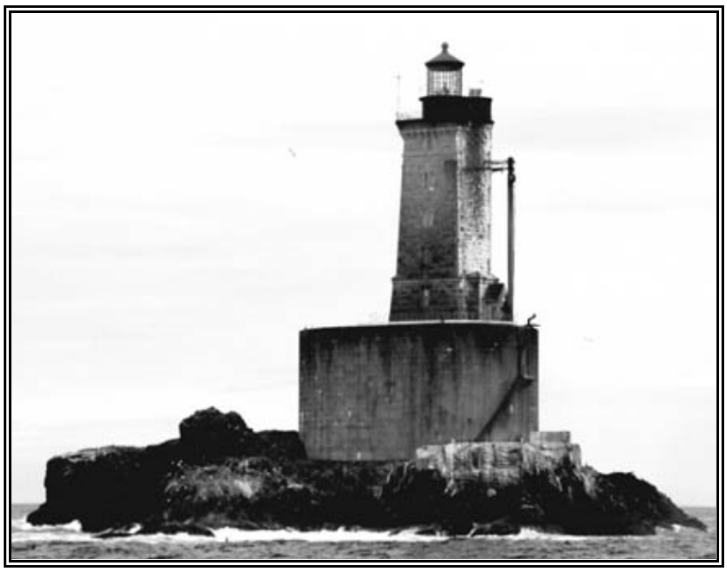
ST. GEORGE REEF
LIGHTHOUSE RESTORATION AND TOUR OPERATION



NATIONAL MARINE FISHERIES SERVICE
OFFICE OF PROTECTED RESOURCES

APPLICATION FOR A MARINE MAMMAL PROTECTION ACT LETTER OF AUTHORIZATION

Applicant: St. George Reef Lighthouse Preservation Society

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PROJECT DESCRIPTION AND BACKGROUND

The Saint George Reef Lighthouse is located on a small rocky islet known as Northwest Seal Rock (NWSR, 41^0 50'24" N, 124^0 22'06" W), which is part of the St. George Reef, in Del Norte County, California. The island is about 7 km offshore and peaks at 17 feet above mean sea level. The lighthouse covers much of the surface of the island. Original construction of the lighthouse was completed in 1892 and it was operated by the U.S. Coast Guard (USCG) until 1975. The Coast Guard decommissioned the light and ceased to maintain the historic building, which rapidly deteriorated and became subject to vandalism. The St. George Reef Lighthouse Preservation Society (SGRLPS) was founded in 1986 with the goals of restoring the lighthouse and increasing recognition of its important historical role in maritime and regional history. In 1996, the SGRLPS entered into an agreement with the federal and local government to manage and renovate the lighthouse on site.

The SGRLPS intends to maintain the Lighthouse, 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 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 Incidental Harassment Authorization (IHA) for these activities on an annual basis.

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. Disturbance to marine mammals may be related to helicopter operations; sound generated during maintenance and restoration activities; and human presence.

Wildlife use of the island apparently increased following abandonment by the USCG. Seabirds were first documented nesting on the window ledges of the lighthouse in 1989 (Carter et al. 1992). A restriction in the deed to the SGRLPS precluded access to the lighthouse from March 15-September 30, for any purpose. This restriction was placed by the U.S. Fish & Wildlife Service (USFWS) with the intent of protecting breeding seabirds and other wildlife from disturbance. Due to requests from the SGRLPS for increased access during the closure period, USFWS recommended that the SGRLPS conduct a study of wildlife use of the island. The SGRLPS funded surveys of marine birds and mammals that spanned a four year period, 1997 to 2000 (Crescent Coastal Research 2001). No seabirds were found nesting at the lighthouse during that period; the most significant wildlife use of the island was by non-breeding sea lions.

Following a review of the wildlife study, the USFWS revised its restriction to no visits from 1 June to 15 October, primarily to limit disturbance to pinnipeds, and advised the SGRLPS that a permit was needed to comply with the Marine Mammal Protection Act. The SGRLPS contacted the National Marine Fisheries Service, Long Beach, by telephone, but was not informed of any necessary compliance action at that time (Guy Towers, SGRLPS, pers. comm.). When the SGRLPS applied to the USCG to operate the lighthouse as an aid to navigation in 2004, NOAA, NMFS confirmed the requirement to have authorization for take of marine mammals if any SGRLPS activities caused harassment of pinnipeds hauling out on the island.

