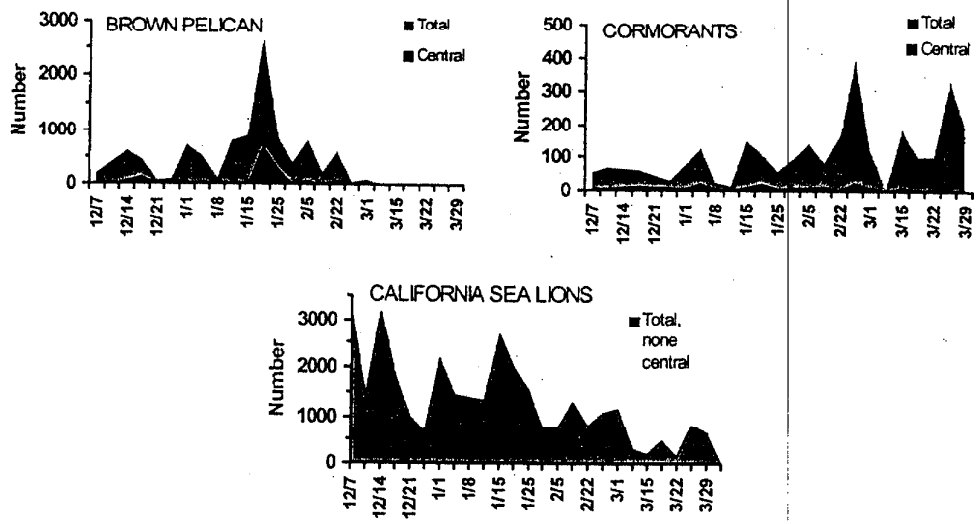
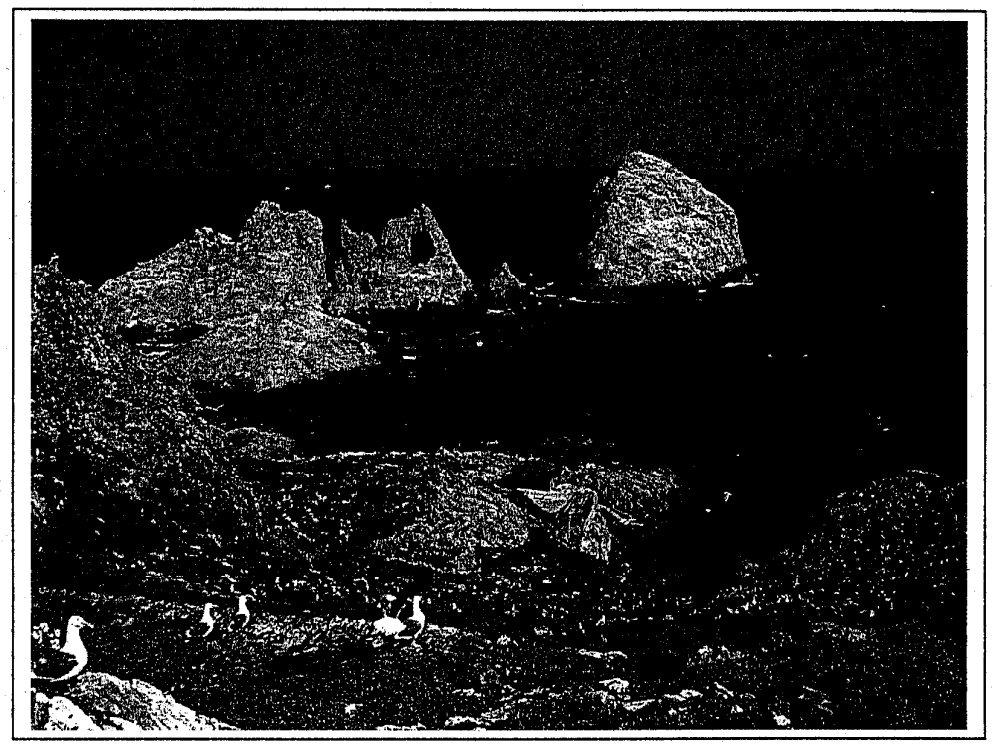


Figure 4. Attendance of Brown Pelicans, cormorants (Brandt's, Double-crested, and Pelagic), and California Sea Lions on Año Nuevo Island marine terrace in the winter of 1998-99. Grey shaded values are total island numbers on the marine terrace (not including beaches and rocky islets) and black shaded values are numbers in the central portion of the marine terrace proposed for habitat restoration.

Seabird Nesting Habitat Restoration and Enhancement on the Farallon Islands, Farallon National Wildlife Refuge, California



A Proposal Submitted to the Command Trustee Council

May 7, 2003

Contact:

Joelle Buffa
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Newark, California

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Phone: (510) 792-0222

Goals and Nexus to Injury

This project restores critical seabird nesting habitat on the Farallon Islands for burrow/crevice nesting seabirds such as the Ashy Storm-Petrel (*Oceanodroma homochroa*) and the Cassin's Auklet (*Ptychoramphus aleuticus*), by eradicating the introduced house mouse (*Mus musculus*).

Background

Island ecosystems, like South Farallon Island (managed by the US Fish and Wildlife Service as part of the Farallon National Wildlife Refuge), are key areas for conservation because they are critical habitat for seabirds and pinnipeds that use thousands of square kilometres of open ocean, but depend on islands for breeding and resting. In addition, islands tend to be rich in endemic species (islands make up about 3% of the earth's surface, but are home to 15-20% of all plant, reptile, and bird species).

Unfortunately, islands have been disproportionately impacted by humans. Approximately 70% of recorded animal extinctions have occurred on islands, and most of these extinctions, including more than half of all seabird extinctions, were caused by invasive species (Fig.1a). Today, more than half of all IUCN red listed birds are threatened by introduced species (Fig. 1b). House mice have been introduced onto islands worldwide, causing ecosystem-wide perturbations, with profound effects on the distribution and abundance of native flora and fauna (eg. Crafford and Scholtz 1987; Crafford 1990; Copson 1986). On the Farallon Islands, introduced house mice appear to be directly and indirectly impacting the breeding success of burrow nesting seabirds, particularly the Ashy Storm-petrel. Approximately 50-70% of the world's population of Ashy Storm-petrel (Fig. 2) is restricted to the Farallons. While the Ashy Storm-petrel has probably always been a species with a restricted distribution and small global population size, recent data suggest this species is in danger of extinction. Between 1972 and 1992, biologists documented a 42% decline in Ashy Storm-petrel populations on the Farallons (Sydemann et al 1998). Mortality rate of Ashy Storm-petrel on the Farallons also appears to be increasing. Recent population viability analyses predict Ashy Storm-

