# FINAL ENVIRONMENTAL ASSESSMENT

Issuance of an Incidental Harassment Authorization
to the St. George Reef Lighthouse Preservation Society to Take Marine Mammals
by Harassment Incidental to Lighthouse Restoration and Maintenance Activities
on St. George Reef Lighthouse Station in Del Norte County, California

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**LEAD AGENCY:** USDC, National Oceanographic and Atmospheric Administration
National Marine Fisheries Service, Office of Protected Resources
1315 East West Highway
Silver Spring, MD 20910

**RESPONSIBLE OFFICIAL:** James H. Lecky, Director, Office of Protected Resources

**FOR INFORMATION CONTACT:** Office of Protected Resources
National Marine Fisheries Service
1315 East West Highway
Silver Spring, MD 20910
(301) 713-2332

**LOCATION:** St. George Reef Light Station, Northwest Seal Rock,
Northeast Pacific Ocean, Del Norte County, California

**ABSTRACT:** The National Marine Fisheries Service proposes to issue an Incidental Harassment Authorization (IHA) to the St. George Reef Lighthouse Preservation Society (SGRLPS) for the taking, by Level B harassment, of small numbers of marine mammals incidental to St. George Reef Lighthouse Station (Station) maintenance and restoration activities. Because the SGRLPS intends to maintain the Station in perpetuity, this EA applies to the current IHA application and any future IHA applications for Station maintenance and restoration activities during the time period of November 1 through April 30, annually.

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**List of Acronyms, Abbreviations, and Initialisms**

| | |
|---|---|
| BiOp | Biological Opinion |
| CCR | Coastal Crescent Research |
| CFR | Code of Federal Regulations |
| CEQ | President's Council on Environmental Quality |
| CPFV | Commercial Passenger Fishing Vessels |
| DPS | Distinct Population Segment |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| ESA | Endangered Species Act |
| FONSI | Finding of No Significant Impact |
| ft | foot/feet |
| FR | Federal Register |
| hr | hour |
| hrs | hours |
| HZ | hertz |
| IHA | Incidental Harassment Authorization |
| ITA | Incidental Take Authorization |
| ITS | Incidental Take Statement |
| km | kilometer |
| KLC | Kodiak Launch Complex |
| LOA | Letter of Authorization |
| m | meter |
| mi | mile |
| min | minutes |
| NAO | NOAA Administrative Order |
| NCCOS | NOAA National Centers for Coastal Ocean Science |
| NEPA | National Environmental Policy Act |
| NMFS | National Marine Fisheries Service |
| NOAA | National Oceanographic and Atmospheric Administration |
| NOR | Notice of Receipt |
| NWFSC | Northwest Fisheries Science Center |
| NWR | National Wildlife Refuge |
| OPR | Office of Protected Resources |
| PATON | Private Aid to Navigation |
| POP | Persistent Organic Pollutants |
| PR1 | NMFS OPR Permits, Conservation, and Education Division |
| PR3 | NMFS Endangered Species Division |
| PRD | Southwest Regional Office Protected Resources Division |
| SGRLPS | St. George Reef Lighthouse Preservation Society |
| SWRO | NMFS Southwest Regional Office |
| USAF | United States Air Force |
| U.S.C. | United States Code |
| USCG | United States Coast Guard |
| USFWS | United States Fish and Wildlife Service |

# 1 CHAPTER 1 PURPOSE OF AND NEED FOR ACTION

## 1.1 DESCRIPTION OF ACTION

In response to a receipt of a request from the St. George Reef Lighthouse Preservation Society (SGRLPS), NMFS proposes to issue an IHA that authorizes takes by level B harassment of marine mammals in the wild pursuant to section 101(a)(5)(D) of the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1631 *et seq*.), and the regulations governing the taking and importing of marine mammals (50 Code of Federal Regulations (CFR) Part 216).

This Environmental Assessment (EA), titled "*Issuance of an Incidental Harassment Authorization to Take Marine Mammals by Harassment Incidental to Lighthouse Restoration and Maintenance Activities on St. George Reef Lighthouse Station in Del Norte County, California,*" (hereinafter, the 2010 EA) addresses the impacts on the human environment that would result from the issuance of this IHA.

### 1.1.1 BACKGROUND

On October 13, 2006, NMFS received an application from the SGRLPS requesting an authorization for the harassment of small numbers of pinnipeds incidental to the conduct of restoration and maintenance work on the historic St. George Reef Light Station (hereinafter, Station) on Northwest Seal Rock (NWSR) in the northeast Pacific Ocean.

The SGRLPS maintains a Private Aid to Navigation (PATON) on the Station. A PATON is a buoy, light or day beacon owned and maintained by any individual or organization other than the US Coast Guard (USCG). In order to renew a PATON permit to conduct annual maintenance of the Station's optical light system, as well as to conduct emergency maintenance in the event of equipment failure, the USCG required the SGRLPS to obtain an Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et. seq*.) permit from the U.S. Fish and Wildlife Service (USFWS) for migratory birds and a MMPA incidental take authorization (ITA) and ESA incidental take statement (ITS) for marine mammals from NMFS.

To comply with the MMPA, SGRLPS has submitted an IHA application due to the presence of four species of pinnipeds known to haul out on NWSR. They are: the Steller sea lion (*Eumetopias jubatus*), California sea lion (*Zalophus californianus*), Pacific harbor seal (*Phoca vitulina richardsi*), and northern fur seal (*Callorhinus ursinus*).

### 1.1.2 PURPOSE AND NEED

In response to the receipt of an IHA application from the SGRLPS, NMFS proposes to issue an IHA pursuant to the MMPA §101(a)(5)(D). The primary purpose of the IHA is to provide an exception from the take prohibitions under the MMPA to allow "takes" by "level B harassment" of marine mammals, including endangered species, for the conduct of Station restoration and maintenance activities. The need for the issuance of the IHA is related to NMFS' mandates under the MMPA. Specifically the MMPA prohibits takes of marine mammals, with specific exceptions, including the incidental, but not intentional, taking of marine mammals, for periods of not more than one year, by United States citizens who engage in a specified activity (other than commercial fishing).

IHA issuance criteria require that activities authorized by an IHA will have a negligible impact on the species or stock(s); and will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses. In addition, the IHA must set forth the permissible methods of taking, other means of effecting the least practicable adverse impact on the species or stock and its habitat, and monitoring and reporting of such takings.

Issuance of an IHA is a federal agency action. For purposes of section 7 of the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et. seq*), NMFS must consult with itself to ensure that its action is not likely to jeopardize the continued existence of any federally-listed species or result in the destruction or adverse modification of critical habitat.

## 1.2 SCOPING SUMMARY

The purpose of scoping is to identify the issues to be addressed and the significant issues related to the proposed action, as well as identify and eliminate from detailed study the issues that are not significant or that have been covered by prior environmental review. An additional purpose of the scoping process is to identify the concerns of the affected public and Federal agencies, states, and Indian tribes.

The MMPA and its implementing regulations governing issuance of an IHA (50 CFR § 216.107) require that upon receipt of a valid and complete application for an IHA, NMFS publish a notice of receipt in the *Federal Register*. The notice summarizes the purpose of the requested IHA, includes a statement about whether an EA or an Environmental Impact Statement (EIS) was prepared, and invites interested parties to submit written comments concerning the application.

NOAA Administrative Order (NAO) 216-6, established agency procedures for complying with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq*.) and the implementing regulations issued by the President's Council on Environmental Quality (CEQ). NAO 216-6 specifies that the issuance of an IHA under the MMPA is among a category of actions that require further environmental review and the preparation of NEPA documentation. The CEQ regulations implementing the NEPA do not require that a draft EA be made available for public comment as part of the scoping process.

### 1.2.1 COMMENTS ON APPLICATION AND EA

On September 29, 2009, NMFS published a notice of a proposed IHA in the *Federal Register* (74 FR 49852), which announced the availability of the application for public comment for 30 days. NMFS did not release the draft EA during the public comment period and received no requests from the public to view the draft 2010 EA. However, the public comment period for the proposed IHA covered the same subject matter, affording public input on environmental impacts. In addition, NMFS will post the final 2010 EA on http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications.

NMFS only received one comment from the Marine Mammal Commission (Commission), which recommended that NMFS issue the requested six-month authorization (See Appendix A). Based on their review, the Commission recommended that NMFS ensure that the proposed monitoring and mitigation measures discussed in the application and *Federal Register* (74 FR 49852, September 29, 2009) notice are included in the final IHA. The Commission concurred with

NMFS' initial scoping (as described in the *Federal Register* notice) and provided no additional issues or alternatives for inclusion and evaluation in the 2010 EA.

### 1.2.2 ISSUES WITHIN THE SCOPE OF THIS EA

The 2010 EA addresses the proposal of NMFS to issue an IHA under Section 101(a)(5)(D) of the MMPA and the alternatives to the proposed action. The IHA, if issued, would authorize the harassment of four species of marine mammals incidental to Station maintenance and restoration activities.

NMFS identified the following issues as relevant to the action and appropriate for detailed evaluation: (1) disturbance of marine mammals from helicopter operations; (2) disturbance of marine mammals related to maintenance and restoration activities; and (3) disturbance of marine mammals related to human presence (acoustic and visual contact).

**Disturbance from Helicopter Operations:** Because NWSR has no safe landing area for boats, the proposed activities would require SGRLPS to transport personnel and equipment from the California mainland to NWSR by helicopter. Acoustic disturbance within the marine mammals' hearing range may include the noise generated by the helicopter's rotors during the approach to NWSR, landing, and departure from the islet.

**Disturbance from Restoration, Maintenance, and Repair Activities:** Sounds associated with renovation and maintenance activities (e.g., hammering, drilling, sawing, and scraping; and moving and/or securing equipment), may have the potential to disturb pinnipeds hauled out on NWSR.

**Disturbance from Human Presence:** NWSR has been uninhabited by humans for over 34 years. As such, the marine mammals present on NWSR are not acclimated to humans and may be disturbed by acoustic or visual contact with humans. Acoustic and visual disturbances may include human vocalizations within the marine mammals' hearing range and the marine mammals detecting human presence (e.g., movement, eye-contact, and human scent) above the haul-out area.

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

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

### 1.3.1 NATIONAL ENVIRONMENTAL POLICY ACT

The NEPA, enacted in 1969, is applicable to all "major" federal actions significantly affecting the quality of the human environment. A major federal action is an activity that is fully or partially funded, regulated, conducted, or approved by a federal agency. NMFS' issuance of an IHA for incidental harassment of marine mammals represents approval and regulation of the applicant's activities. While NEPA does not dictate substantive requirements for an IHA, it requires consideration of environmental issues in federal agency planning and decision making.

The procedural provisions outlining federal agency responsibilities under NEPA are provided in the CEQ's implementing regulations (40 CFR Parts 1500-1508).

NMFS has, through NAO 216-6, established agency procedures for complying with NEPA and the implementing regulations issued by the CEQ. NAO 216-6 specifies that issuance of an IHA under the MMPA and ESA is among a category of actions that require further environmental review. When a proposed action has uncertain environmental impacts or unknown risks, establishes a precedent or decision in principle about future proposals, may result in cumulatively significant impacts, or may have an adverse effect upon endangered or threatened species or their habitats, preparation of an EA or EIS is required. The 2010 EA is prepared , its implementing regulations, and NAO 216-6.

### 1.3.2 ENDANGERED SPECIES ACT

Section 7 of the ESA requires consultation with the appropriate federal agency (either NMFS or the USFWS) for federal actions that "may affect" a listed species or critical habitat. NMFS' issuance of an IHA affecting ESA-listed species or designated critical habitat, directly or indirectly, is a federal action subject to these section 7 consultation requirements. Accordingly, NMFS is required to ensure that its action is not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of critical habitat for such species. Regulations specify the requirements for these consultations (50 Part CFR 402).

The NMFS Office of Protected Resources (OPR) Permits, Conservation and Education Division (PR1) is required to consult with the NMFS Southwest Regional Office (SWRO) Protected Resources Division (PRD) on the issuance of an IHA under § 101(a)(5)(D) of the MMPA. PR1 is required to consult with PRD because the action of issuing an IHA may affect threatened and endangered species under NMFS' jurisdiction.

PR1 is not required to consult with the USFWS on the issuance of an IHA because threatened and endangered species under USFWS' jurisdiction (e.g., California sea otters (*Enhydra lutris nereis*) are not present in the action area.

### 1.3.3 MARINE MAMMAL PROTECTION ACT

Section 101(a)(5)(D) of the MMPA (16 U.S.C. 1371 (a)(5)(D)) directs the Secretary of Commerce (Secretary) to authorize, upon request, the incidental, but not intentional, taking by harassment of small numbers of marine mammals of a species or population stock, for periods of not more than one year, by United States citizens who engage in a specified activity (other than commercial fishing) within a specific geographic region if certain findings are made and, a notice of a proposed authorization is provided to the public for review.

Authorization for incidental taking of small numbers of marine mammals shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), and will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses. The authorization must set forth the permissible methods of taking, other means of effecting the least practicable adverse impact on the species or stock and its habitat, and monitoring and reporting of such takings. NMFS has defined "negligible impact" in 50 CFR

216.103 as "an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."

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

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

Section 101(a)(5)(D) of the MMPA establishes a 45-day time limit for NMFS' review of an application followed by a 30-day public notice and comment period on any proposed authorizations for the incidental harassment of small numbers of marine mammals. Not later than 45 days after the close of the public comment period, if the Secretary makes the findings set forth in Section 101(a)(5)(D)(i) of the MMPA, the Secretary shall issue the authorization with appropriate conditions to meet the requirements of clause 101(a)(5)(D)(ii) of the MMPA.

NMFS has promulgated regulations to implement the permit provisions of the MMPA (50 CFR Part 216) and has produced Office of Management and Budget (OMB)-approved application instructions (OMB Number 0648-0151) that prescribe the procedures (including the form and manner) necessary to apply for permits. All applicants must comply with these regulations and application instructions in addition to the provisions of the MMPA. Applications for an IHA must be submitted according to regulations at 50 CFR §216.104.

### 1.3.4 THE NATIONAL HISTORIC LIGHTHOUSE PRESERVATION ACT OF 2000

The National Historic Lighthouse Preservation Act of 2000 (NHLPA; 16 U.S.C. § 470w-7), an amendment to the National Historic Preservation Act of 1966, as amended, provides a mechanism for the disposal of federally-owned historic light stations. NHLPA recognizes the cultural, recreational, and educational value associated with historic light station properties by allowing these to be transferred at no cost to federal agencies, state and local governments, nonprofit corporations, educational agencies, and community development organizations. These entities must agree to comply with conditions set forth in NHLPA, and be financially able to maintain the historic light station. The eligible entity to which the historic light station is conveyed must make the station available for education, park and recreation, cultural or historic preservation purposes for the general public at reasonable times and under reasonable conditions.

