

San Nicolas Island Roads and Airfield
Repairs Project at
Naval Base Ventura County
San Nicolas Island

**INCIDENTAL HARASSMENT AUTHORIZATION
PACKAGE**

DEPARTMENT OF THE NAVY

Request by Naval Base Ventura County,
for an Incidental Harassment Authorization to Allow for the
Incidental Take of Marine Mammals During San Nicolas Island
Roads and Airfield Repairs Project at San Nicolas Island,
California

Submitted by:
Commanding Officer
Naval Base Ventura County
311 Main Road, Suite 1,
Point Mugu, California 93042

To:
National Marine Fisheries Service
Long Beach, California

Application Prepared by:
Environmental Division
Naval Base Ventura County

Table of Contents

Summary of Request.....	S-1
I. OPERATIONS TO BE CONDUCTED	1
Overview of the Activity	1
Site Description.....	2
Program Activities Summary	2
II. DATES, DURATION AND REGION OF ACTIVITY	5
Dates	5
Duration	5
Region of Activity	5
III. NUMBERS OF MARINE MAMMALS ON DAYTONA AND COAST GUARD BEACHES ON SAN NICOLAS ISLAND.....	6
Northern Elephant Seal	6
California Sea Lion	8
Harbor Seal	8
IV. STATUS, DISTRIBUTION AND NUMBERS OF AFFECTED SPECIES OR STOCKS OF MARINE MAMMALS ON SAN NICOLAS ISLAND	9
Northern Elephant Seal	9
California Sea Lion	10
Harbor Seal	11
Northern Fur Seal	11
Southern Sea Otter.....	11
Guadalupe Fur Seal.....	12
V. TYPE OF INCIDENTAL TAKE AUTHORIZATION REQUESTED.....	12
Disturbance “Take” Criteria.....	13
VI. ANTICIPATED TAKE AND IMPACT ON SPECIES OR STOCKS.....	13
Displacement.....	14
Noise	15
Behavioral Reactions of Marine Mammals to Barge Beach Landings Momentary Alert Reactions	15
Habituation	15
Abandon Area	15

Table of Contents (Cont.)

Reaction Criterion.....	16
Summary and Conclusions.....	16
VII. ANTICIPATED IMPACT ON SUBSISTENCE	16
VIII. ANTICIPATED IMPACT ON HABITAT	17
IX. ANTICIPATED IMPACT OF LOSS OR MODIFICATION OF HABITAT ON MARINE MAMMALS	17
X. MITIGATION MEASURES.....	17
XI. PLAN OF COOPERATION.....	19
XII. MONITORING AND REPORTING PLAN	19
Reports	20
Personnel	20
XIII. COORDINATING RESEARCH TO REDUCE AND EVALUATE INCIDENTAL TAKE.....	20
XIV. REFERENCES CITED	22

List of Tables

Table 1: Barge Delivery Summary	5
Table 2: Fall Surveys of Elephant Seals	6
Table 3: Fall Surveys of California Sea Lions	8
Table 4: Fall Surveys of Harbor Seals	9
Table 5: Maximum Numbers of Marine Mammals Estimated to be Harrassed	15

List of Figures

Figure 1: San Nicolas Island Roads And Airfield Repairs Project.....	3
Figure 2: Marine Mammal Survey Areas SNI Roads and Airfield Repairs Project.....	7
Figure 3: SNI Pinniped Population Survey Sites.....	12

Appendices

- A** **Natural Resource Personnel at NBVC**
- B** **Acronyms and Abbreviations**

Summary of Request

The Department of the Navy (Navy), Naval Base Ventura County (NBVC), California, plans to perform a maintenance and mission-critical infrastructure project at San Nicolas Island (SNI) to repair the roads and airfield. The proposed action would repair up to 12.45 miles of roads and culverts during two phases, and 1 million square feet of airfield surface, shoulders, and airfield culvert repair. The Navy identified the proposed work as critical to maintaining mission readiness: the current degraded road is a safety concern for ordnance and operations transport; culvert repairs are necessary to reduce erosion and sedimentation; and mission-critical repairs are required at the SNI runway that is currently degraded by sinkholes and surface deformations. The SNI roads and shoulder repairs will require approximately 43,500 tons of aggregate materials. Airfield repairs require approximately 151,500 tons of aggregate material. The required aggregate is not available on the island and must be delivered from the mainland. The pier at Daytona Beach is used for transfer of supplies to the island but is not designed to handle large volumes of heavy aggregate. The Navy, therefore, proposes to use barge beach landings on Daytona and Coast Guard Beaches for offloading materials and equipment needed to complete this maintenance and mission-critical infrastructure project. Aggregate would be shipped from the mainland U.S. to the off-shore area of SNI on a primary shipping barge (13,000-ton capacity). The aggregate would be transferred from the primary shipping barge to a smaller “tender” barge (2,000-ton capacity) that would land on the beach. Aggregate would be transferred from the shipping barge to the tender barge using a conveyor belt or loader, then from the tender barge to dump trucks on shore using either loaders or conveyor belts. Best management practices (BMPs) will be instituted to prevent spills into the ocean during the aggregate offloading process (Section X Mitigation Measures, EFH-3 and EFH-4).

The Navy proposes to land the tender barges at either Daytona Beach or Coast Guard Beach, depending on wind and swell conditions at the time of the landing. Up to four separate deliveries would occur each year for 5 years. One shipment of 13,000 tons of aggregate would require eight beach landings over 5 days (approximately two landings per day, four hours for each operation). Because both beaches are haul-out sites for California sea lions, harbor seals and northern elephant seals, beach landings would occur from August 1 through November 30, outside the breeding season and when the fewest pinnipeds are found hauling out on those locations. The barge landing and materials offload could temporarily displace marine mammals from their onshore haulouts, resulting in their movement into the water or down-beach. During barge landings, marine mammals may avoid the proposed project area and haul out at other beach areas. During barge landings or off loadings, the Navy biologist or qualified project biologist will monitor and displace pinnipeds from the immediate landing site as necessary for the safety of the marine mammals and construction workers. Temporary barriers will be used, if necessary, to keep the displaced pinnipeds from re-entering the area. These efforts will greatly minimize the potential for pinnipeds to be affected by project activities. No marine mammal mortalities or injuries are expected from the activity.

Due to the potential for disturbance of marine mammals, the Navy requests an Incidental Harassment Authorization in order to ensure that its road and airfield repairs project is conducted in full compliance with the Marine Mammal Protection Act (MMPA). Pursuant to Section 101(a)(5)(D) of the MMPA, NBVC requests that it be issued an Incidental Harassment Authorization allowing non-lethal takes (disturbing hauled out individuals) of northern elephant

seals, CA sea lions and harbor seals, on land, incidental to its planned roads and airfield repairs at NBVC San Nicolas Island. The project will occur annually for 5 years, commencing in 2014, with a request for an Incidental Harassment Authorization (IHA) extension or renewal each year until all aggregate is received. The items required to be addressed pursuant to 50 C.F.R. § 216.104, "Submission of Requests", are set forth below. This includes descriptions of the specific activities to be conducted, the types and numbers of pinnipeds present, the anticipated nature and extent of "taking", proposed measures to mitigate the "taking" to the lowest level practicable, and a plan to monitor any effects of the activity on these pinnipeds.

