



Full Proposal Project Narrative

Instructions: Save this document on your computer and complete the narrative in the format provided or you may submit your project narrative in a different format if preferable, but note that any project narrative submitted must contain all of the information requested below. The final narrative should not exceed eight (8) pages. Once complete, upload your project narrative into the on-line application as instructed.

1. Abstract (1 page maximum): Provide a brief description of the project, including its primary work components, the conservation need for the project, the degree of conservation urgency (if any) addressed by the project, and the project's objectives and expected outcome(s).

Half of the world's population of **ashy** storm-petrels (*Oceanodroma homochroa*) breeds on the South Farallon Islands. This IUCN endangered species has declined substantially in recent decades. This decline is in part attributed to the fact that several hundred storm-petrels are being killed each year as result of the presence of invasive house mice (*Mus musculus*). The U.S. Fish and Wildlife Service (USFWS), Island Conservation, and PRBO Conservation Science are developing an EIS for house mouse eradication from the Farallones to protect the ashy storm-petrel and other native species. We are requesting funding to research techniques to address possible non-target impacts associated with certain action alternatives that are being developed to eradicate house mice, including aerial broadcast of bait pellets containing rodenticide. Hazing of wildlife is a widely used tool to move animals away from dangerous or undesirable locations. We propose to test different hazing techniques on the South Farallon Islands to determine the most effective and cost efficient methods to move western gulls (*Larus occidentalis*), other gulls, and shorebirds off of the islands and thereby minimizing the probability they would come into contact with the rodenticide. Developing informed mitigation techniques is a critical step toward a project that will achieve long-term conservation outcomes that include reduced mortality and an increased global population size of ashy storm-petrels. Immediate outcomes include the technical knowledge to inform land management agencies and the public on mitigation techniques that minimize non-target impacts to the greatest extent possible.

2. Conservation Outcome(s): Please elaborate on the short-term and long-term conservation outcomes expected from the project (which were likely summarized in the Abstract), including what makes them achievable and important.

Short-term conservation outcomes include acquiring the necessary technical knowledge to minimize non-target impacts of house mouse eradication from the South Farallon Islands. Long-term project outcomes include significant Farallon ecosystem recovery, reduced ashy storm-petrel (*Oceanodroma homochroa*) mortality rate, and increased ashy storm-petrel global population size. Additional long-term outcomes include improving techniques for hazing gulls and other marine birds that can be used during oil spills to reduce numbers of birds that come into contact with the oil.

The South Farallon Islands support the largest and most diverse seabird colony in the contiguous United States, with nearly 200,000 breeding individuals, as well as **five** species of marine mammals. Unfortunately, house mice (*Mus musculus*) were introduced to the South Farallon Islands by early human occupants during the 19th century. Over time, this has caused considerable damage to the Farallon ecosystem. On the South Farallon Islands, introduced house mice (*Mus musculus*) are indirectly impacting the survivorship of burrow-nesting seabirds, especially the ashy storm-petrel, a small, nocturnal, secretive species (Ainley and Boekelhide 1990; Sydeman et al. 1998; Pyle 2001). Half of the world population of ashy storm-petrels breeds on the South Farallones. This IUCN endangered species has experienced a substantial population decline in recent decades

(Sydeman et al. 1998). This decline is in part attributed to the fact that several hundred petrels are being killed each year by wintering burrowing owls, which are attracted to the islands by the abundance of invasive mice.

The presence of invasive mice on many islands throughout the world has resulted in direct and indirect impacts to nesting seabirds, eggs and chicks. House mice on the Farallones not only impact the ash storm-petrel and other seabirds, but also native plants and island endemics such as the Farallon camel cricket (*Farallonophilus cavernicola*) and Farallon arboreal salamander (*Aneides lugubris farallonensis*). Furthermore, invasive house mice have recently been identified as vectors of diseases that have caused mass mortalities of marine mammals in island populations of fur seals (de Bruyn et al. 2008).

Given the documented impact of house mice, the USFWS is reviewing alternatives to eradicate this invasive species from the South Farallon Islands. Certain action alternatives currently being developed involve the use of pellets containing rodenticide that would be spread throughout the island. In addition to mice, these poisonous pellets may be ingested either primarily or secondarily by other non-target species such as western gulls (*Larus occidentalis*), other gull species, and shorebirds. We are requesting funds to assess potential methods to minimize the risk posed to non-target bird species. Specifically, we will test different tools to haze gulls and other birds from the Farallon Islands to reduce the risk they will come into contact with the rodenticide.