Only those light stations that are listed, or determined eligible for listing, in the National Register of Historic Places, can be conveyed under this program. The nomination for listing, or determination of eligibility, is prepared by the USCG following guidelines set forth in 36 CFR 60.9(c) and 36 CFR 63 respectively, as part of their responsibilities prior to the property being transferred to the General Services Administration (GSA) inventory for disposal. It is the

responsibility of the applicant to seek and secure agreements with State Historic Preservation Officers, the USCG, the National Park Service (NPS) and the GSA under the NHLPA.

# 2 CHAPTER 2 ALTERNATIVES INCLUDING THE PROPOSED ACTION

The NEPA implementing regulations (40 CFR § 1502.14) and NAO 216-6 provide guidance on the consideration of alternatives to a federal proposed action and require rigorous exploration and objective evaluation of all reasonable alternatives. Each alternative must be feasible and reasonable in accordance with the President's Council on Environmental Quality (CEQ) regulations (40 CFR §§ 1500-1508). This chapter describes the range of potential actions (alternatives) determined reasonable with respect to achieving the stated objective, as well as alternatives eliminated from detailed study and also summarizes the expected outputs and any related mitigation of each alternative.

This EA evaluates the alternatives to ensure that the they would fulfill the purpose and need, namely: (1) the issuance of an IHA for the take of marine mammals by level B behavioral harassment incidental to the SGRLPS' conduct of restoration and maintenance work on NWSR; and (2) compliance with the MMPA which sets forth specific standards (i.e., unmitigable adverse impact and negligible impact) that must be met in order for NMFS to issue an IHA.

The Proposed Action (Preferred) alternative represents the activities proposed in the submitted application for an IHA, with standard monitoring and mitigation measures specified by NMFS. If the action will have no more than a negligible impact on the species or stocks; will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses; and set forth the appropriate level of mitigation measures and monitoring, then NMFS shall issue the IHA.

## 2.1 PROJECT OBJECTIVES

The SGRLPS intends to maintain the Station, which is listed in the NPS' National Register of Historic Places (Reference Number 93001373), in perpetuity, as stipulated by the NHLPA Quitclaim Deed (GSA Control No. 9-U-CA-556-B). SGRLPS proposes to conduct the proposed restoration and maintenance activities between November 1 and April 30, annually, at a maximum frequency of one three-day work period per month. The proposed duration for each restoration work session would last no more than three days (e.g., Friday, Saturday, and Sunday). As such, the SGRLPS will request an IHA for these activities on an annual basis.

## 2.2 ALTERNATIVE 1: NO ACTION ALTERNATIVE – DENY ISSUANCE OF AN IHA

Evaluation of the No Action Alternative is required by regulations of the CEQ as a baseline against which the impacts of the Proposed Action are compared.

Under the No Action Alternative, NMFS would not issue the proposed IHA for the activities proposed by the SGRLPS. The MMPA prohibits all takings of marine mammals unless authorized by a permit or exemption under the MMPA. If authorization to take, by incidental harassment, Pacific harbor seals, California sea lions, northern fur seals, and Steller sea lions is denied, the SGRLPS would not restore or maintain the Station; marine mammals present on NWSR would not be incidentally harassed; the SGRLPS would forego the project; the USCG would not issue a PATON permit to the SGRLPS; and the SGRLPS would be unable to abide by the stipulations of the NHLPA Quitclaim Deed. As a result, the SGRLPS would be unable to service the PATON and the Station would not be restored and maintained for public use and would remain dormant. Thus, this alternative does not meet the purpose and need.

## 2.3 ALTERNATIVE 2: ISSUANCE OF AN IHA WITH MITIGATION (PREFERRED ALTERNATIVE)

The Proposed Action is the Preferred Alternative. Under this alternative, NMFS would issue a six-month IHA (valid from November 1 through April 30, annually) to the SGRLPS allowing the incidental take by Level B harassment of small numbers of Steller sea lions, Pacific harbor seals, California sea lions, and northern fur seals during lighthouse restoration and maintenance activities on NWSR.

NMFS will incorporate the mitigation and monitoring measures and reporting requirements described in Sections 2.3.6 and 2.3.7 into the IHA. Accordingly, this Preferred Alternative (Issuance of an IHA with Mitigation) would satisfy the purpose and need of the action—issuance of an IHA, with mitigation measures and monitoring, would enable the agency and the SGRLPS to comply with the statutory and regulatory requirements of the MMPA and ESA.

### 2.3.1 HELICOPTER OPERATIONS

SGRLPS plans to charter a Raven R44 helicopter, owned and operated by Air Shasta Rotor and Wing, LLC or Matty Chopper, LLC to transport personnel and equipment from the California mainland to NWSR. The Raven R44, which seats three passengers and one pilot, is a compact-sized (1134 kilograms (kg), 2500 pounds (lbs)) helicopter with two-bladed main and tail rotors. Both sets of rotors are fitted with noise-attenuating blade tip caps that would decrease flyover noise. The helicopter will land on top of the Station's engine room (caisson) which is approximately 15 m (48 ft) above the surface of the pinniped haulout area on NWSR.

SGRLPS proposes to transport no more than 15 work crew members and equipment to NWSR for each session and estimates that each three-day work session would require no more than 42 helicopter landings/takeoffs each month. During landing, the helicopter would land on the caisson to allow the work crew members to disembark and retrieve their equipment located in a basket attached to the underside of the helicopter. The helicopter would then return to the mainland to pick up additional personnel and equipment. Even though SGRLPS would use the helicopter to transport work crew members and materials on the first and last days of the three-day work period, the helicopter would likely fly to and from the Station each day of the work session.

### 2.3.2 PROPOSED HELICOPTER SCHEDULE

The SGRLPS proposes a maximum of 12 flights (six arrivals and six departures) for the first day of the three-day work session for each monthly trip. The first flight would depart from Crescent City Airport (Latitude: 41°46′48″ N; Longitude: 124°14′11″ W) at 9:00 am for a six-minute flight to NWSR. The helicopter would land and takeoff immediately after offloading personnel and equipment every 5 min. The total duration of the first day's helicopter operations would last for approximately three hours (hrs). Crew members would remain overnight at the Station and would not return to the mainland on the first day.

For the second day of each monthly trip, the SGRLPS proposes a maximum of two flights (one arrival and one departure) to transport no more than three crew members off of NWSR. The first flight would depart from Crescent City Airport at 9:00 am for a six-minute flight to NWSR. The total duration of the second day's helicopter operations would last for approximately 15 min.

For the final day of each monthly trip, SGRLPS proposes to conduct a maximum of 22 helicopter flights (11 arrivals and 11 departures) to: (1) transport the remaining crew members and equipment/material back to Crescent City Airport; (2) transport tourists to the Station from Crescent City Airport; and (3) transport tourists from the Station back to Crescent City Airport. The first flight would depart from Crescent City Airport at 9:00 am. The duration of the last day's helicopter operations would last for approximately five hrs.

In summary, the SGRLPS would conduct a total of 42 hrs of helicopter operations each month for the proposed restoration and maintenance activities (See Appendix B).

### 2.3.3 LIGHTHOUSE RESTORATION ACTIVITIES

Restoration activities would include the removal of lead-based paint and peeling plaster, restoration of interior plaster and paint, refurbishing structural and decorative metal, reworking original metal support beams throughout the lantern room and elsewhere, replacing glass as necessary, and upgrading the beacon's solar-powered electrical system.

The proposed lighthouse restoration activities are not expected to cause more exposure of persistent organic pollutants (POP) to marine mammals due to the small scale of the action and the action area. The SGRLPS will encapsulate all construction waste, broken glass, dirt, wood, metal, and including paint and rust shavings within specially marked bags and will transport the bags by helicopter to Crescent City, CA for proper disposal. Disposal of the lead based paint will comply with municipal and/or state laws and ordinances.

### 2.3.4 LIGHT MAINTENANCE ACTIVITIES

In order to maintain the beacon light as a PATON, the SGRLPS will need to conduct maintenance at least once or up to two times per year within the proposed work window. Scheduled light maintenance activities would coincide with the lighthouse restoration activities.

### 2.3.5 EMERGENCY LIGHT MAINTENANCE

If the beacon light fails during the period November 1 through April 30, annually, the SGRLPS proposes to send a crew of two to three people to the Station by helicopter to repair the beacon light. For each emergency repair event, the SGRLPS proposes to conduct a maximum of four flights (two arrivals and two departures) to transport equipment and supplies. The helicopter may remain on site or transit back to shore and make a second landing to pick up the repair personnel.

In the case of an emergency repair between November 1 and April 30, annually, the SGRLPS would consult with the NMFS Southwest Regional Office (SWRO) to determine the timing of the trips to the lighthouse, on a case-by-case basis, based upon the existing environmental conditions and the abundance and distribution of any marine mammals present on NWSR. The SWRO biologists knowledge regarding animal use and abundance on the NWSR and would make a decision regarding when the trips to the lighthouse can be made that would have the least practicable adverse impact to marine mammals. The SWRO would also ensure that the SGRLPS' request for incidental take during emergency repairs would not exceed the number of incidental take authorized in the IHA.

Complete automation of the light generating system and automatic backup system will minimize the number of maintenance and emergency repair visits to NWSR. The light is solar powered using one solar panel; an installed second panel serves as a backup which is automatically activated if needed. A second smaller bulb in the lantern is activated if the primary bulb fails. The SGRLPS also plans to use high-quality, durable materials and thoroughly weatherproof the Station to minimize trips for maintenance and repair in the future. All tools and supplies are stored on the island so that a minimal number of transport trips for emergency maintenance will be necessary.

### 2.3.6 MITIGATION MEASURES

As required under the MMPA, NMFS considered mitigation to effect the least practicable adverse impact on marine mammals and has developed a series of mitigation measures, as well as monitoring and reporting procedures (Section 2.3.7) that would be required under the IHA.

The following measures are designed to eliminate the potential for injury or mortality and to minimize Level B behavioral harassment to marine mammals found on NWSR. These measures would be required under Alternative 2 (Preferred Alternative).

In the case that NMFS should deem other mitigation measures necessary for future restoration and maintenance activities, NMFS would consider these and implement them after consultation and agreement with the NMFS SWRO and the SGRLPS. The additional mitigation measures would appear in future IHAs for the SGRLPS.

#### 2.3.6.1 TIME AND FREQUENCY

Lighthouse restoration activities are to be conducted at maximum once per month between November 1 and April 30, annually. Each restoration session will last no more than three days. Maintenance of the light beacon will occur only in conjunction with restoration activities.

#### 2.3.6.2 HELICOPTER APPROACH AND TIMING TECHNIQUES

The SGRLPS shall ensure that helicopter approach patterns to the lighthouse will be such that the timing techniques are least disturbing to marine mammals. Since the most severe impacts (stampede) are precipitated by rapid and direct helicopter approaches, initial approach to the Station must be offshore from the island at a relatively high altitude (e.g., 800 - 1,000 ft, or 244 - 305 m). Before the final approach, the helicopter shall circle lower, and approach from area where the density of pinnipeds is the lowest. If for any safety reasons (e.g., wind condition) such helicopter approach and timing techniques cannot be achieved, the SGRLPS must abort restoration and maintenance mission for that day.

#### 2.3.6.3 AVOIDANCE OF VISUAL AND ACOUSTIC CONTACT WITH PINNIPEDS

The SGRLPS members, the restoration crew, and tourists will avoid making unnecessary noise while on NWSR and must not view pinnipeds around the base of the Station. Because pinnipeds haul out on the lower platform, the door to this area will remain closed and barricaded at all times.

#### 2.3.6.4 AUTOMATION OF LIGHT STATION EQUIPMENT:

Complete automation of the light generating system and automatic backup system will minimize maintenance and emergency repair visits to the island. The light is solar powered using one solar panel; an installed second panel serves as a backup which is automatically activated if needed. A second smaller bulb in the lantern is activated if the primary bulb fails. Use of high quality, durable materials and thorough weatherproofing is planned to minimize trips for maintenance and repair in the future. All tools and supplies are stored on the island so that a minimal number of transport trips will be necessary.

### 2.3.7 MONITORING AND REPORTING

Under the Preferred Alternative (Alternative 2), NMFS would require the SGRLPS to undertake the following monitoring activities on NWSR. The reporting requirements described in Section 2.3.7.3 would also be implemented under Alternative 2.

#### 2.3.7.1 MONITORING

At least once during the period between November 1 and April 30 annually, a qualified, NMFS-approved biologist shall be present during all three workdays at the Station. This requirement may be modified depending on the results of the monthly monitoring reports. The biologist shall document use of the island by the marine mammals (i.e., dates, time, tidal height, species, numbers present, frequency of use, weather conditions, and any disturbances), and note any responses to potential disturbances.

In the event of any observed Steller sea lion injury, mortality, or the presence of newborn pup, the SGRLPS will notify the NMFS SWRO Administrator and the NMFS Director of Office of Protected Resources immediately and cease operations.

#### 2.3.7.2 AERIAL PHOTOGRAPHIC SURVEYS

Aerial photographic surveys may provide the most accurate means of documenting species composition, age and sex class of pinnipeds using the project site during human activity periods. The SGRLPS will employ a skilled, aerial photographer to document marine mammals hauled out on Northwest Seal Rock for comparing marine mammal presence on Northwest Seal Rock pre- and post-restoration.

The photographer will complete a photographic survey of Northwest Seal Rock using the same helicopter that will transport SGRLPS personnel to the island during restoration trips. For a pre-restoration survey, photographs of all marine mammals hauled-out on the island shall be taken at an altitude greater than 300 m (984 ft) during the first arrival flight to Northwest Seal Rock. For the post-restoration survey, photographs of all marine mammals hauled-out on the island shall be taken at an altitude greater than 300 m (984 ft) during the last departure flight from Northwest Seal Rock. The photographer or a member of the SGRLPS should note the time of day, helicopter altitude, type of camera used, film speed (if applicable), type of camera lens, amount of daylight present, tidal height, and weather conditions.

The SGRLPS and/or its designees will forward the photographs to a biologist capable of discerning marine mammal species. Data shall be provided to NMFS in the form of a report with a data table and any other significant observations related to marine mammals (see Reporting). The SGRLPS will make available the original photographs to NMFS or to other marine mammal experts for inspection and further analysis.

#### 2.3.7.3 REPORTING REQUIREMENTS

The SGRLPS will submit interim monitoring reports to the NMFS SWRO Administrator and the NMFS Director of Office of Protected Resources no later than 30 days after the conclusion of each monthly session. The interim report will describe the operations that were conducted and sightings of marine mammals near the proposed project. The interim report will provide full documentation of methods, results, and interpretation pertaining to all monitoring. The interim report will summarize the dates and locations of restoration and maintenance activities, and all marine mammal sightings (dates, times, locations, activities, associated with the project). The interim report will also include estimates of the number and nature of exposures that could result in the incidental take of marine mammals by Level B behavioral harassment as well as a description of the implementation and effectiveness of the monitoring and mitigation measures of the IHA.