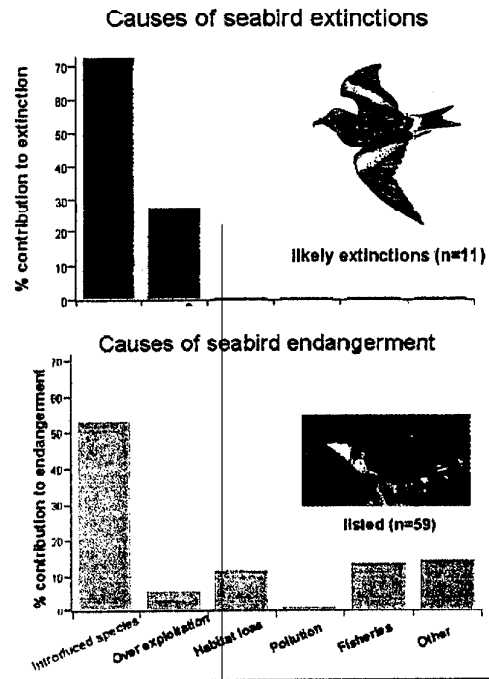

Figure 1. Causes of seabird extinction (a) and endangerment (b) based on IUCN global red list data.

petrel populations will continue to decline at 3% per year (Sydemann et al 1998). Similar declines have been observed in populations of the Cassin's Auklet on the Farallons (Pyle 2001).

Mice are known predators of eggs and chicks of the Ashy Storm-petrel with potentially as many as 12% of eggs and chicks lost to house mice (Ainley and Boekelhide 1990). Furthermore, mice may be important seed dispersers of non-native weeds that are known to degrade quality nesting habitat for seabirds such as Cassin's Auklet and Rhinoceros Auklet (*Cerorhinca monocerata*) (J. Buffa, pers. comm.). More importantly, however, the exotic mice appear to be indirectly responsible for the *hyperpredation* and decline of the local Farallon Island Ashy Storm-Petrel (and to a lesser extent the Cassin's Auklet) breeding population by non-resident, predatory owls. This form of *apparent competition* (see Holt 1977; Roemer et al. 2002) occurs when a local prey species (Ashy Storm-Petrel or Cassin's Auklet) declines due to predation pressure from a predator (owls that normally are not resident on the Farallons) sustained by an alternative prey, in this case the exotic house mice. This type of interaction is now thought to be an under-appreciated mechanism of biodiversity loss. It has been recently demonstrated on Santa Cruz Island, California, resulting in a wholesale restructuring of the food web including the near extinction of the island fox (Roemer et al. 2002). A similar pattern has been seen on seabird colonies where feral cat populations are subsidized by non-native rats and rabbits when the seabirds are absent, thereby causing increased seabird mortality through higher cat populations during the breeding season (see Atkinson 1985, J. Donlan, pers. comm.).

Figure 2. Ashy Storm-petrel

On Southeast Farallon Island, over-wintering owls are thought to cause significant mortality to the Ashy Storm-petrel population and have a lesser impact on the Cassin's Auklet populations as well. Each October, young Burrowing Owls (a threatened species in California) stop off on the Farallons during migration (Pyle & Henderson 1991), at a time when the house mouse population peaks there. Because of the abundant food source provided by the mice, the owls choose to stay at the island for the winter; under normal circumstances they would continue migrating to more favorable wintering locations. Once winter rains set in the mouse population crashes and the owls are forced to seek other prey. Because this coincides temporally with the arrival of Ashy Storm-Petrels and Cassin's Auklets to excavate ground nest sites, the owls switch to eating these seabirds. But the storm-petrels and auklets do not seem to provide enough nutrition for the owls, and most wintering owls die before the spring migration period occurs in April-May (emaciated owl carcasses are routinely found on the island by staff biologists). Up to 10 Burrowing Owls have been recorded wintering per year on the Farallons, and biologists have found wings of up to 20 storm-petrels and 2-3 auklets at an owl roost site. The breeding population of Ashy Storm-Petrel on the Farallons is currently estimated at only

about 1400 birds. This devastating scenario for both storm-petrels and owls, has been confirmed through the collection of owl pellets (~65 % of which contain storm-petrel and auklet feathers in late winter and spring) and an analysis of the occurrence patterns of raptors that do and do not prey upon mice (Mills et al. 2001).

Without mice, the Farallons are unlikely to support a wintering population of owls and thereby greatly reduce adult Ashy Storm-petrel mortality on the colony. Cassin's Auklet mortality would also be reduced to a lesser degree. The removal of mice will almost certainly improve breeding success of the Ashy Storm-Petrel and other seabirds. In addition, the entire island ecosystem, including terrestrial invertebrates, the native salamander (*Aneides lugubris farallonensis*), landbirds, and native plants, will benefit from the removal of the non-native mice. The eradication will prevent seed dispersal by mice and will make it easier to control exotic weeds, a project underway and funded by the Cape Mohican Trustee Council.

Project Descriptions and Methods

The objective of this project is to eradicate introduced house mice from the Farallon Islands and prevent future rodent introduction. A plan outlining the options for removing house mice from the Farallon Islands is in development and will be available by late July 2003. Should the project proceed, a detailed environmental assessment will outline the project methods and appropriate mitigation. A general outline of the project is provided below.

House mice have been successfully removed from islands around the world up to 700 ha in size (Torr 2002). All successful eradication programs have used a rodenticide bait that is dispensed into every mouse territory. Trapping alone has proven to be ineffective for rodent removal from islands (Moors 1985). To increase the probability of successfully removing mice from islands, bait should be placed when there is a food shortage and the mouse population is stable or preferably in decline.

Timing

The removal of the mice will be timed according to a set of biological conditions that maximize the probability of eradicating mice and minimizes the potential impact to the Farallon environment (see below). On the Farallon Islands, the house mouse annual population cycle typically peaks in the fall and declines precipitously with the onset of the winter rains, with a low in late spring (Mills 2001). Thus, the ideal time to eradicate the mice is in late fall through early winter as mouse abundance declines. This coincides with the time of year when the least amount of sensitive or breeding wildlife individuals will be affected.