I. OPERATIONS TO BE CONDUCTED

Overview of the Activity

The Department of the Navy, Naval Base Ventura County (NBVC), California, plans to perform a maintenance and mission-critical infrastructure project at San Nicolas Island (SNI) to repair the roads and airfield. The proposed action would repair up to 12.45 miles of roads and culverts during two phases, and 1 million square feet of airfield surface, shoulders, and airfield culvert repair. The Navy identified the proposed work as critical to maintaining mission readiness: the current degraded road is a safety concern for ordnance and operations transport; culvert repairs are necessary to reduce erosion and sedimentation; and mission-critical repairs are required at the SNI runway that is currently degraded by sinkholes and surface deformations. The SNI roads and shoulder repairs will require approximately 43,500 tons of aggregate materials. Airfield repairs require approximately 151,500 tons of aggregate material. The required aggregate is not available on the island and must be delivered from the mainland. The pier at Daytona Beach is used for transfer of supplies to the island but is not designed to handle large volumes of heavy aggregate. The Navy, therefore, proposes to use barge beach landings on Daytona and Coast Guard Beaches for offloading materials and equipment needed to complete this maintenance and mission-critical infrastructure project. Aggregate would be shipped from the mainland U.S. to the off-shore area of SNI on a primary shipping barge (13,000-ton capacity). The aggregate would be transferred from the primary shipping barge to a smaller “tender” barge (2,000-ton capacity) that would land on the beach. Aggregate would be transferred from the shipping barge to the tender barge using a conveyor belt or loaders, then from the tender barge to dump trucks on shore using either loaders or conveyor belts. Best management practices (BMPs) will be instituted to prevent spills into the ocean during the aggregate offloading process (Section X Mitigation Measures, EFH-3 and EFH-4).

The Navy proposes to land the tender barges at either Daytona Beach or Coast Guard Beach, depending on wind and swell conditions at the time of the landing. If conditions are favorable to land at either beach the Navy will select the beach with fewer pinnipeds and western snowy plovers. Up to four separate deliveries would occur each year for 5 years. One shipment of 13,000 tons of aggregate would require eight beach landings over 5 days (approximately two landings per day, 4 hours for each operation). Because both beaches are haul-out sites for California sea lions, harbor seals and northern elephant seals, beach landings would occur from August 1 through November 30, outside the breeding season when these species are present only sporadically, and in lower numbers than in other times of the year. There is the possibility that marine mammals could be hauled out in the immediate area of the barge landing. The barge landing and materials offload could temporarily displace marine mammals from their onshore haulouts, resulting in their movement into the water or down-beach. CA sea lions and harbor seals will move from the immediate area on their own. Elephant seals will likely have to be displaced down the beach away from areas where heavy equipment will be working. During barge landings, marine mammals may avoid the proposed project area and haul out at other beach areas. During barge landings and material off-loadings, the Navy biologist or qualified project biologist will monitor and displace pinnipeds from the landing site as necessary for the safety of the marine mammals and construction workers. Temporary barriers will be used, if necessary, to keep the displaced pinnipeds from re-entering the area. These efforts will greatly minimize the potential for pinnipeds to be affected by project activities. No marine mammal mortalities or injuries are expected from the activity.

Site Description

SNI is the outermost of eight Channel Islands off the coast of southern California, 63 nautical miles south-southwest of Laguna Point at NBVC Point Mugu and 75 nautical miles southwest of Los Angeles (Figure 1). SNI is owned by the Navy and is under the jurisdiction of NBVC. The island is approximately 9 miles long and 3.6 miles wide. Access to the island by the public is strictly controlled for security reasons and to safeguard against potential hazards associated with military operations. The main support and operational facilities on SNI include an airfield runway and terminal, housing and administration facilities, a power plant, a fuel farm, a reverse osmosis (RO) potable water system, and a public works and transportation department.

Daytona Beach is a wide sandy beach at the south end of SNI, the most sheltered part of the island (Figure 1). Water depth and soft bottom conditions off-shore support barge anchoring and beach landings. Beach Road is an all-weather paved access road that terminates at Daytona pier and a staging area. The equipment staging area is paved and equipped with electric light poles and adequate space for pier offloads. The staging area is enclosed by k-rails that would be temporarily moved to allow access to the beach-landed barge. The Navy has made barge beach landings at Daytona Beach many times in the past.

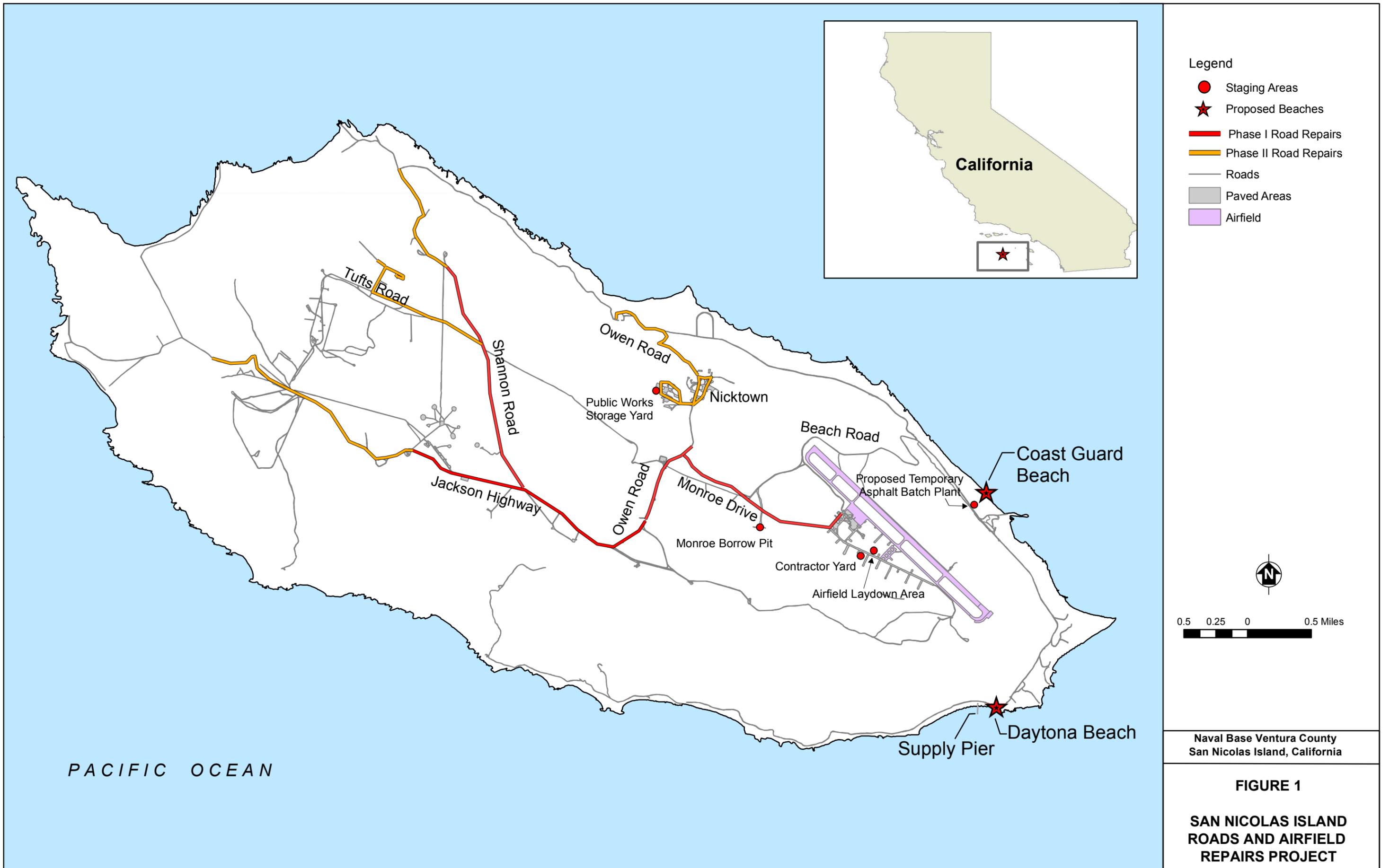
Coast Guard Beach is a sandy beach in a relatively sheltered part of the island at the east side of SNI, accessible by Beach Road (Figure 1). The Navy has used this site successfully in the past for barge deliveries. On Coast Guard Beach, there is approximately 300 feet from the access road to the high tide line. Coast Guard Beach has a gentler slope than Daytona Beach. The nearshore bottom is soft, and water depths of 2 to 5 feet are suitable for beach landings. Existing moorings in the area may potentially be used as anchorage points for the primary shipping barge. A short (0.10 mile) unpaved road that connects Coast Guard Beach to the proposed asphalt batch plant site would require re-grading to facilitate materials transport. To facilitate re-grading the access road, approximately 400 cubic yards of dirt would be used from the Former Borrow Pit, and additional material would be sourced from the Monroe Borrow Pit if necessary. A shallow surface scrape of six inches would occur across the Former Borrow Pit site to collect material for the access road. Re-grading would provide access widths from 30 to 12.5 feet wide and a smoother surface for hauling.