Annually, the SGRLPS will submit a draft Final Monitoring Report to NMFS no later than 90 days after the IHA has expired to the SWRO Regional Administrator and to the Director of Office of Protected Resources at NMFS Headquarters. The report must contain the following information: (a) summary of the dates, times, tides and weather during all restoration and maintenance activities; (b) species, number, location, and behavior of any marine mammals, observed throughout all monitoring activities; and (c) an estimate of the number (by species) of marine mammals that are known to have been exposed to visual and acoustic stimuli associated with the helicopter operations, restoration, and maintenance activities.

### 2.3.8 ESTIMATED TAKE BY INCIDENTAL HARASSMENT

Provided that mitigation and monitoring measures are implemented, NMFS estimates that approximately 204 California sea lions, 172 Steller sea lions, 36 Pacific harbor seals, and 6 northern fur seals could be potentially affected by Level B harassment over the course of each annual IHA. Section 4.2.3.1 describes the basis of NMFS' determination on the impacts of the stressors associated with the restoration and maintenance activities on the marine mammals present on NWSR.

Estimates of the numbers of marine mammals that might be affected are based on consideration of 100 percent of the pinnipeds present on NWSR that could be disturbed by approximately 42 hrs of helicopter operations each month, during the course of the activity. These estimates are also based on pinniped survey counts conducted by CCR on NWSR in the spring of 1997, 1998, 1999, and 2000 (CCR, 2001), calculated for the population variance (Steller sea lions) or for the average monthly abundance (California sea lions, Pacific harbor seals, and northern fur seals) between November 1 and April 30 annually. These incidental harassment take numbers represent 0.14 percent of the U.S. stock of California sea lion, 0.42 percent of the eastern U.S. stock of Steller sea lion, 0.11 percent of the California stock of Pacific harbor seals, and 0.06 percent of the San Miguel Island stock of northern fur seal.

NMFS does not expect the activity to impact rates of recruitment or survival of the pinnipeds since no mortality (which would remove individuals from the population) or injury is anticipated to occur, nor authorized. Only a temporary modification in behavior and/or low-level physiological effects is anticipated to occur over a very short period of time (a maximum of three days per month), occurring at very limited times of the day.

## 2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

NMFS considered an alternative where NMFS issues a six-month IHA without the mitigation measures described in Alternative 2–Issuance of an IHA with Mitigation (the Preferred Alternative). However, this alternative failed to meet the statutory and regulatory requirements of the MMPA for an IHA (e.g., negligible impact, effecting the least practicable adverse impact, and monitoring and reporting of such takings). Accordingly, NMFS did not consider this alternative further.

NMFS also considered an alternative where NMFS issues a six-month IHA described in Alternative 2–Issuance of an IHA with Mitigation (the Preferred Alternative) with the requirement that the SGRLPS use a larger helicopter so that fewer flights would be necessary. However, this alternative was not tractable, as the helicopter landing area could not accommodate a larger helicopter than the Raven-44 model. The use of a larger helicopter to transport more personnel would require the use of a hoist to lower people onto the Station. The use of a hoist would require more time for personnel to disembark thus prolonging acoustic and visual disturbances to the marine mammals hauled out on NWSR.

# 3 CHAPTER 3 AFFECTED ENVIRONMENT

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

## 3.1 PHYSICAL ENVIRONMENT

### 3.1.1 GEOLOGY AND OCEANOGRAPHY

The project area is on the continental shelf, and associated with the Oregonian Province which extends primarily from southeastern Alaska to Point Conception and is part of the Eastern Boreal Pacific Region (NCCOS, 2007). The Oregonian Province extends southward beyond Point Conception along the outer islands of southern California, and in part reappears in upwelling areas off Baja California (NCCOS, 2007). The Pacific Ocean coastline in this region is uplifted, terraced and wave-cut. The Crescent City, CA coastal plain is a 6 to 9 kilometers (km)-wide (3.7 to 5.6 mile- (mi) wide) coastal lowland in northernmost California that lies on the upper plate of the Cascadia subduction zone in northernmost California (Polenz & Kelsey, 1999).

St. George Reef is a group of nine rocks and sunken ledges extending 9.7 km (6.5 mi) northwest and west from Point St. George, CA. NWSR and Southwest Seal Rock are the largest islets and are void of soil and vegetation. NWSR (41°50'24" N, 124°22'06" W), a small, rocky formation most likely composed of marine sediments or pillow basalt, is the western most islet on St. George Reef. NWSR's total area consists of 40,000 square ft (1.6 acres, or 3,716 $m^2$). The islet is approximately 91.4 m (300 ft) in diameter and peaks at 5.18 m (17 ft) above mean sea level. The sounding depths of the water (Figure 1) surrounding NWSR ranges from 71 to 250 fathoms (130 to 457 m) (NOAA, 2007).

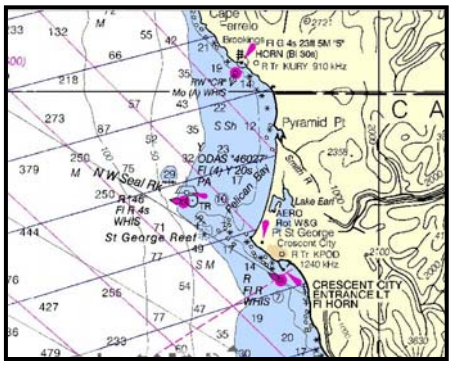


**Figure 1. NOAA Sounding Map of St. George Reef in the Pacific Ocean.**

NWSR is subject to intense wave energy and is frequently inundated by waves that crash over the peak elevations of the island and up onto the lighthouse structure (Figure 2). Wave heights average about 1.8 m (6 ft), but can be as high as 9.1 m (30 ft) in this area. The National Data Buoy Center's Station 46027, located near St. George (41°51'1" N, 124°22'52" W), indicates that air temperatures average 10.7° Celsius (C) throughout November through April (NBDC, 2009). The prevailing winds are from the northwest and average wind speed is 3.7 knots throughout November through April (NBDC, 2009). For the same period, average sea surface temperature measures approximately 12.6° C (54.6° Fahrenheit) and the significant wave height averaged 4.8 m (15.7 ft) (NBDC, 2009). The increased wave height during the winter months (Figures 6 and 7) will reduce the available haul out space and

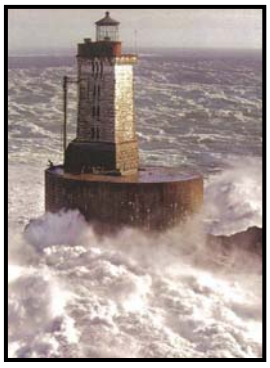

**Figure 2. St. George Reef Light Station inundated by waves. Stephen Corley.**

as a result, the number of animals hauling out at Northwest Seal Rock (NMFS, 2010).

The California Current System includes a southward-flowing surface current (the California Current), a northward flowing undercurrent (the Davidson Current or California Undercurrent), and various eddies and upwelling jets that run perpendicular to the coast. Such complexity, along with shallow- and deep-water habitats, steep topography, coastal lagoons, steep cliffs, and islands for breeding, brings a rich fauna of marine life to northern California (NCCOS, 2007).

### 3.1.2 ST. GEORGE REEF LIGHT STATION

**Figure 3. Helicopter landing area on St. George Reef Light Station.**

The Station (Figure 3), built in 1892, has six floors, rises 44.5 m (146 ft) above mean sea level and consists of a concrete base (18.5 m (61 ft) above mean sea level) that covers approximately 20 percent of the exposed rock on NWSR. The Station is capped by a cast iron lantern room and is one of the most exposed light stations on the Pacific coast.

The SGRLPS removed the Station's first-order Fresnel lens in 1983 to display at the Del Norte County Historical Museum in Crescent City, CA. To maintain the Station as a PATON, the SGRLPS is in the process of automating the Station's light equipment. Currently, one solar panel powers the Station's primary beacon light. A secondary panel and beacon light serve as an automatic backup if either the primary bulb or panel fails.

The helicopter will land on top of the concrete pier shown by the arrow in Figure 3. The landing area is approximately less than 40 ft wide and is approximately 15 m (48 ft) above the haulout area. It is the only area on NWSR accessible for a landing. According to CCR, the portion of the haulout area in proximity to the helicopter landing area (southwest reef area) is used exclusively by California sea lions (CCR, 2001).

### 3.1.3 HISTORIC SITE

The Station is listed in the NPS' National Register of Historic Places (Reference Number 93001373).

### 3.1.4 ESSENTIAL FISH HABITAT

NMFS has designated Essential Fish Habitat (EFH) for groundfish species (or species assemblages), adjacent to the action area. Details of the designations and description of the habitats are available in the Pacific Coast Groundfish Fishery Management Plan (PFMC, 2008). EFH can consist of both the water column and the underlying surface (e.g. seafloor) of a particular area. Certain properties of the water column such as temperature, nutrients, or salinity are essential to various species and may support the different life stages of each managed species.

The effects of restoration and maintenance activities would not occur in the surrounding water column and thus would not impact EFH or fish populations. Accordingly, this EA will not

consider EFH in greater detail for the remainder of this document. Further, NMFS has not designated any Habitat Areas of Particular Concern (HAPC) within the action area.

### 3.1.5 DESIGNATED CRITICAL HABITAT

NMFS has designated critical habitat for the eastern Distinct Population Segment (DPS) of Steller sea lions in California at Año Nuevo Island, Southeast Farallon Island, Sugarloaf Island and Cape Mendocino pursuant to section 4 of the ESA (see 50 CFR 226.202(b)). NWSR is neither within nor nearby these designated areas.

NMFS has also designated critical habitat for the threatened southern DPS of North American green sturgeon (*Acipenser medirostris*) pursuant to section 4 of the ESA (see 50 CFR 226.219). NWSR is located within this designated critical habitat.

## 3.2 SOCIAL AND ECONOMIC ENVIRONMENT

Socioeconomics comprise the basic attributes and resources associated with the human environment, particularly population and economic activity. This section addresses the socioeconomic effects of the proposed action on commercial and recreational fishing, tourism, and subsistence use.

### 3.2.1 TOURISM AND RECREATION

The Station is privately owned by the SGRLPS and is not open to the general public. Presently, there are no established or dedicated tours of the Station on NWSR. However, some charter vessels may transit from Crescent City Harbor to NWSR to fish or conduct boat tours in the offshore area. The SGRLPS intends to conduct guided tours of the Station during the last day (Sunday) of restoration activities. Tours would take place once per month during the IHA's November 1 through April 30 timeframe, annually. Up to three tourists would visit the Station at a time for a one-hour tour. The SGRLPS intends to provide guided tours of the Station indefinitely, or as long as the NHLPA Quitclaim Deed remains in effect.

### 3.2.2 SUBSISTENCE USE

MMPA provisions require that an IHA not have an unmitigable adverse impact on the availability of the affected species or stock for subsistence uses. There are no subsistence activities directed at marine mammals within the area of NWSR.

## 3.3 BIOLOGICAL ENVIRONMENT

The northern California coast is a very rich biological area within the California Current System. The combination of productive waters and numerous offshore islands along the coast have created an environment where marine life is abundant and diverse. Invertebrates, fish, seabirds, sea turtles, and marine mammals are present in the action area.

### 3.3.1 MARINE INVERTEBRATES

NWSR is located in the neritic zone (water column over shelf to 200 m isobath) (NCCOS, 2007). Most of the invertebrate flora and fauna in the offshore environment of NWSR consists of phytoplankton and zooplankton. Maximum phytoplankton production occurs during the spring and summer upwelling season and zooplankton biomass in the California Current is highest in late spring, summer, and early fall (NCCOS, 2007).

The effects of restoration and maintenance activities would not occur in the water column and thus would not impact marine invertebrates . Accordingly, this EA will not consider invertebrate species in greater detail for the remainder of this document.

### 3.3.2 ENDANGERED SPECIES-LISTED FISH

The ESA-listed fish species that may occur in the marine environment around NWSR are the chinook (*Oncorhynchus tshawytscha*) and coho (*O. kisutch*) salmon, steelhead trout (*O. mykiss*) and green sturgeon.

#### CHINOOK SALMON

**Geographic Range:** In the U.S., Chinook salmon are found from the Bering Strait area off Alaska south to Southern California. Historically, they ranged as far south as the Ventura River, California. Juvenile Chinook may spend from three months to two years in freshwater before migrating to estuarine areas as smolts and then into the ocean to feed and mature. Chinook salmon remain at sea for one to six years, with the exception of a small proportion of yearling males (called jack salmon), which mature in freshwater or return after two or three months in salt water (NMFS, 2009a).

#### COHO SALMON

**Geographic Range**: The species was historically distributed throughout the North Pacific Ocean from central California to Point Hope, Alaska, through the Aleutian Islands, and from the Anadyr River, Russia, south to Hokkaido, Japan. Coho probably inhabited most coastal streams in Washington, Oregon, and central and northern California. Some populations, now considered extinct, are believed to have migrated hundreds of miles inland to spawn in tributaries of the upper Columbia River in Washington, and the Snake River in Idaho (NMFS, 2009b).

#### STEELHEAD TROUT

**Geographic Range**: In the United States, steelhead trout are found along the entire Pacific Coast. Worldwide, steelhead are naturally found in the Western Pacific south through the Kamchatka peninsula. Adults migrate from a marine environment into the freshwater streams and rivers of their birth in order to mate. Unlike other Pacific salmonids, they can spawn more than one time. Migrations can be hundreds of miles. Young animals feed primarily on zooplankton. Adults feed on aquatic and terrestrial insects, mollusks, crustaceans, fish eggs, minnows, and other small fishes (including other trout) (NMFS, 2009d).

#### GREEN STURGEON

**Geographic Range**: The southern population of green sturgeon is listed as a threatened species (April 7, 2006; 71 FR 17757). This species consists of coastal and Central Valley populations south of the Eel River, with the only known spawning population in the Sacramento River (NMFS, 2009c). Less is known about the green sturgeon's distribution north of its spawning grounds and geographic range. Given the lack of observations or incidences of bycatch in California fisheries, green sturgeon are likely rare in the action area (NMFS, 2010).

These species may potentially occur within the marine environment around NWSR. However, the effects of restoration and maintenance activities would not occur in the water column and thus would not impact fish . The transmitted sound from the helicopter has low intensity. Given that sound transfers poorly from air into the water column (Gladwin, 1988), it is unlikely that these sound levels produced by the helicopter overflights would cause physical damage or even behavioral effects in fish based on the sound levels that have been found to cause such effects, this EA will not consider impacts to these species in greater detail for the remainder of this document.

### 3.3.3 SEABIRDS

Castle Rock is an island on the outer coast of Del Norte County, CA and is approximately 3.3 km (2 mi) southwest of NWSR. It is managed by the USFWS as part of the Humboldt Bay National Wildlife Refuge (HBNWR). Castle Rock covers 13-14 acres (5.26 hectares) and is 71.6 m (235 ft) high at its peak. The HBNWR provides habitat for thousands of breeding and migrating seabirds and remains a primary staging area for the fully recovered Aleutian cackling goose (*Branta canadensis*) (Jacques, 2007).