(1) A detailed description of the specific activity or class of activities that can be expected to result in incidental taking of marine mammals

A. Restoration:
The SGRLPS initiated physical restoration of the historic lighthouse on Northwest Seal Rock in 1996. Restoration activities include 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, and upgrading the present electrical system. Power to the island is provided by an air compressor and gas generator. The beacon light is to be powered by solar energy. Because Northwest Seal Rock has no safe landing area for boats, work crews and equipment will be transported from the mainland to the Lighthouse by a light helicopter, a Raven R44, that lands on top of the engine room at the Lighthouse, about 48 feet above the rock island. Materials are transported by a basket attached to the underside of the helicopter. When the helicopter with the basket arrives at the Lighthouse, the helicopter hovers over the island and the basket is placed on the engine room of the Lighthouse. When the helicopter flies with the basket, it is unable to land at the platform and thus, hovers at least 150 feet above Northwest Seal Rock. Volunteers remove the materials from the basket and the helicopter returns to the mainland with the basket in tow. Typically, volunteers remain at the Lighthouse overnight the first two days of the trip and return to the mainland on the third day. Even though the helicopter is primarily used to transport volunteers and materials on the first and last days of the three day activity, the helicopter may fly to and from the Lighthouse on all three days of the restoration and maintenance activities.

Restoration activities include 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, and upgrading the present electrical system. Power to the island is provided by an air compressor and gas generator. The beacon light is to be powered by solar energy. Trips to the site are made by small helicopter, owned and operated by Air Shasta Rotor and Wing, LLC, Redding, CA. 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. Volunteers involved in restoration are taken out 3 at a time. The number of helicopter trips is estimated at no more than 36 landings/takeoffs per month (*i.e.,* one weekend per month-Friday, Saturday, and Sunday).

Typically, on Friday, there would be eight flights to the Lighthouse bringing 12 – 15 crew members and equipment/material and eight flights back to the mainland for a total of 16 flights on day one. 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 Northwest Seal Rock. The helicopter would land and take-off immediately after offloading personnel and equipment every 20 minutes (min). The total duration of the first day's aerial operations would last for approximately three hours (hrs) and 34 min and would end at approximately 12:34 p.m. Once the restoration crew is transported to the Lighthouse, the majority of the crew would remain overnight (Friday and Saturday) and return the last day of restoration and maintenance activities (Sunday). Even though SGRLPS would use the helicopter to transport work crew members and materials on the first and last days of the three-day activity, the helicopter would likely fly to and from the Lighthouse on all three days of the restoration and maintenance activities.

For the second day (Saturday), the SGRLPS proposes a flight plan comparable to, but likely less than, what is described above for Friday (up to six arrivals and six departures) and below for Sunday (four arrivals and four departures) flight activities to Northwest Seal Rock. This is a slight modification from the original 2009 IHA application (a maximum of two flights was authorized in the previous IHA). As restoration work progresses, the SGRLPS anticipates that there will be a need to access the area using the helicopter more frequently than what was previously authorized on Saturdays. The first flight would depart from Crescent City Airport at 9:00 a.m. for a six-minute flight to Northwest Seal Rock. The total duration of the second day's aerial operations would last for no more than 3 hours, depending on the number of crew members transported to and off Northwest Seal Rock. It is not expected that the addition of flights on Saturday would change the overall take estimate, since it is expected that all animals on the island would have flushed into the water by the first helicopter flight. In addition, the overall take estimate is a conservative estimate and likely an overestimate for the number of animals likely found hauled out on the island.

For the final day of operations, SGRLPS proposes to conduct a maximum of eight helicopter flights (four arrivals and four departures) to transport the remaining crew members and equipment/material back to the Crescent City Airport. The total duration of the last day's aerial operations for restoration and maintenance would last for approximately two hrs.

The SGRLPS also began conducting public tours to the lighthouse by helicopter in 1998 in conjunction with restoration activities and proposes to conduct public tours at the Lighthouse during the last day of the proposed restoration schedule. SGRLPS Visitors would be transported by helicopter during the Sunday work window period. Additional flights would be conducted solely for the transport of tourists to and from the Lighthouse, but those flights would be conducted in the later hours of the morning, when most, if not all of the sea lions are expected to have left Northwest Seal Rock (*i.e.*, it is expected animals will have been harassed off Northwest Seal Rock from previous activities). The maximum number of expected tourists is 36 people per tour day. The total number of helicopter trips on a tour day (Sunday) is estimated at 17, all between the hours of 9:00 am to 1:00 pm. It is expected that each flight would land every 15-20 minutes. Thus, the total duration of the last day's aerial operations, including the restoration and maintenance activities described previously (two hour and 14 minute duration) would last for approximately four hrs. The scheduled duration of each visit is 1 hour per tour group. The last tour group would leave the Lighthouse before 1:00 pm. An example of the Sunday tour schedule is shown in Table 1. No additional allowance is included for animals that might be affected by additional flights for the transportation of tourists. Return trips from the Lighthouse to the mainland would include construction workers, some equipment, and some tourists. An additional eleven flights would be flying to the Lighthouse to transport tourists. The corresponding return flights would transport tourists, construction equipment, or remaining construction workers. Although some of these flights would be conducted solely for the transportation of tourists, those flights would be flown at a time when no pinnipeds are expected to be at the Lighthouse, since it is expected that all animals on the island would flush into the water by the first few helicopter flights.

