

**Proposal the Luckenbach Trustee Council
Mouse Eradication on the Farallon Islands
2010 Scope of Work and Budget**

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Overview

The Farallon Islands, which are managed by the U.S. Fish and Wildlife Service as the Farallon National Wildlife Refuge, are a unique ecosystem of the Northeast Pacific Ocean. The largest islands of the group, the South Farallon Islands, include two main islands (Southeast Farallon and West End Islands) and several smaller islets. These islands host the largest seabird breeding colony in the contiguous United States, with about 250,000 birds of 13 species. Three species have their largest colonies in the world here: Ashy Storm-Petrel (*Oceanodroma homochroa*), Brandt's Cormorant (*Phalacrocorax penicillatus*) and Western Gull (*Larus occidentalis*). Five species of marine mammal also occur and breed here regularly. The islands also host an endemic subspecies of the Arboreal Salamander (*Aneides lugubris farallonensis*) and the endemic Farallon Camel Cricket (*Farallonophilus cavernicolus*).

Introduced house mice (*Mus musculus*) have been present on the South Farallon Islands since sometime in the 19th century. The only remaining introduced mammals on the islands, these mice have impacted the island's natural resources in several ways. Mainly, house mice indirectly impact the survivorship and population sizes of the smaller seabirds, especially the rare Ashy Storm-Petrel. More specifically, mice influence the overwintering of several migratory Burrowing Owls (*Athene cunicularia*) each year. When the mouse population crashes in late winter, owls switch to prey mainly on storm-petrels. Mice also likely impact the islands' salamanders through both predation and competition for resources, the islands' invertebrates through predation, and contribute to the expansion of introduced plants by spreading seeds.

To eliminate the impacts of introduced mice and help restore the native ecosystem of the South Farallon Islands, the U.S. Fish and Wildlife Service (USFWS), partnered with Island Conservation and PRBO Conservation Science, proposes to eradicate non-native house mice. The currently preferred technique for mouse eradication requires an aerial application of pelletized grain bait containing rodenticide across the island. Prior to commencing with the proposed eradication, a series of work objectives must be met, including: 1) finalize preparation of an Environmental Assessment (EA), in accordance with the National Environmental Policy Act (NEPA) and its associated regulations, to determine whether mouse eradication would have significant impacts on the quality of the human environment; 2) to trial the efficacy of the preferred technique; and 3) to further examine Burrowing Owl winter abundance, survivorship, and predation rates on sensitive species prior to eradication.

This scope of work describes tasks to be conducted in 2010 related to the proposed mouse eradication on the South Farallon Islands.

Description of Work

The work tasks are structured in two distinct phases: Environmental Compliance and Research & Development. The methods for each phase are further described, and total costs summarized in the attached estimated budget.

Environmental Compliance

In 2006, Island Conservation obtained funding to prepare an Environmental Assessment (EA), as required by the National Environmental Policy Act (NEPA), for non-native house mouse eradication on the South Farallon Islands. While the impacts analysis is nearly complete, its development has taken longer than anticipated due to long delays from other anticipated sources of funds, as well as personnel transitions both at FWS and IC. Furthermore, the analysis uncovered critical environmental issues that required additional scrutiny. The primary environmental issue identified during the NEPA analysis process is the potential vulnerability of gulls to non-target impacts from the mouse eradication. The Farallones are home to the world's largest colony of Western Gulls, and the population ecology of the Farallones western gull colony is unique. The importance of understanding the potential risk to gulls was underscored by the observation of numerous gull mortalities following a similar rodent eradication operation on Rat Island in the Aleutian Islands, AK. In preparation for implementation, completion of the environmental compliance process is essential. Completion of the draft EA and other associated permitting will be done in four phases: 1) administrative draft EA; 2) public draft; 3) final EA; and 4) additional compliance. Specifically, completion of the environmental impacts analysis and associated timeline include:

Phase I: Administrative Draft

1) Administrative draft EA for review and comment by FWS Regional Office, FWS Ecological Service, FWS Division of Migratory Birds Management, and external natural resource management agencies. These reviews will be contingent upon results from a comprehensive gull risk analysis (see below). Estimated completion July 2010;