The goal of the proposed hazing trial is to determine which techniques are most effective at hazing gulls off the South Farallon Islands and keeping them off the island during the period of risk to rodenticide ingestion. We will:

- Establish which hazing techniques are most effective for hazing gulls;
- Estimate the personnel, equipment, and materials needed to safely and effectively haze gulls for extended periods;
- Determine the effective distances for the various techniques and tools;
- Assess which methods are most appropriate in the different areas of the South Farallon Islands
- Observe gulls and ascertain where they retreat to when hazed (i.e. do they leave the South Farallon Islands or return to land elsewhere on the islands); and
- Observe marine mammals and document behavioral reactions to bird hazing.

This project will provide implementing agencies with realistic and achievable mitigation techniques to use during a house mouse removal from the Farallones. Project results are critical to implementing an eradication that 1) reduces impacts to native species and 2) raises public awareness and support for invasive rodent eradications that protect native species and ecosystems. Reducing non-target impacts of rodent eradication is one aspect of a vital project to protect the rare ash storm-petrel, which relies on terrestrial predator-free islands to breed.

3. Activities: Provide a work plan of key activities (including any activities that will be performed by subcontractors) to achieve project outputs and outcomes, and an implementation timeline for conducting those activities.

Hazing of birds, including gulls, is a common activity around airports and refuse dumps in California. We have already reviewed the most effective tools that are used in these situations and plan to test the most appropriate ones on the South Farallon Islands. These include: lasers, spotlights, pyrotechnics, biosonics, predator calls, air cannons, Mylar tape, small helicopter, human presence, kites, radio-controlled aircraft, and possibly trained dogs (with proper certification/vaccination records). We will partner with agencies experienced with hazing gulls in other situations and build upon their staff's valuable field experience, specifically Office of Spill Prevention and Response (OSPR) and USDA Wildlife Services.

Although the proposed mouse eradication would likely be carried out during the fall when most seabirds are absent from the South Farallon Islands, some western gulls, other species of migrant gulls, and certain shorebirds such as black oystercatchers (*Haematopus bachmani*) would occur on the island at this time. These gulls would be at risk of exposure to the rodenticide. To minimize the risk of exposure, the USFWS wants to develop mitigation to be included as part of the alternatives under consideration to eradicate house mice. This proposal is requesting funds to develop a bird hazing program as mitigation for risks to non-target bird species, primarily western gulls, during the mouse eradication.

A small scale trial of several hazing techniques was conducted on the South Farallon Islands in January 2011 by Island Conservation, USDA-APHIS, and PRBO Conservation Science. This trial tested a suite of already established hazing tools to determine their efficacy on the South Farallon Islands. While providing valuable information, this trial was limited in scope and duration due to limited funding. Thus, it is necessary to test hazing techniques more thoroughly, focusing on testing the capacity to move large numbers of gulls and keep them off for extended periods across all of the South Farallon Islands.

Over a period of three weeks beginning in late November 2012, Island Conservation proposes to trial a variety of hazing techniques on the South Farallon Islands.