The sandy bottom would be disturbed offshore when the shipping barge dropped anchors and when the tender barge landed on the beach. Contact with the seafloor would temporarily increase turbidity, but no long-term adverse effects would result. Turbidity events would be limited to the duration of barge landing and offload.

Program Activities Summary

The following task descriptions provide an overview of the activities associated with the barge landings. Barges typically land at high tide and when wind and swells are relatively low. A typical barge landing operation includes:

- Re-grading the existing road from the beach
- Constructing a temporary ramp and berm on the beach,
- Landing the barge,
- Offloading the barge,
- Removing the ramp and berm, and
- Restoring the beach to its pre-barge landing condition.



Naval Base Ventura County
San Nicolas Island, California

FIGURE 1

**SAN NICOLAS ISLAND
ROADS AND AIRFIELD
REPAIRS PROJECT**

Fig1_SNI_RdRep_Locations.mxd; ALortie TTEMI-BLDR
Data Source: Tetra Tech EMI GIS databases

The delivery process consists of:

- Site Preparation: Site preparation would begin the day before the tender barge arrives. An authorized biologist would move any harbor seals, CA sea lions or elephant seals in the immediate area. Elephant seals may require active displacement in the work zone which would be done by an authorized biologist. A biologist would remain onsite if any marine mammals are to be displaced during barge operations.

A temporary sand ramp would be configured using D-8 bulldozers to push, grade, and compact sand perpendicular to the shoreline. The ramp would require moving about 20 cubic yards of beach sand at Daytona Beach, or a smaller volume of sand at Coast Guard Beach because of its more gradual slope. Sand would be moved only above the high tide line. The amount of sand to be moved is a function of the beach slope for each landing site. Two tractors would be positioned 100 feet on either side of the landing area before the tender barge arrives to provide stable anchorage for the tender barge. A set of chains and cables would be attached to each tractor to secure the tender barge.

- Barge Delivery: The primary shipping barge would drop anchor approximately 650 feet off-shore in about 24 feet (4 fathoms or 7.3 meters) of water at Coast Guard Beach, and 45 feet (7.5 fathoms or 13.7 meters) of water at Daytona Beach. The tender barge would tie off to the primary shipping barge while the materials are being transferred. Materials would be offloaded to the tender barge using a conveyor belt or loader. BMPs will be in place to minimize spillage into the ocean. (Section X Mitigation Measures, EFH-4)
- Barge Beach Landing: Once the tender barge is loaded with approximately 2,000 tons from the primary shipping barge, it would cast off and the tug boat would push it onto the beach. The tender barge would be tethered to each of the two D-8 bulldozers, positioned approximately 200 feet apart on the beach. Hydraulic winches on the tender barge would tighten the chains and secure the barge.

Once the tender barge is stabilized, fiberglass matting may be laid over the temporary sand ramp, if necessary, to provide a stable surface and allow traction for vehicles during loading and unloading. Previous material transfers onto the beaches have not required matting due to stable sand surfaces. The bulldozers at the barge and ramp interface would ensure that the anchoring remains stable during unloading.

- Offloading: Aggregate would be offloaded from the tender barge either by loaders that load dump trucks or by a conveyor belt directly from the barge to dump trucks. Super10 truck and truck tractor/trailer support vehicles would be transported to SNI before the material is delivered using the Navy supply barge and Navy pier.
- Barge Removal: After all offloading operations are complete, crew members would remove any fiberglass matting from the temporary ramp and the bulldozers would redistribute the sand above the high-tide line and contour the beach to its previous topography. The anchoring cables and chains would be released and stored off site for future use. The tug would pull the barge away from the beach.
- Biological Monitoring: During offloading, the area would be monitored for pinnipeds and other native fauna to ensure that the animals are not adversely affected, or significantly affected by the material delivery. If marine mammals are occupying the beach during the planned landing, an authorized biologist would displace the animals

according to procedures outlined in Section 101(a)(5)(D) of the Marine Mammal Protection Act. An authorized biologist would remain on-site until barge operations are complete. Pinnipeds will only be displaced if they are within the heavy equipment work zone, which extends 200 feet on both sides of the landing site.

II. DATES, DURATION AND REGION OF ACTIVITY

Dates

Up to four separate deliveries would occur each year for 5 years. Beach landings would occur from August 1 through November 30, outside the breeding season to minimize disturbance to marine mammals. This IHA will cover calendar year 2014, with a request for an IHA extension or renewal each year until all aggregate is received. Table 1 has the proposed delivery schedule.

Duration

One shipment of 13,000 tons of aggregate would require eight beach landings over 5 days: site preparation would take approximately 1 day; two landings per day, lasting approximately 4 hours for each landing and material offload operation, would occur over the remaining 4 days.

Region of Activity

The Navy proposes to land the tender barges at San Nicolas Island, on either Daytona Beach or Coast Guard Beach, depending on wind and swell conditions at the time of the landing.

TABLE 1: BARGE DELIVERY SUMMARY

Project	Material Required	# of Primary Shipping Barge Deliveries	Estimated Delivery Schedule	
			Year	Quantity
Roads Repair (Phase I and Phase II)	43,500 tons	3*	Year 1	2 x 13,000 tons
			Year 2	1 x 8,100 tons
			Year 3	1 x 9,400 tons
Airfield repairs	151,500 tons	12**	Year 2	2 x 13,000 tons 1 x 4,900 tons
			Year 3	3 x 13,000 tons 1 x 3,600 tons
			Year 4	3 x 13,000 tons
			Year 5	3 x 13,000 tons

* Three primary barge shipments for roads repair includes two full 13,000 ton shipments, and two co-mingled shipments, shared with airfield aggregate material (8,100 tons in Year 2 and 9,400 tons in Year 3).

** Twelve primary barge shipments for airfield repairs includes eleven full 13,000 ton shipments, and two co-mingled shipments shared with road repair aggregate material (4,900 tons in Year 2 and 3,600 tons in Year 3).

III. NUMBERS OF MARINE MAMMALS ON DAYTONA AND COAST GUARD BEACHES ON SAN NICOLAS ISLAND

Three species of pinnipeds occur regularly on San Nicolas Island—the northern elephant seal (*Mirounga angustirostris*), the California sea lion (*Zalophus californianus*), and the Pacific harbor seal (*Phoca vitulina richardsi*). These species are protected under the MMPA and are not listed under the Endangered Species Act (ESA). These three species are expected in small numbers on Daytona and Coast Guard Beaches from August 1 through November 30 and the following sections detail results of surveys conducted in October and November 2011, to show numbers of pinnipeds that occur in the vicinity of the proposed action area between August 1 and November 30.