B. Light Maintenance:

As required by the United States Coast Guard, in order to maintain St. George Reef Lighthouse as a Private Aid to Navigation, the SGRLPS needs to conduct annual, and at most biannual,

maintenance of the light (during restoration and post-restoration). During restoration, this maintenance will coincide with restoration trips during the work window. To access Northwest Seal Rock, the same helicopter (Raven R44) used for restoration activities will be employed. Light maintenance is expected to take no longer than 3 hours and would coincide with the helicopter flights described under Section A above. Should the beacon light fail during the work window (1 November to 30 April), a trip to the Lighthouse will be made by helicopter (same as above) by one crew of 2-3 people. Only 1-2 helicopter landings at the Lighthouse are anticipated to service the light during an emergency situation (*i.e.,* beacon light failure during the work window) for a maximum of 4 flights. The helicopter may remain on site or transit back to shore and make a second landing to pick up the repair personnel.

C. Emergency Light Maintenance:
If the beacon light fails, a trip to the lighthouse will be made by helicopter (same as above) by one crew of 2-3 people. Only 1-2 helicopter landings are anticipated to service the light during an emergency situation. Should emergency light maintenance need to occur outside of the work window, the SGRLPS will contact the NMFS Southwest Regional office immediately and prior to beginning any emergency work to discuss minimization measures to reduce potential impacts to marine mammals.

(2) The date(s) and duration of such activity and the specific geographical region where it will occur

A. Restoration:
Work trips are proposed for a 6 month period (1 November through 30 April), during one weekend each month and lasting no more than three days (*e.g.*, Friday, Saturday, and Sunday). The duration of each visit would be 1-3 days. Major restoration work is expected to be completed in 3 years. After that, maintenance trips are anticipated at a lower frequency for maintenance and minor repairs.

Guided tours of the lighthouse would take place during the same window of time as restoration: November 1- April 30. Tours would take place approximately once per month in conjunction with Sunday restoration activities. The total number of helicopter trips per tourist day is estimated at 17, and would take place between the hours of 0900-1330. Two to three tourists would visit the island at a time. The scheduled duration of each visit is 1 hour per tour group. See Table 1 below for an example of a lighthouse tour in conjunction with restoration activites.

Table 1. An example of a Lighthouse tour in conjunction with restoration activities (Sundays only) at St. George Reef Lighthouse, Crescent City, CA.

Flight No.	Time	Crew Out	Crew at Lighthouse	Tourists In	Tourists Out	Tourists at Lighthouse
	Before 09:00	0	15	0	0	0
1	09:00	3	12	3	0	3
2	09:15	3	9	3	0	6
3	09:30	3	6	3	0	9
4	09:45	3	3	3	0	12
5	10:00	0	3	3	3	12
6	10:15	0	3	3	3	12
7	10:30	0	3	3	3	12
8	10:45	0	3	3	3	12
9	11:00	0	3	3	3	12
10	11:15	0	3	3	3	12
11	11:30	0	3	3	3	12
12	11:45	0	3	3	3	12
13	12:00	0	3	0	3	9
14	12:15	0	3	0	3	6
15	12:30	0	3	0	3	3
16	12:45	0	3	0	3	0
17	13:00	3	0	0	0	0

B. Light Maintenance

As required by the United States Coast Guard, in order to maintain St. George Reef Lighthouse as a Private Aid to Navigation, the SGRLPS needs to conduct annual, and at most biannual, maintenance of the light. Maintenance is expected to be no longer than 3 hours.

C. Emergency Light Maintenance

Emergency trips to the light may be necessary outside of the work window, *i.e.*, from May 1-September 30. Landings at the lighthouse would only take place in the event that the light failed to operate and thus, ceased to serve as an aid to navigation. Trips to the island during the summer and early fall are expected to be very rare, and not needed each year. In the event of failure of the light, a single helicopter with 2-3 persons would land at the site and dispatch 1-2 technicians to service the light. Duration of the trip is expected to be no longer than 3 hours. The helicopter may remain on site or transit back to shore and make a second landing to pick up the repair personnel.