Approach

The key to successfully eradicating mice from islands is dispensing bait into every mouse territory. Three approaches are used to achieve this goal. First, bait stations can be laid out on an approximately 20 x 20 m (or smaller) grid pattern and then regularly checked and supplied with a waxed block bait for one to two years. Second, a broadcast method (by hand or aerially) in which pelletized bait are distributed very evenly at a density of approximately one pellet per m^2. Third, a combination of bait stations and broadcast methods can be used. The correct approach is dictated by a combination of the island's topography and size, and a host of other biological constraints. The Farallon Islands at ~55 ha, is well within the size range of successful mouse eradications using bait stations or aerial broadcast. Much of the island is accessible on foot, although the island's steep and rugged cliffs and offshore rocks present a logistical challenge to delivering bait (Figure 3). Fixed ropes would likely have to be installed for operators to service bait stations in these areas. Aerially broadcasting bait would overcome this danger, but precautions would be needed to ensure adequate amount of bait is delivered into all habitats inhabited by mice.

Figure 3. Cliffs and Offshore rocks of the Farallon Islands.

Rodenticide

There are nine rodenticides registered for use in the US. Factors that will determine the rodenticide of choice are: previous successful use in island restoration projects, demonstrated ability to control the mouse population, and likely potential effects in the Farallon Island environment (see below). The vast majority of successful eradications have used brodifacoum, an anticoagulant rodenticide that has the greatest efficacy against mice, can kill mice after one feeding, and for which resistance in mice populations is rare. Thus, brodifacoum offers the highest probability of successfully removing mice from the island.

Environmental Consequences (Adverse and Beneficial)

A. Beneficial effects.

The eradication of house mice from Southeast Farallon Island will benefit Ashy Storm-Petrels and Cassin's Auklets by eliminating a predator that is known to take eggs and chicks and, indirectly, causes considerable mortality of adult birds. Furthermore, mouse removal will benefit some of the other nine breeding seabird species either directly, or indirectly by limiting the spread of introduced plants known to degrade seabird nesting

habitat. Introduced plants are perennial and grow through seabird breeding season, blocking burrow and crevice entrances. Native species are annuals that die back, leaving access to burrows and crevices during the seabird breeding season.

Islands provide critical habitat for seabirds and the vast majority of seabirds have evolved on these islands in the absence of terrestrial predators. As a result, seabird life history characteristics make them particularly vulnerable to increased predation. Most seabirds are long lived and have high adult survivorship (Russell 1999). Even small reductions in adult survivorship can cause drastic reductions in annual population growth and colony persistence (Keitt et al. 2002). When a predator impacts multiple life history stages, such as the house mouse impacting the eggs, chicks and adults of Ashy Storm-petrel and Cassin's Auklet on the Farallons it can have devastating impacts on a species.

Eradicating mice from the Farallons will remove what is thought to be one of the important causes for the decline in Ashy Storm-Petrel populations. However, the benefits are not limited to Ashy Storm-Petrels, Cassin's Auklets, and the other breeding seabirds of the island. Another threatened species, the Burrowing Owl will also benefit. Very few, if any, of the Burrowing Owls that choose to spend the winter on Southeast Farallon Island survive to migrate to their breeding grounds in the spring. So, not only are mice causing direct and indirect impacts on the Ashy Storm-Petrel and Cassin's Auklet, they appear to be increasing the mortality rate of another threatened species, the Burrowing Owl.

In addition, removing house mice from the islands will likely benefit landbirds, salamanders, terrestrial and likely intertidal invertebrates and the plant community. The removal will also eliminate a destructive nuisance and improve health and safety standards at the research facilities on the island.

B. Adverse impacts

There is potential for impacts of the eradication operation; however, any impact will be temporary and will be offset by the long-term benefit of the removal of mice. The potential negative effects of the project will be fully evaluated during the project-planning phase and in an environmental assessment. Appropriate mitigation will be implemented to offset those risks from the rodenticide, personnel traversing the islands, and disturbance to wildlife. The recent rat eradication on Anacapa Island, Channel Islands National Park in Southern California can be used to predict with some degree of certainty the likely impacts from eradication activities. The mitigations used on Anacapa will provide a model for the development of mitigation measures on the Farallon Islands to reduce risks from project activities.

Potential short-term adverse impacts of removing mice from the Farallon Islands may include exposure of non-target species to the rodenticide. A number of factors contribute to the risks to non-target species including: (1.) toxicology of rodenticide chosen, (2.) bait composition and application method, (3.) behavior of target species, (4.) behavior of non-target species and (5.) local environmental factors (Record and Marsh 1988, Taylor

1993). Each of these variables will be considered in the planning phase and in the environmental assessment. Understanding the risks associated with the use of the rodenticide allows for planning and implementation of effective mitigation strategies to reduce those risks.

Wildlife such as roosting seabirds and marine mammals hauled out on beaches may be temporarily disturbed during either an aerial or bait station operation. However, the operation is timed to coincide with seasonal minimums in the number of seabirds and marine mammals on the island. The disturbance will be of very short duration, and there will always be alternative roosting/haul out habitat at any point in time. The eradication is designed to benefit the Farallon ecosystem as a whole and any disturbance to seabirds will be offset by the benefit of reduced predation.

If bait stations are used, temporary trails will need to be created for access on foot. The regular visits to stations to replenish bait may lead to soil erosion and compaction, and possibly dispersal of weed seeds into otherwise pristine areas. This is a "one-time" project and the benefits of the eradication (including stopping weed seed dispersal by mice) offsets any potential impact due to the operations. Careful planning and ongoing monitoring will mitigate any negative impact due to soil erosion and compaction. Procedures for staff to minimize risks of weed seed dispersal will be implemented.

Probability of Success

The eradication of mice from the Farallon Islands is a realistic, achievable goal. The house mouse is the last non-native mammal to be removed from the islands and the removal will have direct benefits to seabirds and the entire island ecosystem. Cats and rabbits were successfully removed from Southeast Farallon Island in the early 1970's, shortly after the island was added to the Farallon National Wildlife Refuge. The eradication of mice from offshore islands has been successful worldwide in a wide variety of climatic conditions. The Farallons are within the size range of successful island mouse eradications and there are no logistical, biological, or regulatory constraints that could hinder the success of the project. The probability of success is very high if similar techniques employed in other mouse eradication programs are used.

The recent successful removal of rats from Anacapa Island in Southern California has pioneered the pathway through the complex regulatory and biological challenges facing these types of projects. The experience and knowledge gained from Anacapa will be applied to the Farallon Islands to efficiently plan and implement the mouse removal project.

Performance Criteria and Monitoring

Performance Criteria: The ultimate success of the mouse removal will be the recovery and increase in the population of Ashy Storm-Petrel, Cassin's Auklet, and other crevice/burrow-nesting seabirds. The project must be carried out with an acceptable methodology and with appropriate mitigation strategies that minimize risk of disturbance

to key species and reduce risk to non-target species. All details of the project methods and mitigation will be developed and outlined in a removal plan (in prep.) and a project-specific, environmental-assessment document.