2) Minimum Requirements Analysis (Wilderness Act), which will be incorporated into the EA during this work phase. Estimated completion July 2010;

3) Biological Assessments for Endangered Species Act (ESA) listed species, which will be incorporated into the EA during this work phase. Estimated completion July 2010; and

4) Gull Risk Analysis. In order to better understand the potential risk to western gulls, we will request the assistance of experts in risk analysis modeling to quantify potential impacts to gulls on the Farallones as a result of mouse eradication operations. The gull impact model would be used to enumerate the number of potential gull mortalities (both low and high-end estimates) following aerial bait application. The model would use input variables, including expected gull population size during time of proposed eradication, bait availability with eradication time window, toxicant environmental fate, and likelihood index for each possible gull exposure pathway based on dietary preference. Criteria for model analysis would include use of best available scientific evidence, clear identification of model uncertainty and sources, and conservative estimate of anticipate impact (e.g. err on the side of overestimation). Model results

would be applied to complete the comprehensive environmental compliance process for mouse eradication on the Farallones (refer to Phase 1). Duration of phase: Apr- June 2010. Number of people: risk model consultant (likely with subcontractor to avian population ecologist). Deliverables: completed gull risk assessment model report, with results incorporated into Draft EA.

Duration of phase: April-July 2010. Number of people: 1 key personnel to complete EA draft, not including personnel to conduct Gull Risk Analysis or personnel to provide review and comment. Deliverables: Draft EA

Phase 2: Public Draft Release

After administrative review of the EA is complete, and revisions and comments from reviewing parties have been incorporated, the EA will be circulated to the affected public for review as required by NEPA. A draft EA will be made available for public review, announced in the Federal Register, media outlets such as regional papers of record, and through directly contacting individuals and organizations that have expressed or are otherwise thought to have interest in the project. The public review period will include a public information session in which members of the public will be able to meet face-to-face with FWS and cooperator staff. Estimated circulation date for the Draft EA Sept. 2010.

Phase 3: Final EA

A Final EA will be prepared after the public comment period has closed, addressing the comments that FWS has received. The Final EA will be accompanied by a Finding of No Significant Impact (FONSI), signed by the appropriate decisionmaker at FWS (likely the Project Lead for the SF Bay NWRC, but possibly the FWS Regional Director). Estimated date of FONSI Jan. 2011.

If, at any point during Phases 1 or 2, the FWS decision makers determine that a FONSI would not be appropriate (i.e., significant impacts to the environment appear likely), this Scope of Work will need to be revised substantially. The most likely course of action in this case would be the issuance of a Notice of Intent to prepare an Environmental Impact Statement, which would require additional public input and document preparation time and would add additional cost and time.

Duration of phase: July 2010 – January 2011 Number of people: 1 IC compliance specialist to manage EA circulation and revision, 1 IC Project Manager to contribute to public information session, 2 FWS personnel to administer FWS requirements for public EA circulation and collect & synthesize public comments, not including personnel to provide support for public information session and addressing comments. Deliverables: Public Draft EA, Final EA including public comments.

Phase 4: Additional Compliance

The proposed mouse eradication would be carried out in compliance with all applicable Federal and state laws and regulations. Therefore, in preparation for implementation applications for permission or authorization to conduct the eradication will be completed to coincide with the

administrative draft of the Environmental Assessment (anticipated July 2010). These permit applications include:

- 1) Application for Manager's Permit from Gulf of Farallones National Marine Sanctuary
- 2) Application for incidental take of migratory birds (under the Migratory Bird Treaty Act)
- 3) Application for National Pollution Discharge Elimination System individual permit (under the Clean Water Act)
- 4) Application for Incidental Harassment Authorization (under the Marine Mammal Protection Act)

Duration of phase: Mar- July 2010. Number of people: 1 IC compliance specialist to complete permit applications, 1 FWS personnel to administer FWS requirements for permit application, not including personnel to provide review and comment. Deliverables: completed permit applications, as listed above.