Northern Elephant Seal

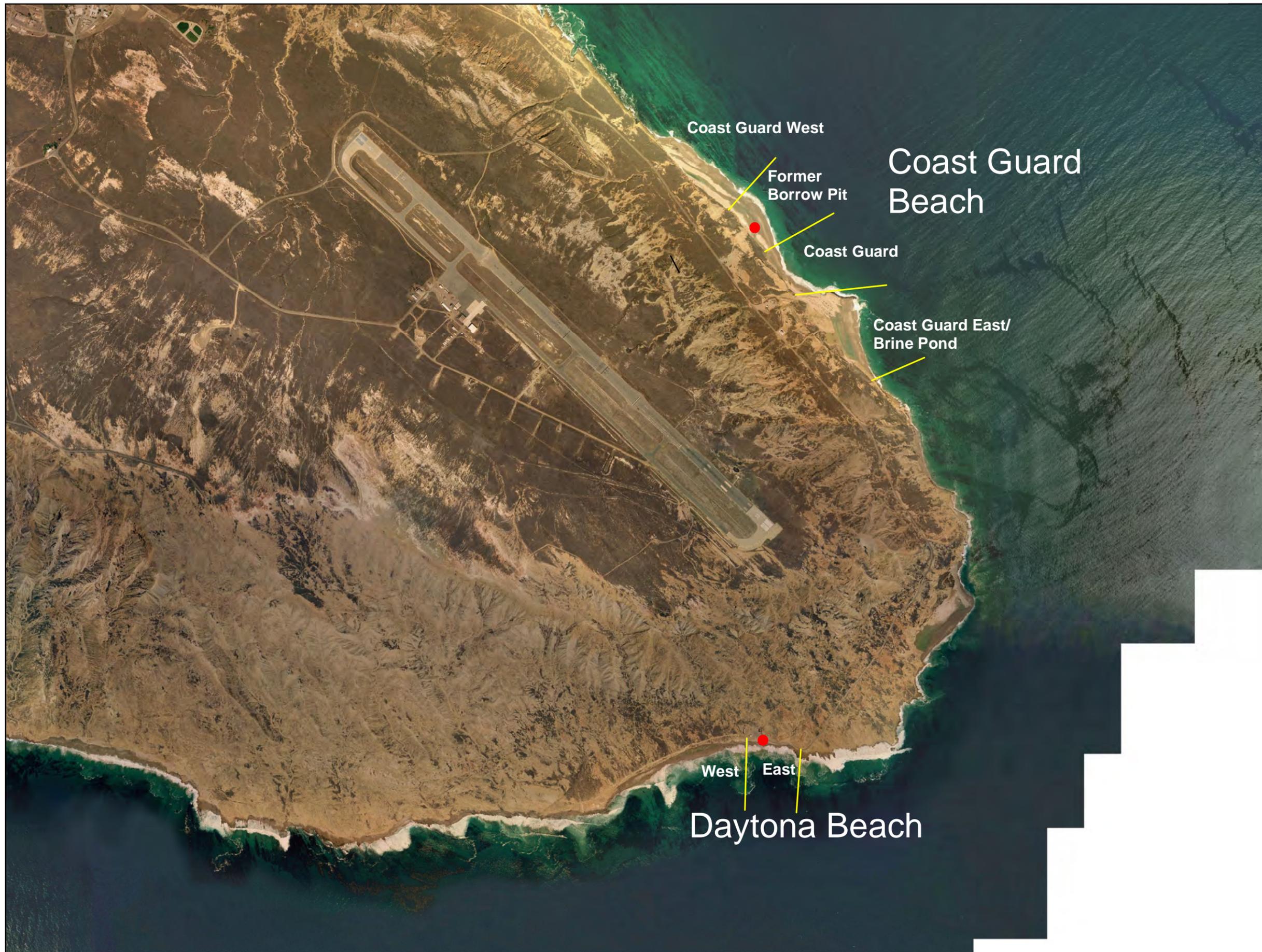
Northern elephant seals haul out on both Daytona Beach and Coast Guard Beach. Currently, elephant seals haul out at Daytona and Coast Guard barge landing areas from December through mid-May. This time frame encompasses the breeding season and the female and juvenile molting period. Adult males have been known to haul out at both Daytona and Coast Guard Beaches through August (Lowry 2002). In 2002, the estimated number of individuals at Daytona Beach was more than 2,000 (U.S. Navy 2002).

Table 2 shows the results from recent fall surveys conducted by Navy biologists for elephant seals observed at Daytona and Coast Guard Beaches in the vicinity of the proposed action area. Fall survey areas are shown on Figure 2.

TABLE 2: FALL SURVEYS OF ELEPHANT SEALS

Survey Date, 2011	Coast Guard Beach				Daytona Beach	
	East/Brine Pond	Coast Guard Beach	Former Borrow Pit	West	East of Pier	West of Pier
Oct 20	N/S	N/S	0	N/S	N/S	N/S
Oct 25	N/S	N/S	2 subadults	N/S	0	3 subadults
Oct 27	23 juveniles 2 females	0	2 juveniles 2 females	N/S	1 juvenile	0
Nov 1	0	N/S	1 individual	~60 mixed pinnipeds	0	0
Nov 3	N/S	N/S	2 subadults	N/S	0	0
Nov 7	N/S	N/S	10 individuals	N/S	0	0
Nov 8	N/S	0	2 individuals	N/S	0	0

Notes: N/S Not surveyed



Legend

- Proposed Barge Beach Landing Locations
- Survey Areas, Fall 2011



0.25 0.125 0 0.25 Miles

Naval Base Ventura County
San Nicolas Island, California

**FIGURE 2
MARINE MAMMAL
SURVEY AREAS
SNI ROADS AND AIRFIELD
REPAIRS PROJECT**

California Sea Lion

The California sea lion is the most common pinniped at SNI. The SNI population has ranged from 43,000 to 57,000 individuals since 2001. Mixed age groups of sea lions intermittently haul out in the vicinity of the proposed beach landing areas throughout the year, and bachelor bulls haul out at the landing sites during June and July. In 2002, the number of California sea lions on Daytona Beach was estimated to be about 500 (U.S. Navy 2002).

Table 3 shows results from recent fall surveys conducted by Navy biologists for California sea lions observed at Daytona and Coast Guard Beaches in the vicinity of the proposed action area.

TABLE 3: FALL SURVEYS OF CALIFORNIA SEA LIONS

Survey Date, 2011	Coast Guard Beach				Daytona Beach	
	East/ Brine Pond	Coast Guard Beach	Former Borrow Pit	West	East of Pier	West of Pier
Oct 20	N/S	N/S	0	N/S	N/S	N/S
Oct 25	N/S	N/S	0	N/S	0	1 juvenile
Oct 27	1 female	1 juvenile	1 juvenile	N/S	0	0
Nov 1	0	N/S	0	~60 mixed pinnipeds	0	0
Nov 3	N/S	N/S	0	N/S	0	1 subadult male
Nov 7	N/S	N/S	40 individuals	N/S	0	0
Nov 8	N/S	0	30 individuals	N/S	0	0

Notes: N/S Not surveyed

Harbor Seal

Most harbor seals on SNI haul out at several specific, traditionally used sandy, cobble, and gravel beaches. Harbor seals are very rare at the barge landing area at Daytona Beach (Smith 2005). However, West Coast Guard Beach is now the largest regularly used haul out on SNI (G. Smith, personal communication). Peak counts on SNI are about 450 seals, representing about 2 percent of the California stock. The best estimate of the California stock of harbor seals is 30,196 (Carretta et al. 2012);

Table 4 shows results from recent fall surveys conducted by Navy biologists for harbor seals observed at Daytona and Coast Guard Beaches in the vicinity of the proposed action area.

TABLE 4: FALL SURVEYS OF HARBOR SEALS

Survey Date, 2011	Coast Guard Beach				Daytona Beach	
	East/ Brine Pond	Coast Guard Beach	Former Borrow Pit	West	East of Pier	West of Pier
Oct 20	N/S	N/S	0	N/S	N/S	N/S
Oct 25	N/S	N/S	0	N/S	0	0
Oct 27	0	0	0	N/S	0	0
Nov 1	0	N/S	0	~60 mixed pinnipeds	0	22 individuals
Nov 3	N/S	N/S	0	N/S	0	0
Nov 7	N/S	N/S	20 individuals	N/S	0	0
Nov 8	N/S	0	10 individuals	N/S	0	0

Notes: N/S Not surveyed

IV. STATUS, DISTRIBUTION AND NUMBERS OF AFFECTED SPECIES OR STOCKS OF MARINE MAMMALS ON SAN NICOLAS ISLAND

Northern Elephant Seal

SNI is the second largest elephant seal rookery and hauling ground in the Southern California Bight (Lowry 2002). They prefer gradually sloping, sandy beaches. If sandy beaches are not available, they will haul out on pebbles, boulders, or rocky shores. Each year, approximately 30 percent (23,000 individuals) of the elephant seals hauling out on all California shorelines haul out at SNI on Daytona Beach and Coast Guard Beach.