Mouse Eradication

Monitoring: The project requires a long term monitoring program for the presence/absence of mice. A combination of trapping and ecological indicators will be used to evaluate the presence/absence of mice using pre-eradication survey data to compare to post eradication data.

Seabird Monitoring

The benefits of mouse removal to the seabirds and the island ecosystem will likely be measurable after the first season of implementation. The benefits of the removal of rats from Anacapa in 2002 are already measurable five months after the eradication. Active nests of the crevice nesting Xantus's Murrelets have been found in previously inactive caves, and no evidence of freshly depredated eggs have been found in searched areas (D. Whitworth, pers. comm.).

Thirty years of pre-project data on seabird breeding population and productivity, vegetation structure, burrowing owl occurrence patterns, salamander populations, and invertebrate and intertidal communities, collected by PRBO from Southeast Farallon Island, will allow comparisons of pre-and post-project changes in reproductive parameters, colonization of newly created habitat, and other aspects of the Farallon Island ecosystem.

Rodent Re-Introduction Prevention

A key component to the eradication is the development of a plan to prevent the re-introduction of mice or other non-native rodents, especially rats. The effort and conservation gains made from the eradication could be negated with the re-introduction of rodents or other non-native species. Invasive species, including vertebrates, invertebrates, weeds and pathogens can all be transported to the island inadvertently and have detrimental impact on breeding seabirds. The rodent re-introduction prevention program will be one component of a comprehensive program designed to prevent many non-native species from being introduced onto the island.

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Farallon Island Seabird Habitat Restoration Project									
Projected Budget									
	Year 1		Year 2		Year 3		Year 4		
	Phase I - Pre-Eradication Enviro Compliance and R&M		Phase II - Implementation		Phase III - Post Eradication Monitoring				
Salaries & Benefits									
Project Leader (GS-11)	$ 60,300.00		$ 60,300.00		$ 30,150.00		$ 19,500.00		
Principal Investigator	$ 9,040.00		$ 9,040.00		$ 4,500.00		$ 2,250.00		
Field Biologists	$ 25,425.00	$ 94,765.00	$ 25,425.00	$ 94,765.00	$ 8,475.00	$ 43,125.00	$ 8,475.00	$ 30,225.00	
Equipment									
Traps	$ 2,500.00	$ 2,500.00	$ -	$ -	$ -	$ -	$ -	$ -	
Travel/Transport									
Boat transport	$ 11,000.00		$ 15,000.00		$ 5,000.00		$ 5,000.00		
Helicopter Support	$ 3,500.00		$ 25,000.00		$ 3,500.00		$ 3,500.00		
Travel&Housing of Technical Experts	$ 3,500.00		$ 4,500.00		$ 2,500.00		$ 1,500.00	$ 10,000.00	
Field per diem @15/day	$ 4,500.00	$22,500.00	$ 4,500.00	$49,000.00	$ 1,350.00	$ 12,350.00	$ 1,350.00		
Materials and Supplies									
Outboard Gas/Oil/Maintenance	$ 1,500.00		$ 2,500.00		$ 500.00		$ 500.00		
Radio Collars (House Mice)	$ 3,500.00		$ 3,500.00		$ -		$ -		
Research Supplies	$ 7,500.00		$ 7,500.00		$ 500.00		$ 500.00		
Bait and supplies	$ 1,600.00	$14,100.00	$ 11,200.00	$24,700.00	$ -	$ 1,000.00	$ -	$ 1,000.00	
Stakeholder Coordination and Public Outreach									
Videography	$ -		$ 20,000.00						
Outreach Materials and Coordination	$ 12,500.00	$12,500.00	$ 7,500.00	$27,500.00	$ 2,500.00		$ 2,500.00		
Miscellaneous Costs									
Toxicological Analysis	$ 1,500.00		$ 10,000.00		$ -		$ -		
Non-Target Bird Mitigation	$ -	$1,500.00	$ 22,000.00	$32,000.00	$ -	$ 2,500.00	$ -	$ 2,500.00	
Sub-Total		$ 147,865.00		$ 227,965.00		$ 58,975.00		$ 43,725.00	
Operating Costs									
FWS Project Manager	$ 27,500.00		$ 27,500.00		$ 27,500.00		$ 27,500.00		
FWS Admin Support (Utilities, P-copy, salary)	$ 5,000.00		$ 5,000.00		$ 5,000.00		$ 5,000.00		
Contractor Overhead (18% of Sub-Total)	$ 26,615.70	$ 59,115.70	$ 41,033.70	$ 73,533.70	$ 10,615.50	$ 43,115.50	$ 7,870.50	$ 40,370.50	
Total		$ 206,980.70		$ 301,498.70		$ 102,090.50		$ 84,095.50	
FWS Indirect Cost Recovery (5% of Total)		$ 10,349.04		$ 15,074.94		$ 5,104.53		$ 4,204.78	
(Assumes project contracted out, higher rate will apply if done in house)									
GRAND TOTAL		$ 217,329.74		$ 316,573.64		$ 107,195.03		$ 88,300.28	
Estimated Project Total Year 1-4		$ 729,398.67							

