequate handrails, and improvements to the access road surface would alleviate existing safety issues present under the No Action Alternative. The new design would also adhere with NPS policies for park accessibility including compliance with all applicable regulations. The pier deck and roadway design elevations would address existing structural deficiencies, and would accommodate projected sea level rise through 2050 and 2100 (Ashton Engineering 2014). This alternative would meet the Project's purpose and need to provide a safe landside approach to allow year-round access to Santa Cruz Island at Scorpion Anchorage in a variety of weather conditions, resulting in a benefit to recreation. Therefore, Alternative 1 would result in long-term, major, beneficial impacts on recreation from operations compared to the No Action Alternative.

Cumulative Impact Analysis

Alternative 1 would result in short-term, major, adverse impacts on recreation during construction. These impacts would be limited to the construction phase and localized to Santa Cruz Island. Operational impacts of Alternative 1 would be long-term, major, and beneficial. Therefore, impacts would not be considered cumulatively major.

Mitigation

No mitigation is proposed.

Conclusion

Alternative 1 would result in short-term, major, adverse impacts on recreation during construction, and long-term, major, beneficial impacts on recreation from operations.

IMPACTS OF ALTERNATIVE 2

Alternative 2 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier approximately 300 feet south of the existing pier. A steel sheetpile retaining wall and rock armoring would be constructed to support and protect the approximately 110-foot-long access road that would connect the new pier terminus to North Scorpion Valley Road. Alternative 2 assumes no Project-related

increase in visitation numbers to Santa Cruz Island.

Impact Analysis

During construction of Alternative 2 at the central portion of the beach, the existing Scorpion Pier would continue to provide NPS and concessioner access to Santa Cruz Island. It is likely that during construction access to the park by visitors or employees could be restricted or eliminated for periods of time. Skiffs would still likely be required, and some mooring buoys would likely be temporarily relocated or not available for use. Access restrictions would be limited to the minimum required to maintain safety for park visitors and employees. Construction impacts on recreation would be minor and short term. Access limitations during construction would proportionately reduce available access to hiking trails, camping sites, fishing sites, the Scorpion Ranch Visitor center, the existing kayak staging area, the Scorpion Ranch Corral, and other Santa Cruz Island amenities. The staging access route south of Scorpion Creek would be used during construction in order to minimize recreational impacts. Therefore, Alternative 2 would result in short-term, moderate, adverse impacts on recreation during construction compared to the No Action Alternative.

Similar to Alternative 1, this alternative would address safety, access, and structural integrity deficiencies present at the existing pier. Alternative 2 would meet the Project's purpose and need to provide a safe landside approach to allow year-round access to Santa Cruz Island at Scorpion Anchorage in a variety of weather conditions, resulting in a benefit to recreation. Therefore, Alternative 2 would result in long-term, major, beneficial impacts on recreation from operations compared to the No Action Alternative.

Under Alternative 2, visitors would land at a point closer to Scorpion Ranch services compared to the existing location. This would be a long-term, minor, beneficial impact on recreation compared to the No Action Alternative.

Under Alternative 2, the beach area in the pier footprint would no longer be available to accommodate kayaking, snorkeling, and swimming. Displacement of mooring buoys would also likely occur. Passage across the pier and access road would be facilitated by stairs on either side, and removal of the existing pier structure would restore recreational access to the northern part of Scorpion Beach and Anchorage. These effects would constitute a long-term, minor, adverse impacts on recreation compared to the No Action Alternative.

Cumulative Impact Analysis

Alternative 2 would result in short-term, moderate, adverse impacts on recreation during construction; long-term, minor, adverse impacts due to displacement of available recreational activity areas; and long-term, minor to major, beneficial impacts from operations on recreation. These impacts would not be considered cumulatively major.

Mitigation

No mitigation is proposed.

Conclusion

Alternative 2 would result in short-term, moderate, adverse impacts on recreation during construction; long-term, minor, adverse impacts to recreation from displacing beach and anchorage areas available for kayaking, snorkeling, and swimming; and long-term, major beneficial impacts on recreation from operations.

PUBLIC HEALTH AND SAFETY

METHODOLOGY AND THRESHOLDS

Impacts on or associated with public health and safety were qualitatively evaluated based on the potential for the alternatives to temporarily or permanently result in health or safety effects related to operational hazards or hazardous materials. Because the Project purpose and objectives include providing a safe landside approach to allow year-round access to Santa Cruz Island at Scorpion Anchorage in a variety of weather conditions for visitors and NPS staff, these analyses address the potential for each alternative to expose individuals to hazards during operation of Scorpion Pier. In addition, because construction of the alternatives under evaluation may require demolition or alteration of existing structures, as well as grading and possible soil excavation, these analyses address the potential to encounter hazardous materials in existing structures and in soils.

The proposed measurement index used to evaluate impacts is the potential for hazardous operating conditions or hazardous materials to affect public health and safety. An alternative would be considered to have a major impact if it would result in substantial changes in risks to public health and safety throughout the study area.

The analysis considered the potential for an alternative to do the following:

- Create a significant hazard to the public through exposure to hazardous conditions through NPS or concessioner operations of Scorpion Pier and the approach roadway
- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment
- Be located on or near a hazardous materials site as listed by federal or state regulatory agencies

Potential seismic hazards to public safety are addressed in the "Geology, Soils, and Seismicity" section of this chapter. Potential hazards to waterbodies from runoff during construction and operation are discussed in the "Water Quality and Hydrology" section of this chapter.

IMPACTS OF THE NO ACTION ALTERNATIVE

The No Action Alternative assumes that the existing Scorpion Pier and approach roadway would continue to provide NPS and concessioner access to Santa Cruz Island. No construction or permanent modifications to the existing Scorpion Pier or approach roadway would occur under the No Action Alternative, and the existing pier and access roadway would continue to be maintained by the Park Service.

The No Action Alternative assumes no change in concessioner operations bringing visitors to Santa Cruz Island. Although the number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity, visitation is primarily controlled by the concessioner contract, weather, and park rules and regulations (i.e., the GMP/Wilderness Study/EIS and Park Superintendent's public use limits for island; NPS 2014a). The No Action Alternative assumes continuation of existing concessioner contracts and no change to ferry vessel capacities or number of crossings.

Impact Analysis

Because no construction is proposed, the No Action Alternative would not result in impacts related to disturbance or exposure to hazardous materials on site during construction.

The existing Scorpion Pier and approach roadway do not meet NPS requirements for safe visitor access, and continued operation under the No Action Alternative would create a safety risk to park visitors. Unsafe conditions are expected to worsen as a result of both sea level rise and continued degradation of existing structures. The No Action Alternative would not address existing and worsening hazards associated with NPS and concessioner operations at the pier and approach roadway. Therefore, the no Action Alternative would result in long-term, major, adverse impacts on public health and safety through the perpetuation of unsafe operating conditions, and expected continued structural deterioration.

Ongoing Scorpion Pier and concessioner operations under the No Action Alternative would occur in adherence with several plans and policies designed to address potential impacts associated with hazardous material storage, transport, and use. These plans are discussed in detail in the "Water Quality and Hydrology" section of this chapter. As a result of adherence to these established plans and procedures, the No Action Alternative would have no hazardous materials or public health and safety impacts.

Cumulative Impact Analysis

Because the No Action Alternative would be consistent with present conditions with respect to public health and safety hazards, there would be no cumulative impacts related to these issues as a result of this alternative.