In general, they primarily breed and give birth on off-shore islands, including the Channel Islands, from December to March (Stewart and Huber 1993; Stewart and others 1994); adults return between March and August to molt. The elephant seal breeding season peaks in late January to early February and molting peaks in late April to early May on SNI (Odell 1974; Stewart and Yochem 1984). They haul out at the barge landing areas from December through mid-May on Daytona Beach and Coast Guard Beach, with some early arrivals recorded in mid-to late November. This time frame encompasses the breeding season and female and juvenile molting period, with pups remaining through April (Smith 2005). After they spend time at sea to feed, females and juveniles haul out between March and May, with peak occurrences in April. Adult males tend to haul out and molt between June and August, with peak numbers in July.

In the late 1980s, elephant seals began to use west Daytona Beach (outside of the beach landing area) as a pupping area and have gradually moved eastward along the beach over the years. In 1988, 144 elephant seal pups were born at the west end of Daytona Beach. This number has increased steadily since then, reaching a total of 1,000 pups born at Daytona Beach in 1995 (Lowry and others 1996). In 2002, the estimated number of individuals at Daytona Beach was more than 2,000 (U.S. Navy 2002).

Daytona Beach had a two year average, from 2005 and 2010, of 1,787 elephant seals. Coast Guard Beach had an average of 1,895 elephant seals from the same two years (Lowry Unpublished Data). The average total of elephant seals for SNI from 2005 and 2010 was 14,750 (Lowry Unpublished Data). These numbers represent peak season counts and as such, are an overestimate for the proposed fall operations. Additionally, the Lowry survey counts were conducted over a larger area than the proposed action area at both Daytona and Coast Guard Beach (Areas “C” and “Q” in Figure 3).

The California elephant seal stock is rapidly growing, and was estimated at approximately 124,000 seals in 2005 (Carretta and others 2010). From 1988 to 2000, birth rates at SNI increased at an average annual rate of 7.3 percent (Lowry 2002). Primary sources of mortality are entanglement in fishing gear and other debris, boat collisions, power plant entrainment, and gunshot wounds.

California Sea Lion

The California sea lion is the most common pinniped at SNI. They haul out at many sites along southern and western SNI, including Daytona Beach and Coast Guard Beach. They haul out on SNI beaches to mate and pup beginning in late May and continuing through July. Females nurse their pups for eight months, alternating between nursing the pups on land and foraging at sea. During the molting period, they haul out in September, and smaller numbers of females and juveniles haul out intermittently throughout the year.

The SNI population has ranged from 43,000 to 57,000 individuals since 2001. Pup production between 2003 and 2008 has ranged from 25,000 to 29,000 (U.S. Navy 2010). Large numbers of sea lions haul out and pup one-half mile west of the barge landing site at Daytona Beach (U.S. Navy 2002). Mixed age groups intermittently haul out in the vicinity of the Daytona Beach barge landing area throughout the year, and bachelor bulls haul out at the barge landing site during June and July (Smith 2005). In 2002, the number of California sea lions on Daytona Beach was estimated to be about 500 (U.S. Navy 2002).

San Nicolas Island had an average total of 51,797 California sea lions from 2004 to 2008 (Lowry Unpublished Data). Daytona Beach, between 2004 and 2008, had an average of 1,325 California sea lions while Coast Guard Beach had an average of 1,380 (Lowry Unpublished Data). These numbers represent peak season counts on Daytona and Coast Guard Beaches and as such, are an overestimate for the proposed fall operations. Additionally, the survey counts were conducted over a larger area than the proposed action area at both Daytona and Coast Guard Beach (Figure 3).

The minimum population size of the U.S. stock, which includes the Channel Islands, is 141,842 (Carretta and others 2010). Based on trends in pup counts (1975 to 2005), the population appears to be increasing. Primary causes of mortality are entanglement in gillnets and other debris, boat collisions, entrainment in power plants, and gunshot wounds (Carretta and others 2010).

Harbor Seal

Harbor seal haul out sites are distributed along mainland California and on off-shore islands, including the Channel Islands. Pupping occurs on beaches from late February through April on SNI, with nursing of pups extending into May. Harbor seals are abundant in late May and early June while they are molting, and are least abundant in winter (Stewart and Yochem 1984). Most harbor seals on SNI haul out at several specific, traditionally-used sandy, cobble, and gravel beaches. A few seals haul out at onshore and off-shore ledges and reefs, mostly during the pupping and molting season. Harbor seals are very rare at the barge landing area at Daytona Beach (Smith 2005). They regularly haul out on the west end of Coast Guard Beach but only occasionally in fall when overall island numbers are lowest (G. Smith, Navy biologist, personal communication).

For the years 2004, 2007 and 2009, Daytona Beach had an average of 69 harbor seals and Coast Guard Beach had an average of 201 (Lowry Unpublished Data). The average total for SNI for 2004, 2007 and 2009 was 800 harbor seals (Lowry Unpublished Data). These numbers represent peak season counts and as such, are an overestimate for the proposed fall operations. Additionally, the survey counts were conducted over a larger area than the proposed action area at both Daytona and Coast Guard Beach (Figure 3).

Peak counts on SNI represent about 2 percent of the California stock. The California stock is estimated to be 34,233 seals (Carretta and others 2010). The primary human-caused mortalities are entanglement in gillnets and other debris, boat collisions, entrapment in power plants, and gunshot wounds.

Northern Fur Seal

A single Northern fur seal with a pup has been hauling out on SNI the past few years (G. Smith, Navy biologist, personal communication). Northern fur seals may temporarily haul out on land in Alaska, British Columbia and on off-shore islands including the Channel Islands (Fiscus 1983). Adult males usually occur on shore during the four month period from May to August, though some may be present until November. Adult females can be found on shore for as long as six months from June to November. After their respective times on shore seals of both genders spend the next seven to eight months at sea (Roppel 1984).

The San Miguel stock is estimated to be 9,968 (Melin et al. 2008). Primary causes of mortality are entanglement in fishing gear and other debris, trawling operations and gunshot wounds. The sightings of the Northern fur seal are infrequent and not expected to occur within the proposed action footprint and therefore will not be discussed further.

Southern Sea Otter

A small translocated population of approximately 50 southern sea otters (*Enhydra lutris nereis*) occurs on SNI (Tetra Tech 2011). Historically, these animals prefer the northwestern shore (Rathbun and others 2000). They primarily forage in kelp habitat, feeding on abalone, sea urchins and rock crabs. They prefer rocky shoreline, kelp beds, and water depths of approximately 66 feet (U.S. Navy 2010). The proposed action areas do not support their preferred habitat. During surveys conducted four times a year from 2005 to 2010, only one individual was sighted within the Proposed Action footprint, in June 2008 (Tetra Tech 2011).

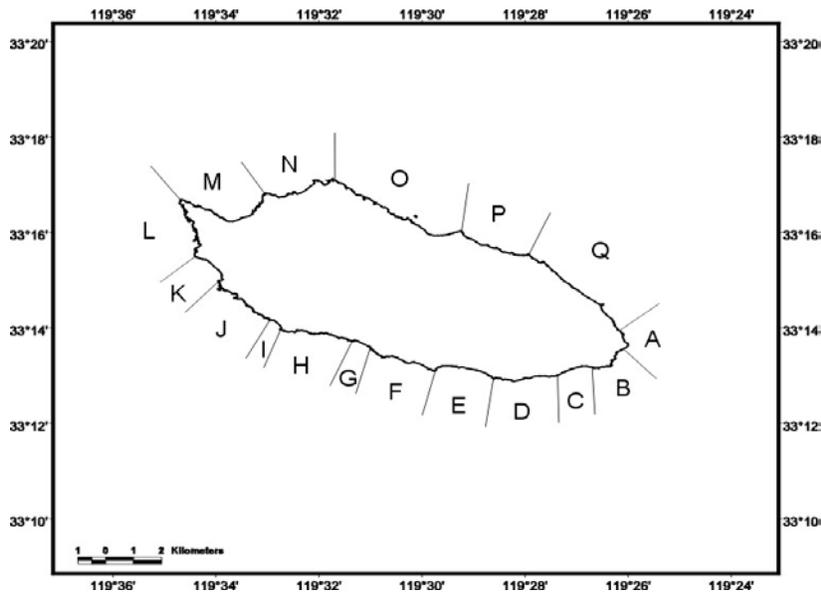
They will not be discussed further because southern sea otters are not expected to occur within the proposed action footprint.