Farallon

Farallon Island Seabird Habitat Restoration Projec:								
Projected Budget								
	Year 1		Year 2		Year 3		Year 4	
	Phase I - Pre-Eradication Enviro Compliance and R&M		Phase II - Implementation		Phase III - Post Eradication Monitoring			
Salaries & Benefits								
Project Leader (GS-11)	$ 60,300.00		$ 60,300.00		$ 30,150.00		$ 19,500.00	
Principal Investigator	$ 9,040.00		$ 9,040.00		$ 4,500.00		$ 2,250.00	
Field Biologists	$ 25,425.00	$ 94,765.00	$ 25,425.00	$ 94,765.00	$ 8,475.00	$ 43,125.00	$ 8,475.00	$ 30,225.00
Equipment								
Traps	$ 2,500.00	$ 2,500.00	$ -	$ -	$ -	$ -	$ -	$ -
Travel/Transport								
Boat transport	$ 11,000.00		$ 15,000.00		$ 5,000.00		$ 5,000.00	
Helicopter Support	$ 3,500.00		$ 25,000.00		$ 3,500.00		$ 3,500.00	
Travel&Housing of Technical Experts	$ 3,500.00		$ 4,500.00		$ 2,500.00		$ 1,500.00	$ 10,000.00
Field per diem @15/day	$ 4,500.00	$22,500.00	$ 4,500.00	$49,000.00	$ 1,350.00	$ 12,350.00	$ 1,350.00	
Materials and Supplies								
Outboard Gas/Oil/Maintenance	$ 1,500.00		$ 2,500.00		$ 500.00		$ 500.00	
Radio Collars (House Mice)	$ 3,500.00		$ 3,500.00		$ -		$ -	
Research Supplies	$ 7,500.00		$ 7,500.00		$ 500.00		$ 500.00	
Bait and supplies	$ 1,600.00	$14,100.00	$ 11,200.00	$24,700.00	$ -	$ 1,000.00	$ -	$ 1,000.00
Stakeholder Coordination and Public Outreach								
Videography	$ -		$ 20,000.00					
Outreach Materials and Coordination	$ 12,500.00	$12,500.00	$ 7,500.00	$27,500.00	$ 2,500.00		$ 2,500.00	
Miscellaneous Costs								
Toxicological Analysis	$ 1,500.00		$ 10,000.00		$ -		$ -	
Non-Target Bird Mitigation	$ -	$1,500.00	$ 22,000.00	$32,000.00	$ -	$ 2,500.00	$ -	$ 2,500.00
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Estimated Project Total Year 1-4		$ 729,398.67						

8

Pacific Seabird Group

DEDICATED TO THE STUDY AND CONSERVATION OF PACIFIC SEABIRDS AND THEIR ENVIRONMENT

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May 5, 2003

Charlene Hall
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Re: Support for New Zealand Shearwater Restoration Project

Dear Ms. Hall:

On behalf of the Pacific Seabird Group (PSG), we wish to express our support for the Rakiura Titi Restoration Project, which has been proposed to you for funding from the Command Oil Spill Trust Fund by Henrik Moller, Hannah M. Nevins and Josh Adams. As you may know, PSG is an international non-profit organization that was founded in 1972 to promote knowledge, study and conservation of Pacific seabirds. PSG takes a broad international perspective in recognition that the oceans are linked by the wandering of seabirds and the flow of ocean currents. Our membership is drawn from the entire Pacific basin, including Canada, Mexico, Russia, Japan, China, Australia, New Zealand, and the USA. Among PSG's members are biologists who have research interests in Pacific seabirds, government officials who manage seabird refuges and populations and individuals who are interested in marine conservation. PSG has long advised and worked cooperatively with government agencies to further these interests, especially with regard to oil spill restoration. PSG was funded by the Exxon Valdez Oil Spill Trustee Council to host an international seabird restoration workshop in Alaska in 1995 and produced a monograph on this subject.

We understand that the T/V Command oil spill took place in late September 1998 in Monterey Bay, and that shearwaters were the second most frequent species among the oiled birds that were recovered in beached bird surveys subsequent to the spill. Shearwaters were the most numerous species identified in aerial surveys. In addition, a dead sooty shearwater that had been banded in

New Zealand was recovered. Sooty shearwaters are abundant in Monterey Bay during autumn as they feed and prepare to migrate south to New Zealand and Chilean breeding colonies. Sooty shearwater populations may be declining off the coasts of California in recent years. PSG believes that it is appropriate to restore populations that have been damaged in oil spills at their colonies when this is the most efficacious means of restoration. Several years ago, PSG supported the proposal and ultimate decision of the American Trader Oil Spill Trustee Council in Southern California to restore a brown pelican colony in Baja, Mexico. We believe that this was the first instance of using such funds outside the United States.

In this instance, restoring a shearwater colony in New Zealand makes ecological sense and seems to be an excellent means of assisting the recovery of this species. The proposed project seeks funds to eradicate introduced rats from four nesting islands in the Big South Cape Group. As you may know, for over a decade PSG has been an international leader in advocating the removal of introduced predators from seabird colonies, including foxes from the Aleutian Islands, rats from Anacapa Island off California and numerous introduced predators from Mexican and South Pacific seabird colonies. PSG was awarded one of the first NAFTA grants to bring New Zealand biologists to North America to train Mexican seabird biologists on predator removal techniques. The project proposed by Moller, Nevins and Adams appears to us to be an ideal restoration project, and we urge you to provide funds to restore Sooty Shearwaters. It fits perfectly within long-standing PSG policies, and we welcome the opportunity to support it.

PSG appreciates your consideration of our comments on this proposal, and is always interested in providing our views on these important issues.

Sincerely,

Craig S Harr

Craig S. Harrison
Vice Chair for Conservation

Michelle Hester
Oikonos
P.O. Box 979
Bolinas, CA 94924

Julie Thayer and Dr. William Sydeman
PRBO, Conservation Science
4990 Shoreline Hwy
Stinson Beach, CA 94970

13 May 2003

Command Trustees:

The revised Draft 5-yr Budget Table and Budget Justification is presented for the Año Nuevo Island Seabird Habitat Restoration project upon request from Steve Hampton and Jennifer Boyce for further consideration by the Command Trustee Council. Restoration planning and study designs are in review and consequently the budget changes as we gather information from the feasibility studies and expert consultations. The current estimated budget for a five year restoration project (2005 - 2009) totals $473,558.

The goals of the project remain as stated in initial proposals:

1) Improving habitat quality and soil stability in the central marine terrace region, the main habitat for burrowing seabirds, to reduce injury to Rhinoceros and Cassin's Auklets and facilitate colonization and population growth. This will be accomplished through planting native plant assemblages and using temporary ground-cover to reduce erosion until natural vegetative processes are restored.

2) Conduct studies to quantify the response of seabird populations to improved habitat quality.

3) Provide valuable knowledge on island habitat restoration techniques to apply elsewhere. Numerous islands suffer from similar habitat perturbations (e.g. Castle Rock, Scorpion Rock) and learning how to restore natural processes to extreme island environments will increase our ability to conserve populations, biodiversity, and precious island ecosystems

The large reduction in cost from the first draft budget presented to Command Trustees is due to the assumption that one third of the planting will be completed and the water catchment/irrigation will be installed before Command funds become available (predicted for 2005). Every winter, over a foot of topsoil is lost in some areas, therefore, there is an urgency to begin efforts in fall 2002. The level of inkind support, donated equipment and supplies, and other matching from ongoing programs may make this possible.