1. **Lasers:** Two different handheld lasers could be used during the course of the trial: red or green Avian Dissuader ® (50mW) and handheld green laser pointer (5mW). These lasers will likely be used during pre-dawn hours (~0530-0700 h) to haze gulls already settled on the island. The use of lasers is considered one of the more potentially effective hazing methods as it can be done at a distance, is very effective on birds at night, and does not appear to affect pinnipeds. Lasers will be used as much as possible; however, they are only effective at night.
2. **Spotlight:** Spotlights (10 million candlepower) could be used during pre-dawn hours (0530 -0700 h) to haze gulls already settled on the island. The spotlight may also be tested to haze gulls intermittently settling on ledges. Two short nighttime (2000 -2300 h) sweeps by gull roosting areas may be attempted in order to haze any gulls that might have settled back on the island during the course of the evening.
3. **Biosonics:** Up to three Bird-Guard broadcasting units (bird distress calls) could be used to deter gulls from alighting on the island, as well as encourage them to flee if they are already present. Speakers will be placed in locations that allow access. Additionally, up to 3 Bird Gard® SUPER PRO systems could be used to cover problem gull areas on each island. A number of electronic chips with both gull distress and predator calls could be used.
4. **Pyrotechnics:** Bird bombs, CAPA charges, screamers, and screamer-bangers could be used to deter gulls during daylight hours.
5. **Zon gun:** Zon gun air cannon will be used to deter problem birds. This involves a propane canister which charges a cylinder to produce a loud sound periodically.
6. **Helicopter:** A helicopter may be used during the trial to haze gulls in remote portions of the islands. Additional operational purposes to test include:
 - A. Perimeter monitoring flights around the islands to determine the location and numbers of gulls and pinnipeds in remote areas that cannot be viewed from Southeast Farallon Island observation points;
 - B. Moving and deploying personnel and equipment to and from areas inaccessible by foot;
 - C. Conducting radio-telemetry flights to examine movement patterns of gulls, as well as the efficacy of hazing.

7. **Human Movements:** Accessing areas on remote West End Island in order to investigate possible gull roosting areas, to haze gulls, and to monitor pinniped responses to hazing activities. Up to five researchers and hazers may be needed to conduct the trial.
 8. **Kites and Radio-controlled aircraft:** The use of 5-10 predator kites (such as Eagle or Helikites) or radio-controlled aircraft may be effective in hazing gulls. Several kites may be used to assess their potential in windy and windless settings.
 9. **Mylar tape:** Bamboo poles measuring approximately six feet with 1-meter lengths of 1" mylar tied to the tops of them could be placed in areas popularly used by gulls. Strips of mylar measuring 1-1.5 meters could be tied to two pieces of monofilament strung between bamboo poles, with the distance between the monofilaments being approximately four meters.
 10. **Trained Dogs:** Well-trained herding working dogs (eg. border collies, etc) have been utilized to haze birds in certain areas and can cover a large amount of terrain over a long period of time without having any impacts on the environment that foot traffic might. Any dogs used for this purpose would have the necessary immunizations and certificates to ensure that no diseases are transmitted between dogs and pinnipeds, or any pinnipeds are harassed.
4. **Monitoring and Maintenance:** Describe the general monitoring approach that will be used to assess incremental progress during the project. If applicable, describe specific provisions for long-term maintenance, management and protection associated with project.

IC measures project progress through milestones, scheduled through the project period with specific internal or external deliverables. To monitor our progress on metrics for this project, IC will schedule all field activities early in the grant period and will closely coordinate all activities with project partners (USFWS and PRBO Conservation Science). IC will utilize internal meetings to create and review a draft plan of field activities. Regular communication and meetings will be scheduled throughout the grant period to ensure November 2012 field activities can all be completed as scheduled, including bad weather back up plans. Internal field reports will be required of the project manager who will report back on all attempted hazing activities and the various success of each.

5. **Subcontractor(s):** If applicable, provide complete name and address of all subcontractors that are intended to perform activities. Note that proposed subcontractors are subject to NFWF approval.

Possible contractors include: Norm MacDonald- helicopter operations.

6. **Other (Optional):** Provide any further information important for the review of this proposal.

Island Conservation is working closely with the USFWS Farallon National Wildlife Refuge and the Refuge's cooperator, PRBO Conservation Science, in developing and implementing this plan. USFWS has determined that these trials are critical to their evaluation of potential methods of eradicating invasive house mice from the islands. Island Conservation's mission is to prevent extinctions by removing invasive species from islands. We prevent extinctions by working where the concentration of both biodiversity and species extinction is greatest – islands – and by removing one of the greatest threats to the continued existence of plant and animal species – introduced invasive vertebrates. Once damaging invasive species are removed from islands, native species and island ecosystems can recover with little or no additional intervention.

To date we have restored 48 islands, saved 323 seabird colonies, and protected a total of 305 species from the threat of extinction. Island Conservation works on islands in four geographic regions (North and South America, the South West Pacific, and the Caribbean) and our work includes planning or implementing projects. In addition to our on-the-ground restoration projects, we implement ecological monitoring, conservation science, and innovation programs to measure and inform our work to protect island species.

Citations

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