

**Appendix D2**  
**Restore Alcids to Santa Barbara Island**

## **D2.1 GOALS AND NEXUS TO INJURY**

The goal of this 5-year action is to re-establish an active Cassin's auklet breeding population on Santa Barbara Island through social facilitation and habitat improvement, and to improve recruitment and productivity of Xantus's murrelets through the installation of artificial nest boxes and habitat improvement. Eggshell thinning and/or elevated levels of DDT were documented in eggs of the Cassin's auklet and Xantus's murrelet in the Southern California Bight (SCB) (Kiff 1994, Fry 1994). Section 5.1.1 provides a detailed description of seabird nexus.

## **D2.2 BACKGROUND**

The Channel Islands are critical nesting habitat for seabirds in the SCB. Santa Barbara Island is the smallest of the Channel Islands, measuring 2.6 square kilometers (km<sup>2</sup>) (1 square mile [mi<sup>2</sup>]) in size. This island is within the Channel Islands National Park and is owned and managed by the National Park Service (NPS). The vegetation communities contain a mixture of grass and shrublands, and eight community types have been identified (Hochberg et al. 1979). Habitat modification and degradation on Santa Barbara Island has been severe in the past due to human activities such as farming, burning, and livestock grazing. Vegetation and soil changes from non-native grazing mammals and past agricultural practices likely led to a large historical decline in seabird populations and may have caused an increase in the number of deer mice on the island (Murray et al. 1983). The endemic deer mouse is a known predator of seabird eggs on Santa Barbara Island (Murray et al. 1983). Seabirds were also severely affected by cats that were brought to Santa Barbara Island in the late 1800s. An effort to eradicate cats from the island was under way by the 1950s, and the last cat was removed in 1978 (Murray et al. 1983).

### **D2.2.1 Cassin's Auklets**

In 1897, Cassin's auklets bred in large numbers on Santa Barbara Island (Grinnell in Hunt et al. 1979). However, cats decimated this population and by 1908 no signs of the species were seen (Howell 1917). A trip to the island in 1911 revealed only bones and feathers of auklets all over the island, and the observer concluded "that they had been exterminated by the cats with which the island is infested" (Willett in Hunt et al. 1979). Recent surveys have demonstrated that this colony has not recovered from the impacts of cat predation (Carter et al. 1992).

In 1991, Cassin's auklets persisted in small numbers on the offshore islet of Sutil Island and in a bluff at Elephant Seal Point on Santa Barbara Island (Carter et al. 1992). A few Cassin's auklets were regularly observed on Elephant Seal Point throughout the early to mid-1990s (Martin, pers. com., 2003). In 1999, a survey of Sutil Island was carried out to specifically capture Cassin's auklets. This effort resulted in the capture of five individuals (Martin, pers. com., 2003). However, recent surveys have not documented Cassin's auklets at Sutil Island, and it is possible they no longer breed at Santa Barbara Island (Martin, pers. com., 2003).

### **D2.2.2 Xantus's Murrelets**

The worldwide breeding range of the Xantus's murrelet is restricted to the Channel Islands and the west coast of Baja California, Mexico. Currently there are only 12 nesting islands scattered

along 500 miles of coastline (Burkett et al. 2003). The Xantus's murrelet population is highly concentrated, with approximately 82 percent of the population breeding on five islands/island groups (Santa Barbara, Anacapa, the Coronado Islands, San Benitos, and Guadalupe). Historical accounts and literature from the 1940s indicates that Xantus's murrelets were much more abundant at that time than today (Burkett et al. 2003). Currently, the Xantus's murrelet is considered an uncommon species, with approximately 3,460 breeding birds in California and less than 10,000 birds worldwide (Burkett et al. 2003). In light of the small breeding population and documented population decline of the species, the California Fish and Game Commission made a finding in February 2004 to list the Xantus's murrelet as a state threatened species under the California Endangered Species Act. This listing was finalized in June 2004. In addition, the Xantus's murrelet was identified as a candidate species in May 2004 for listing as a federally threatened species under the Endangered Species Act.