Mitigation

No mitigation is proposed.

Conclusion

The No Action Alternative would result in no impact with respect to disturbance or exposure to hazardous materials in soils and structures on site during construction; no impact through operational use of potentially hazardous materials; long-term, major, adverse impacts through exposure to hazardous conditions during operations; and no impacts with respect to siting on or near a hazardous materials site.

IMPACTS OF ALTERNATIVE 1

Alternative 1 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier, oriented nearly parallel to the existing pier and extended farther into deeper water. An improved 435-foot-long elevated access road would connect the new pier terminus to North Scorpion Valley Road. The improved road would be supported by a new steel sheetpile retaining wall, and additional protective rock armoring would be installed along the shoreline to protect the road. Alternative 1 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

Construction activities under Alternative 1 would require demolition of the existing pier and roadway, and minor excavation. It is unlikely that hazardous materials are present in building materials, structures, or soils underlying the sites and may be exposed during construction. Construction would comply with all local, state, and federal permit requirements, including any agency-required water quality monitoring requirements. Therefore, Alternative 1 would result in no impacts to public health and safety from exposure to hazardous materials during construction compared to the No Action Alternative.

Ongoing NPS and concessioner operations would occur in adherence with applicable federal, state, and local regulations related to pollutant sources as detailed in the "Water Quality and Hydrology" section of this chapter. Therefore, there would be no impact to public health and safety due to use of potentially hazardous materials through ongoing operations.

Alternative 1 includes construction of a new pier that would allow visitors to disembark via a gangway connected to the pier, rather than via ladder as would occur under the No Action Alternative. The wider approach pier, adequate handrails, and improvements to the access road surface would alleviate existing safety issues present under the No Action Alternative. Roadway improvements would similarly address operational safety hazards posed by the existing uneven roadway surface. Improvements to both the pier and roadway have been designed to accommodate the effects of sea level rise. Therefore, Alternative 1 would have long-term, major, beneficial impacts to public health and safety through improved safe access and operations, for both NPS staff and visitors.

Given the site's existing and historic functions, it is unlikely that any hazardous materials underlie the study area. Therefore, Alternative 1 would have no impact associated with siting on or near a hazardous materials site compared to the No Action Alternative.

Cumulative Impact Analysis

Because Alternative 1 would result in no adverse impacts on public health and safety, its incremental contribution to any cumulative impacts on public health and safety would not be major, and would be considered unchanged from the No Action Alternative.

Mitigation

No mitigation is proposed.

Conclusion

Alternative 1 would result in no impact with respect to disturbance or exposure to hazardous materials in soils and structures on site during construction; no impact through operational use of potentially hazardous materials; long-term, major, beneficial impacts to public health and safety through operations; and no impacts with respect to siting on or near a hazardous materials site.

IMPACTS OF ALTERNATIVE 2

Alternative 2 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier approximately 300 feet south of the existing pier. A steel sheetpile retaining wall and rock armoring would be constructed to support and protect the approximately 110-foot-long access road that would connect the new pier terminus to North Scorpion Valley Road. Alternative 2 assumes no Project-related increase in visitation numbers to Santa Cruz Island.

Impact Analysis

Alternative 2 would be located in the same area as portions of Alternative 1. Operations under Alternative 2 would be identical to Alternative 1. Due to similarities in construction activities, construction-related impacts to public health and safety under Alternative 2 would be consistent with those of Alternative 1, with the exception that Alternative 2 would include a shorter approach roadway and therefore less excavation. Despite this minor difference, the impact analysis and cumulative impact analysis determinations, as well as the conclusions, would be the same as those of Alternative 1.

SUMMARY OF MITIGATION MEASURES

Table 17 presents a summary of all the proposed mitigation measures described in this chapter.

TABLE 17. SUMMARY OF MITIGATION MEASURES

Mitigation Measure	Description
Noise-MM-1	The Park Service would ensure that the contractor does the following, to the extent feasible: • When feasible, install noise mufflers to stationary equipment and impact tools that are no less effective than those provided by the manufacturer • Install barriers around particularly loud activities at the construction site to eliminate the line of sight between the source of noise and nearby sensitive receptors • Surround the air compressors powering the DTH hammer with a noise wall or shroud on three sides to help shield visitors, staff, and biota from any noise from the compressors • When feasible, use construction equipment with low noise emission ratings • Locate equipment, materials, and staging areas as far as practicable from sensitive receptors • Prohibit unnecessary idling of vehicles or equipment • Require applicable construction-related vehicles or equipment to use designated truck routes to access the Project site • Restrict construction activities between 7:00 a.m. to 7:00 p.m. Monday through Saturday
Aquatic-MM-1	The Park Service would obtain and comply with all required resource agency permit conditions, including any required work windows.
Aquatic-MM-2	The Park Service would ensure that sensitive wetland habitats and biota (i.e., marine/intertidal/rocky shore, estuarine/intertidal/emergent, and riverine/lower perennial/rock bottom wetlands) would be mapped prior to the initiation of construction and mitigation/replacement plans would be developed and approved by resource agencies, as required through the permitting process completed in Aquatic-MM-1. If habitat replacement is required, every attempt would be made to construct those habitats in the Scorpion Anchorage area. Likewise, transplant/translocation of sensitive species would be completed prior to the initiation of construction in the specified area and in accordance with agency-approved plans.
Aquatic-MM-3	The Park Service would ensure the following: • Contractor shall maintain a 500-meter (1,640-foot) safety zone (as is typically required by NMFS for Incidental Harassment Authorizations) around sound sources in the event that the sound level is unknown or cannot be adequately predicted. • Contractor shall bring loud mechanical equipment online slowly. • The Park Service shall employee a NMFS-approved protected species observer to conduct marine mammal monitoring during in-water

Mitigation Measure	Description
	construction • The protected species observer shall halt work activities when a marine mammal enters the 500-meter (1,640-foot) safety zone.
Aquatic-MM-4	The Park Service would ensure that pre-construction (within 60 days prior to construction) and post-construction (within 30 days following construction) surveys are conducted for eelgrass and Caulerpa as required by CEMP (NMFS 2014) and the Caulerpa Control Protocol (NMFS 2008). If eelgrass is observed in the impact area, monitoring and mapping would be required to identify potential impacts from construction. Monitoring and mapping would include pre- and post-project transects to map the extent of eelgrass. Any decrease in eelgrass (i.e., pre-project versus post-project) would constitute an impact and would be mitigated for pursuant to CEMP (NMFS 2014).
Terrestrial-MM-1	The Park Service would ensure that construction traffic, parking, and laydown areas would occur within previously disturbed lands to the extent feasible. Wildlife exclusion fencing would be installed and maintained around the perimeter of construction corridors and staging areas. To the extent feasible, roadside vegetation in the construction area would be maintained at short height to increase visibility of foxes if present. Equipment and vehicle travel would be limited to existing roads or construction corridors during construction. Vehicular speed would be limited to 15 miles per hour. Best management practices would be used by the construction contractor to minimize impacts on wildlife including no pets, containment of garbage, and no feeding of wildlife by construction crews that may be housed on the island. On-site open water sources that serve as wildlife attractants would not be created or maintained. Project construction would occur only during daylight hours. All employees and contractors working in the field would be required to complete environmental awareness training prior to working on site. Training would include information regarding sensitive biological resources, restrictions, protection measures, individual responsibilities associated with the Project, and the consequences of noncompliance. If the Santa Cruz Island fox is observed within the immediate vicinity of the pier, Park Service staff would stop pier construction and operation activities. NPS biologists would then be notified immediately to determine the potential impacts that could result from the attendant human activity. Mitigation measures would then be developed to best avoid or minimize impacts on the Santa Cruz Island fox. Mitigation could include, but is not limited to, restricting park operations or visitor use within the active den area or relocating individual foxes to more remote areas of the island. Staging areas would be thoroughly inspected by the construction contractor to ensure no foxes have taken refuge within stockpiled materials or equipment. If a fox is found and does not leave on its own accord, NPS biologists would be informed and the fox would be removed in a manner determined by the biologist that would cause the least amount of harm and stress to the animal.
Cultural-MM-1	Potential mitigation for impacts to site CA-SCrI-423 from access road construction and armoring would include evaluating the extent of potential