The project timeline presented in this budget spans five years from 2005 to 2009. Assuming one third of the terrace is planted in 2002, years one and two of this budget include planting the remaining two thirds and year three includes adaptive supplemental planting depending on previous results. To quantify the response of seabird populations to improved habitat quality and the success of restoration, studies will be necessary for a minimum of five years. Years four and five of the budget focus on these studies and end products. At the end of five years, the advisory committee will assess the value of monitoring additional years. For example, Rhinoceros Auklet age of first breeding is between three and seven years, therefore, to quantify parameters that track recruitment, more years of data will likely be necessary.

In addition, the first three years of the restoration include funding to conserve the existing Rhinoceros and Cassin's Auklet population and provide valuable data by continuing the nest box program. Auklets have bred in nest boxes since 1993 on Año Nuevo Island. To date, a total of 301 chicks have been produced from nest boxes. It is important to continue this conservation to provide nesting sites protected from collapse until soil stability is restored and to replace individuals injured during the Command oil spill and ongoing contamination from other sources. Boxes provide a stable, secure habitat for nesting and acquiring basic age-specific life history and demographic information that is not known for Rhinoceros Auklets. The breeding population in nest boxes continues to increase while the number in natural burrows has not recovered to the number that bred in 1997, before vegetation disappeared. There are currently 76 next boxes in the proposed restoration area and 60% of these were occupied by breeding pairs in 2002.

Justification of Salary Time Allocation

The primary cost benefits of this proposal is that we will make use of existing synergistic program funding to carry out the restoration. On-going research by PRBO and UC Santa Cruz significantly reduce the costs for boat transportation, facility maintenance, and data acquisition. If we were to attempt this project without participation in on-going programs and the financial support by California State Parks, costs would likely double. Brief budget justifications are provided below. Additional details and explanation can be provided upon request by Command as the project develops.

Project Personnel
Project personnel include three principal investigators, Michelle Hester, Oikonos, and Julie Thayer and Bill Sydeman, PRBO Conservation Science. In addition, one staff biologist from Oikonos will focus on field work, education, and reporting. Contract services include work by Go Natives (30 days/yr for yrs 1 & 2) and UC Santa Cruz (8 days/yr for all years) for project review and expert consultation.

Average estimated annual time allocation and salary:

Oikonos - M. Hester, coPI	5.0 mo	@ $4000 salary
Oikonos - TBA Biologist	5.0 mo	@ $2700 salary
PRBO - J. Thayer, coPI	4.0 mo	@ $4000 salary
PRBO - W. Sydeman, coPI	0.5 mo	@ $6750 salary

In the Draft 5-yr Budget Table, total salary costs include a 5% annual increase, an additional 35% to cover taxes / benefits, and the respective organizations's overhead rate. Oikonos' current overhead rate is 20% applied to salary and expenses (for items under $4,000) and 10% applied to subcontracts. PRBO's current overhead rate is 29%.

Project Planning, Study Design, and Coordination
Success of this project requires extensive volunteer coordination, logistics, and plan development and reviews. Year-round salary time includes purchasing and transporting supplies, mainland staging of plants and equipment in preparation for island crossings, advisory committee communications and meetings, adaptive management of project and collaborations. Revegetation efforts will end in 2007, therefore, costs for logistics and coordination are reduced in 2008 and 2009.

Fall Revegetation
Planting, erosion control, seed collection, and irrigation installation will begin after seabird chicks have fledged and before rains begin; anticipated for October - November. Transporting and staging supplies on the island, and installation will require much labor and skilled boat handling. We estimate this process will take a minimum of three weeks with project staff and a team of experienced volunteers. The irrigation system will be revmoved upon successful establishment of plants (estimated for 2008).

Habitat Enhancement
Seasonal data collection on plant growth, distribution, and seabird response. In addition, time for adaptive maintenance will be needed year-round to respond to habitat changes and the effects of severe weather on the water catchment system.

Nest-site Protection
Auklets arrive in February to begin prospecting and re-establishing territories and mate bonds. Nest box maintenance and repairs will begin in January to assure birds have access to structurally sound nesting sites. From mid-April to mid-September, nest boxes are monitored once a week to document breeding occupancy, nesting success, and population growth.

Education
Time allocation in this budget is minimal for website presentation, annual training courses for docents, and two public presentations a year. The outreach potential for this project is impressive due to the high public visitation at the Año Nuevo Visitors Center and the State Park's volunteer docent program. We would prefer to expand the education and outreach portion of this project to educate the public about the true costs of oil transportation and the sensitivity of California's limited island habitat. We are designing an "Island Experience" exhibit to compliment the State Park's program and could provide more details if Command Trustees are interested in expanding the education value of the program.

Results and Reporting
Costs include annual time for data management, data summaries, and restoration progress reports. In addition, years four and five include time for scientific meeting preparation, one peer-reviewed manuscript, and other final products required by funders.

Justification of Expenses

Ground Cover
Erosion control material and structure for seeds and plants: Annual costs - BioD-Mat 90 coconut fiber, 7000 sq ft, $2310; Burlap, 3000 sq ft $500; staples for attachment, $390. The small cost for year three is for supplemental ground cover to augment some areas as necessary.

Water Catchment and Irrigation
Costs for irrigation of the remaining 2/3 of the marine terrace include: repairs to the existing system, $200; irrigation pvc pipe for 300 sq ft, $210; battery timer valves; $70, drip emitters $90. This assumes water catchment (gutters, solar pumps, tank storage) and 1/3 of the irrigation is installed in 2002.

Boat Transport Supplies

Majority of costs are covered by matching funds from on-going studies. Trips to the island will be coordinated with UC Santa Cruz and PRBO to reduce disturbance and combine resources. There will be over 100 trips made across the dangerous Año Nuevo Channel to transport plants and supplies. An extra outboard motor on the island is a safety necessity: 15 hp outboard, $2,500. Other annual costs include towing lines $50; annual outboard and zodiac maintenance $500; extra outboard prop. $60. We anticipate the boat will need replacement by 2008 ($3,800 for 12.5 ft inflatable zodiac and related equipment).

Native Plants

As explained in previous proposals, the current recommended restoration strategy is an aggressive approach with grown plants in dense concentrations augmented with erosion control material and seed planting. As of May 2003, the native species that has best survived the harsh island conditions in the experimental plots (and the only remnant native species that exists on the island) is salt grass, *Distichlis spicata*. Of the native seed assembledge collected from mainland point in fall of 2001, Beach Bur (*Ambrosia chamissonis*) is now sprouting and may also prove to be an appropriate island species. Assuming salt grass will be the main species used for revegetation, combined with planting of more native seeds, costs are estimated for 10,000 sq ft per year (approx. 1/3 of the proposed area). Planting at a density of 1 plant/sq ft at $2.00 each plant results in a total annual cost of $20,000 (for 2005 and 2006). The small cost in year three is for supplemental planting in needed areas.