Little historical information exists on the size of the Xantus's murrelet population on Santa Barbara Island prior to the introduction of cats in the late 1800s. Similar to Cassin's auklets, this species was preyed upon by cats (Sumner and Bond 1939), and likely only persisted in small numbers on Sutil Island and inaccessible cliffs on Santa Barbara Island. Research from the 1970s to 2001 documented a decline in murrelet numbers on Santa Barbara Island. Surveys conducted on Santa Barbara Island from 1975 to 1978 estimated the number of breeding murrelets to be 3,000 (Hunt et al. 1979, Hunt et al. 1980). Surveys conducted in 1991 estimated 1,402 breeding birds (Carter et al. 1992). In 2001, surveys were again conducted to reassess the nesting population of murrelets on Santa Barbara Island. Results from this study showed a 14 percent decline in the number of active nest sites in 2001 compared to the 1991 survey. Monitoring has also documented that nest site occupancy rates have declined from approximately 35 to 70 percent in the mid-1990s to 30 percent or less since then (Wolf et al. 2000). The loss of some of these nest sites has been attributed to a reduction in shrub cover (Wolf et al. 2000).

Despite this marked decline, Santa Barbara Island has the most important colony of Xantus's murrelets within the Channel Islands National Park. This island supports 51 percent of the Xantus's murrelet population in California (Burkett et al. 2003). The Xantus's murrelet population on Santa Barbara Island is essential to the long-term survival and recovery of this species within its limited range. Efforts to increase this population on Santa Barbara Island is one focus of this proposed restoration action.

### **D2.3 PROJECT DESCRIPTION AND METHODS**

The goal of this action is to facilitate the recovery of the Cassin's auklet and Xantus's murrelet on Santa Barbara Island. This action will improve nesting habitat for Cassin's auklets and Xantus's murrelets on Santa Barbara Island by removing exotic vegetation from nesting areas and revegetating the area with native plants. Vocalization playback systems will be used to attract Cassin's auklets to suitable nesting areas to re-establish the auklet colony. Also, artificial cavities and nest boxes will be installed for both Cassin's auklets and Xantus's murrelets to provide a stable and secure nesting area to improve productivity and assist in monitoring efforts. This habitat restoration and social attraction efforts aim to: (1) increase recruitment, (2) increase reproductive output, and (3) decrease egg and chick mortality by providing safe breeding habitat.

Several areas will likely be targeted for attracting Cassin's auklets, including the hillside behind the NPS Ranger Station and the summit and southeastern bluffs of Signal Peak. Within these

areas, exotic vegetation will be removed and native plants installed to restore the area. Native plants such as tree sunflower (*Coreopsis gigantea*), buckwheat (*Eriogonum giganteum compactum*), and purple needlegrass (*Nacella pulchra*) will be used. The removal of exotic vegetation and planting of native plants will be done during the non-breeding season to avoid impacts to nesting birds.

Once the site is prepared, vocalization playback systems will be used to attract auklets. Nest boxes will be made for Cassin's auklets and will be placed in each target area. Artificial nest sites will be insulated against the elements (heat being more of a concern than cold) with dirt, sand, or rocks depending on the topography.

In addition to habitat enhancement, nest boxes will be made specifically for Xantus's murrelets. These nest boxes will provide a secure nesting area for this species with the goal of increasing recruitment and reproductive output.

NPS will complete additional planning, review, and environmental compliance before implementation of this action.

## **D2.4 ENVIRONMENTAL BENEFITS AND IMPACTS**

### **D2.4.1 Biological**

#### *Benefits*

By providing additional high-quality breeding habitat, this action seeks to re-establish a historic breeding colony of Cassin's auklets and aid in the recovery of the threatened Xantus's murrelet. The combination of habitat restoration and nest boxes will provide a favorable environment for both Cassin's auklets and Xantus's murrelets on Santa Barbara Island. In Northern California, nest boxes have enhanced the population growth rate of several cavity-nesting alcid species at various sites by increasing recruitment of breeding-age birds, improving productivity, and decreasing mortality (Sydeman et al. 2000). The use of playback systems will further facilitate the recolonization of the Cassin's auklet on the island. These techniques should increase the number of breeding pairs of Cassin's auklets and Xantus's murrelets on the island, thereby increasing the number of offspring produced. This action will restore critical seabird nesting habitat in the Channel Islands, as well as aid in the recovery of this important Xantus's murrelet colony. By re-establishing the historical colony of Cassin's auklets and increasing the number of breeding pairs of Xantus's murrelets, this action will have long-term benefits to these species.