Mitigation Measure	Description
	ground disturbance as design advances, and developing a mitigation strategy. Recommended mitigation includes fieldwork to determine the boundaries of intact and disturbed deposits, as well as data recovery where intact deposits would be impacted.
Cultural-MM-2	Potential mitigation for activities at staging areas and for construction traffic would include requirements that the activities be conducted in such a way that surface and shallowly buried archeological deposits would not be disturbed. This would likely include mapping the horizontal and vertical extent of those deposits, and restricting access to areas where deposits may be damaged. Requirements may also include preparing all or part of the staging area surface (for example, by laying down geotextile) to avoid disturbance.
Cultural-MM-3	Potential mitigation for impacts to site CA-SCrI-423 from pier, approach road, and retaining wall construction would include evaluating the extent of potential ground disturbance as design advances, and developing a mitigation strategy. Recommended mitigation includes fieldwork to determine the boundaries of intact and disturbed deposits, as well as data recovery where intact deposits would be impacted.
Cultural-MM-4	Potential mitigation for indirect impacts could include additional research and testing to determine the extent of impacts, or the development of alternative mitigation in consultation with the Santa Ynez Band of Chumash Mission Indians.
Cultural-MM-5	Potential impacts to the Caire-Gherini Ranch Complex cultural landscape could be avoided or mitigated by designing new features to ensure their compatibility with the historic district and cultural landscape.

Sustainable and Long-term Management

Present-day Scorpion Ranch Bunkhouse.

SUSTAINABLE AND LONG-TERM MANAGEMENT

RELATIONSHIP OF SHORT-TERM USES OF THE ENVIRONMENT AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Construction of Alternatives 1 and 2 would result in short-term uses of the environment that are needed to achieve Project objectives and accomplish long-term objectives. Construction activities would be of short duration, potentially resulting in temporary effects such as fugitive dusts and increased emissions, increased noise, disturbance of cultural resources, and loss of recreational opportunities. Long-term benefits of the Project include significantly improving the quality and safety of the Scorpion Island visitor experience. These long-term benefits would outweigh the short-term impacts resulting from construction.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible and irretrievable commitments of resources are commitments where the resource would be permanently lost or consumed. Irreversible commitments would result from Project construction that would consume fossil fuels, labor, and construction materials such as concrete, steel, wood, and other materials. Some archeological sites may be affected; while the impacts to these resources would be mitigated, impacts would nonetheless be irreversible. Loss of terrestrial and aquatic biological resources, which may occur as a result of the Project, would be irreversible, although these communities are expected to fully recover.

The use of waterfront areas for piers, roadways, and other structures would constitute an irretrievable commitment of resources during the period the site is used for concessioner and NPS operations. However, these resources could be converted to another use at a future date.

ADVERSE IMPACTS THAT CANNOT BE AVOIDED

The Project could result in unavoidable major adverse impacts to seismic safety hazards and major short-term construction noise impacts that could not be mitigated through alteration of an alternative's design. The Park Service avoids impacts that it determines to be unacceptable (NPS 2006a). Based on the analysis in this EIS, the Project would not result in any unacceptable impacts.

GROWTH-INDUCING IMPACTS

Although the number of visitors to Santa Cruz Island has risen steadily in the past and future visitation levels are anticipated to remain close to maximum capacity, visitation to the island is primarily controlled by the concessioner contract, weather, and park rules and regulations (i.e., the GMP and Park Superintendent's public use limits for island; NPS 2014a). The Project assumes no Project-related increase in visitation numbers to Santa Cruz Island. Therefore, the Project itself is not growth-inducing.

Consultation and Coordination

INTRODUCTION

This chapter provides an overview of public involvement and consultation processes undertaken for the Project. It also includes information on other requirements for the Project, as well as a list of preparers.

HISTORY OF PUBLIC INVOLVEMENT

Early agency and stakeholder scoping for the Project began in 2010. Public scoping meetings and additional meetings with key stakeholders took place in 2013. These public involvement activities are shown in Table 18 and described in further detail in the following paragraphs.

TABLE 18. PUBLIC INVOLVEMENT ACTIVITIES

Activity	Date
Notice of Intent published in the national register; scoping period begins	May 29, 2013
Public meeting at Robert J. Lagomarsino Visitor Center	June 18, 2013
Public meeting at Santa Barbara Public Library	June 19, 2013
Scoping period ended	July 29, 2013

The NOI for the Project was published in the Federal Register on May 29, 2013. The NOI provided information about the Project and invited public and agency input on the scope of the EIS during the 60-day scoping period.

Scoping meetings were held on June 18 and 19, 2013, at the Robert J. Lagomarsino Visitor Center in Ventura and the Santa Barbara Public Library, respectively. Both meetings presented information about the purpose, need, and objectives of the Project and concepts for possible alternatives.

Additional outreach occurred with the CDFW, SHPO, CSLC, Chumash Council of Elders, Santa Ynez Band of Chumash Mission Indians, and Island Packers.

Information on the key concerns documented during the Project's public and agency scoping process is presented in the "Purpose and Need for Action" chapter.

CURRENT AND FUTURE PUBLIC INVOLVEMENT

The formal public comment period for this Draft EIS began upon publication of a NOA in the FR. Agencies and the general public have the opportunity to review and comment on this Draft EIS during the 60-day comment period. Copies of the Draft EIS are available at the locations noted in the "Distribution Information" section of this chapter. For specific public comment period start and end dates, please visit the Project's website: http://parkplanning.nps.gov/ScorpionPier.

The Park Service will record, categorize, and respond to all substantive public comments received on this Draft EIS. The Final EIS will incorporate text revisions as appropriate, will identify revisions corresponding to comments received, and will identify the Park Service's reasons for identifying the preferred alternative. The release of the Final EIS will be announced through publishing an NOA in the Federal Register and posting updates on the Project website. The Record of Decision will be issued a minimum of 30 days after publication of the NOA for the Final EIS.

FUTURE COMPLIANCE REQUIREMENTS

The Project will require compliance with a number of other policies and regulations. The anticipated requirements of the Project are listed in Table 19.