Guadalupe Fur Seal

The federally threatened Guadalupe fur seal (*Arctocephalus townsendi*) does not breed at SNI and only single individuals have been intermittently observed over the last few years hauled out along the southwest portion of the coast. Records indicate they are not likely to occur on the eastern portion of SNI, at the Coast Guard or Daytona Beach proposed action areas. Because the Guadalupe fur seal is not expected to occur within the proposed action footprint, it will not be discussed further.

Cetaceans are not addressed in this IHA because they do not occupy SNI beaches nor do they commonly occur in the inshore waters where barge operations take place.

FIGURE 3: SNI PINNIPED POPULATION SURVEY SITES



The areas used for Lowry's unpublished pinniped population counts are "C" and "Q" representing Coast Guard and Daytona Beaches.

V. TYPE OF INCIDENTAL TAKE AUTHORIZATION REQUESTED

The type of incidental taking authorization that is being requested (i.e., takes by harassment only, takes by harassment, injury and/or death), and the method of incidental taking are detailed below. NBVC requests an IHA pursuant to Section 101(a)(5)(D) of the MMPA for incidental take by harassment during its planned exercise activities at NBVC San Nicolas Island during the road and airfield repairs project, commencing in 2014. The operations outlined in Section I have the potential to take marine mammals by harassment only. Barge beach landings, offloading and barge removal will likely result in movement of marine mammals from haul-outs into the adjacent water ("takes") or in the case of elephant seals, moving them down-beach away from

the heavy equipment working zone. The effects will depend on the behavior of the animal at the time of reception of the stimulus, as well as the distance from the activity. No take by serious injury or death is anticipated. There are not expected to be any “takes” of cetaceans due to their rare occurrence at San Nicolas Island. Any cetaceans or marine mammals in the water surrounding barge landing areas would not be affected by the activities, since the distance from the project site precludes the potential for visual disturbance. The anticipated nature of the “takes” is discussed further in Section VI, Anticipated Impact on Species or Stocks.

Disturbance “Take” Criteria

Takes are defined under the MMPA as “to harass, hunt, capture, collect, or kill, or attempt to harass, hunt, capture, collect, or kill any marine mammal.” The 1994 amendments to the MMPA establish two types of takings or harassment, one that involves injury (Level A), and another that involves direct or indirect disturbance (Level B). Level A harassment is “any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild,” and Level B harassment is “any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns,” as defined under the MMPA. The National Marine Fisheries Service (NMFS) considers Level B harassment to occur when a marine mammal has a “significant behavioral response in a biologically important behavior or activity.”

Marine mammals disturbed from haul-outs in the action area would likely be displaced to alternative haul-out sites farther from the barge activities. For this application, marine mammals are assumed to be Level B harassment if, as a result of activities, behavioral patterns of marine mammals are disrupted. Consistent with NMFS (NMFS 1999), momentary alert or startle reactions by marine mammals hauled out with no movement into the water are not considered to be “taking”. Also, marine mammals that are half-submerged, not out of the water and swim away as the barge approaches will not be considered taken by harassment.

VI. ANTICIPATED TAKE AND IMPACT ON SPECIES OR STOCKS

Barge beach landings and associated construction could affect pinnipeds at Daytona and Coast Guard beaches in two main ways:

- (1) Potential displacement of haul out areas at the barge landing site (behavioral effects),
and
- (2) Potential impacts of noise associated with barge landing and construction (noise effects).

Either of these has the potential for “harassment” or “take.” Historically, actions similar to the barge beach landing have occurred at both Daytona and Coast Guard Beaches. This section describes these prior activities relative to pinniped displacement, because potential impacts from the barge landings are expected to be similar. This description is followed by a general discussion of the potential impacts of noise.

Displacement

Only a small number of adult pinnipeds are expected to occur during barge beach landing operations (from August through November) and pups are not expected to be present at Daytona Beach or Coast Guard Beach. Given past trends, only a few straggler adult, subadult or juvenile sea lions and elephant seals are expected to occur at either beach. Harbor seals have only rarely occurred in the Daytona Beach barge landing area and have been observed on west Coast Guard Beach and closer to the barge landing site but not so often in the fall. Coast Guard Beach is expected to have more pinnipeds than Daytona Beach.

The Navy historically has had to displace pinnipeds from Daytona Beach and Coast Guard Beach during past barge landings and during construction of the pier at Daytona Beach (in 2005), and during repairs of the RO water system at Coast Guard Beach (in 2005 and 2006). Pinniped populations at Daytona Beach increased dramatically during historical barge beach landings (Smith 2005).

According to pinniped displacement reports from 2003 to 2006, individual marine mammals hauling out on Daytona Beach during barge beach landings and pier construction appeared temporarily affected by the associated noise and presence of humans and equipment. The steady increase of pinniped populations at Daytona Beach throughout the history of barge beach landings before construction of the pier and during construction of the pier, suggests that the animals are not adversely affected by these activities. Like at Daytona Beach, marine mammals hauling out on Coast Guard Beach during repairs of the RO water system did not appear to be significantly affected by the associated noise and presence of humans and equipment. Typical responses to displacement included increased alertness, raising of the head, and movement laterally along the beach or in the direction of the water (2006 displacement letter from Grace Smith to Rod McInnis/NMFS). The continued use of Coast Guard Beach by elephant seals and sea lions suggests that the pinniped populations were not adversely affected by these activities. The barge landings are not expected to affect pups or pinniped breeding behavior because beach landings would only take place from August 1 to November 30, outside the breeding season. Therefore, displacement impacts on pinnipeds would be less than significant. Table 5 details estimated takes per species.

It is estimated that no more than 50 harbor seal displacements will occur each day with the potential for take to be higher in August and taper lower in November when harbor seal numbers are very low on SNI (Stewart and Yochem, 1984). It is estimated that 75 sea lion displacements will occur each day but haul-out numbers at Coast Guard Beach are intermittent in fall. It is estimated that 25 elephant seal displacements will occur each day with numbers increasing in October and November. Estimates include displacements during site preparation and off-loading. These numbers will likely include the displacement of returning individuals, such as elephant seals that will likely move back into the hazard area and have to be displaced multiple times.

TABLE 5: MAXIMUM NUMBERS OF MARINE MAMMALS ESTIMATED TO BE HARASSED

Year	Shipments/Total Days for Offload	California Sea Lions Per day/yearly total	Pacific Harbor Seals Per day/yearly total	Northern Elephant Seals Per day/yearly total
One	2/10	Up to 75 per day/750 total	Up to 50 per day/500 total	Up to 25 per day/250 total
Two	3/15	75/1125	50/750	25/375
Three	4/20	75/1500	50/1000	25/500
Four	3/15	75/1125	50/750	25/375
Five	3/15	75/1125	50/750	25/375

Notes: Numbers presented are a maximum total and likely overestimates, as explained above.

Noise

Noise can affect behavior for marine mammals, may cause displacement, masking effects (reduce a pinniped's ability to hear other, lower-level sounds in their environment), or impair hearing or have other physiological effects. Noise generated at the temporary asphalt batch plant that would be located approximately 300 feet uphill from Coast Guard Beach would be approximately 66.5 decibels (dB) at Coast Guard Beach (given that sound attenuates 6 dB with every doubling of the distance away from the source [California Department of Transportation 2009]). The beach is lower than the temporary asphalt batch plant, and noise from the plant would likely be inaudible at this distance over ambient sound at the surf zone (Southall and others 2007). Given the low level of noise being generated and the distance from the beach, noise from the asphalt batch plant would not be expected to adversely affect pinnipeds at Coast Guard Beach.