#### *Impacts*

This action is expected to have minimal short-term biological impacts. The removal of exotic vegetation and the planting of native plants will be done during the non-breeding season to avoid impacts to nesting birds. There will be additional human activity on Santa Barbara Island as a result of this action that could result in temporary displacements of native wildlife or the trampling of native plants. However, it is expected that any impacts will be short term and minimal. If it is determined that herbicides are necessary for plant removal, they will be applied in a manner that avoids or minimizes adverse impacts and is in compliance with NPS policies.

Subsequent monitoring may temporarily disturb target species; however, the use of nest boxes will minimize such impacts to nesting alcids.

#### **D2.4.2 Physical**

##### *Benefits*

Restoration of native plants could have long-term benefits to the physical environment of Santa Barbara Island by stabilizing the soil and decreasing erosion.

##### *Impacts*

This action may result in short-term, minimal impacts due to trampling and increased soil erosion.

#### **D2.4.3 Human Use**

##### *Benefits*

This action will have no known benefits to cultural resources, recreation, aesthetics, transportation, or human health and safety.

##### *Impacts*

This action will have no known impacts to cultural resources, recreation, aesthetics, transportation, or human health and safety. Cultural resources will be avoided on the island during project implementation. It is expected that the nest boxes will be largely screened by vegetation and will not be visible to the public.

### **D2.5 LIKELIHOOD OF SUCCESS/FEASIBILITY**

Social attraction techniques, including the use of vocalization playback systems, have been successfully used for a variety of seabirds throughout the world. The use of artificial nest boxes has also proven to be successful for alcids such as the Cassin's auklet. Experts in the field of social attraction will be consulted during project planning and implementation to ensure that vocalization playback systems and artificial nest sites are designed in a manner that maximizes project success. This action will be determined to be successful when Cassin's auklets and/or Xantus's murrelets begin occupying the newly created nesting habitat.

Moderate operations and maintenance will be required for this action. Minimal maintenance is expected for cleaning and repair of nest boxes. The revegetation area may require periodic removal of exotic plants. Benefits are anticipated to be self-sustaining after project implementation.

## D2.6 PERFORMANCE CRITERIA AND MONITORING

To quantify the efficacy of the restoration efforts, a minimum of four years of monitoring is proposed. Monitoring protocols for birds nesting in artificial cavities will follow those established by experts in the field of seabird ecology. A monitoring plan will be developed to allow the Natural Resource Trustees for the Montrose case (Trustees) to evaluate the success of the restoration efforts by collecting simultaneous information on reproductive success, site occupancy, and mortality. Due to the State threatened status and sensitivity to disturbance of Xantus's murrelets, no adults of this species will be handled.

## D2.7 EVALUATION

Santa Barbara Island supports the largest colony of Xantus's murrelets in California. This island also at one time supported a sizable population of Cassin's auklets before the colony was decimated by cats. Because these colonies have not recovered from past impacts, creation of additional nesting habitat is expected to result in a long-term measurable increase in the number of Xantus's murrelets and Cassin's auklets on Santa Barbara Island.

The Trustees have evaluated this action against all screening criteria developed to select restoration actions and have concluded that this action is consistent with the selection factors. The Trustees determined that this type and scale of action will effectively provide long-term benefits to the Cassin's auklet and Xantus's murrelet. Both of these seabirds are priority species for restoration. This action will create high-quality seabird nesting habitat and aid in the recovery of these species.

## D2.8 BUDGET

*Year 1 costs (allotment of costs across categories may change):*

- Labor  
(wildlife biologists, housing, etc.).....\$88,000
- Supplies (nest boxes, playback systems) .....\$30,000
- Transportation (boat, personnel).....\$20,000
- **Estimated total, year 1.....\$138,000**

*Years 2–5 Costs:*

- Labor  
(wildlife biologists, enforcement support).....\$88,000
- Supplies  
(nest box replacement/maintenance, etc.).....\$15,000
- Transportation (boat, personnel).....\$13,000
- Estimated per year cost.....116,000
- **Estimated total, years 2–5 .....\$464,000**
- **Estimated total costs, years 1–5 .....\$602,000**