Research and Development

This component of the project includes four main components: 1) communications plan; 2) biomarker trials; 3) introduction prevention plan; and 4) intertidal fish surveys.

Communications Plan

To support the primary goal of the project – to protect and restore the ecosystem of the South Farallon Islands by eradicating non-native house mice – the project partners will develop a strategic communications plan. The purpose of the communications planning is to:

- 1) support the environmental assessment with strategic communications to educate local and regional agencies, decision-makers, NGOs, and the public about the purpose and need for eradication and the expected long-term conservation benefits.
- 2) mitigate any potential opposition to eradication by garnering support from key audiences; and
- 3) develop a strategy for handling crisis communications.

The partners will create a communications team made up of at least one staff member each from Island Conservation, USFWS, and PRBO Conservation Science. In 2010, the team will create a plan and key messages and produce information to educate constituencies about the project (via web sites, printed materials, digital presentations, etc.). Communications planning will begin as soon as funding is available (~June 2010) with key messages and background materials developed to coincide with release of the Environmental Assessment. It is expected that the communications team, strategy development, and outreach will continue in follow-on years through implementation, eradication confirmation, and 1-5 years of recovery monitoring using additional funds. The Communications plan is a critical path element in the mouse eradication and must be completed prior to the EA release for public comment. If funding is delayed for the

Communications plan this will inevitably delay the NEPA timeline, which may in-turn delay implementation of the eradication.

Duration of phase: May-Dec 2010. Number of people: 3-4 key personnel for the core communication team. Deliverables: communication plan and associated educational material. Equipment/supplies to be purchased: Website url, website development (contract), some printed materials.

Biomarker trial

Prior to the proposed eradication, a field trial that will be conducted on Southeast Farallon Island in fall 2010 to assess the efficacy of mouse eradication at the target application rate of a preferred bait (using a placebo replica infused with the non-toxic biomarker pyranine), and to monitor non-target species exposure to broadcast pellets. Specifically during the trial the following will be evaluated:

- 1) mouse density and reproductive status using mark-recapture techniques;
- 2) mouse home range size and movement using radio telemetry;
- 3) mouse acceptance and palatability of preferred bait type using paired food choice trials;
- 4) the rate of bait removal using bait consumption plots to extrapolate a target application rate for the eradication;
- 5) determine the probability of eradication by assessing mouse exposure to a biomarker from a non,-toxic, biomarker-infused bait applied at the target application rate in study plots; and
- 6) and evaluate what non-target species are at risk of primary or secondary rodenticide exposure using a biomarker from a non,-toxic, biomarker-infused bait applied at the target application rate in study plots. In addition, we will hire an expert in pest management of buildings to assess structural issues with regards to mouse proofing and possible impacts from potential fumigation.

Duration of phase: field trial Nov- Dec 2010 Number of people: 4 from Island Conservation, with additional assistance from FWS and PRBO staff. Deliverables: field trial report, including considerations for eradication and non-target mitigation Equipment/supplies to be purchased: Sherman mouse traps; trap supplies; biomarker bait; bait application and monitoring supplies (bait application measuring devices, survey flags); UV lights for biomarker screening; dissection supplies; gull capture devices (box traps, spotlight, noose pole).

Introduction Prevention Plan

To better assure that mice and other non-native mammals or herps are not accidentally introduced to the island in the future, we will develop a prevention plan specific to the South Farallon Islands. Development of the plan will be followed by implementation in 2011.

Duration: June 2010 to February 2011. Number of people: 1 to write the plan, not including input and review from other FWS and PRBO staff. This will be conducted by the FWS Project Manager.

Intertidal Fish Surveys

Fish living in the tide pools at the South Farallon Islands could potentially be impacted by the mouse eradication project. Very little, if any, inventory has been done of the intertidal fish community at the Farallones. To determine if any sensitive species occur at the Farallones and to acquire baseline data to compare to post-eradication levels, Gulf of the Farallones National Marine Sanctuary proposes to hire an intertidal fish expert to conduct surveys.