(3) The species and numbers of marine mammals likely to be found within the activity area

Four species of marine mammals have been observed on Northwest Seal Rock, the Steller sea Lion (*Eumatopias jubatus*), California sea lion (*Zalophus californicus*), Pacific Harbor Seal (*Phoca vitulina*), and Northern fur seal (*Callorhinus ursinus*). No breeding by any of these species has ever been documented on the island. Post breeding and non-breeding sea lions of both species use the site regularly in summer, harbor seals infrequently haul out there, and fur seals are rare visitors; only one has ever been detected on the island (CCR 2001).

Steller sea lions are present on Northwest Seal Rock from at least April through mid-October with greatest numbers in June and July (CCR 2001). During the 1997-2000 study, numbers of

Steller sea lions were very low in April, but increased during May to a mean of 87 animals (range = 20-186, N= 4 counts). Maximum counts are 355 animals in late June (CCR 2001) and 354 in July (NMFS, Table 1). Numbers apparently drop back to relatively low levels by early fall. In September-October, 1998, 55-56 Steller sea lions were present. Winter use is presumed to be minimal, due to inundation of the natural portion of the island by large swells.

There is a Steller sea lion rookery at the southern end of the St. George Reef on an island known as Southwest Seal Rock, about 4 km south of the project site. A portion of the sea lion population using the lighthouse island 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. Pups have not been detected on Northwest Seal Rock during the July aerial photo surveys (M. Lowry, NMFS, SWFSC, unpubl. data). Occasional birthing appears to take place at the haulout at St. George Reef Lighthouse. One recently born pup was seen on the island in 1991 (*in* CCR 2001) and one newborn was observed from the lighthouse during the site visit by NMFS on 13 May 2005 (M. DeAngelis, NMFS, pers. comm.). The pup was abandoned by its mother and later died.

Table 2. Steller sea lion count data for the St. George Reef and Castle Rock, July 5-17, 2000-2004. Preliminary data from M. Lowry, National Marine Fisheries Service, Southwest Fisheries Science Center.

	2000	2001	2002	2003	2004
NW Seal Island	334	335	175	220	354
SW Seal Island non-pups	532	455	541	583	738
SW Seal pups	293	338	367	458	444
Castle Rock	12	66	692	100	918

California sea lion abundance at Northwest Seal Rock appears to be highly variable, with populations building in May and declining by August. The highest count was 541 individuals in June, but this was during the 1998 El Nino event, and is probably not representative of more normal conditions. During May, numbers have ranged from 10-154 (mean= 81; N= 4). Recent counts by NMFS in July (2000-2004) have been very low. The total numbers of California sea lions recorded in 2000 and 2003 were 3 and 11, respectively (M. Lowry, NMFS, SWFSC unpubl. data).

Harbor Seals were observed on NW Seal rock only once in 20 surveys during 1997-2000 (CCR 2001). Six individuals were counted in August 1998. One northern fur seal was seen on the island, in October 1998 (CCR 2001).

A previous IHA issued in 2010 required the SGRLPS to conduct a pre-restoration and post-restoration aerial survey of all marine mammals hauled-out on NWSR for each session.

On February 26, 2010, the SGRLPS' photographed the haulout areas on the initial approach to NWSR at an altitude of 900 m (2,953 ft). During the approach, the photographer observed no animals hauled out on NWSR. The SGRLPS observed no animals hauled on NWSR during the two-day restoration session and no pinnipeds were present during the helicopter's February 28th departure flight to the mainland.

On April 9, 2010, the SGRLPS' photographed the haulout areas on the initial approach to NWSR at an altitude of 900 m (2,953 ft). Similar to the February session, the photographer observed no animals hauled out on NWSR during approach. The SGRLPS observed no animals hauled on NWSR during the three-day restoration session and no pinnipeds were present during the helicopter's April 11th departure flight to the mainland.

(4) A description of the status, distribution, and seasonal distribution (when applicable) of the affected species or stocks of marine mammals likely to be affected by such activities

A. Steller Sea Lion.
Steller sea lions range along the North Pacific rim from northern Japan to California and are divided into two distinct stocks (NMFS 2005). The project site occurs in the range of the eastern stock, which includes the population along the coast from central California north to Cape Suckling, in southeast Alaska. Both the eastern and western stocks were listed as federally Threatened in 1990 (55 FR 49204); the western stock was subsequently upgraded to Endangered status in 1997. The species is also listed as "depleted" under the U.S. Marine Mammal Protection Act and is classified as a "strategic" stock.