TABLE 19. POTENTIAL FUTURE COMPLIANCE REQUIREMENTS

Regulation	Agency	Requirement
CWA Section 404	USACE	Standard Individual or Nationwide Permit
Rivers and Harbors Act	USACE	Standard Individual or Nationwide Permit
ESA	USFWS, NMFS	Concurrence or Biological Opinion
M-SFCMA	NMFS	General Concurrence, Abbreviated Consultation, or Expanded Consultation
MMPA	NMFS	Incidental Harassment Authorization
Section 106	ACHP, SHPO, tribes	Consultation on Project effects to historic properties; agreement document if any adverse effects
CWA Section 401/Porter-Cologne Water Quality Control Act	Central Coast RWQCB	Water Quality Certification/Waste Discharge Requirements
CZMA	CCC	Consistency Determination
CWA Section 402	Central Coast RWQCB	General Construction Permit; Vessel General Permit; SWPPP

Notes:
ACHP – Advisory Council on Historic Preservation
CCC – California Coastal Commission
CWA – Clean Water Act
CZMA – Coastal Zone Management Act
NMFS – National Marine Fisheries Service
RWQCB – Regional Water Quality Control Board
SHPO – State Historic Preservation Officer
SWPPP – Stormwater Pollution Prevention Plan
USACE – U.S. Army Corps of Engineers
USFWS – U.S. Fish and Wildlife Service

Consultations with NMFS and USFWS

The Park Service has initiated consultations with NMFS and USFWS under Section 7 of the ESA of 1973, and with NMFS under the M-SFCMA and MMPA. The Park Service has determined, as described in the "Aquatic Biological Resources" and "Terrestrial Biological Resources" sections of the "Environmental Consequences" chapter, that the Project may affect, but is not likely to adversely affect several marine species, and that the Project would have only temporary and minimal effects on EFH.

Section 106 of NHPA

Section 106 of NHPA requires that agencies consult with the ACHP, SHPO, interested and affected federally recognized Indian tribes, other interested parties, and the public. Section 106 regulations at 36 CFR 800.8(c) allow agencies to use "the process and documentation," required under NEPA to fulfill all or part of Section 106 requirements.

The Park Service notified the ACHP, SHPO, and representatives of the Chumash Council of Elders and Santa Ynez Band of Chumash Mission Indians of the Project. The notification included the NOI to prepare an EIS, and a statement that the NEPA process would be used to fulfill some Section 106 requirements related to consulting the public and other interested parties. The Park Service is conducting a separate Section 106 consultation process with the ACHP, SHPO, and tribes.

LIST OF PREPARERS AND CONSULTING PARTIES

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LOCATIONS WHERE DRAFT EIS IS AVAILABLE FOR PUBLIC REVIEW

The Draft EIS is available for review on the Project's website: http://parkplanning.nps.gov/ScorpionPier.

Paper copies of the Draft EIS are also available for public review at the Office of the Superintendent (1901 Spinnaker Drive, Ventura, California); and at the main branch of the Santa Barbara Public Library (40 East Anapamu Street, Santa Barbara, California).

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Appendixes

APPENDIX A
SPECIAL STATUS SPECIES TABLES

TABLE A-1. ADDITIONAL CNPS LIST PLANT SPECIES WITH THE POTENTIAL TO OCCUR IN THE STUDY AREA

Common Name	Scientific Name	California Rare Plant Rank
Aphanisma	*Aphanisma blitoides*	1B.2
Coulter's saltbush	*Atriplex coulteri*	1B.2
South coast saltscale	*Atriplex pacifica*	1B.2
Round-leaved filaree	*California macrophylla*	1B.1
Island white-felted paintbrush	*Castilleja hololeuca*	1B.2
Candleholder dudleya	*Dudleya candelabrum*	1B.2
Island wallflower	*Erysimum insulare*	1B.3
Island alumroot	*Heuchera maxima*	1B.2
Island mallow	*Lavatera assurgentiflora* ssp. *assurgentiflora*	1B.1
Santa Cruz Island ironwood	*Lyonothamnus floribundus* ssp. *aspleniifolius*	1B.2
Wavy-leaved malacothrix	*Malacothrix foliosa* ssp. *crispifolia*	1B.2
Junak's malcothrix	*Malacothrix junakii*	1B.1
Mexican malacothrix	*Malacothrix similis*	2A
Santa Cruz Island gooseberry	*Ribes thacherianum*	1B.2

Notes:
California Rare Plant Rank 1B.1 – rare, threatened, or endangered in California and elsewhere; seriously threatened in California (more than 80% of occurrences threatened/high degree and immediacy of threat)
California Rare Plant Rank 1B.2 – rare, threatened, or endangered in California and elsewhere; fairly threatened in California (20 to 80% of occurrences threatened/moderate degree and immediacy of threat)
California Rare Plant Rank 2A – extirpated in California, common elsewhere
Source: CDFW 2014

TABLE A-2. FEDERALLY LISTED SPECIES WITH THE POTENTIAL TO OCCUR IN THE STUDY AREA

Species	Federal	State	Habitat Association	Potential to Occur
Invertebrates				
Black abalone *(Haliotis cracherodii)*	E	-	Marine intertidal and splash zone communities	Very low potential to occur. Intertidal habitat may be suitable for this species. No recorded observations in the study area.
Amphibians				
California red-legged frog *(Rana draytonii)*	T	SSC	Aquatic, flowing waters standing waters, freshwater marsh, marsh and swamp, riparian forest, riparian scrub, riparian woodland	No potential to occur. Habitat not present.
Birds				
Western snowy plover *(Charadrius alexandrinus nivosus)*	T	SSC	Great Basin standing waters, sandy shore, wetland	No potential to occur. Habitat not present.
Mammals				
Santa Cruz Island fox *(Urocyon littoralis santacruzae)*	E	T	Chaparral, cismontane woodland, Coastal scrub	High potential to occur. Recorded observations in study area.
Plants				
Island barberry *(Berberis pinnata* ssp. *insularis)*	E	E; 1B.2	Cismontane woodland, closed-cone coniferous forest, coastal scrub	Very low potential to occur. Coastal scrub habitat may be suitable for this species. No recorded observations in the study area.
Hoffmann's rockcress *(Boechera hoffmannii)*	E	1B.1	Coastal bluff scrub	Very low potential to occur. Coastal scrub habitat may be suitable for this species. No recorded observations in the study area.
Santa Cruz Island liveforever *(Dudleya nesiotica*)	T	1B.1	Rocky or gravelly, clay, coastal bluff scrub, coastal scrub	Very low potential to occur. Coastal scrub habitat may be suitable for this species. No recorded observations in the study area.
Box bedstraw *(Galium buxifolium)*	E	SR; 1B.2	Closed-cone coniferous forest, coastal bluff scrub, coastal scrub	Very low potential to occur. Coastal scrub habitat may be suitable for this species. No recorded observations in the study area.

Species	Federal	State	Habitat Association	Potential to Occur
Island rush-rose *(Helianthemum greenei)*	T	1B.2	Chaparral, cismontane woodland, closed-cone coniferous forest, coastal scrub	Very low potential to occur. Coastal scrub habitat may be suitable for this species. No recorded observations in the study area.
Santa Cruz Island malacothrix *(Malacothrix indecora)*	E	1B.1	Chaparral, coastal bluff scrub, coastal dunes, coastal scrub	Very low potential to occur. Coastal scrub habitat may be suitable for this species. No recorded observations in the study area.
Island malacothrix *(Malacothrix squalida)*	E	1B.1	Chaparral, cismontane woodland, coastal bluff scrub	Very low potential to occur. Coastal scrub habitat may be suitable for this species. No recorded observations in the study area.
Santa Cruz Island winged-rockcress *(Sibara filifolia)*	E	1B.1	Coastal scrub	Very low potential to occur. Coastal scrub habitat may be suitable for this species. No recorded observations in the study area.
Santa Cruz Island fringepod *(Thysanocarpus conchuliferus)*	E	1B.2	Chaparral, cismontane woodland	Very low potential to occur. Coastal scrub habitat may be suitable for this species. No recorded observations in the study area.