Travel

Travel costs to participate in field-work and coordination meetings include mileage between Marin County and Año Nuevo State Reserve. The previous budget included a 4x4 passenger vehicle as it was determined this would be a cost benefit considering the amount of driving and the need to transport heavy equipment. This item was replaced with mileage costs, although to reduce personal injury and logistics, a 4x4 vehicle is still desperately needed to transport restoration and boating equipment to the beach on a regular basis.

Other costs include volunteer per diems, one local meeting annually to review the revegetation plans and study designs. Costs for the dissemination of project results include attending scientific meetings during the final year of the project. Hester will present research results at the Society for Conservation Biology and the Pacific Seabird Group meetings.

Año Nuevo Island Seabird Habitat Restoration					
[illegible]					
2005 to 2009					
ver. 5/13/2005					
Salary	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
	2005	2006	2007	2008	2009
Costs presented include: Salary, benefits, and overhead					
(see budget justification attached for base salary rates and details)					
Project Planning, Study Design, & Coordination (Jan-Dec)	14,669	14,948	15,227	8,615	8,770
Restoration plan and study design review, volunteer coordination, mainland staging of equipment and supplies					
Fall Revegetation (Nov, Dec)	15,297	15,589	12,736	0	0
Seed collection, transporting supplies to island, planting, erosion control, volunteer coordination (ends after 2007)					
Habitat Enhancement (Jan-Dec)	13,885	14,111	14,338	15,325	16,524
Upkeep, erosion control adaptations, seabird and plant response studies, water catchment					
Nest site protection - Nest boxes (Jan-Sept)	26,507	27,012	27,517	0	0
Nest box repair and maintenance, nest success monitoring					
Education (Jan - Dec)	5,068	5,165	5,261	5,358	5,455
Docent training, public presentations, website					
Results and Reporting (Jan - Dec)	7,736	7,884	8,031	15,178	17,751
Data management, data summaries, restoration progress reports, scientific meeting preparation, peer-reviewed manuscript, final products					
Total Annual Salary, Benefits, Overhead	83,162	84,709	83,110	44,476	48,500
Expenses & Equipment					
round Cover	3,200	3,200	237	0	0
degradable coconut fiber and burlap					
Water Catchment and Irrigation	570	570	200	0	0
Yrs 1 & 2 - parts for 1/3 of terrace and catchment system upkeep					
(irrigation system removed upon plant establishment in 2008)					
Boat Transport Supplies	3,110	560	560	4,360	560
15hp backup outboard and annual maintenace					
inflatable zodiac 12.5ft (anticipate needing a replacement in 2008)					
Nest Box Repairs	150	170	190	0	0
wood, paint and supplies					
Aerial Photos	4,500	4,500	4,500	4,500	4,500
habitat change documentation (2 surveys / yr)					
Travel	7,200	7,200	5,000	4,000	8,000
scientific meetings, field site travel, volunteer per diem					
Journal Publication	0	0	0	1,000	1,000
publisher costs for peer-reviewed manuscripts					
Education Supplies					
digital camera equipment, software	2,200	500	500	2,400	500
SubTotal Expenses	20,930	16,700	11,187	16,260	14,560
Indirect Costs (20%)	2,093	1,670	1,119	1,626	1,456
Other Expenses (no indirect cost applied)					
Native Plants	20,000	20,000	2,000	0	0
Yrs 1 & 2 - planting 1/3 of terrace					
r 3 augmented planting					
otal Expenses	43,023	38,370	14,306	17,886	16,016
Total Project Annual Cost	126,185	123,079	97,416	62,362	64,516
Total 5 year Project Cost = $473,558					

NZ

"Hannah Nevins" <hrnevins@hotmail.com>

05/28/2003 06:59 PM

To: Steve_Hampton@dfg.gov, shampton@dfg.gov
cc: Charlene_Hall@fws.gov, henrik.moller@stonebow.otago.ac.nz, Jennifer.Boyce@noaa.gov, josh_adams@usgs.gov
Subject: Rakiura Titi Restoration Project-budget

Steve Hampton and Trustees,

Thanks for your reposponse to the Shearwater restoration project we have proposed. I have talked to the NZ folks, and we have put together three options for a revision of the budget, showing where objectives will be scaled back, and potential increases in other 'in kind' contributions to meet all of the original goals. Please see attached letter and spreadsheet which detail the revisions and answers to your questions about the project.

Please let us know if you need any more information.
-Hannah

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Response_to_Hampton RTRP_budget_revised

May 28, 2003

Re: Rakiura Tïtï Restoration Project – response to questions from Council (5/15/03)

Steve Hampton
Resource economist, CDFG
Command Oil Spill Trustee Council

Dear Steve & *Command* Trustees,

Thanks for your positive response to our proposed Rakiura Tïtï Restoration Project (RTRP). To facilitate communication about our proposal, we thought it appropriate to reiterate questions that came up during our 5/16/03 phone discussion regarding the details of this project. We provide herein more complete answers to your questions so that you may communicate our goals more effectively with the other trustee council members.

We have included a modification of the original budget showing tiered cost-benefits (attached spreadsheet). Basically, this will allow the trustee council to evaluate the level of effort and corresponding costs for each of the four main objectives. The cost of the primary objective to eradicate rats should not be modified, however, depending on the overall budget constraints of the trustee council, we suggest considering the desired level of effort to meet objectives 2 – 4.

Briefly, the RTRP team is seeking funding over the next 10 years to (rank in order of importance):

(1) Eradicate the non-native introduced rats,
(2) Establish quarantine to prevent re-introduction of rats,
(3) Monitor and predict restoration success, and
(4) Create educational outreach to inform the people of New Zealand and California about the project.

Answers to questions posed by the *Command* Trustees (Hampton):

1) Are there other sources of funding for this project?

No. This project was designed specifically to address the restoration of damages to Sooty Shearwaters that occurred during the *Command* spill and to measure the success of restoration actions. The regional manager for the NZ Department of Conservation (DoC) is in support of this project (Greg Lind; Appendix D) and has agreed to provide a substantial "in kind" support amounting to US$101,000 (Appendix C). DoC is not able to spend large amounts of funds for restoration outside their estate (the Tïtï Islands are owned by Rakiura Mäori, not the Crown Government of New Zealand). The Rakiura Tïtï Administering Body (RTIAB) is also in support of this project (see letter from Ron Bull), but have limited funds reserved for monitoring chick-harvest of Tïtï (shearwaters) through their on-going program, "Keep the tïtï forever". Because our project will

ultimately benefit the entire island ecosystem currently affected by rats, the DoC is very supportive of this project. No large funds exist to meet a project of this scale. However, we will apply for smaller grants to meet peripheral parts of the project (objectives 3 and 4) if the *Command* Trustees can not meet the full cost.