The eastern stock of Steller sea lions has been relatively stable to increasing over the past few decades with variation in trends at different sites (NMFS 2005). Numbers have decreased at the southern extent of the range in southern and central California, but have increased in northern California and Oregon (NMFS 2005, Robin Brown, Oregon Department of Fish and Wildlife (ODFW), pers. comm.). The minimum population estimate for the eastern stock is 43,728 (NMFS 2005).

The nearest Steller sea lion breeding area relative to the project site is at Southwest Seal Rock (41^0 49'00" N, 124^0 21'00" W). The rookery comprises a significant portion of the California total, and numbers of pups born there have ranged from 293 to 444. The population at the site has been increasing at an annual rate of about 4% since the mid 1970's (Robin Brown, ODFW; Table 1).

Steller sea lions are not known to migrate, but may disperse widely outside the breeding season. There appears to be a post-breeding movement of females and pups to haulouts in the vicinity of Southwest Seal Rock, including Northwest Seal Rock, Castle Rock NWR and associated shoals (M. Lowry, NMFS, unpubl. data; CCR 2001). Monthly surveys during 1998 indicated that pups first showed up at Northwest Seal Rock in August (CCR 2001). Steller Sea lions are present at Castle Rock year round (Jaques and Strong 1995; unpubl. data). Numbers of Steller sea lions are presumed to be low during winter at Northwest Seal Rock, although data are lacking. Data from July aerial surveys suggests that use of Northwest Seal Rock as a post-breeding haul out has been persistent with no apparent trend since 2000 (Table 1).

B. California Sea Lion

California sea lions range from southern Mexico to British Columbia, Canada. The U.S. stock was most recently estimated at 138,881 animals (NMFS 2006). The population has experienced an annual growth rate of approximately 6% since at least 1975. The species is not listed under the Endangered Species Act and is not "depleted" or listed as "strategic" stock under the MMPA.

California sea lions breed at large rookeries on the Channel Islands in southern California, and on both sides of the Baja California peninsula. No established rookeries are known north of Point Reyes, California, but large numbers of subadult and non breeding or post-breeding male California sea lions are found throughout the Pacific Northwest. There is a mean seasonal pattern of peak numbers occurring in the northwest during fall, but local areas show high annual and seasonal variability.

Northwest Seal Rock counts varied greatly during 1997-2000, from 0 to 540 animals. Spring (April-May) counts averaged 70 animals (n=6), summer counts (June- August) averaged 154 (n=12), and fall 1998 counts were of 214 and 255 animals (CCR 2001).

C. Harbor Seal

The eastern North Pacific subspecies of harbor seal (*P.v. richardsi*) ranges from Baja, California, Mexico to the Pribilof Islands in Alaska. These seals occur in nearshore coastal and estuarine habitats. The California stock was most recently estimated at 31, 600 animals and may have reached its environmental carrying capacity (NMFS 2006). They are not listed under the Endangered Species Act and are not considered "depleted" or "strategic" under the MMPA.

Breeding takes place at many locations and rookery size varies from a few to many hundreds of pups at rookeries. The nearest pupping location relative to the project site is at Castle Rock shoals.

Northwest Seal Rock is not an important haulout site for harbor seals, and it is not a rookery. This is likely due to its distance offshore, relatively steep topography and full exposure to swells and seas. Harbor seals were seen on only 1of 20 CCR surveys of the island (CCR 2001).

D. Northern Fur Seal

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 United States, but individuals occasionally come ashore on islands well offshore (*i.e.*, Farallon Islands and Channel Islands in California). One male was seen on Northwest Seal Rock in October 1998. It is possible that a few animals may use the island more often that indicated by the CCR surveys, if they were mistaken for other otariid species.

(5) The type of incidental taking authorization that is being requested (i.e., takes by harassment only; takes by harassment, injury and/or death) and the method of incidental taking

This is an application for an Incidental Harassment Authorization for take of pinnipeds by SGRLPS activities at St. George Reef Lighthouse on Northwest Seal Rock. The type of take expected is harassment of pinnipeds during helicopter landings and takeoff from the island. Harassment may be caused by pinnipeds temporarily moving from the rocks and lower structure

of the lighthouse into the sea due to the noise and appearance of helicopter during approaches and departures. No injury or death is expected, due to controlled helicopter approaches (see below) and the small size of the island, which gives the animals relatively instant access to the water.

For those pinnipeds that return to the lighthouse island during restoration activities, no disturbance response has been observed due to the presence of people on or in the lighthouse structure. In addition, people can not access the platform at the base of the lighthouse or the natural rock of the island, unless there is an emergency situation.