Castle Rock supports one of the largest populations of nocturnal cavity nesting seabirds in California and one of the most important colonies of common murres (*Uria aalge*) on the Pacific coast and is one of only five sites in the California Current System that supports more than 100,000 nesting seabirds (Jacques, 2007; USFWS, 2005). Ten other species of seabirds also nest on Castle Rock, including three species of cormorants (*Phalacrocorax spp.*), pigeon guillemots (*Cepphus columba*), Cassin's (*Ptychoramphus aleuticus*) and rhinoceros auklets (*Cerorhinca monocerata*), Leach's (*Oceanodroma leucorhoa*) and fork-tailed storm-petrels (*Oceanodroma furcata*), and tufted puffins (*Fratercula cirrhata*). The USWFS reports that only one species of shorebird, the black oystercatcher (*Haematopus bachmani*), nests at Castle Rock (Jacques, 2007).

Castle Rock is also important to non-breeding seabirds as well, as it serves as a communal roost for thousands of brown pelicans (*Pelecanus occidentalis*) during migration, and has become one of the most important resting sites for this state and previously federally-listed species on the northern California coast (Jacques, 2007).

Due to the proximity of NWSR to Castle Rock, the SGRLPS commissioned Crescent Coastal Research (CCR) to conduct a survey to characterize species composition, type of use, and seasonal presence of birds on NWSR from 1997 to 2000. During the four-year study, CCR observed eleven species of marine birds roosting on NWSR. They included the: black turnstone (*Arenaria melanocephala*), Brandt's cormorant (*Phalacrocorax penicillatus*), California brown pelican (*P. o. californicus*), brown-headed cowbird (*Molothrus ater*), California gull (*Larus californicus*), Heermanns gull (*Larus heermanni*), pelagic cormorant (*Phalacrocorax pelagicus*), Peregrine falcon (*Falco peregrinus*), pigeon Guillemots, wandering tattler (*Heteroscelus incanus*), and western gull (CCR, 2001).

Two species, Brandt's cormorants and the western gulls were regularly observed in the project area from 1998 to 2000. In addition, CCR reported sighting the California brown pelican on two of the 20 visits to NWSR, with a peak count of only three birds (CCR, 2001).

#### 3.3.3.1 BRANDT'S CORMORANT

**Geographic Range**: Brandt's cormorants are endemic to marine and brackish environments along the west coast of North America. It breeds from Southeast Alaska to Mexico with the highest concentrations closely tied to the California Current System. Along the Pacific Coast of North America, it occurs regularly from Vancouver Island, British Columbia, south to Island Margarita on the Pacific Coast of Baja California and Island San Pedro Mártir in the Gulf of California (USFWS, 2005).

**Nesting and Breeding**: Brandt's cormorants nest during the upwelling season (March through August) associated with the California Current. Typically, Brandt's cormorants nest in dense colonies of hundreds to thousands of birds on rocky islets, sloping areas or on cliffs with flat ledges. The nest is large and disorderly and made of plants or seaweed (NCCOS, 2007). (USFWS, 2005)Egg laying occurs from May through June in Washington state (USFWS, 2005).

The most recent surveys indicate a total breeding population of less than 100,000 individuals, with approximately 75 percent breeding in California and Oregon. The USFWS conducted a complete census of breeding colonies in California, Oregon, and Washington from 2001-2003 and enumerated approximately 37,000 nests (USFWS, 2005).

**Distribution on NWSR**: In 1998, CCR reported 12 Brandt's cormorants present in small roosting groups around the islet. From 1997 to 2000, CCR reported that no Brandt's cormorants were observed breeding or nesting on NWSR. As NWSR is subject to inundation by waves, no appropriate breeding habitat is available for the Brandt's cormorant.

#### 3.3.3.2 WESTERN GULL

**Geographic Range**: The western gull is endemic from southern Washington to Santa Margarita Island, Baja California Sur, and a small world population size of fewer than 40,000 pairs nesting at fewer than 200 colony sites (PRBO, 2005). The total population is estimated between 80,000 and 120,000 breeding birds with the majority of the population concentrated in California (50 to 77 percent), and the largest single colony is found on Southeast Farallon Island, with approximately 20,000 to 22,000 birds (PRBO, 2005; USFWS, 2005).

**Nesting and Breeding**: Western Gulls nest in colonies ranging from single pairs to thousands of pairs. The species begins to occupy its nesting colonies during the Davidson Current Season (November through March) and continues to occupy them through the Upwelling Season (March through August). Breeding habitat ranges from small sea stacks to the largest islands, as well as mainland cliffs (NCCOS, 2007).

**Distribution on NWSR**: In 1998, CCR reported approximately 12 western gulls present in small roosting groups around the islet. From 1997 to 2000, CCR reported that no western gulls were observed breeding or nesting on NWSR. As NWSR is subject to inundation by waves, no appropriate breeding habitat is available for this species.

#### 3.3.3.3 CALIFORNIA BROWN PELICAN

**Geographic Range:** The California brown pelican, one of six subspecies of brown pelican, is found throughout the temperate and tropical regions of the Americas, along both Atlantic and

Pacific coasts. The global population of brown pelicans is estimated at 650,000 with approximately 194,000 California breeders found along the coasts of southern California and Baja California, Mexico.

**Nesting and Breeding:** The California brown pelican, breeds in western North America primarily on islands off southern California and western Mexico, and including the Gulf of California (Burkett, Logsdon, & Fien, 2007). Only two breeding colonies are located within California, on Anacapa and Santa Barbara islands (Channel Islands) (USFWS, 2005). Brown pelicans typically begin to breed in the spring. Nesting occurs from February through October (USFWS, 2005).

**ESA Status**: In December 2005, the USFWS was petitioned to delist the brown pelican under the ESA. In the Federal Register notice of May 24, 2006, the USFWS announced their 90-day finding on the petition, and found that the petition presented substantial scientific or commercial information indicating that the petitioned action may be warranted. In February 2007, USFWS completed a five-year review of the listed distinct population segment of the brown pelican and has recommended delisting for the species (Burkett, et al., 2007). In November 2009, the USFWS removed the brown Pelican from the Endangered Species List.

**Distribution on NWSR**: There are no reports of California brown pelicans nesting or breeding on NWSR. From 1997 to 2000, CCR reported that no western gulls were observed breeding or nesting on NWSR. As NWSR is subject to inundation by waves, no appropriate breeding habitat is available for this species.

During a four-year study of seabirds on NWSR, CCR found no evidence of any nesting sites at the Station from 1998 to 2000 (CCR, 2001). They conclude that it is unlikely that NWSR would become colonized seabirds as the islet had not been colonized in the preceding 12 years of human absence. The low probability of any seabird species nesting, breeding, or roosting on NWSR during the proposed work season between November 1 and April 30, annually is sufficiently small to be negligible. Thus, this EA will not consider impacts to seabirds in greater detail.

### 3.3.4 ENDANGERED SPECIES-LISTED SEA TURTLES

The ESA-listed sea turtle species that may occur in the marine environment around NWSR are the leatherback (*Dermochelys coriacea*), loggerhead (*Caretta caretta*), Olive ridley (*Lepidochelys olivacea*), and green turtle (*Chelonia mydas*).

#### LEATHERBACK SEA TURTLES

**Geographic Range**: Leatherback sea turtles, listed as endangered under the ESA, may be observed transiting through the action area. Leatherbacks are known to migrate to central and northern California from their natal beaches in Indonesia to feed on jellyfish. The upwelling process that is part of the productive Californian coastal ecosystem provides ideal foraging habitat for leatherbacks and other marine life. During aerial surveys conducted since the early 1990s, leatherbacks were most often spotted off Point Reyes, south of Point Arena, in the Gulf of the Farallones, and in Monterey Bay. Leatherback turtles usually appear in Monterey Bay and California coastal waters during August and September and move offshore in October and November. Other observed areas of summer leatherback concentration include northern

California and the waters off Washington through northern Oregon, offshore from the Columbia River plume (NMFS, 2010).

#### GREEN, LOGGERHEAD, AND OLIVE RIDLEY SEA TURTLES

**Distribution**: These species of sea turtles, all listed as threatened under the ESA, would be rare in the action area, but records show that all species have stranded in Northern California and the Pacific Northwest area (NMFS, 2010). In the eastern Pacific, loggerheads have been reported as far north as Alaska, and as far south as Chile. In the U.S., occasional sightings are reported from the coasts of Washington and Oregon, but most records are of juveniles off the coast of California (NMFS, 2010).

These species may potentially occur within the marine environment around NWSR. However, the effects of restoration and maintenance activities would not occur in the water column and thus would not impact sea turtles. The transmitted sound from the helicopter has low intensity. Given that sound transfers poorly from air into the water column (Gladwin, 1988), it is unlikely that these sound levels produced by the helicopter overflights would cause physical damage or even behavioral effects in sea turtles based on the sound levels that have been found to cause such effects, this EA will not consider impacts to these species in greater detail for the remainder of this document.

### 3.3.5 MARINE MAMMALS

#### 3.3.5.1 SPECIES NOT CONSIDERED IN THIS ENVIRONMENTAL ASSESSMENT

There are several endangered cetaceans that may be transiting near the action area including the blue (*Balaenoptera musculus*), fin (*Balaenoptera physalus*), humpback (*Megaptera novaeangliae*), sei (*Balaenoptera borealis*), north Pacific right (*Eubalena japonica*), sperm (*Physeter macrocephalus*), and southern resident killer (*Orcinus orca*) whales. These species are found farther offshore than the action area and are not likely to be affected by the restoration and maintenance activities. Accordingly, this EA will not consider this species in greater detail.

California (southern) sea otters are listed as threatened under the ESA and categorized as depleted under the MMPA. This species ranges in coastal waters within 2 km of shore, especially shallows with kelp beds and abundant shellfish. In rough weather, the species takes refuge among kelp, or in coves and inlets. Neither CCR nor the SGRLPS encountered California sea otters on NWSR during the course of the four-year wildlife study (CCR, 2001). NMFS has determined that the described restoration and maintenance activities, and the accompanying IHA will have no effect on the California sea otter or its critical habitat. Accordingly, this EA will not consider this species in greater detail.

#### 3.3.5.2 SPECIES CONSIDERED IN THIS ENVIRONMENTAL ASSESSMENT

The four species of pinnipeds expected to be most commonly hauled out on NWSR are the California sea lion, the Pacific harbor seal, the Steller sea lion, and the northern fur seal. General information on these species can be found in Caretta et. al. (2008) and Angliss and Allen (2008) and is available at the following URLs: http://www.nmfs.noaa.gov/pr/pdfs/sars/po2008.pdf and http://www.nmfs.noaa.gov/pr/pdfs/sars/ak2008.pdf respectively. Additional information on these species is relevant to the analysis of impacts.

#### 3.3.5.3 CALIFORNIA SEA LION

**Status**: California sea lions are not listed as threatened or endangered under the ESA, nor are they categorized as depleted under the MMPA.

**Geographic Range**: The California sea lion includes three subspecies: *Z. c. wollebaeki* (on the Galapagos Islands), *Z. c. japonicus* (in Japan, but now thought to be extinct), and *Z. c. californianus* (found from southern Mexico to southwestern Canada; herein referred to as the California sea lion). The subspecies is comprised of three stocks: (1) the U.S. stock, beginning at the U.S./Mexico border extending northward into Canada; (2) the western Baja California stock, extending from the U.S./Mexico border to the southern tip of the Baja California peninsula; and (3) the Gulf of California stock, which includes the Gulf of California from the southern tip of the Baja California peninsula and across to the mainland and extends to southern Mexico (M. S. Lowry et al., 1992).

**Population Size**: In 2008, the estimated population of the U.S. stock of California sea lion ranges from 141,842 to 238,000 animals and the maximum population growth rate was 6.52 percent when pup counts from El Niño years (1983, 1984, 1992, 1993, 1998, and 2003) were removed (Carretta et al., 2008). Major rookeries for the California sea lion exist on the Channel Islands off southern California and on the islands situated along the east and west coasts of Baja California. Males are polygamous, establishing breeding territories that may include up to fourteen females. They defend their territories with aggressive physical displays and vocalization. Sea lions reach sexual maturity at four to five years old and the breeding season lasts from May to August. Most pups are born from May through July and weaned at 10 months old (Carretta, et al., 2008).

**Seasonal Distribution**: The breeding areas of the California sea lion are on islands located in southern California, western Baja California, and the Gulf of California (Carretta, et al., 2008). In general, the seasonal abundance of California sea lions off central California is linked to spring and fall pre- and post-breeding migrations, with greater numbers of sea lions present during the Oceanic season, just after breeding (August – November) (NCCOS, 2007).

**Distribution on NWSR**: CCR reported that counts of California sea lions on NWSR varied greatly (from six to 541) during the observation period from April 1997 through July 2000. CCR also reported that counts for California sea lions during the spring (April – May), summer (June - August), and fall (September – October), averaged 25, 154, and 235, respectively (CCR, 2001). Recent counts by NMFS in July (2000–2004) have been low. The total numbers of California sea lions recorded in 2000 and 2003 were three and 11, respectively (M.S. Lowry, unpubl. data).

**Use of NWSR**: According to CCR, California sea lions exclusively use the southwest area of NWSR to the haulout area (CCR, 2001). This area is directly below the helicopter landing area on the Station. There are no reports of this species breeding on the islet. Post-breeding and non-breeding California sea lions regularly haul out on NWSR in the summer to haul out (CCR, 2001). CCR has provided no additional information on the use of NWSR by California sea lions to inform this analysis.

### 3.3.5.4 PACIFIC HARBOR SEAL

**Status**: Pacific harbor seals are not listed as threatened or endangered under the ESA, nor are they categorized as depleted under the MMPA.

**Geographic Range**: The animals inhabit near-shore coastal and estuarine areas from Baja California, Mexico, to the Pribilof Islands in Alaska. Pacific harbor seals are divided into two subspecies: *P. v. stejnegeri* in the western North Pacific, near Japan, and *P. v. richardsi* in the northeast Pacific Ocean. The latter subspecies, recognized as three separate stocks, inhabits the west coast of the continental United States, including: the outer coastal waters of Oregon and Washington states; Washington state inland waters; and Alaska coastal and inland waters. Two of these stocks, the California stock and Oregon/Washington coast stock, of Pacific harbor seals are identified off the coast of Oregon and California for management purposes under the MMPA. However, the stock boundary is difficult to distinguish because of the continuous distribution of harbor seals along the west coast and any rigid boundary line is (to a greater or lesser extent) arbitrary, from a biological perspective (Carretta et. al., 2008).