Behavioral Reactions of Marine Mammals to Barge Beach Landings Momentary Alert Reactions

Authorized biologists will move pinnipeds, if present, before the barge performs a beach landing on SNI. While barges transfer material off-shore there should not be startle responses or stampedes, as barges may be visible but are far enough off-shore not to cause a behavioral reaction.

Habituation

It is likely marine mammals will move to additional beaches away from the barge landings at Daytona and Coast Guard beaches to avoid the disturbance associated with the barge beach landings.

Abandon Area

It is unlikely marine mammals will abandon areas. Because beach landings would occur from August 1 through November 30, outside the breeding season when marine mammals are present only sporadically, and in lower numbers than in other times of the year, only a small portion of the marine mammal population will likely be disturbed. Very few pinnipeds would be disturbed

and disturbance will be minimal and should not be significant enough to result in marine mammals abandoning areas.

Reaction Criterion

Disturbance will be recorded by authorized biologists. If the tender barge is approaching and marine mammals hauled out on Daytona or Coast Guard beach move into the water, those marine mammals would be recorded as “harassed”. Momentary alert or startle reactions by marine mammals hauled out, with no movement into the water are not considered to be “taking”. Also, marine mammals that are half-submerged, not out of the water and swim away as the barge approaches will not be considered taken by harassment.

Summary and Conclusions

Effects of the operations are expected to be minimal and short-term. With protective measures in place, the disturbance should be reduced as much as possible.

VII. ANTICIPATED IMPACT ON SUBSISTENCE

There are no subsistence uses for northern elephant seals, California sea lions or harbor seals in California waters, and thus no anticipated impacts on subsistence.

VIII. ANTICIPATED IMPACT ON HABITAT

During the period of the proposed activity, marine mammals may use various haul-outs around the barge landings and around SNI as places to rest and molt. The pinnipeds do not feed when hauled out. CA sea lions and elephant seals displaced into water usually move down-beach and haul out farther away from activity, while harbor seals will most likely stay in the water (G. Smith, personal communication). Therefore it is not expected that the barge activities will have any impact on the food or feeding success of the marine mammals. The proposed barge operations are not expected to cause significant impacts on habitats used by marine mammals, or on the food sources that these marine mammals use.

IX. ANTICIPATED IMPACT OF LOSS OR MODIFICATION OF HABITAT ON MARINE MAMMALS

The Navy anticipates no loss or permanent modification of the habitat used by marine mammal populations that haul-out in the barge landing areas. Temporary sand ramps would be constructed at Daytona and Coast Guard beaches to allow for transfer of material from the barge to dump trucks on the beach. Additionally, two tractors would be positioned on either side of the landing area before the tender barge arrives, to provide stable anchorage for the tender barge. The area of the temporary sand ramps would be re-shaped on completion of each shipping barge offload, at the end of the 5 day period. Disturbance to marine mammal habitat would be only temporary.

X. MITIGATION MEASURES

The availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks, their habitat, and on their availability for subsistence uses, paying particular attention to rookeries, mating grounds, and areas of similar significance, are described below.

The Navy will undertake a variety of measures designed to reduce the level of disturbance for marine mammals that might be hauled-out near the proposed barge landing site. All operations will be coordinated with the NBVC Point Mugu Environmental Division.

Mitigation measures include:

BIO-1 All construction activity will take place within the proposed action footprint. Contractors will be provided with maps showing the centerlines and limits of surveys that were used for the environmental analyses in the final EA and informed that construction activity shall be confined to those corridors. Stakes will be used to delineate heavy equipment work and driving zones. Maps will include the locations of U.S. Army Corps of Engineers jurisdictional waters.

BIO-4 All construction personnel must attend a mandatory environmental briefing at the start of the work day for work to be performed in sensitive habitats, and personnel attendance must be documented. For work in non-sensitive habitats, environmental briefings will

occur weekly or as needed. Federal regulations regarding protected biological species must be emphasized, along with the importance of honoring environmental closure areas. The Environmental briefing would be given by Naval Facilities Engineering Command (NAVFAC) Southwest and NBVC personnel or the project biologist before work begins. If the training is given by the project biologist, then NAVFAC Southwest or NBVC staff would brief the project biologist, and the biologist would brief the crew on the resources and avoidance and compensation measures involved in the project. Environmental training will include a description of sensitive species and habitats potentially on or near the project site, and the surrounding habitat; details on each species' habitat requirements; the protective measures to be implemented for each species; and the responsibilities of the project biologist and of those on site to protect biological resources. The training will describe the requirements and boundaries of the project, the importance of complying with compensation measures, and the requirements for reporting non-compliance and any resolution methods. Training will provide information on and legal consequences of the potential effects of trash, trespassing, and harassing or harming designated sensitive habitat areas and species in or outside of the project footprint.

BIO-6 Construction equipment will be inspected before mobilization to ensure no pinnipeds are under or near equipment.

BIO-10 To avoid significant impacts to marine mammals, the NBVC Point Mugu Environmental Division or qualified project biologist will conduct displacement procedures in accordance with Section 101(a)(5)(D) of the MMPA. During barge landings and offloadings, the Navy biologist or qualified project biologist will displace pinnipeds from the landing site as necessary for the safety of the marine mammals and construction workers. Temporary barriers will be used, if necessary, to keep the displaced pinnipeds from re-entering the area. This effort will greatly minimize the potential for pinnipeds to be affected by project activities.

The Navy biologist will monitor pinniped reactions to beach barge landings to ensure their protection and project compliance with the MMPA, and to ensure no Level A take occurs.

BIO-13 The project biologist will monitor heavy equipment operation on the beach, as needed, to ensure compliance with compensation measures and will keep the project engineer, NAVFAC Southwest, and NBVC informed about construction that may threaten significant biological resources. The project biologist will record activities daily and provide electronic versions of biological monitoring reports at least weekly to NAVFAC Southwest and NBVC.

BIO-14 The project biologist will be available to monitor construction activities to ensure compliance with sensitive biological resource avoidance and minimization measures, including implementation of specific measures for protection of marine mammals. The biologist will: (1) ensure impacts on sensitive resources are minimized, (2) educate workers about sensitive habitats and how to implement avoidance and minimization

measures, and (3) attend road repair-related meetings as needed. If authorized by the U.S. Fish and Wildlife Service (USFWS) or NMFS, the project biologist may also relocate marine mammals occupying work zones, according to USFWS and MMPA regulations and guidelines.

EFH-3 No oil, fuel or chemicals will be allowed to be discharged to waters of the state. Vessels will be equipped with spill kits and cleanup materials, and operators will be trained in responding to an accidental release of oil, fuel, or chemicals. Offloading equipment will be checked for leaks at the start of beach grading and aggregate offloading each day.

EFH-4 Measures will be taken to prevent spillage of aggregate during the barge to barge transfer process. Measures may include but are not limited to, the use of a tarp or other barrier between the two barges, to capture spillage.

XI. PLAN OF COOPERATION

Section XI does not apply to this Incidental Harassment Authorization application, as the proposed activity will take place in California waters.

XII. MONITORING AND REPORTING PLAN

The suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species, the level of taking or impacts on populations of marine mammals that are expected to be present while conducting activities and suggested means of minimizing burdens by coordinating such reporting requirements with other schemes already applicable to persons conducting such activity are described below. Monitoring plans should include a description of the survey techniques that would be used to determine the movement and activity of marine mammals near the activity site(s) including migration and other habitat uses, such as feeding.

Implementation of the following three objectives from the 2010 Integrated Natural Resources Management Plan for Naval Base Ventura County, San Nicolas Island, California (INRMP) will further mitigate any potential impacts to marine mammals:

I. Continue to monitor marine mammal populations and evaluate interactions related to island activities.

A. Ensure that activities that affect marine mammals are accomplished in accordance with the MMPA.

B. Apply for required authorizations as early in the project planning process as practicable for actions that may impermissibly impact marine mammals.

C. Comply with conditions contained in regulations or authorizations granted to the Navy by the NMFS or the USFWS.

D. Maintain compliance with the MMPA by continuing the year-round closure of the south side to unauthorized activities.

E. Maintain compliance with the MMPA by seasonally closing north-side breeding and haul-out sites to incompatible and unauthorized activities.