(6) By age, sex, and reproductive condition (if possible), the number of marine mammals (by species) that may be taken by each type of taking identified in paragraph (a)(5) of this section, and the number of times such takings by each type of taking are likely to occur

A. During the proposed normal window of operations (November 1 - April 30) an estimated 0-60 Steller sea lions may be disturbed in varying degrees by helicopter activity at the lighthouse. In the event of an emergency trip to the lighthouse for repairs in summer, more Steller sea lions may be present (up to 350-400 animals) and a portion of these are expected to respond to helicopter disturbance. An observed range of 0-40% of all pinnipeds present of the island was temporarily displaced due to helicopter landings in 1998. Data suggested that the majority of these animals returned to the island, once helicopter activities ceased, over a period of minutes to 2 hours (Fig. 1).

An estimated maximum of up to 25 older, but still nutritionally dependent, Steller sea lion pups and their mothers may be present at Northwest Seal Rock and affected by helicopter trips in the fall. Pups are mobile on land and fully capable of swimming to and from the island once they are at Northwest Seal Rocks. No long term separations between mothers and pups are anticipated due to the brief nature of the disturbance events. A female was observed nursing a pup during one landing in 1998 (CCR 2001). All other age and sex classes present may also be temporarily affected.

California sea lions, primarily sub-adult males, are likely to be disturbed by some of the helicopter activities on the island. A range of 0-200 non-breeding animals may be present and potentially disturbed in a given day during normal (non-El Nino) years (CCR 2001).

Harbor seals rarely occur on the project site and no pupping takes place on the island. No harbor seals have been seen during the normal window of operations, thus no impact is expected from restoration or light maintenance. An emergency visit to the island in summer to repair the light could affect up to 6 adult Harbor seals.

The presence of a Northern Fur Seal on the project site is expected to be very rare. Helicopter activities may disturb up to one adult, migrating, fur seal per year in the unusual case that there was overlap of a fur seal and human activity at the island.

Table 2. Authorized Take Numbers for Each Species on Northwest Seal Rock

Species	Estimate of Take

Steller sea lion *(Eumetopias jubatus)* Eastern Distinct Poyuiation Segment……..172
California sea lion *(Zalophus californianus)* ……..204
Pacific harbor seal *(Phoca vitulina)* ……36
northern fur seal *(Callorhinus ursinus).*…….. 6

B. Number of times that each type of taking is likely to occur.

The only type of taking expected is displacement into the water. The pinnipeds on Northwest Seal Rock appear to show rapid habituation to helicopter landing and departure (CCR 2001, Guy Towers, SGRLPS, pers.comm). While up to 40% of the 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 0% have flushed on subsequent landings on the same date (Fig. 1). However, it is likely that up to 100% of the seals will be flushed during the entire series of helicopter landings. Data collected in 1998 indicated that relatively few animals responded to the disturbance when helicopter landings occurred at short intervals (Fig. 2). The estimated 10 landings, at relatively short intervals, on a given restoration or tourism date may be considered as one bout of "taking" with variable impacts on each landing.

1) Light maintenance will occur at least once, but no more than twice, in one year between November 1 and April 30. The light maintenance will occur in conjunction with restoration activities described in number 1.
2) Emergency maintenance may be necessary. If the emergency work occurs during the work window, it is expected that 0-4 incidents during the three year period may occur. If emergency work is necessary outside of the work window, from May I-October 31, the SGRLPS will contact NMFS-SWR and USCG immediately and prior to, beginning any emergency as this action is not covered by this biological opinion.

3) One to two day bouts of restoration activity, including helicopter landings that may cause taking, are expected to occur as many as 18 times (6 months, 1-3 day trips per month) per season during November 1- April 30). This will terminate in approximately two years and be replaced by a lesser degree of routine maintenance no more than 2 maintenance trips per year).
4) Light maintenance will occur at least once, if not twice, in one year between November 1 and April 30. The light maintenance will occur in conjunction with restoration activities described in number 1.
5) Emergency maintenance will occur only as necessary from May 1-September 30. The expected number of taking events from this activity is 0 to 4 incidents. If emergency work is necessary outside of the work window, from May I-October 31, the SGRLPS will contact NMFS-SWR and USCG immediately and prior to, beginning any emergency as this action is not covered by the incidental harassment authorization or biological opinion.

(7) The anticipated impact of the activity upon the species or stock

It is expected that all or a portion of the marine mammals hauled out on the island will depart the rock and move into the water upon initial helicopter approaches (CCR 2001). The movement to the water is expected to be gradual, as opposed to a stampede, due to the disturbance minimization approach technique (see 11), small size of the aircraft, relatively quiet rotors, and

behavioral habituation on the part of the animals, as helicopter trips continue throughout the day. During bouts of helicopter activity some animals may be temporarily displaced from the island and either raft in the water or relocate to other haulouts. Most animals are expected to return soon after helicopter activities cease for that day. The long term effect on the island as a non-breeding haulout is expected to be negligible. NMFS annual survey data from 2000-2004 does not indicate a negative trend in use of the site during the last five years of lighthouse restoration and tourism activities.