Notes:
E – endangered
T – threatened
SSC – state species of special concern
California Rare Plant Rank 1B.1 – rare, threatened, or endangered in California and elsewhere; seriously threatened in California (more than 80% of occurrences threatened/high degree and immediacy of threat)
California Rare Plant Rank 1B.2 – rare, threatened, or endangered in California and elsewhere; fairly threatened in California (20 to 80% of occurrences threatened/moderate degree and immediacy of threat)
Source: CNDDB Search of the Project Quadrangle and Surrounding Quadrangles (Santa Cruz Island D, Santa Cruz Island C, and Anacapa Island); and Prisoners Harbor EIS (NPS 2010b)

TABLE A-3. STATE LISTED THREATENED AND ENDANGERED PLANTS AND ADDITIONAL SPECIAL STATUS WILDLIFE SPECIES WITH THE POTENTIAL TO OCCUR IN THE STUDY AREA

Species	State	Habitat Association	Potential to Occur
Ashy storm-petrel *(Oceanodroma homochroa)*	SSC	Protected deep water coastal communities	No potential to occur. Habitat not present.
Bald eagle *(Haliaeetus leucocephalus)*	E	Lower montane coniferous forest, sandy shores, wetlands	Low to moderate potential to occur. May hunt in study area. No recorded observations in the study area.
Scripps's murrelet *(Synthliboramphus hypoleucus)*	T	Lives at sea and nests on land caves, crevices, and often along steep slopes or cliffs	Low to moderate potential to occur. May forage in study area.
Anacapa Island deermouse *(Peromyscus maniculatus anacapae)*	SSC	Tundra, taiga, temperate and boreal forest , swamps and bogs, prairies, deserts, and scrublands	No potential to occur. Occurs exclusively on Anacapa Island.
Black storm-petrel *(Oceanodroma meliana)*	SSC	Frequents ocean waters in central California from late spring to winter, nests in cavities and crevices	Low to moderate potential to occur. May forage in study area.
Cassin's auklet (*Ptychoramphus aleuticus)*	SSC	Associated with cooler, chlorophyll-rich waters near the shelf break near Channel Islands; nests in earthen burrows, rocky crevices, debris piles, cracks under buildings, and large caves	Low to moderate potential to occur. May forage in study area.
Channel Islands spotted skunk *(Spilogale gracilis amphiala)*	SSC	Chaparral-grassland, open grassland, fennel-grassland, and ravines on Santa Cruz Island	Moderate to high potential to occur in study area.
Double crested cormorant *(Phalacrocorax auritus)*	SSC	Prefers water less than 30 feet deep with rocky or gravel bottom for foraging; roosts and rests beside water on offshore rocks, islands, steep cliffs, dead branches of trees, wharfs, and jetties	Low to moderate potential to occur. May forage in study area.
Golden eagle *(Aquila chrysaetos)*	SSC	Forests, canyons, shrub lands, grasslands, and oak woodlands; nests on platforms on steep cliffs or in large trees	No potential to occur. Species relocated to mainland; no individuals present since 2006.
Pallid bat *(Antrozous pallidus)*	SSC	Variety of chaparral, scrub, grassland, and woodland habitats	Moderate to high potential to occur in study area.
Townsend's big-eared bat *(Corynorhinus townsendii)*	SSC	Variety of chaparral, scrub, grassland, and woodland habitats	High potential to occur in study area. Known to roost in Scorpion Ranch.

Species	State	Habitat Association	Potential to Occur
Western mastiff bat (*Eumops perotis)*	SSC	Variety of chaparral, scrub, grassland, and woodland habitats	Moderate to high potential to occur in study area.
Santa Cruz Island bird's-foot trefoil *(Acmispon argophyllus var. niveus)*	E	Chaparral, coastal scrub	Very low potential to occur. Coastal scrub habitat may be suitable for this species. No recorded observations in the study area.

Notes:
T – threatened
D – delisted
FP – fully protected
SSC – state species of special concern
Source: CDFW 2014; NPS 2010b; NPS 2013a

TABLE A-4. TERRESTRIAL VERTEBRATES OF SANTA CRUZ ISLAND

Common Name	Scientific Name	Endemic
Amphibians		
Blackbelly slender salamander	*Batrachoseps nigriventris*	
Channel Islands slender salamander	*B. pacificus pacificus*	Channel Islands
Pacific tree frog	*Pseudacris regilla*	
Reptiles		
Southern alligator lizard	*Elgaria multicarinata*	
Island fence lizard	*Sceloporus occidentalis beckii*	Channel Islands
Side-blotched lizard	*Uta stansburnia*	
Santa Cruz gopher snake	*Pituophis catenifer pumilus*	Santa Cruz and Santa Rosa Islands
Western yellow-bellied racer	*Coluber constrictor mormon*	
Mammals		
California myotis	*Myotis californicus*	
Long-eared myotis	*M. evotis*	
Fringed myotis	*M. thysanodes*	
Townsend's western big-eared bat	*Corynorhinus townsendii townsendii*	
Big brown bat	*Eptesicus fuscus*	
Pallid bat	*Antrozous pallidus*	
Silver-haired bat	*Lasionycteris noctivagans*	
Hoary bat	*Lasiurus cinereus*	
Western bat	*L. blossevillii (= L.borealis, in part)*	
Mexican free-tailed bat	*Tadarida brasiliensis*	
Western mastiff bat	*Eumops perotis*	
Santa Cruz deer mouse	*Peromyscus maniculatus santacruzae*	Santa Cruz Island
Santa Cruz Island harvest mouse	*Reithrodontomys megalotis santacruzae*	Santa Cruz Island
Santa Cruz Island fox	*Urocyon littoralis santacruzae*	Santa Cruz Island
Island spotted skunk	*Spilogale gracilis amphiala*	Santa Cruz and Santa Rosa Islands
Landbirds		
Golden eagle	*Aquila chrysaetos*	
Red-tailed hawk	*Buteo jamaicensis*	
Peregrine falcon	*Falco peregrinus*	
American kestrel	*Falco sparverius*	
Wild turkey	*Meleagris gallopavo*	
California quail	*Callipepla californica*	
Western snowy plover	*Charadrius alexandrines nivosus*	
Killdeer	*Charadrius vociferous*	
Black oystercatcher	*Haematopus bachmani*	