**Population Size**: In 2008, the estimated population of the California Pacific harbor seals ranged from 31,600 to 34,233 animals and the maximum population growth rate was 3.5 percent. The estimated population of the Oregon/Washington coast stocks was 22,380 animals and the maximum population growth rate was 4.0 percent (Carretta, et al., 2008)

**Seasonal Distribution**: In California, over 500 harbor seal haulout sites are widely distributed along the mainland and offshore islands, and include rocky shores, beaches and intertidal sandbars (Lowry et. al., 2005). Harbor seals are present year round and the species does not make extensive migrations, and tends to remain relatively close to haulout sites (NCCOS, 2007). Harbor seals mate at sea and females give birth during the spring and summer, although, the pupping season varies with latitude. Pups are nursed for an average of 24 days and are ready to swim minutes after being born (Carretta, et al., 2008). Harbor seal pupping takes place at many locations and rookery size varies from a few pups to many hundreds of pups. The nearest harbor seal rookery relative to the proposed project site is at Castle Rock National Wildlife Refuge, located approximately located 965 m (0.6 mi) south of Point St. George, and 2.4 km (1.5 mi) north of the Crescent City Harbor in Del Norte County, California (Jacques, 2007).

**Distribution on NWSR**: Due to the location of the proposed project which is situated near the border of Oregon and California, both stocks of Pacific harbor seal could be present within the proposed project area. CCR documented low counts of harbor seals on NWSR during the observation period from April 1997 through July 2000. In 1998, CCR observed only one harbor seal hauled out on NWSR during 20 observation surveys.

**Use of NWSR**: CCR noted that harbor seal use of NWSR as a seasonal haul out site is minimal and they hypothesized that harbor seals may avoid the islet because of its distance from shore, relatively steep topography, and full exposure to rough and frequently turbulent sea swells (CCR, 2001). NWSR is not an important haul out site for harbor seals and it is not a rookery.

#### 3.3.5.5 NORTHERN FUR SEAL

**Status:** Northern fur seals are not listed as threatened or endangered under the ESA. However, they are categorized as depleted under the MMPA.

**Geographic Range**: Northern fur seals occur from southern California north to the Bering Sea and west to the Sea of Okhotsk and Honshu Island of Japan. Two separate stocks of northern fur seals are recognized within U.S. waters: an Eastern Pacific stock distributed among sites in Alaska, British Columbia; and a San Miguel Island stock distributed along the west coast of the continental U.S (Carretta, et al., 2008).

**Population Size**: In 2008, the estimated population of the San Miguel Island stock ranged from 5,096 to 9,424 animals and the maximum population growth rate was 8.6 percent (Carretta, et al., 2008). Northern fur seals breed in Alaska and migrate along the west coast during fall and winter. Due to their pelagic habitat, they are rarely seen from shore in the continental U.S., but individuals occasionally come ashore on islands well offshore (i.e., Farallon Islands and Channel Islands in California). During the breeding season, approximately 74 percent of the worldwide population is found on the Pribilof Islands in Alaska, with the remaining animals spread throughout the North Pacific Ocean (Carretta, et al., 2008).

**Seasonal Distribution**: The northern fur seal is one of the most pelagic of the pinnipeds, and during winter and early spring, is most abundant over the continental shelf and slope and deep ocean waters of mid-latitudes off western North America (NCCOS, 2007). During their winter migration, female northern fur seals from the Pribilof Islands cue on a variety of oceanographic features and travel south in the California Current off Canada, British Columbia, Washington, and Oregon, and arrive off California beginning in February (Ream, Sterling, & Loughlin, 2005).

**Distribution on NWSR**: CCR observed one male northern fur seal hauled out on NWSR in October, 1998 (CCR, 2001).

**Use of NWSR**: It is possible that this species may use the island as a seasonal haulout more often that indicated by the 2001 CCR surveys, if they were mistaken for other otariid species (DeAngelis, 2007)M. DeAngelis, NMFS, pers. comm.). CCR has provided no additional information on the use of NWSR by northern fur seals to inform this analysis.

#### 3.3.5.6 STELLER SEA LION

**Status:** The Steller sea lion eastern District Population Segment (DPS) stock is listed as threatened under the ESA and is categorized as depleted under the MMPA.

**Geographic Range**: Steller sea lions range along the North Pacific Rim from northern Japan to California, with centers of abundance and distribution in the Gulf of Alaska and Aleutian Islands, respectively. Two separate DPS of Steller sea lions were recognized within U.S. waters: an eastern DPS, which includes animals east of Cape Suckling, Alaska (144° W), and a western DPS, which includes animals at and west of Cape Suckling (Carretta, et al., 2008).

**Seasonal Distribution**: The species is not known to migrate, but individuals disperse widely outside of the breeding season (late May through early July), thus potentially intermixing with animals from other areas (Angliss & Allen, 2008).

**Population Size**: In 2008, the estimated population of the range of the eastern U.S. stock ranged from 44,404 to 55,832 animals and the maximum population growth rate was 3.1 percent (Angliss & Allen, 2008). The eastern DPS of Steller sea lions breeds on rookeries located in southeast Alaska, British Columbia, Oregon, and California; there are no rookeries located in Washington State. Counts of pups on rookeries conducted near the end of the birthing season are nearly complete counts of pup production. A northward shift in the overall breeding distribution has occurred, with a contraction of the range in southern California and new rookeries established in southeastern Alaska (Pitcher et al., 2007).

**Distribution on NWSR**: CCR reported that Steller sea lion numbers at NWSR ranged from 20 to 355 animals. Counts of Steller sea lions during the spring (April - May), summer (June - August), and fall (September - October), averaged 53, 110, and 56, respectively (CCR, 2001). More recent survey data (2000 – 2004) from NWSR showed that Steller sea lion counts ranged from 175 to 354 in July (M. Lowry, NMFS/SWFSC, pers. comm.). Winter use of NWSR by Steller sea lion is presumed to be minimal, due to the inundation of NWSR by large swells (CCR, 2001).

**Use of NWSR**: A portion of the Steller sea lion population hauled out on NWSR in the spring are adult males, females (including pregnant females), and juveniles. In the fall all age classes are likely present, including females and pups that have presumably dispersed from the rookery at Southwest Seal Rock.

Up to 19 pups were observed at Northwest Seal Rock in October 1998 (NMFS, 2010). Pups have not been detected on Northwest Seal Rock during the July aerial photo surveys conducted by NMFS (M. Lowry, NMFS, unpubl. data). CCR reports that pupping appeared to have occurred in 1991 with the observation of a recently born pup was on the islet (Crescent Coastal Research 2001) and one newborn was observed from the lighthouse during the site visit by NMFS on May 13, 2005. The pup, observed in 2005, was abandoned by its mother and later died (M. DeAngelis, NMFS, pers. comm., 2005).

# 4 CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

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

## 4.1 EFFECTS OF ALTERNATIVE 1: DENY ISSUANCE OF AN IHA (NO ACTION)

Under the No Action Alternative, NMFS would not issue the proposed IHA for the activities proposed by the SGRLPS. Accordingly, any takes of marine mammals resulting from the proposed lighthouse restoration and maintenance would not be authorized and any incidental take of marine mammals would be a violation of the MMPA. As a result, the SGRLPS would abandon the proposed restoration and maintenance activities, as the USCG permit stipulates that the SGRLPS obtain an IHA from NMFS in order to service the PATON on NWSR. As a result, the SGRLPS would be unable to service the PATON and the Station would not be restored and maintained for public use and would remain dormant. If SGRLPS is prohibited from restoring and maintaining the Station pursuant to the NHLPA, there would be no measurable impacts to the human environment.

## 4.2 EFFECTS OF ALTERNATIVE 2: ISSUANCE OF AN IHA WITH MITIGATION (PREFERRED)

### 4.2.1 IMPACTS ON THE PHYSICAL ENVIRONMENT

**Geology and Oceanography**: Based on a review of the data, no direct impacts are expected from the action of issuing an IHA for the incidental take, by Level B harassment only, of small numbers of marine mammals to the SGRLPS.

Based on a review of the data, no significant indirect impacts are expected from SGRLPS' conduct of restoration and maintenance activities on the Station. Restoration and maintenance activities would be restricted to the Station's tower which is 44.5 m (146 ft) above the surrounding rocks and marine sediment of NWSR. These activities are not expected to disturb the geology nor the water surrounding NWSR. Helicopter trips to and from the Station could involve activities that may result in some non-significant environmental impacts (i.e., minimal discharges of pollutants released into the air).

**St. George Reef Light Station**: No significant direct impacts are expected from the action of issuing an IHA for the incidental take, by Level B harassment only, of small numbers of marine mammals to the SGRLPS.

No significant indirect impacts are expected from the conduct of restoration and maintenance activities which include the removal of lead-based paint and peeling plaster, restoration of interior plaster and paint, refurbishing structural and decorative metal, reworking original metal support beams, replacing glass as necessary, and upgrading the present electrical system. The SGRLPS will encapsulate all waste products within specially marked bags and will transport the bags by helicopter to Crescent City, CA for proper disposal. Disposal of the lead based paint will comply with municipal and/or state laws and ordinances. These restoration efforts would serve as a benefit to the integrity and of the structure and operability of the Station's PATON.

**Essential Fish Habitat**: NWSR is located adjacent to designated EFH (water column) for groundfish species (or species assemblages). No significant direct impacts are expected from the action of issuing an IHA for the incidental take, by Level B harassment only, of small numbers of marine mammals to the SGRLPS. The action of issuing an IHA to SGRLPS is not likely to affect, destroy, or adversely modify designated EFH or HAPC.

No significant indirect impacts to EFH are expected from the conduct of restoration and maintenance activities. These activities would be restricted to the Station's tower which is 44.5 m (146 ft) above any EFH surrounding NWSR. Considering the elevation and location of these activities, significant indirect impacts on EFH are unlikely and are not likely to affect, destroy, or adversely modify designated EFH or HAPC.

**Historic Site**: The Station is listed as a historical landmark. No significant direct impacts are expected from the action of issuing an IHA for the incidental take, by Level B harassment only, of small numbers of marine mammals to the SGRLPS.

The SGRLPS, founded in 1986, aims to restore the Station and increase public recognition of the Station's role in maritime and regional history. Pursuant to the NHLPA, the SGRLPS has shown that it is financially able to maintain the historic Station. Also, pursuant to the NHLPA, it will make the Station available for educational and historic preservation purposes for the general public at reasonable times and under reasonable conditions. Although the restoration efforts would serve as a benefit to the integrity and of the structure, these effects are considered negligible.

**Designated Critical Habitat**: NWSR is located adjacent to designated critical habitat (water column) for the southern DPS of green sturgeon. No significant direct impacts are expected from the action of issuing an IHA for the incidental take, by Level B harassment only, of small numbers of marine mammals to the SGRLPS.

No significant indirect impacts to critical habitat are expected from the conduct of restoration and maintenance activities. These activities would be restricted to the Station's tower which is 44.5 m (146 ft) above any critical habitat surrounding NWSR. The proposed activities are not likely to affect, destroy, or adversely modify designated critical habitat for the southern DPS of green sturgeon.

### 4.2.2 IMPACTS ON THE SOCIAL AND ECONOMIC ENVIRONMENT

**Commercial Fishing**: None of the activities would be directed at commercial fishing or would likely have any impact on commercial fishing in the action area. No significant direct impacts are expected from the action of issuing an IHA for the incidental take, by Level B harassment only, of small numbers of marine mammals to the SGRLPS. No significant indirect impacts are expected from the SGRLPS conducting maintenance and restoration activities at the Station.

**Recreational Fishing**: Local anglers may charter commercial passenger fishing vessels (CPFV), private boats or rental boats to transit to fishing areas around NWSR. However, none of the activities are directed at recreational fishing. No significant direct impacts are expected from the action of issuing an IHA for the incidental take, by Level B harassment only, of small numbers

of marine mammals to the SGRLPS. No significant indirect impacts are expected from the SGRLPS conducting maintenance and restoration activities at the Station.

**Tourism and Recreation**: The lighthouse maintenance and renovation activities would have little effect on existing public recreation activities occurring near NWSR which is inaccessible by boat. No significant direct impacts are expected from the action of issuing an IHA for the incidental take, by Level B harassment only, of small numbers of marine mammals to the SGRLPS. No significant indirect impacts are expected from the SGRLPS conducting maintenance and restoration activities at the Station.

**Subsistence Use**: Subsistence hunts of marine mammals do not occur in the area. No significant direct impacts are expected from the action of issuing an IHA for the incidental take, by Level B harassment only, of small numbers of marine mammals to the SGRLPS. No significant indirect impacts are expected from the SGRLPS conducting maintenance and restoration activities at the Station.

### 4.2.3 IMPACTS ON THE BIOLOGICAL ENVIRONMENT

#### 4.2.3.1 MARINE MAMMALS

The proposed restoration and maintenance activities are likely to cause three primary stressors to marine mammals in the area: (1) disturbance to marine mammals from helicopter operations; (2) disturbance to marine mammals related to maintenance and restoration activities; and (3) disturbance to marine mammals related to human presence (acoustic and visual contact).

Marine mammals produce sounds in various important contexts—social interactions, foraging, navigating, and to responding to predators (Southall et al., 2007). Animals exposed to either natural or anthropogenic sound may experience physical and psychological effects, ranging in magnitude from none to severe (Southall, et al., 2007). Pinnipeds produce a diversity of sounds, though generally over a lower and more restricted bandwidth (generally from 100 Hz to several tens of kHz). Their sounds are used primarily in critical social and reproductive interactions. Pinnipeds spend time both at sea and on land, however, and thus produce sounds in both water and air (Southall, et al., 2007).

Any pinnipeds hauled out on NWSR at the time of the restoration and maintenance activities may be exposed to sounds from helicopter operations, restoration, maintenance, and repair activities and human presence have the potential to experience stress responses related to visual and acoustic disturbances, and behavioral disturbance (Nowacek, Thorne, Johnston, & Tyack, 2007).

##### 4.2.3.1.1 HEARING SENSITIVITIES TO SOUND

Exposure to high intensity sound for a sufficient duration may result in physical injury to non-auditory structures such as the lungs and other gas-containing structures and/or auditory effects such as a noise-induced threshold shift—an increase in the auditory threshold after exposure to noise (Finneran, Carder, Schlundt, & Ridgway, 2005).

Factors that influence the amount of threshold shift include the amplitude, duration, frequency content, temporal pattern, and energy distribution of noise exposure. The magnitude of hearing threshold shift normally decreases over time following cessation of the noise exposure. The amount of threshold shift just after exposure is called the initial threshold shift. If the threshold shift eventually returns to zero (i.e., the threshold returns to the pre-exposure value), it is called temporary threshold shift (TTS) (Southall, et al., 2007). TTS has been demonstrated and studied in certain captive odontocetes and pinnipeds exposed to strong sounds (reviewed in Southall et al., 2007).