- II. Monitor and protect island-wide pinniped breeding and haul-out sites.
 - A. Maintain minimum flight level of 1,000 feet (305 meters) over shoreline when pinnipeds are present in accordance with the Small Take Regulations.
 - B. Continue aerial breeding season surveys for northern elephant seals and California sea lions in cooperation with the NMFS to gather data on distribution, abundance, age structure, pup production, and reproductive phenology.
 - C. Continue aerial breeding season survey for harbor seals in cooperation with the NMFS to determine pup production and total population.
 - D. Maintain closure signs around breeding and haul out sites.
 - E. Continue educational instruction on marine mammal issues and individual responsibility for island personnel.
 - F. Continue to provide support for pinniped research.

- III. Maintain adaptive management strategies to address complex issues related to marine mammal resource conflicts and occurrence.
 - A. Examine current exclusion practices and propose a pilot exclusion activity focused on excluding pinnipeds from sensitive western snowy plover nesting areas and threatened plant species.
 - B. Complete and formalize marine mammal stranding protocol to address scientific evaluations of rare or unusual occurrences.
 - C. Maintain signs that warn island personnel of the location of sensitive marine mammal areas.
 - D. Update the educational kiosk on SNI.

Reports

The Navy will prepare, and submit to NMFS, a brief preliminary report describing the activities, marine mammal monitoring work and results, and such other information as NMFS may require, 90 days after the activities cease. This report would include all monitoring results from each barge landing exercise. This report will summarize the results of the activities, summarize marine mammal behavioral observations, and estimate the amount and nature of “take” of marine mammals by harassment or in other ways. It will provide locations and numbers of marine mammals hauled out away from exercise area. In the unanticipated event that any cases of marine mammal mortality are judged to result from exercise activities, this will be reported to NMFS immediately. It is assumed that this report will be reviewed by NMFS, and that it may need to be revised to take account of comments that have been received.

Personnel

Appendix A provides additional information about the qualifications of the Navy personnel who are expected to be involved.

XIII. COORDINATING RESEARCH TO REDUCE AND EVALUATE INCIDENTAL TAKE

Suggested means of learning of, encouraging, and coordinating research opportunities, plans, and activities relating to reducing such incidental taking and evaluating its effects are described.

As it is well known that hauled-out marine mammals would be disturbed by approaching watercraft, human beings or noise there are no potential research opportunities.

XIV. REFERENCES CITED

- Carretta, J. V., K.A. Forney, E. Oleson,, K. Martien, M.M. Muto, M.S. Lowry, J. Barlow, J. Baker, B. Hanson, D. Lynch, L. Carswell, R.L. Brownell Jr., J. Robbins, D.K. Mattila, K. Ralls, and M.C. Hill, 2011. U.S. Pacific Marine Mammal Stock Assessments: 2010. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southwest Fisheries Science Center, La Jolla, CA. 352 pp.
- Fiscus, C. H. 1983. Fur seals and islands. In: Background papers submitted by the United States to the 26th meeting of the Standing Scientific Committee of the North Pacific Fur Seal Commission, Washington, D.C., March 28-April 5, 1983. Available at National Marine Mammal Laboratory, 7600 Sand Point Way NE, Seattle, WA 98115.
- Lowry, M. S., W.L. Perryman, M.S. Lynn, R.L. Westlake, and F. Julian. 1996. Counts of northern elephant seals, *Mirounga angustirostris*, from large-format aerial photographs taken at rookeries in southern California during the breeding season. *Fisheries Bulletin* 94(1):176-185.
- Lowry, M. S. 2002. Counts of northern elephant seals at rookeries in the Southern California Bight: 1981-2001. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southwest Fisheries Science Center, La Jolla, CA.
- Melin, S. R., A. J. Orr, and R. L. DeLong. 2008. The status of the northern fur seal population at San Miguel Island, California, 2006 and 2007. Pp. 41-54, In: Testa, J. W. (ed.), *Fur seal investigations, 2006-2007*. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-188. 76 pp.
- National Marine Fisheries Service (NMFS). 1999. Taking and importing marine mammals; taking marine mammals incidental to rocket launches/Final rule. *Fed. Regist.* 64:9925-9932.
- NMFS. 2006. Letter to Rod McInnis, Regional Administrator, NMFS Southwest Region from Grace Smith. Summary of Navy activities relating to the displacement of pinnipeds on San Nicolas Island, 1 January 2006 through 31 December 2006.
- Odell, D. K. 1974. Seasonal occurrence of the northern elephant seal, *Mirounga angustirostris*, on San Nicolas Island, California. *Journal of Mammalogy* 55:81-95.
- Rathbun, G. B., B.B. Hatfield, and T.G. Murphey. 2000. Status of translocated sea otters at San Nicolas Island, California. *The Southwestern Naturalist* 45(3):322-375.
- Roppel, A. Y. 1984. Management of northern fur seals on the Pribilof Islands, Alaska, 1786-1981. U.S. Dep. Commer., NOAA Tech. Report NMFS-4. 32 pp.

- Smith, G. 2005. Report of pinniped displacement activities at the San Nicolas Island barge landing area December 2004-May 2005. NAVAIR Range Sustainability Office.
- Southall, B. L., A. E. Bowles, W. T. Ellison, J. J. Finneran, R. L. Gentry, C. R. Greene, Jr., D. Kastak, D. R. Ketten, J. H. Miller, P. E. Nachtigall, W. J. Richardson, J. A. Thomas, and P. L. Tyack. 2007. Marine Mammal Noise and Exposure Criteria: Initial Scientific Recommendations. *Aquatic Mammals* 33: 411-521.
- Stewart, B. S. and H.R. Huber. 1993. *Mirounga angustirostris*. *Mammalian Species* 449:1-10.
- Stewart, B. S., and P. K. Yochem. 1984. Seasonal Abundance of Pinnipeds on San Nicolas Island, California, 1980-1982. *Bulletin of the Southern California Academy of Sciences* 83: 121-32.
- Stewart, B. S., P.K. Yochem, H.R. Huber, R.L. DeLong, R.J. Jameson, W.J. Sydeman, S.G. Allen, and Le B.J. Boeuf. 1994. History and present status of the northern elephant seal population. In: *Elephant Seals: Population Ecology, Behavior, and Physiology* (Ed. by B. J. Le Boeuf & R. M. Laws), pp. 29-48: University of California Press.
- Tetra Tech EM Inc. (Tetra Tech). 2011. Interview with Brian Hatfield, USGS biologist, USGS-BRD Western Ecological Research Center, Piedras Blancas Office, Santa Cruz Field Station, San Simeon, CA, regarding estimated sea otter population size at San Nicolas Island, and quarterly data from 2005-2010. Conducted by Mandi McElroy, Tetra Tech biologist, August 17.
- U.S. Navy. 2002. Environmental Assessment to Construct a Supply Pier at San Nicolas Island, Ventura County, California. Prepared by Naval Air Weapons Station, China Lake. September.
- U.S. Navy. 2010. Integrated Natural Resources Management Plan for Naval Base Ventura County, San Nicolas Island, California. Prepared for Naval Facilities Engineering Command Southwest and Naval Base Ventura County. Prepared by Tierra Data, Inc. December.

Appendix A

The monitoring work will be done by qualified personnel from the Naval Base Ventura County Point Mugu Environmental Division. The following are resumes of the personnel who are expected to be involved.

APPENDIX B

Acronyms and Abbreviations

The following list shows the meaning of acronyms and abbreviations used in this report.

dB	decibels
BMP	Best management practice
ESA	Endangered Species Act
IHA	Incidental Harassment Authorization
MMPA	Marine Mammal Protection Act
NAVFAC	Naval Facilities Engineering Command
Navy	Department of the Navy
NBVC	Naval Base Ventura County
NMFS	National Marine Fisheries Service, U.S. Dept of Commerce
RO	Reverse osmosis
SNI	San Nicolas Island
USFWS	U.S. Fish and Wildlife Service