(8) The anticipated impact of the activity on the availability of the species or stocks of marine mammals for subsistence uses

Not Applicable.

(9) The anticipated impact of the activity upon the habitat of the marine mammal populations, and the likelihood of restoration of the affected habitat

There are no long or short term physical impacts on the habitat. All restoration activities occur on the upper levels of the lighthouse that are not used by marine mammals. All waste and discarded materials and equipment are removed from the island after each visit.

(10) The anticipated impact of the loss or modification of the habitat on the marine mammal populations involved

There will be no physical impact on habitat.

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

A. Window of normal operations limitation. By restricting helicopter flights to November 1 to April 30, harassment impacts will affect a lower number of pinnipeds. Also, it is expected that any Steller sea lion pups present at the site will be at least 3 months of age and agile on land and in the ocean, thereby minimizing the risk of injury.

B. Helicopter approach and timing techniques.

1) The most severe impacts (stampede) are precipitated by rapid and direct helicopter approaches. By making the initial approach to one side of the island at higher altitude (e.g., 800-1,000 ft), then circling lower, and making the final approach from the northwest, where density of pinnipeds tends to be lower, adverse impacts can be minimized.
2) Sea lions have shown habituation to helicopter flights within a day at the project site. By clustering helicopter arrival/departures within a short time period, animals are expected to show less response to subsequent landings.

C. Avoidance of visual and acoustic contact with people on island. Tourists, SGRLPS members, and restoration crews will be instructed to avoid unnecessary noise and not expose themselves visually to pinnipeds around the base of the lighthouse. Although no impacts from these activities were seen during the CCR study, it is relatively simple to avoid this potential impact.

The door to the lower platform (which is used at times by pinnipeds) will remain closed and barricaded to all tourists and other personnel. The door will only be opened when necessary and at a time when no animals are present on the lower platform.

D. 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.

(12) Where the proposed activity would take place in or near a traditional Arctic subsistence hunting area and/or may affect the availability of a species or stock of marine mammal for Arctic subsistence uses, the applicant must submit either a plan of cooperation[9] or information that identifies what measures have been taken and/or will be taken to minimize any adverse effects on the availability of marine mammals for subsistence uses.

Not Applicable

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

To describe the abundance, species composition, and age/sex categories of pinnipeds using Northwest Seal Rocks, and to measure the amount and severity of any impacts from SGRLPS activities, an experienced biologist will be present on a sample of visits to the island. This observer will be able to identify all species of pinnipeds expected to use the island, and qualified to determine age and sex classes when viewing conditions allow. Impacts will be quantified by number and species of animals flushed; the proportion of the total that flush; and the nature of flushing (*e.g.*, stampede, active departure, slow displacement). Pinniped response will be analyzed with respect to the frequency of landing activities. Using these methods, modifications to island visitation with respect to timing and approach may be implemented to further reduce impacts.

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. Aerial photo coverage of the island will be completed from the same helicopter used to transport SGRLPS personnel to the island during restoration of tourist trips during a sample of visits. Photographs of all marine mammals hauled out on the island will be taken at an altitude greater than 300 meters, prior to the first landing on each visit included in the monitoring program. Photographic documentation of marine mammals present at the end of the day will also be made for a before and after comparison. These photographs can be made available to NMFS or other marine mammal experts for inspection and further analysis.

Monitoring frequency is expected to be determined through consultation with NMFS as a condition of this requested permit.

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

SGRLPS visits to the Northwest Seal Rock site provide an opportunity for research and coordination of effort with research and management entities. Population data from aerial surveys, evaluation of helicopter impacts, and means of minimizing effects on pinnipeds can be shared with the Oregon Dept. of Fish and Wildlife (ODFW), USFWS, NMFS and others. If additional funding is obtained, further research objectives may be achieved. Examples of this include potential use of remote cameras to help with regional assessments of seasonal pinniped distribution, movement patterns, and habitat use, in coordination with long-term monitoring being conducted at Southwest Seal Rock by ODFW and NMFS.

REFERENCES

Brown, Robin. Personal Communications. Oregon Department of Fish and Wildlife. Wildlife Diversity Program. Newport, Oregon.