Common Name	Scientific Name	Endemic
American oystercatcher	*Haematopus palliates*	
Mourning dove	*Zenaida macroura*	
Barn owl	*Tyto alba*	
Northern saw-whet owl	*Aegolius acadicus*	
White-throated swift	*Aeronautes saxatalis*	
Anna's hummingbird	*Calypte anna*	
Allen's hummingbird	*Selasphorus sasin sedentarius*	All Channel Islands
Acorn woodpecker	*Melanerpes formicivorus*	
Northern flicker	*Colaptes auratus*	
Pacific-slope flycatcher	*Empidonax difficilis insulicola*	All Channel Islands
Black phoebe	*Sayornis nigricans*	
Ash-throated flycatcher	*Myiarchus cinerascens*	
Horned lark	*Eremophila alpestris insularis*	All Channel Islands
Barn swallow	*Hirundo rustica*	
Common raven	*Corvus corax*	
Island scrub-jay	*Aphelocoma insularis*	Santa Cruz Island
Bushtit	*Psaltriparus minimus*	
Red-breasted nuthatch	*Sitta canadensis*	
Rock wren	*Salpinctes obsoletus*	
Bewick's wren	*Thryomanes bewickii nesophilus*	Northern Channel Islands
Blue-gray gnatcatcher	*Polioptila caerulea*	
Northern mockingbird	*Mimus polyglottos*	
Loggerhead shrike	*Lanius ludovicianus anthonyi*	Northern islands plus San Clemente
European starling	*Sturnus vulgaris*	
Hutton's vireo	*Vireo huttoni*	
Orange-crowned warbler	*Vermivora celata sordida*	All Channel Islands
Black-headed grosbeak	*Pheucticus melanocephalus*	
Rufous-crowned sparrow	*Aimophila ruficeps obscura*	Anacapa and Santa Cruz islands
Song sparrow	*Melospiza melodia clementae*	Santa Cruz and Santa Rosa islands
Spotted towhee	*Pipilo maculates*	
Rufous-sided towhee	*Pipilo erythrophthalmus*	
Chipping sparrow	*Spizella passerine*	
Red-winged blackbird	*Agelaius phoeniceus*	
Western meadowlark	*Sturnella neglecta*	
Lesser goldfinch	*Carduelis psaltria*	
House finch	*Carpodacus mexicanus frontalis*	All Channel Islands but Santa Barbara
Belted kingfisher	*Megaceryle alcyon*	
Mallard	*Anas platyrhynchos*	
Sharp-shinned hawk	*Accipiter striatus*	
Yellow-rumped warbler	*Dendroica coronata*	
Bald eagle	*Haliaeetus leucocephalus*	

Common Name	Scientific Name	Endemic
Seabirds		
Ashy storm-petrel	*Oceanodroma homochroa*	
Brandt's cormorant	*Phalacrocrax penicillatus*	
Double-crested cormorant	*P. auritus*	
Pelagic cormorant	*P. pelagicus*	
California brown pelican	*Pelecanus occidentalis Californicus*	
Western gull	*Larus occidentalis*	
Cassin's auklet	*Ptychoramphus aleuticus*	
Pigeon guillemot	*Cepphus columba*	
Xantus's murrelet	*Synthliboramphus hypoleuca*	
Rhinoceros auklet	*Cerorhinca monocerata*	

Note:
Source: Modified from NPS 2013a; NPS 2010b

APPENDIX B
NOISE AND VIBRATION ANAYLSIS CALCULATIONS

Noise Analysis Calculations

Equation Used to Calculate Combined Noise Level of Construction Equipment

$N_e = 10 \log_{10} (10^{[N_1/10]} + 10^{[N_2/10]})$, where:

N_e = combined noise level of construction equipment at 50 feet = 102 dBA

N_1 = noise level of vibratory pile driver at 50 feet = 96 dBA

N_2 = noise level of impact pile driver at 50 feet = 101 dBA

Equation Used to Calculate Attenuated Noise Level of Construction Equipment

$N_a = N_e - 6(Di/Do)$, where:

N_a = attenuated noise level of construction equipment

Di = distance of noise source to receptor

Do = reference distance = 50 feet

Equation Used to Calculate Combined Noise Level of Construction Equipment and Existing Ambient Noise at Sensitive Receptors

$N_s = 10 \log_{10} (10^{[Na/10]} + 10^{[N_3/10]})$, where:

N_3 = noise level of existing ambient noise at the receptor

Table 1. Calculated Maximum Attenuated Noise Level from Construction at Sensitive Receptors

Site	Receptor	N_1	N_2	Di	Do	N_a	N_3	N_s
Alternative 1	Visitors seeking solitude	96	101	0	50	108	0	108
	Lower Campground overnight campers			1,110		0	0	3
	Scorpion Ranch historic structures			140		91	0	91
	Ranger residences			1,500		0	0	3
Alternative 2	Visitors seeking solitude			0		108	0	108
	Lower Campground overnight campers			1,110		0	0	3
	Scorpion Ranch historic structures			140		91	0	91
	Ranger residences			1,500		0	0	3

Vibration Analysis Calculations

Equation Used to Calculate PPV Levels

$PPV_{vs} = PPV_{ref} \times (25/D)^{1.5}$, where:

PPV_{vs} = attenuated PPV level (in/sec)

PPV_{ref} = PPV level of vibration source at 25 feet =

0.644 for the impact pile driver during construction

0.012 for the shuttle during operation

D = distance of vibration source to receptor

Equation Used to Convert PPV to VdB

$L_v = 20 \times \log10(V/V_{ref})$

L_v = attenuated velocity level in decibels (VdB)

V = RMS velocity amplitude = PPV_{vs}/crest factor of 4

$V_{ref} = 1 \times 10^{-6}$ inches per second

Table 2. Calculated Construction PPV and VdB Levels at Sensitive Receptors

Site	Receptor	PPV_{ref}	Di	PPV_{vs}	VdB
Alternative 1	Visitors seeking solitude	0.644	0	80500.000	206
	Lower Campground overnight campers		1,110	0.002	55
	Scorpion Ranch historic structures		140	0.049	82
	Ranger residences		1,500	0.001	51
Alternative 2	Visitors seeking solitude		0	80500.000	206
	Lower Campground overnight campers		1,110	0.002	55
	Scorpion Ranch historic structures		140	0.049	82
	Ranger residences		1,500	0.001	51

APPENDIX C
FLOODPLAIN STATEMENT OF FINDINGS

FLOODPLAIN STATEMENT OF FINDINGS

INTRODUCTION

Executive Order (EO) 11988, "Floodplain Management," requires the National Park Service (NPS or Park Service) and other agencies to evaluate the likely impacts of actions in floodplains. It is NPS policy to preserve floodplain values and minimize potentially hazardous conditions associated with flooding. If a proposed project is in an applicable regulatory floodplain, then flood conditions and associated hazards must be quantified, and a formal statement of findings (SOF) must be prepared. Director's Order (DO)-77-2: Floodplain Management provides direction for the preparation of a floodplain SOF. This SOF has been prepared to comply with EO 11988 and DO #77-2.

EO 11990, "Protection of Wetlands," requires the Park Service and other agencies to evaluate the likely impacts of actions in wetland. Per NPS DO #77-1: Wetland Protection and Procedural Manual #77-1, Section 4.2, pier construction projects with long term wetland impacts of 0.1 acre or less are exempted from requiring a wetland SOF. The proposed selection of a replacement site, including construction and operations, hereafter referred to as the Project, would result in impacts to 0.04 acre of wetland resources, as determined using the wetland delineation provided in NPS' *Report for Travel to Channel Islands National Park during May 11 – 16, 2003* (NPS 2003). The proposed Project is therefore exempt from requiring a wetland SOF.