**Helicopter Operations**: Pinnipeds have the potential to be disturbed by airborne and underwater noise generated by the engine of the aircraft (Born, Riget, Dietz, & Andriashek, 1999; Richardson, Greene, Malme, & Thomson, 1995). Data on underwater TTS-onset in pinnipeds exposed to pulses are limited to a single study which exposed two California sea lions to single underwater pulses from an arc-gap transducer and found no measurable TTS following exposures up to 183 dB re: 1 µPa (peak-to-peak) (Finneran, Dear, Carder, & Ridgway, 2003).

Auditory fatigue to airborne sound has also been measured in harbor seals, California sea lions, and northern elephant seals (*Mirounga angustirostris*) after exposure to nonpulse noise for 25 minutes (Kastak, Southall, Holt, Kastak, & Schusterman, 2004). The harbor seal experienced approximately 6 dB of TTS at 99 dB re: 20 µPa. Onset of TTS was identified in the California sea lion at 122 dB re: 20 µPa. The northern elephant seal experienced TTS-onset at 121 dB re: 20 µPa (Kastak, et al., 2004).

There is a dearth of information on acoustic effects of helicopter overflights on pinniped hearing and communication (Richardson, et al., 1995). Any noise attributed to helicopter operations on NWSR would be temporary and the affected area would be expected to return to the original state when the restoration and maintenance activities have ceased. SGRLPS plans to charter a Raven R44 helicopter to transit to NWSR. Acoustic tests on the helicopter's noise output measured a sound pressure level (SPL) of 81.9 decibels (dB) re: 20 µPa (peak) (A-weighted) approximately 150 m from the ground (NMFS, 2010). To NMFS' knowledge, there has been no specific documentation of TTS, let alone permanent threshold shift (PTS), in free-ranging pinnipeds exposed to helicopter operations during realistic field conditions. Thus, it is unlikely that the received levels from the helicopter (81.9 dB re: 20 µPa) would cause TTS or PTS in the pinnipeds present on NWSR.

Considering the mitigation measures described in Section 2.3.6 for helicopter operations, no significant impacts on the hearing sensitivities of California sea lions, Pacific harbor seals, Steller sea lions, or northern fur seals are expected. Further, no significant impacts on the population size or breeding stock of Steller sea lions, California sea lions, Pacific harbor seals, or northern fur seals are expected to occur from the Proposed Action of issuing an IHA to SGRLPS.

**Restoration, Maintenance, and Repair Activities**: Noise generated from restoration and maintenance activities (e.g., sanding, hammering, or use of hand drills), could also disturb pinnipeds hauled out on NWSR.

Moulton et al. (2003) investigated changes in local abundance and distribution of ringed seals on landfast ice of the central Alaskan Beaufort Sea pre- and post-construction and drilling operations at British Petroleum's Northstar oil development from 1997 to 2001. Industry activities included construction of ice roads, transport of approximately 18,300 truckloads of gravel from shore to the development and installation of pipelines to shore. The authors found no evidence of reduced seal densities close to Northstar post-construction during the springs of 2000 and 2001 (Moulton, Richardson, Williams, & Blackwell, 2003). In 2000, numbers of seal sightings in various one-km increments of distance did not differ significantly from numbers expected based on the amount of survey coverage within each one-km increment ($P = 0.35$) (Moulton, et al., 2003). One year later, Moulton et al. observed that seal densities varied significantly with distance from Northstar ($P < 0.001$) and tended to be higher close to the operations. As compared with other parts of the 0–10 km zone, density was significantly higher 1–2 km from Northstar and significantly lower 6–8 km from Northstar. In contrast, they noted that observed seal densities in the 1997 to 1999 period did not differ significantly within 10 km of Northstar ($P > 0.40$) and average seal densities were lower near Northstar pre-construction and drilling than in years post-construction and drilling (Moulton, et al., 2003).

To NMFS' knowledge, there has been no specific documentation of TTS, let alone PTS, in free-ranging pinnipeds exposed to construction activities during realistic field conditions. Thus, it is unlikely that the received levels from the restoration or maintenance activities would cause TTS or in the pinnipeds present on NWSR.

Considering the mitigation measures described in Section 2.3.6 for restoration and maintenance activities, no significant impacts on the hearing sensitivities of California sea lions, Pacific harbor seals, Steller sea lions, or northern fur seals are expected. Further, no significant impacts on the population size or breeding stock of Steller sea lions, California sea lions, Pacific harbor seals, or northern fur seals are expected to occur from the action of issuing an IHA for the incidental take, by Level B harassment only, of small numbers of marine mammals to the SGRLPS.

**Human Presence**: To NMFS' knowledge, there has been no specific documentation of TTS in free-ranging pinnipeds exposed to human voices during realistic field conditions. Thus, it is unlikely that the received levels from human vocalization would cause TTS or in the pinnipeds present on NWSR. Considering the mitigation measures described in Section 2.3.6 for human disturbance, no significant impacts on the hearing sensitivities of California sea lions, Pacific harbor seals, Steller sea lions, or northern fur seals are expected. Further, no significant impacts on the population size or breeding stock of Steller sea lions, California sea lions, Pacific harbor seals, or northern fur seals are expected to occur from the action of issuing an IHA for the incidental take, by Level B harassment only, of small numbers of marine mammals to the SGRLPS.

#### 4.2.3.1.2 Stress Responses Related to Acoustic and Visual Disturbances

Two major systems are known to be involved in stress: the sympathetic nervous system (SNS) and the hypothalamic-pituitary-adrenal (HPA) axis. These systems are activated very rapidly and have broad impacts on diverse aspects of physiological functioning. The concerted effort of these and other critical endocrine and neural systems ultimately comprises an organism's

response to a stressor (Wright et al., 2009). Indirect measures of SNS activation (e.g., increased heart rate, blood pressure, or hyperthermia) or direct measures of SNS output from the adrenal medulla (plasma concentrations of catecholamines – epinephrine and norepinephrine) and HPA activation (corticosteroid concentrations in plasma, tissue or excrement) are often collectively or individually used to indicate the severity of a stressor. Relatively low-level physiological responses include changes in cardiac rate and respiratory patterns, which may lead to changes in metabolism (Southall, et al., 2007).

**Helicopter Operations**: One study assessed how daily exposure to sonic booms, emanating from the supersonic aircraft Concorde, affected heart rates of gray seals (*Halichoerus grypus*) during breeding seasons on Sable Island, Nova Scotia (Perry, Boness, & Insley, 2002). Sonic boom SPLs ranged from 121.68 to 133.33 dB, with a mean of 114.21 dB (standard deviation (SD) = 6.49). Heart rates of gray seal mothers and pups were not significantly different between pre-boom, boom, and post-boom periods for either group. Finally, they reported that seal heart rates before and after booms were consistently lower than those measured during the 15-second boom interval. However, these observations are mostly anecdotal as the sample sizes were to small and had little statistical power to detect significant differences (Perry, et al., 2002).

Another study investigated the physiological stress response to noise in captive marine mammals by exposing four captive beluga whales (*Delphinapterus leucas*) to playbacks of drilling noise but found no changes in the subjects' stress hormone levels measured immediately after playbacks (Thomas, Kastelein, & Awbrey, 1990). However, the small sample size of this study, the use of captive animals and other technical limitations mean that extrapolation of these results to wild animals should be done with caution as captive animals may be acclimated to noise (Wright, et al., 2009).

Causative links to changes in endocrine and neural processes have yet to be demonstrated in pinnipeds with respect to helicopter overflights in situ. Based on a review of the data and considering the mitigation measures described in Section 2.3.6 for helicopter operations, no significant impacts on the stress responses of California sea lions, Pacific harbor seals, Steller sea lions, or northern fur seals are expected. Further, no significant impacts on the population size or breeding stock of Steller sea lions, California sea lions, Pacific harbor seals, or northern fur seals are expected to occur from the action of issuing an IHA for the incidental take, by Level B harassment only, of small numbers of marine mammals to the SGRLPS.

**Restoration, Maintenance, and Repair Activities and Human Disturbance**: Causative links to changes in endocrine and neural processes have yet to be demonstrated in pinnipeds with respect to construction activities or human disturbance in situ.

One study on Galapagos marine iguanas (*Amblyrhynchus cristatus*) compared plasma corticosterone levels in animals heavily exposed to tourism and animals from a site undisturbed by humans. Initial corticosterone levels measured were not significantly different between the two groups(Romero & Wikelski, 2002). Plasma corticosterone levels in animals exposed to tourism were 50 percent less than iguanas known to be chronically stressed. The authors suggested that iguanas in tourist areas were not chronically stressed and observed that both groups of iguanas exhibited elevated corticosterone levels after 30 min of capture and restraint–

indicating that both groups had the potential to respond physiologically to stressful stimuli (Romero & Wikelski, 2002). However, the animals exposed to tourism exhibited a lower stress response post-sampling than the control group. The authors concluded that iguanas were physiologically affected by tourism, but they were unable to determine the changes were ultimately beneficial or harmful(Romero & Wikelski, 2002).

Based on a review of the data and considering the mitigation measures described in Section 2.3.6 for restoration, maintenance, and repair activities and human disturbance, no significant impacts on the stress responses of California sea lions, Pacific harbor seals, Steller sea lions, or northern fur seals are expected. Further, no significant impacts on the population size or breeding stock of Steller sea lions, California sea lions, Pacific harbor seals, or northern fur seals are expected to occur from the action of issuing an IHA for the incidental take, by Level B harassment only, of small numbers of marine mammals to the SGRLPS.

#### 4.2.3.1.3 BEHAVIORAL DISTURBANCE

Behavioral responses are a demonstrable change in the activity of an animal in response to a sound. These effects can be difficult to detect due to the cryptic and variable nature of pinniped behavior. Examples of behavioral responses include the abandonment of an important activity (e.g. resting, socializing, foraging, nursing or traveling) or a location in response to some sound, and the repeated abandonment of such vital activities can lead to detrimental consequences for the animal(s) affected (Nowacek, et al., 2007).

**Helicopter Operations**: Aircraft noise has the potential to affect behavior (Born, et al., 1999) and pinnipeds have the potential to be disturbed by the physical presence of the aircraft (Born, et al., 1999; Richardson, et al., 1995). The primary factor that may influence abrupt movements of animals is engine noise, specifically changes in engine noise. Responses by mammals could include hasty dives, or flushing and stampeding from a haul out site. However, there are few well documented studies of the impacts of aircraft overflight over pinniped haul out sites or rookeries, and many of those that exist, are specific to military activities or to the use of larger helicopter models (Born, et al., 1999; Efroymson & Suter, 2001).

Born et al. (1999) recorded the escape response of hauled-out ringed seals (*Phoca hispida*) encountering either a fixed-wing twin-engine aircraft or a low-flying helicopter in northwestern Greenland. They observed that the seals entered the water in higher proportions and at greater distances as a reaction to the helicopter compared with the fixed-wing aircraft and concluded that disturbance of hauled out ringed seals can be substantially reduced if a small-type helicopter does not approach them closer than about 1500 m, and a small-type fixed-wing aircraft not closer than about 500 m (Born, et al., 1999).

Holst et al. (2003) observed California sea lions, northern elephant seals, and harbor seals hauled out on San Nicolas Island (SNI), California beaches during the U.S. Navy's launches of small missiles, some of which produced sonic booms. Unattended video cameras set up around the periphery of SNI documented the behavior of the three pinniped species during the missile launches. Responses varied by species, distance from the launch azimuth, and other factors (Holst, Lawson, Richardson, Schwartz, & Smith, 2003). The authors reported that adult sea lions exhibited startle responses and increased vigilance up to two minutes after each launch and

juveniles and particularly pups reacted more vigorously by moving along the beach (Holst, et al., 2003). They also observed that elephant seals exhibited little reaction to launches with most individuals raised their heads briefly and typically returned to their previous activity within 15 seconds. Finally, they note that harbor seals were the most responsive to the missile overflights. During the majority of launches, 67 to 100 percent of harbor seals within three to four km of the launch trajectory entered the water and did not return for at least several hrs (Holst, et al., 2003).

Perry et al. (2002) assessed how daily exposure to sonic booms, emanating from the supersonic aircraft Concorde, affected beach counts and frequency of behavior in gray and harbor seals. The researchers found no significant differences in the behavior or beach counts of gray seals or harbor seals following sonic booms. Male harbor seals exhibited increased vigilant behavior, both in frequency and duration, post-boom (Perry, et al., 2002). Odell (1971) conducted a census of breeding pinnipeds on the Channel Islands. He used an aerial camera to count pinnipeds from a helicopter at an altitude of 76 m (250 ft) and observed that the speed of the aircraft was such that the animals were photographed and passed by before they could flush into the water (Odell, 1971).

In 1999, the U.S. Air Force (USAF) used a Bell 206 helicopter to conduct opportunistic observations of pinniped behaviors before and after rocket launches from the Alaska Aerospace Development Corporation's Kodiak Launch Complex (AADC/KLC). Collection of behavioral observations occurred during helicopter approaches and landings over two days on Ugak Island, Alaska. The helicopter approached the Steller sea lions twice to place monitoring equipment. Both landings were similar as the helicopter did not overfly the Steller sea lions directly, but instead made an oblique approach from the southwest, landing a few hundred meters from the haul out site. The author observed that the animals congregated tightly and stood alert as the helicopter landed and observers approached. However, the animals did not stampede nor enter the water immediately (Bowles, 2000). Bowles observed that a few sea lions eventually abandoned the beach as observers walked around the haulout area, but observed no general exodus, nor rafting behaviors – congregating in the water close to shore – as observers left the area (Bowles, 2000). Given the unexpected behavior of the animals, the author concluded that the Steller sea lions had failed to stampede because they had acclimated to helicopter landings and takeoffs and human approaches during the construction of the KLC (Bowles, 2000).

Several factors complicate the analysis of long- and short-term effects for aircraft overflights and data on behavioral effects of overflights by aircraft (or component stressors) on most wildlife species are sparse. Moreover, models that relate behavioral changes to abundance or reproduction, and those that relate behavioral or hearing effects thresholds from one population to another are generally not available (Manci, Gladwin, Villella, & Cavendish, 1988). In addition, the aggregation of sound frequencies, durations, and the view of the aircraft into a single exposure metric is not always the best predictor of effects and it may also be difficult to calculate. Overall, there has been no indication that single or occasional aircraft flights above pinnipeds in water would cause long-term displacement (Richardson, et al., 1995).

Level B harassment of pinnipeds may occur during helicopter approaches and departures from NWSR due to the pinnipeds temporarily moving from the rocks below the Station into the sea. It is likely that the initial helicopter approach to the Station would cause a subset, or all of the

marine mammals hauled out on the island to depart the rock and move into the water. However, they appear to show rapid habituation to subsequent helicopter approaches and departures (G. Towers, SGRLPS, pers. comm.). The pinnipeds' movement into the water is expected to be gradual due to the required controlled helicopter approaches (see Section 2.3.6), the small size of the aircraft, its relatively quiet rotors, and behavioral habituation on the part of the animals as helicopter trips continue throughout the day. According to the CCR Report (2001), while up to 40 percent of the California and Steller sea lions present on the rock have been observed to enter the water on the first of a series of helicopter landings, as few as zero percent have flushed on subsequent landings on the same date.