Duration: Surveys will be conducted sometime between November 2010 and February 2011 in conjunction with other standardized intertidal sampling of algae and invertebrates. Products: A summary of species found. Results will be included in a report following post-eradication surveys.

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		Environmental Compliance	R&M	Total
Island Conservation (Eradication Experts)				
Salaries & Benefits	Project Leader/Eradication Expert	\$11,901	\$15,990	\$27,891
	IC Executive Director	\$943	\$1,964	\$2,906
	US Director	\$8,585	\$2,547	\$11,132
	Project Support Coordinator	\$0	\$12,025	\$12,025
	IT Manager	\$2,008	\$856	\$2,864
	Science Writer	\$8,783	\$580	\$9,363
	IC Field Biologists	\$0	\$8,138	\$8,138
	Subtotal	\$32,219	\$42,100	\$74,319
Equipment				
	Traps		\$ 3,300	\$3,300
	Subtotal	\$0	\$3,300	\$3,300
Travel/Transport				
	Boat transport	\$0	\$0	\$0
	Helicopter Support	\$0	\$0	\$0
	Eradication expert pilot	\$0	\$0	\$0
	Emergency evacuation insurance	\$0	\$325	\$325
	Travel of Technical Experts	\$5,226	\$6,972	\$12,198
	Housing of Technical Experts	\$1,620	\$4,379	\$5,999
	Rental vehicle	\$0	\$1,920	\$1,920
	Field per diem	\$1,031	\$4,230	\$5,261
	Subtotal	\$7,877	\$17,826	\$25,703
Materials and Supplies				
	Radio Collars (House Mice)	\$0	\$3,000	\$3,000
	Research Supplies: Helicopter PPE (Nomax clothing, gloves, helmets, eye protection)	\$0	\$1,124	\$1,124
	Bait stations	\$0	\$0	\$0
	Bait and supplies	\$0	\$2,025	\$2,025
	Bait shipping & helicopter bucket transport	\$0	\$855	\$855
	Subtotal	\$0	\$7,004	\$7,004
Stakeholder Coordination and Public Outreach				
	Outreach Materials and Coordination	\$4,463	\$0	\$4,463
	Subtotal	\$4,463	\$0	\$4,463
Grants to Others				
	Toxicological Analysis	\$0	\$0	\$0
	Non-Target Bird Mitigation/Risk Analysis	\$0	\$15,425	\$15,425
	Introduction Prevention Plan	\$0	\$0	\$0
	Subtotal	\$0	\$15,425	\$15,425
Project Expenses				
	Professional services	\$1,883	\$ 3,745	\$5,628
	Occupancy expense	\$1,002	\$ 2,220	\$3,222
	Project services	\$315	\$ 767	\$1,082
	Subtotal	\$3,200	\$6,732	\$9,932
Island Conservation Subtotal		\$47,759	\$92,387	\$140,146
Island Conservation Overhead (2006: 30%; 2010: 15.7% of Sub-Total)		\$7,530	\$14,567	\$22,097
Island Conservation Contract Total		\$55,289	\$106,954	\$162,243
PRBO Contract (Island Biology Specialists)		\$0	\$12,500	\$12,500
Contracts (Pass-through) Total		\$55,289	\$119,454	\$174,743

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U.S. Fish and Wildlife Service (FWS)			
FWS Operating Costs			
FWS Project Manager	\$0	\$38,945	\$38,945
FWS Admin Support	\$0	\$5,000	\$5,000
Outboard Gas/Oil/Maintenance/Other	\$0	\$3,000	\$3,000
Final EA Printing	\$1,500	\$0	\$1,500
Introduction Prevention Plan	\$0	\$0	\$0
FWS Subtotal (Direct Costs)	\$1,500	\$46,945	\$48,445
FWS Indirect Cost Recovery			
FWS Direct Cost Recovery (29.5%)	\$443	\$13,849	\$14,291
FWS Pass Through Recovery (6%)	\$3,317	\$7,167	\$10,485
FWS Total		\$67,961	\$73,221
NOAA Intertidal Fish Surveys & Report	\$0	\$7,500	\$7,500
PROJECT TOTAL	\$55,289	\$194,915	\$255,464