PROPOSED PROJECT

As described in the Environmental Impact Statement (EIS), the Park Service proposes to replace and relocate Scorpion Pier, as well as make improvements to the access road, in order to improve park operations, improve the visitor experience, and provide safe access to Santa Cruz Island. The existing pier is deteriorating and does not meet NPS requirements for administrative use or safe visitor access. The access road to the current pier location also requires frequent rebuilding due to wave and storm erosion. Disembarkation requires visitors and NPS staff to use ladders in pitching and shifting seas, and it is not safe for boats to approach or dock when tides are low or when wave heights are greater than 1 or 2 feet. Therefore, vessel operators have difficulty accessing the pier and disembarking passengers and cargo without risk to individuals, vessels, and the pier itself.

The proposed Project would construct a longer, wider pier approximately 300 feet south of the existing pier, which is closer to the Scorpion Canyon North Road and provides easier access to visitor facilities. Once the new pier is completed, the existing pier and abutments would be removed and disposed of on the mainland. The relatively short access road that would connect the new pier terminus to North Scorpion Valley Road would be supported by a steel sheetpile retaining wall that is protected from extreme waves and flood waters by rock armoring. The road would be surfaced with an even layer of crushed rock. A small stairway would be constructed to provide beach access.

SITE DESCRIPTION AND FLOODPLAIN VALUES

The existing Scorpion Pier provides access to Santa Cruz Island from Scorpion Anchorage.

Santa Cruz Island provides numerous recreational opportunities, including beach activities, hiking trails, a historic district, a 240-person campground, and kayaking, swimming, scuba diving, and snorkeling sites. Scorpion Anchorage is a semiprotected ocean environment that poses challenges in making boat-to-pier transitions safely, particularly during strong ocean swell conditions. After disembarking, visitors are required to traverse approximately 400 feet across a rough, coarsely graded gravel access road. The road is within the floodplain of Scorpion Creek, a nearby seasonal stream, and must be repaired and regraded several times per year due to impacts from storms, wave erosion, and the flooding of Scorpion Creek.

Scorpion Creek drains a small portion of the north side of the easternmost tip of Santa Cruz Island. It is a seasonally intermittent channel with U-shaped morphology near its confluence with the ocean (NPS 2010). The creek channel transitions to estuarine/intertidal/emergent wetland habitat near its confluence with the beach at Scorpion Anchorage. Longshore currents and intertidal exchange create and maintain a cobble beach and bar along the shoreline and at the end of the stream channel, which reduces intertidal exchange between the creek and estuarine wetlands (NPS 2003). The Scorpion Creek floodplain includes the entire lower valley, from canyon wall to wall (NPS 2015).

The lower end of the Scorpion Creek riverine wetland channel, including part of the estuarine wetland, has been dramatically altered by dredging over the past 100 years. Flows are confined to a 35-foot-wide, 800-foot-long channel (NPS 2003). Prior to grazing and channelization, the stream channel likely meandered back and forth across the entire valley floor through a series of braided channels. In that predisturbance situation, the riverine and palustrine wetlands likely extended across the entire valley floor (NPS 2003). Much of the original floodplain and estuary has filled with sediment, or was graded by previous settlers (NPS 2006). In recent years, the Park Service has twice excavated a portion of the channel to restore some flow capacity to the channel following flood events (NPS 2015).

DESCRIPTION OF SITE-SPECIFIC FLOOD RISK

The proposed Project is located within the Scorpion Creek floodplain and adjacent to the shoreline, within an area susceptible to inundation from large storms, sea level rise, and tsunamis. This section provides a description of these three hazards and a discussion of associated risks to persons and property as a result of the proposed Project.

FLOOD HAZARDS

Storm Hazard. The proposed Project includes improvements to the access road, which is located within the Scorpion Creek floodplain. Intense frontal storms are characteristic of the study area, and the Scorpion Creek watershed is steep and highly dissected. These conditions contribute to rapid runoff, erosion, and debris flows, which combine to produce large flow events. Significant flood events recently occurred at Scorpion Creek in 1997 and 2010 (Photos 1 and 2). During these events, significant sedimentation transport and deposition occurred, and in 1997, structures at Scorpion Ranch were inundated. While there are no streamflow gages in the watershed to

provide historical flow data for calculating flood frequency, discharge calculations made following the 1997 flood suggest that the storm approximated a 100-year return-period runoff event. The lower 700 to 800 feet of Scorpion Creek, located within the proposed Project area, did not fill significantly during the 1997 storm. However, this area remains vulnerable to filling during small flood events. Severe tidal events may further exacerbate these conditions.

PHOTO 1. VIEW OF SCORPION CREEK FOLLOWING 1997 FLOOD EVENT

PHOTO 2. VIEW OF SCORPION CREEK FOLLOWING 2010 FLOOD EVENT

Sea Level Rise Hazard. The coastal engineering analysis completed for the proposed Project indicates a sea level rise of 1.1 foot by 2050 within Scorpion Anchorage (Coast and Harbor Engineering 2011). Sea level rise estimates for 2100 vary from 0.74 foot to 3.2 feet. This is approximately the median of the sea level rise estimates for the area (1.2 feet for 2050; 1.4 to 5.5 feet for 2100) published by the California Coastal Commission (CCC 2015). Wave heights in 2050 are expected to be similar to existing conditions,[1] but will cause impacts at higher elevations due to the 1.1-foot increase in mean sea levels by that time. In addition, the depth-limited wave breaking location shifts landward accordingly to reach the shallow water required to trigger breaking.[2] In 2050, the 5- and 10-year maximum wave height (1.8 times higher than the significant wave height[3]) would strike the pile caps of the existing pier structure (Ashton Engineering 2014).

In addition to the wave height calculations performed for the coastal engineering analysis, a wave runup analysis was performed during design of the proposed Project. Sea level rise will affect wave runup elevations in the vicinity of the existing access road. When taking into account a predicted 3.2-foot sea level rise by the year 2100, the maximum upland wave runup elevation caused by extreme storms at mean higher high water was determined to be 14.8 feet along a transect intersecting the middle segment of the existing access road. High storm surf events may result in approach roadway erosion, the effects of which would be exacerbated by sea level rise.

Tsunami Hazard. The Channel Islands are not included in the state's tsunami inundation maps, although the Park Service identifies the Channel Islands as within a tsunami hazard zone. Extreme tsunami events have been known to generate waves of 50 or even 100 feet—on the coasts of Japan, South America, Alaska, and Hawaii. These wave heights are associated with very rapid shallowing of the ocean bottom toward the coast. No such abrupt shallowing of the ocean toward the coast exists in Southern California, and there is no oceanic trough off the coast of the Channel Islands. Consequently, effects of tsunami waves due to distant earthquakes have been limited to a rise of a few feet (County of Santa Barbara Planning and Development 2010). The most recent local and

[1] This assumes that the 50-year wind speeds will not change significantly by 2050 compared to 2015 conditions.
[2] Wind generated waves generally break in water depths approximately 1.2 times their height (USACE 2002).
[3] Significant wave height is the average of the highest third of the waves in the sea state.

significant tsunami event occurred in March 2011, when a tsunami originating in Japan caused modest swells throughout the coast of Southern California.

PROPOSED PROJECT FLOOD RISKS

The proposed Project includes improvements designed to address existing safety hazards, as well as the hydrological effects of sea level rise. This includes construction of a steel sheetpile retaining wall and rock armoring to support and protect the approximately 110-foot-long access road that would connect the new pier terminus to North Scorpion Valley Road. The pier deck and roadway design elevations would address existing structural deficiencies, and would accommodate projected sea level rise through 2050 (Ashton Engineering 2014). Should the need arise to elevate the pier superstructure in the future due to increased/ accelerated sea level rise, the use of steel piles would allow for the possibility of doing so by lengthening the steel piles. These improvements would reduce the pier and roadway's susceptibility to damage by waves and storms. The need for roadway maintenance following flood events would also be reduced.