During the sessions of helicopter activity, some animals may be temporarily displaced from the island and either raft in the water or relocate to other haul-outs. Sea lions on NWSR have shown habituation to helicopter flights within one day at the project site and most animals are expected to return soon after helicopter activities cease for that day. By clustering helicopter arrival/departures within a short time period, animals are expected to show less response to subsequent landings (NMFS, 2010).

NMFS has determined, provided that the mitigation and monitoring measures described in Sections 2.3.6 and 2.3.7 are implemented, that the impact of conducting helicopter operations on St. George Reef Light Station on NWSR may result, at worst, in a temporary modification in behavior and/or low-level physiological effects (Level B Harassment) of small numbers of certain species of marine mammals. While behavioral and avoidance reactions may be made by these species in response to the resultant noise from the helicopter, these behavioral changes are expected to have a negligible impact on the affected species and stocks of marine mammals. While the number of potential incidental harassment takes will depend on the distribution and abundance of marine mammals on NWSR, the number of potential harassment takings is estimated to be relatively small compared to the stock size. Accordingly, no significant impacts on the population size or breeding stock of Steller sea lions, California sea lions, Pacific harbor seals, or northern fur seals are expected to occur from the action of issuing an IHA for the incidental take, by Level B harassment only, of small numbers of marine mammals to the SGRLPS. No significant indirect impacts are expected from the SGRLPS conducting helicopter operations at the Station.

**Restoration, Maintenance, and Repair Activities**: In 2000, Blackwell et al. (2004) documented reactions of ringed seals to impact pipe-driving sounds at Northstar Island, Prudhoe Bay, Alaska in 2000. During 55 hrs of observation, 23 observed seals exhibited little or no reaction to any industrial noise except for the approach of a Bell 212 helicopter. The authors noted that ringed seals swam in open water near the island throughout construction activities and as close as 46 m from the pipe-driving operation and concluded that the seals around Northstar Island were habituated to industrial sounds (Blackwell, Lawson, & Williams, 2004).

The restoration activities have the potential to impact Steller sea lions, California sea lions, Pacific harbor seals, and northern fur seals, hauled out on NWSR. Restoration and maintenance activities would involve the removal of peeling paint and plaster, restoration of interior plaster and paint, refurbishing structural and decorative metal, reworking original metal support beams

throughout the lantern room and elsewhere, replacing glass as necessary, upgrading the present electrical system; and annual light beacon maintenance.

Any noise associated with these activities is likely to be from light construction (e.g., sanding, hammering, or use of hand drills). The SGRLPS proposes to confine all restoration activities to the existing structure which would occur on the upper levels of the Station, which are not used by marine mammals.

As discussed previously, NMFS has determined, provided that the mitigation and monitoring measures described in Sections 2.3.6 and 2.3.7 are implemented, that the impact of conducting restoration, maintenance, and repair activities on the St. George Reef Light Station on NWSR may result, at worst, in a temporary modification in behavior and/or low-level physiological effects (Level B Harassment) of small numbers of certain species of marine mammals. While behavioral and avoidance reactions may be made by these species in response to the resultant noise from these activities, these behavioral changes are expected to have a negligible impact on the affected species and stocks of marine mammals. Accordingly, no significant impacts on the population size or breeding stock of Steller sea lions, California sea lions, Pacific harbor seals, or northern fur seals are expected to occur from the action of issuing an IHA for the incidental take, by Level B harassment only, of small numbers of marine mammals to the SGRLPS. No significant indirect impacts are expected from the SGRLPS conducting maintenance and restoration activities at the Station.

**Human Presence**: Englehard et al. (2002) studied lactation behavior between harems of southern elephant seals (*Mirounga leonina*) located in areas of low and high human presence on Macquarie Island to determine if human presence affected pup growth. The researchers noted that in the area of high human presence, the seals exhibited a three-fold increase in alert behaviors. However, this incidence of alertness decreased to pre-disturbance levels after the humans departed (Engelhard, Baarspul, Broekman, Creuwels, & Reijnders, 2002). The authors observed no significant differences in any behavioral variables and reported no long-term changes in behavior resulting from human presence. They concluded that human disturbance appeared not to have significantly contributed to the population decline observed at Macquarie Island. However, the conclusion requires caution given the fairly low power of the analyses (Engelhard, et al., 2002).

Cassini (2001) studied the responses (i.e., retreats, threats, attacks or leaving the rookery) of South American fur seals (*Arctocephalus australis*) to tourist approaches at a non-reproductive, continental colony of located in Cabo Polonio, Uruguay. The author observed that fur seals tolerated relatively close distances to humans (greater than 10 m (32 ft)), but retreated or responded aggressively when tourists crossed a threshold of 10 m (32 ft) (Cassini, 2001). Previous studies on pinnipeds underscore the fact that there appears to be a threshold distance (about 10 m between tourists and animals) that triggers these negative behavioral responses. The author also noted that tourist behavior is another important component in the degree of responses of pinnipeds to human approaches. Tourists shouting, running, or waving their hands elicited more negative responses than those walking and speaking in low voices (Cassini, 2001). Cassini concluded that, with a minimal control of visitor's behavior, the impact of tourism on this colony would be low.

In order to mitigate for interactions with humans, the IHA would require the SGRLPS members, the restoration crew, and tourists to avoid making unnecessary noise while on NWSR. In addition, the group is prohibited from viewing pinnipeds at the base of the Station. Because pinnipeds haul out on the lower platform, the door to this area will remain closed and barricaded at all times.

NMFS has determined, provided that the mitigation and monitoring measures described in Sections 2.3.6 and 2.3.7 are implemented, that the impact of human presence on St. George Reef Light Station on NWSR may result, at worst, in a temporary modification in behavior and/or low-level physiological effects (Level B Harassment) of small numbers of certain species of marine mammals. No significant impacts on the population size or breeding stock of Steller sea lions, California sea lions, Pacific harbor seals, or northern fur seals are expected to occur from the action of issuing an IHA for the incidental take, by Level B harassment only, of small numbers of marine mammals to the SGRLPS. No significant indirect impacts are expected from human presence at the Station.

**Conclusions:** Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the mitigation and monitoring measures, NMFS finds that the SGRLPS' planned helicopter operations, restoration, and maintenance activities will result in the incidental take of small numbers of marine mammals, by Level B harassment only, and that the total taking from helicopter operations, restoration, and maintenance activities exercise will have a negligible impact on the affected species or stocks.

#### 4.2.3.1.4 POTENTIAL FOR INJURY OR MORTALITY

NMFS does not expect the activity to impact rates of recruitment or survival of the pinnipeds since no mortality (which would remove individuals from the population) or injury is anticipated to occur, nor authorized.

A flushing event can include an active departure of a haulout site, slow displacement into the water, or a stampede which occurs when a large proportion of the pinnipeds in a group enter the water defensively (Bowles, 2000). Rapid and direct helicopter approaches have the potential to initiate stampedes, and it is likely that an initial helicopter approach to the Station would cause all of the marine mammals hauled out on NWSR to stampede into the water. In order to mitigate for the potential of a stampede, the IHA would require the helicopter to implement approach and timing techniques that are least disturbing to marine mammals. For example, the initial approach to the Station must be offshore from the island at a relatively high altitude (e.g., 800 - 1,000 ft, or 244 - 305 m). Before the final approach, the helicopter shall circle lower, and approach from area where the density of pinnipeds is the lowest. If for any safety reasons (e.g., wind condition) such helicopter approach and timing techniques cannot be achieved, the SGRLPS would be required to abort the restoration and maintenance mission for that day.

No deaths or injuries to adult animals have been documented due to past helicopter operations conducted by CCR, the SGRLPS or by the USCG on NWSR (NMFS, 2010). The most common

response to helicopter approaches and landings of pinnipeds present on NWSR is to depart NWSR temporarily into the water.

Holst et al. (2003), in their observations of California sea lions, northern elephant seals, and harbor seals hauled out on SNI during launches of missiles that produce sonic booms found no evidence of injury or mortality for any observed pinniped species during or immediately after the launches (Holst, et al., 2003). Holst et al., findings are consistent with NMFS' determination, provided that the mitigation and monitoring measures described in Sections 2.3.6 and 2.3.7 are implemented such as controlled helicopter approaches, that the likelihood of a stampede would be diminished. Also, the pinniped abundance on NWSR would typically be low between November 1 and April 30 annually, and any animals present on NWSR during this time period are likely to have sufficient spacing between them to avoid injury in the event of a stampede.

NMFS estimates that the likelihood of mother-pup separation during helicopter overflights would be rare as the activities, if permitted from November 1 through April annually, would occur outside of the breeding season for the pinnipeds present on NWSR. In the event of any observed Steller sea lion injury, mortality, or the presence of newborn pup, the SGRLPS will notify the NMFS SWRO Administrator and the NMFS Director of Office of Protected Resources immediately and cease operations.

NMFS has determined, provided that the aforementioned mitigation and monitoring measures are implemented, that the impact of conducting helicopter operations, restoration, and maintenance activities on St. George Reef Light Station located on NWSR may result, at worst, in a temporary modification in behavior and/or low-level physiological effects (Level B harassment) of small numbers of certain species of marine mammals.

While behavioral modifications, including temporarily vacating the area during the lighthouse restoration and maintenance period, may be made by these species to avoid the resultant helicopter landing/takeoff and visual disturbance from human presence, the availability of alternate areas within these areas and haulout sites, and the short and sporadic duration of the restoration and maintenance activities, have led NMFS to determine that this action will have a negligible impact on Steller sea lions, California sea lions, Pacific harbor seals, and northern fur seals.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the mitigation and monitoring measures, NMFS finds that the SGRLPS' planned helicopter operations, restoration, and maintenance activities will result in the incidental take of small numbers of marine mammals, by Level B harassment only, and that the total taking from helicopter operations, restoration, and maintenance activities exercise will have a negligible impact on the affected species or stocks.

## 4.3 COMPLIANCE WITH APPLICABLE LAWS / NECESSARY FEDERAL PERMITS

NMFS has determined that its proposed IHA is consistent with the applicable requirements of the MMPA, ESA, and NMFS' regulations. The applicant has secured or applied for necessary permits from the NMFS, the USCG and the NPS.

### 4.3.1 ENDANGERED SPECIES ACT

This section summarizes conclusions resulting from consultation required under section 7 of the ESA. The consultation process was concluded after close of the comment period on the application to ensure that no relevant issues or information were overlooked during the initial scoping process summarized in Chapter 1. For the purpose of the consultation, the *Federal Register* notice of receipt and the draft EA represented NMFS' assessment of the potential biological impacts.

In a 2010 Biological Opinion (BiOp) titled, "*Maintain St. George Reef as a Private Aid to Navigation; Conduct Maintenance and Renovation Activities at St. George Reef Lighthouse, November 1- April 30*," the SWRO concluded that that PR1's issuance of an IHA to SGRLPS for lighthouse renovation and light maintenance activities was likely to adversely affect, but not likely to jeopardize the continued existence of Steller sea lions. NMFS has designated critical habitat for the eastern DPS of Steller sea lions in California at Año Nuevo Island, Southeast Farallon Island, Sugarloaf Island and Cape Mendocino, California pursuant to section 4 of the ESA (see 50 CFR 226.202(b)). However, Northwest Seal Rock is neither within nor nearby these designated areas. The SWRO issued an incidental take statement (ITS) for 172 Steller sea lions pursuant to section 7 of the ESA. The ITS contained reasonable and prudent measures for implementing terms and conditions to minimize the effects of this incidental take and these are incorporated into the IHA.

### 4.3.2 MARINE MAMMAL PROTECTION ACT

The applicant submitted an application which included responses to all applicable questions in the regulations. The requested activities are consistent with applicable issuance criteria in the MMPA and NMFS' implementing regulations. NMFS considered the views and opinions of the Commission, scientists, or other persons or organizations knowledgeable about the marine mammals that were the subject of the application. These views, and other matters germane to the application, supported NMFS' initial determinations of the action having a negligible impact on the species or stocks and an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses for issuance of the IHA.

The IHA would contain standard terms and conditions stipulated in the MMPA and NMFS' regulations. As required by the MMPA, the IHA would specify: (1) the effective date of the permit; (2) the number and kinds (species and stock) of marine mammals that may be taken; (3) the location and manner in which they may be taken; and (4) other terms and conditions deemed appropriate.

### 4.3.3 THE NATIONAL HISTORIC LIGHTHOUSE PRESERVATION ACT OF 2000

The USCG decommissioned the Station in 1975. In 1996, the United States Government Services Administration, and the government of Del Norte County transferred the management and upkeep of the Station to SGRLPS which aims to restore and restore and preserve the Station which is listed in the National Park Service's National Register of Historic Places (Reference Number 93001373). The SGRLPS has secured the appropriate agreements with State Historic

Preservation Officers, the USCG, the National Park Service (NPS) and the GSA under the NHLPA.

## 4.4 UNAVOIDABLE ADVERSE EFFECTS

NMFS does not expect SGRLPS' requested activities to have adverse consequences on the viability of the subpopulations of the pinnipeds on NWSR. Further, NMFS does not expect the eastern DPS population of Steller sea lions to experience reductions in reproduction, numbers, or distribution that might appreciably reduce their likelihood of surviving and recovering in the wild. Given this and the likely response by pinnipeds hauled out on NWSR to the proposed project, individual animals are likely to be adversely affected by aircraft and possibly by human presence during proposed project activities, but as mentioned throughout this EA, the project is to have a negligible impact on the affected species or stocks of marine mammals.

## 4.5 CUMULATIVE EFFECTS

Cumulative effects are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions" (40 CFR §1508.7). Cumulative impacts can result from individually minor but collectively significant actions that take place over a period of time.

The area is located approximately 7 km (4.4 mi) offshore from Californian coastlines and situates in a relatively remote location. The sustained high prevailing winds during most of the year and intense wave action around the islet prevent human access to the rock by vessels and discourage most human activities in the surrounding waters.

Although human activities elsewhere have been shown to have detrimental impacts to the marine environment within the area, NMFS has determined that the restoration and maintenance activities would not have a significant cumulative effect on the human environment. In addition, NMFS has determined that the action would not likely have significant cumulative effects on Steller sea lions, Pacific harbor seals, California sea lions, and northern fur seals. Particularly as the current population status of these species is either stable or is close to carrying capacity.

Such activities that are likely to affect the human environment near NWSR include scientific research activities, geophysical seismic surveys, seabird research, commercial and recreational fishing, overfishing and decline of prey species, subsistence hunting, marine pollution, and disease. The following sections describe projects and activities based in and along the coast of California near NWSR that may, but would not necessarily result in potential cumulative adverse impacts to the biological and physical environment.