Carter, H.R., G.J. McChesney, D.L. Jaques, C.S. Strong, M.W. Parker, J.E. Takekawa, D.L. Jory, and D.L. Whitworth. 1992. Breeding populations of seabirds in California, 1989-1991. Draft Final Report to the USFWS.

Crescent Coastal Research. 2001. Wildlife use of the Saint George Reef Lighthouse: An assessment of potential impacts and recommendations for lighthouse visitation. Unpubl. report to the St. George Reef Lighthouse Society. 14 p.

Jaques, D.L. and C.S. Strong. 1995. 1995 Survey of northern elephant seals and other pinnipeds at Castle Rock National Wildlife Refuge. Unpubl. report to the USFWS and ODFW, Wildlife Diversity Program, Newport, Oregon. 7 pp.

Lowry, Mark. Unpubl. Data. NOAA, NMFS, Southwest Fisheries Sciences Center, La Jolla, California.

National Marine Fisheries Service. 2006. U.S. Pacific marine mammal stock assessments: 2005. NOAA Tech. Memorandum NOAA-TM-NMFS-SWFSC-388

National Marine Fisheries Service. 2005. U.S. Pacific marine mammal stock assessments. Alaska Fisheries Science Center.

Towers, Guy. Personal Communications. President, St. George Reef Lighthouse Preservation Society. Crescent City, CA.

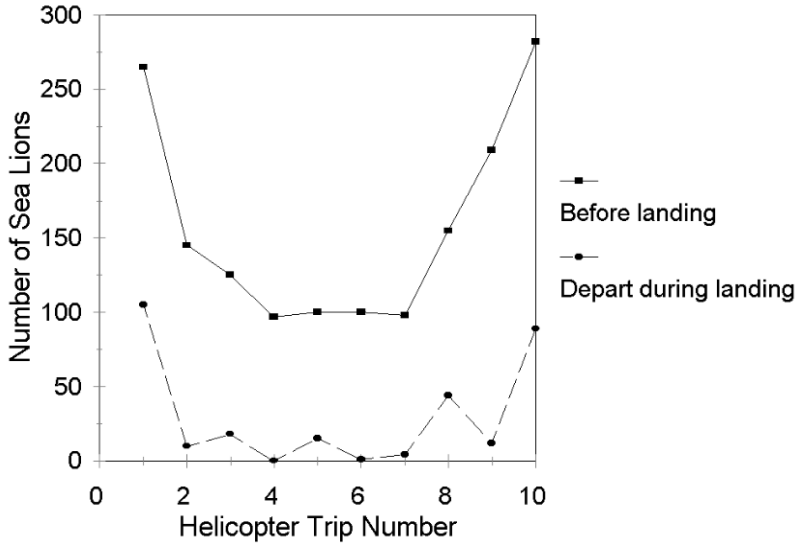

Figure 1. Numbers of pinnipeds hauled out at Northwest Seal Rock throughout a series of helicopter landings at the lighthouse during restoration activities on October 17, 1998; 0925-1515. Data are from CCR (2001). Shown are the number of sea lions present immediately before a landing and the number of those that moved into the water, apparently in response to the helicopter, during the landing. Most of the animals present were California sea lions.

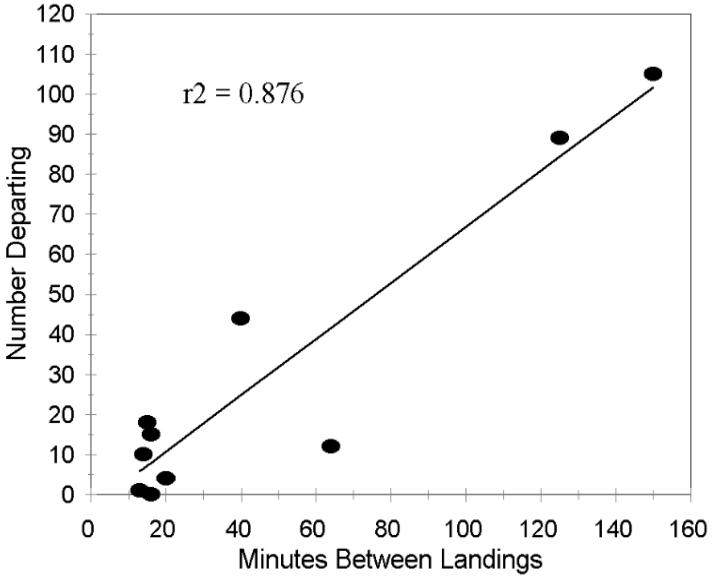

Figure 2. Relationship between numbers of pinnipeds departing in response to helicopter landings and minutes between landings. Data are from CCR (2001).