Potential impacts from tsunami inundation would be similar to other Channel Island sites fronting the ocean. Based on historic records, it is anticipated that a tsunami or seiche event would result in relatively small swells at Scorpion Anchorage. The National Oceanic and Atmospheric Administration (NOAA) operates a tsunami warning system that serves all coastal states, including California and the Channel Islands. Taking into consideration NOAA's tsunami warning system, and the fact that the proposed Project has been designed to account for increased wave action and sea level rise, any potential impacts from tsunamis would be improved from existing conditions.

Prior to and during large storm events, visitors and staff would avoid areas subject to flooding. Similarly, NOAA's tsunami warning system should provide ample time for individuals to avoid flood prone areas. Santa Cruz Island contains varied topography, and upland areas not subject to flood inundation are available in close proximity to the Project site.

Thus, the proposed Project would not result in increased exposure of individuals or structures to flood hazards. The Project would not increase visitation to Santa Cruz Island or exposure of individuals to storms, tsunamis, or sea level rise. Rather, it provides a more stable, robust, and safe structure than currently available for operations, and reduces exposure to individuals and the pier structure.

DESCRIPTION AND EXPLANATION OF FLOOD MITIGATION PLANS

Because the proposed Project will not worsen existing flood hazards, but rather improve the resiliency of the pier and improve visitor and park safety and operations, no mitigative actions in accordance with the NPS floodplain guidelines and with EO 11988, "Floodplain Management" will be required. Potential hazards to property have been addressed through the Project design; the proposed Project includes replacement of the existing deficient pier and improvements to the access roadway, both of which have been designed to address existing safety hazards from flooding, as well as the hydrological effects of sea level rise. Given the site's recreational use, individuals would be able to avoid the site during flooding. NOAA already implements a tsunami warning system to mitigate for the small tsunami risk present at the Project site and throughout

the Channel Islands. The Project would not increase visitation to Santa Cruz Island or exposure of individuals to flood hazards.

The proposed improvements are designed to be consistent with the intent of the standards and criteria of the National Flood Insurance Program (44 Code of Federal Regulations Part 60), to protect life and property from the effects of flooding.

JUSTIFICATION FOR USE OF THE FLOODPLAIN

The overall purpose of the proposed Project is to improve access to Santa Cruz Island at Scorpion Anchorage. The proposed Project would substantially reduce hazardous conditions caused by the inadequate and continued degradation of the pier and access road. There are no alternative sites that would meet the Project purpose while being located outside of flood hazard areas. Tsunamis and sea level rise present uniform regional hazards, and any pier site within Scorpion Anchorage would be equally subject to associated risks. The Scorpion Creek floodplain includes the entire lower valley. The valley is flanked on either side by steep and incised slopes subject to erosion, which are not suitable for construction of any access roads (Photo 3). Construction of the access road outside of the floodplain is therefore infeasible. Furthermore, improvements to the existing access road are preferred over new construction, as cultural resources are commonly present in undisturbed areas within the Project vicinity.

PHOTO 3. VIEW OF ERODED STEEP HILLSIDES

As described below, the No Action Alternative would result in increased flood hazard risk to structures and individuals, as existing structural deficiencies would not be addressed. Conversely, both the proposed Project and Alternative 1 (as described in the EIS) reduce this risk. However, Alternative 1 has substantially greater impacts to wetlands, cultural resources, and aesthetic values, and was not selected as described in the decision-making process outlined in the EIS.

INVESTIGATION OF ALTERNATIVE SITES TO THE PROPOSED PROJECT

No Action Alternative. The No Action Alternative assumes a continuation of existing conditions at the existing location. The pier measurements and configuration would remain the same. No improvements would be made to the connecting access road.

Under the No Action Alternative, improvements along Scorpion Creek would remain vulnerable to damage from large flow events. Periodic maintenance of the existing roadway and potentially to other structures would be needed to maintain safe operating conditions, which would impact cultural and natural resources on an ongoing basis.

The study area would remain susceptible to inundation during storms, tsunamis, or future sea level rise. Furthermore, the effects of sea level rise, including increased tidal inundation along the shoreline and landward progression of the surf zone (i.e., breaking wave location), could exacerbate existing hazards from wave action. This includes hazardous conditions encountered by employees and visitors during disembarkation. Sea level rise will also affect wave runup elevations in the vicinity of the existing access road, potentially leading to increased erosion and the need for more frequent maintenance. Therefore, flood risks from storms and sea level rise would be greater than compared to the proposed Project or Alternative 1. Potential tsunami hazards would be greater than the proposed Project or Alternative 1, which would improve the structural protection.

Alternative 1. Alternative 1 would include removal and demolition of the existing pier and abutments and replacement with a longer, wider pier, oriented nearly parallel to the existing pier and extended farther into deeper water. An improved 435-foot-long elevated access road would connect the new pier terminus to North Scorpion Valley Road. The new road would be supported by a new steel sheetpile retaining wall, and additional protective rock armoring would be installed along the shoreline to protect the road.

Similar to the proposed Project, Alternative 1 includes pier and roadway improvements that would address existing safety hazards, as well as the hydrological effects of sea level rise. In addition, Alternative 1 improvements would reinforce the roadway and address structural deficiencies in the existing pier, thereby reducing their susceptibility to damage by waves and storms. The need for roadway maintenance following flood events would also be reduced. Therefore, flood risks from storms, tsunamis, and future sea level rise would be reduced compared to existing conditions, yet not as improved as the proposed Project. Potential tsunami hazards would be reduced compared to existing conditions.

However, Alternative 1 would result in greater wetland resource and cultural resource impacts compared to the proposed Project. Alternative 1 would require additional shoreline armoring compared to the proposed Project, including placement of 1,320 cubic yards of permanent fill (rock riprap) below the mean high tide line. This would result in loss of 0.30 acre of wetland resources, while the proposed Project would result in loss of only 0.04 acre of wetland resources, as described in the EIS. These wetland impact areas were determined using the wetland delineation provided in NPS' *Report for Travel to Channel Islands National Park during May 11 – 16, 2003* (NPS 2003).

The additional armoring of the longer access road may pose greater risk to cultural resources than the proposed Project, and would create negative aesthetics by armoring a substantial portion of the beach area. The process for rejecting Alternative 1 and selecting the proposed Project is outlined in the EIS.

CONCLUSION

The Park Service concludes that the proposed Project would improve flood risks associated with storms, tsunamis, and future sea level rise. Although the proposed new pier and improved access road would be susceptible to inundation from these flood hazards, the planned improvements would result in increased protection of structures and individuals compared to existing conditions. The proposed Project would not result in increased visitation, and therefore would not increase exposure of individuals to these hazards. Given the recreational nature of Santa Cruz Island, the Project site could be avoided during storm events. Upland areas away from flood hazards zones are available in close proximity, and flood conditions may be predicted and communicated through weather forecasts and by the tsunami warning system. There are no alternative sites that would meet the Project objectives while avoiding flood hazards, and the alternatives considered would result in greater or equal flood risks. Therefore, NPS finds the proposal to be consistent with EO 11990.

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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