### 4.5.1 MARINE MAMMAL RESEARCH

Research activities permitted under the MMPA and ESA are highly regulated and closely monitored, and may include the incidental taking or harassment of pinnipeds in the course of research activities. Many of these permits only allow the incidental harassment of California sea lions, Pacific harbor seals, northern elephant seals, and northern fur seals during studies of other marine mammal species in the vicinity. Most marine mammal surveys introduce no more than increased vessel traffic impacts to the environment.

Currently, there are at least seven active research permits along the California coastline that allow activities that have the potential to result in either Level A or Level B harassment (*e.g.*, vessel/aerial surveys, photo-identification, collection of sloughed skin, tagging, capture and handling, etc.) of marine mammals. Mortalities may occasionally occur incidental to marine mammal research activities authorized under MMPA permits issued to a variety of government, academic, and other research organizations. Between 2002-2006, there were a total of 12 reported incidental mortalities resulting from research on the eastern stock of Steller sea lions, which results in an annual average of 2.4 mortalities per year from this stock (Angliss & Allen, 2008).

### 4.5.2 GEOPHYSICAL SEISMIC SURVEYS

Geophysical seismic survey cruises operate within the Pacific Ocean along the California coast, and the use of airguns during seismic surveys does not impact pinnipeds while they are hauled out, only when they are in the water. There are currently no geophysical seismic surveys occurring in northern California waters. However, NMFS authorized incidental take from one seismic survey off the Oregon coast in 2009 and it is reasonable to assume that some level of similar survey activity might occur over the duration of the IHA. Results from monitoring the area indicate that the activities only have temporary, short-term impacts on the behavior of the animals and they do not result in the injury or mortality of the animals.

### 4.5.3 SEABIRD RESEARCH

Research on other animal species, such as seabirds, occurs along the California coastline. Currently, there is one active IHA for the incidental harassment of pinnipeds during scientific research studies on seabirds. Although the researchers are not conducting studies targeting pinnipeds, there is the possibility that California sea lions, Pacific harbor seals, northern elephant seals, or northern fur seals (as well as other pinniped species not subject of this action) could be incidentally harassed when the researchers are present near haul-out sites or rookeries. Both of these studies are being conducted on islands south of NWSR. The most common responses of the pinnipeds noted to date include brief startle reactions as noted by lifting of the head or movement of less than one meter (three ft) and flushing into the water. These activities have not resulted in any injury or mortality of pinnipeds.

### 4.5.4 COMMERCIAL AND RECREATIONAL FISHING

There is no commercial fishing centered around NWSR. However, NMFS reports that over 200 commercial vessels were registered in and delivered landing to Crescent City (NWFSC, 2006). Crescent City Harbor, 6 mi southeast of NWSR, is the home of a commercial fishing fleet that generated $15.5 million dollars in seafood landings in 2008 (CDFG, 2009). Currently only one commercial fish processor is based in the Crescent City area, Caito Fisheries, Inc. The company processes crab, cod, snapper as well as salmon and markets their products wholesale (NWFSC, 2006).

Entrapment and entanglement in commercial fishing gear is one of the most frequently documented sources of human-caused mortality in marine mammals (Read, 2008). Although there are no commercial fisheries within the project area, commercial fisheries operating elsewhere may potentially impact these marine mammal species/stocks. All of the four species are killed incidentally in set and drift gillnet fisheries (Angliss & Allen, 2008; Carretta, et al.,

2008). The incidental mortality due to fisheries is especially high for harbor seals and California sea lions. However, the populations for both species are growing and fishing mortality is declining (Angliss & Allen, 2008; Carretta, et al., 2008). The exact impact of mortality from entanglement in fishing gear is difficult to accurately determine, however, as many marine mammals that die from entanglement in commercial fishing gear tend to sink rather than strand ashore.

There is no dedicated recreational fishery based around NWSR. According to the California Recreational Fisheries Survey 2007 Annual Review, the Redwood District (which includes Crescent City) had the lowest number of reported angler trips by commercial passenger fishing vessel (CPFV) (4,626) and the lowest number of reported angler trips by private or rental boats (6,889) within the state (CDFG, 2008). In general, recreational fishing effort in northern California has generally declined from 2005 to 2007 in both the shore modes (man-made structures and beach and bank) and the boat modes (private/rental boats and CPFV) (CDFG, 2008).

### 4.5.5 Overfishing and Decline of Prey Species

Commercial fisheries may affect marine mammals indirectly by altering the quality and reducing the quantity of their prey species. The removal of large numbers of fish (both target and non-target or bycatch species) from a marine ecosystem can change the composition of the fish community, altering the abundance and distribution of prey available for marine mammals. In addition, by removing large amounts of biomass, commercial fisheries compete with other consumers that depend on the target species for food, which can, in turn, increase competition between different piscivorous predators. Changes in the abundance and distribution of prey can then have cascading effects on predators, including increased susceptibility to predation and reduced productivity.

Although there are no commercial fisheries within the project area, fisheries elsewhere off Californian coast may contribute to the depletion of prey species for these marine mammal species.

### 4.5.6 Subsistence Hunting

Subsistence hunting of marine mammals is not known to occur around NWSR. The subsistence harvest of Steller sea lions occurs in Alaska and Canada and information on the subsistence harvest comes via two sources: the Alaska Department of Fish and Game and the Ecosystem Conservation Office of the Aleut Community of St. Paul (Angliss & Allen, 2008). The mean annual subsistence take from this stock over the five-year period from 2002 through 2006 was 135 Steller sea lions/year (Angliss & Allen, 2008).

Pacific Northwest treaty Indian tribes may have tribal regulations allowing tribal members to exercise treaty rights for subsistence harvest of harbor seals. There have been only a few reported takes of harbor seals from directed tribal subsistence hunts. It is possible that very few seals have been taken in directed hunts because tribal fishers use seals caught incidentally to fishing operations for their subsistence needs before undertaking a ceremonial or subsistence hunt (Carretta, et al., 2008).

### 4.5.7 MARINE POLLUTION

Marine mammals are exposed to contaminants via the food they consume, the water in which they swim, and the air they breathe. Point and non-point source pollutants from coastal runoff, offshore mineral and gravel mining, at-sea disposal of dredged materials and sewage effluent, marine debris, and organic compounds from aquaculture are all lasting threats to marine mammals in the project area. The impacts of these pollutants are difficult to measure.

The persistent organic pollutants (POPs) tend to bioaccumulate through the food chain; therefore, the chronic exposure of POPs in the environment is perhaps of the most concern to high trophic level predators such as California sea lions, Pacific harbor seals, northern elephant seals, and northern fur seals.

The SGRLPS' helicopter operations and restoration and maintenance activities are not expected to cause increased exposure of POPs to marine mammals on NWSR due to the small scale and localized nature of the activities. Additionally, the SGRLPS will encapsulate all waste products within specially marked bags and will transport the bags by helicopter to Crescent City, CA for proper disposal. Disposal of the lead based paint will comply with municipal and/or state laws and ordinances.

### 4.5.8 DISEASE

Disease is common in all pinniped populations and has been responsible for major die-offs worldwide, but such events are usually relatively short-lived. NMFS notes two unexplained harbor seal mortality events occurred in Point Reyes National Park, located south of NWSR, involving at least 90 harbor seals in 1997 and 16 animals in 2000. Necropsies of three seals from the 2000 event diagnosed cases of severe pneumonia and tests for morbillivirus were negative. Subsequently, NMFS found that all west-coast harbor seals tested for morbilliviruses were seronegative, indicating that this disease was not endemic in the population (Carretta, et al., 2008).

### 4.5.9 SUMMARY OF CUMULATIVE EFFECTS

All of the issues noted above are likely to have some level of impact on marine mammal populations in the area. Although commercial harvest no longer takes place and existing subsistence harvest is set by quotas, scientific research activities, geophysical seismic surveys, seabird research, commercial and recreational fishing, overfishing and decline of prey species, subsistence hunting, marine pollution, and disease continue to result in some level of impact to pinniped populations in the area. Nonetheless, the proposed lighthouse restoration and maintenance activities would only add negligible impacts to the project area due to limited helicopter traffic and limited pedestrian traffic to the action area.

The maintenance and restoration activities are well planned to minimize impacts to the biological and physical environment of the areas by implementing mitigation and monitoring protocols. Therefore, NMFS has determined that the SGRLPS' restoration, maintenance, and repair activities would not have a significant cumulative effect on the human environment, provided that the mitigation and monitoring measures described in Sections 2.3.6 and 2.3.7 are implemented.

# 5 LIST OF PREPARERS

Jeannine Cody, M.Sc.
Fishery Biologist
Office of Protected Resources
NOAA/National Marine Fisheries Service
Silver Spring, MD

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**PERSONAL COMMUNICATIONS**

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# 7 APPENDIX A - COMMENTS RECEIVED ON THE APPLICATION

MARINE MAMMAL COMMISSION

29 October 2009

Mr. P. Michael Payne, Chief
Permits, Conservation, and Education Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway, Room 13635
Silver Spring, MD 20910

Dear Mr. Payne:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the application submitted by the St. George Reef Lighthouse Preservation Society under section 101(a)(5)(D) of the Marine Mammal Protection Act. The applicant is seeking authorization to take small numbers of California sea lions, Steller sea lions, Pacific harbor seals, and northern fur seals by harassment incidental to aircraft operations and restoration and maintenance work on the St. George Reef Light Station on Northwest Seal Rock off the coast of Culver City, California. The Commission also has reviewed the National Marine Fisheries Service's 29 September 2009 *Federal Register* notice (74 Fed. Reg. 49852) requesting comments on its proposal to issue the authorization, subject to certain conditions.

The Service believes that taking of the subject species could result from noise and visual disturbance from aircraft operations and restoration and maintenance activities carried out between 1 November 2009 and 30 April 2010. The proposed activities would be conducted no more than once a month, with each session lasting no more than three days. The Service has preliminarily determined that the proposed activities will result, at most, in temporary modification of pinniped behavior and, therefore, will have a negligible impact on the subject species. This preliminary determination anticipates the adoption of proposed monitoring and mitigation measures, including restrictions on the timing and frequency of activities, the use of helicopter approach and timing measures to minimize disturbance to the animals, and measures to avoid exposing animals to visual and acoustic stimuli associated with the proposed activities.

**RECOMMENDATION**

Based on its review of the application and *Federal Register* notice, the Marine Mammal Commission recommends that the National Marine Fisheries Service issue the requested authorization, subject to the inclusion of the proposed monitoring and mitigation measures.

Please contact me if you have any questions concerning this recommendation.

Sincerely,

Timothy J. Ragen

Timothy J. Ragen, Ph.D.
Executive Director

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# 8 APPENDIX B – HELICOPTER OPERATIONS SCHEDULE

| Fri Flights for St. George Reef Light Station Renovation Activities | Depart Airport | Arrive Light | Depart Light | Arrive Airport | Work Crew In | Work Crew Out | Tourists In | Tourists Out | Total Persons on Island |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 9:00 AM | 9:06 AM | 9:11 AM | 9:17 AM | 3 | 0 | 0 | 0 | 3 |
| 2 | 9:27 AM | 9:33 AM | 9:38 AM | 9:44 AM | 3 | 0 | 0 | 0 | 3 |
| 3 | 9:54 AM | 10:00 AM | 10:05 AM | 10:11 AM | 3 | 0 | 0 | 0 | 3 |
| 4 | 10:21 AM | 10:27 AM | 10:32 AM | 10:38 AM | 3 | 0 | 0 | 0 | 3 |
| 5 | 10:48 AM | 10:54 AM | 10:59 AM | 11:05 AM | 3 | 0 | 0 | 0 | 3 |
| 6 | 11:15 AM | 11:21 AM | 11:26 AM | 11:32 AM | 0 | 0 | 0 | 0 | 0 |
| | | | | Total | 15 | 0 | 0 | 0 | 15 |
| | | | | | | | | | |
| Friday Landings/Takeoffs | 12 | | | | | | | | |
| Fri Time Elapsed | 2:32 | | | | | | | | |
| Fri Disturbance Time | 2:20 | | | | | | | | |

| Sat Flights for St. George Reef Light Station Renovation Activities | Depart Airport | Arrive Light | Depart Light | Arrive Airport | Work Crew In | Work Crew Out | Tourists In | Tourists Out | Total Persons on Island |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 9:00 AM | 9:06 AM | 9:11 AM | 9:17 AM | 0 | 3 | 0 | 0 | 12 |
| | | | | Total | 0 | 3 | 0 | 0 | 12 |
| | | | | | | | | | |
| Saturday Landings/Takeoffs | 2 | | | | | | | | |
| Total Time Elapsed | 0:17 | | | | | | | | |
| Total Disturbance Time | 0:05 | | | | | | | | |

| Sun Flights for St. George Reef Light Station Renovation Activities | Depart Airport | Arrive Light | Depart Light | Arrive Airport | Work Crew In | Work Crew Out | Tourists In | Tourists Out | Total Persons on Island |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 9:00 AM | 9:06 AM | 9:11 AM | 9:17 AM | 0 | 3 | 3 | 0 | 12 |
| 2 | 9:27 AM | 9:33 AM | 9:38 AM | 9:44 AM | 0 | 3 | 3 | 0 | 12 |
| 3 | 9:54 AM | 10:00 AM | 10:05 AM | 10:11 AM | 0 | 3 | 3 | 0 | 12 |
| 4 | 10:21 AM | 10:27 AM | 10:32 AM | 10:38 AM | 0 | 3 | 3 | 0 | 12 |
| 5 | 10:48 AM | 10:54 AM | 10:59 AM | 11:05 AM | 0 | 0 | 3 | 3 | 12 |
| 6 | 11:15 AM | 11:21 AM | 11:26 AM | 11:32 AM | 0 | 0 | 3 | 3 | 12 |
| 7 | 11:42 AM | 11:48 AM | 11:53 AM | 11:59 AM | 0 | 0 | 3 | 3 | 12 |
| 8 | 12:09 PM | 12:15 PM | 12:20 PM | 12:26 PM | 0 | 0 | 0 | 3 | 9 |
| 9 | 12:36 PM | 12:42 PM | 12:47 PM | 12:53 PM | 0 | 0 | 0 | 3 | 6 |
| 10 | 1:03 PM | 1:09 PM | 1:14 PM | 1:20 PM | 0 | 0 | 0 | 3 | 3 |
| 11 | 1:30 PM | 1:36 PM | 1:41 PM | 1:47 PM | 0 | 0 | 0 | 3 | 0 |
| | | | | Total | 0 | 12 | 21 | 21 | 0 |
| | | | | | | | | | |
| Sunday Landings/Takeoffs | 22 | | | | | | | | |
| Sun Time Elapsed | 4:47 | | | | | | | | |
| Sun Disturbance Time | 4:35 | | | | | | | | |
| | | | | | | | | | |
| Total Helicopter Disturbance (hours) | 42.0 | | | | | | | | |
| Total Landings / Takeoffs | 36 | | | | | | | | |