2) Would the NZ DoC be doing this work without these funds?

No. The goals of this project are outside typical management actions for both the DoC and the Mäori tribal groups which have jurisdiction of the Tïtï Islands. The tribal groups monitor chick harvest and are working to develop a sustainable harvest model for the tïtï population. Because they are responsible for overseeing these natural resources, they have a vested interest in supporting this project with in kind funding. The RTIAB has been instrumental in providing the time of Dr. Moller to develop this proposal. The NZ DoC would donate all their time for free as part of the "good neighbor" role. These stakeholders all have an interest in seeing the RTRP project happen with the support of *Command* funds, but would not fund this work themselves independently because it is directed at restoration outside of DoC-owned land and consequently outside their mandate for management.

2) Could the work be done for less money?

Yes. We could pare down the budget, but it is essential to keep full funding for the primary objective (rat eradication). The financial support for the other objectives, prevention, monitoring, education, could be scaled back to reduce the costs. See rationale below for each objective. We have identified three levels of funding for each of the secondary objectives: Full, Middle, and Minimal. See attached summary tables and detailed worksheets with three budget scenarios to evaluate the cost-benefits of each scenario. Funding the full proposal is by far the best option because there are no guarantees that we can find grants for the remaining tasks, but we understand that the Trustees wish to spread benefits may force them to fund a reduced project.

(1) Eradication. This is the primary purpose of the proposal and as such we couldn't see any way of reducing this funding objective in any way. This objective is urgent and important.

(2) Quarantine. The long-term benefits of the project will be cemented in place by the performance of this second objective's primary goal – i.e. to maintain the islands in a rodent free state. Although this work is also urgent and important it may be possible to carry out the core components of this objective on a slightly reduced budget.

(3) Monitoring. The focus of this objective is accountability – in order to quantify the success of the eradication it is necessary to monitor the changes. We have calculated two reduced monitoring budgets for consideration. These reductions will invariably lead to some compromise being made upon the quality and quantity of science (frequency, intensity of monitoring) that can be undertaken.

(4) Education. While this work is important it is less urgent than the previous three. Reduced funding in this sector will most likely lead to limited outputs. A number of cuts have been made to this objective's budget.

In each budget scenario, the Level of "in kind" support has been increased to compensate for the budget reduction, these funds are dependent upon on finding alternative funding sources and are not guaranteed (except at the level of initial US$285,000). However, film and educational packages may be appealing components to US and NZ non-profit conservation groups, and are more likely to be funded by other groups.

Briefly, we list what "drops out" of each objective with reduced funding levels:

Full funding option
no change to funding any objective

Middle funding option
Objective 1 - Eradication
no change

Objective 2 - Quarantine
Involvement of quarantine officer reduced (in later years)
Less features produced for the Tïtï Times
No funding for the production of a documentary on the project

Objective 3 - Monitoring
Reduced number of benchmark plots established
Reduced study and modeling of rat impacts
Reduced monitoring programme by Rakiura Mäori Scientist
Exchange visits between US and NZ teams reduced from 5 to 1

Objective 4 - Education
No funding for the production of a documentary on the project
The number of education packages produced by Oikonos reduced from 3 to 2
The number of exchange visits by US researchers reduced from 4 to 2

Minimal funding option

Objective 1 - Eradication
No change

Objective 2 - Quarantine
Involvement of quarantine officer further reduced (in later years)

Even less features produced for the Tïtï Times
No funding for the production of a documentary on the project

Objective 3 - Monitoring
Reduced number of benchmark plots established
No study and modeling of rat impacts
Further reduced monitoring programme by Rakiura Mäori Scientist
No exchange visits between US and NZ teams

Objective 4 - Education
No funding for the production of a documentary on the project
The number of education packages produced by Oikonos reduced from 3 to 1
The number of exchange visits by US researchers reduced from 4 to 1

3) Could the DOC increase their matching funds if the *Command* couldn't fund entire project?
No. As mentioned above, DoC is not mandated to spend their funds outside the DoC estate. These groups have promised matching in kind support at the maximum available to them; however, with the guaranteed support of the *Command* council, we will be in a better position to request further support from these and other groups. If the educational outreach component of the study is not funded by *Command*, we will continue to seek additional funds elsewhere to implement this objective.

4) Is there any problem with running a sole contract through a US based organization rather than a NZ group? (You indicated that the Trustee Council might have a problem giving money directly to NZ Government)

This would not be a grant to the NZ government — it would be to a US or NZ based non-profit organization. Oikonos (US non-profit) could serve as the as the sole contractor for this work, and eradication program would be sub-contracted to NZ specialists and assisted with operational support by the DoC. No payments would go to NZ Government.

The US/NZ Rakiura Tïtï Restoration Project (RTRP) working group would provide project direction for the implementation of the project. The RTRP working group for this project is to include members of the Rakiura Tïtï Islands Administering Body (RTIAB), Rakiura Tïtï Islands Committee (RTIC), New Zealand Department of Conservation (DoC), *Kia Mau Te Tïtï Mo Ake Tõnu Atu* – "Keep the Tïtï Forever" research Team from the University of Otago, NZ, the US based non-profit research group Oikonos, and other seabird specialists from the US. The project team could form a New Zealand-based Trust, Incorporated Society or Company as directed by the *Command* Trustees if the Oikonos option is not workable. We will find a way to meet your needs in this regard.

5) How sustainable is the harvest? Are 500,000 chicks per year harvested?-And if so, might this be a detriment to goals of restoration?

Understanding the sustainability of the harvest is beyond the goals of the proposed RTRP, but is a main goal of many NZ resource management groups (RTIAB, RTIC, DoC, Univ. of Otago). Harvest is not seen as a hindrance to the success of this project because the potential depredation by rats to shearwaters will replace the additional mortality imposed on the population by the oil spill. Our simulations have already incorporated best estimates of the harvest take and predicted replacement of the adults killed by the spill. There are no formal estimates of total take yet (the 250,000 to 500,000 figure you mention is an anecdotal estimate that has been repeated over and over without real evidence for its validity). That estimate was for all 36 Tïtï Islands not just the 4 nominated for rat eradication.

There is evidence of an annual 1-2% population decline from nesting islands without chick-harvesting, suggesting that other mortality factors such as climate change, by-catch, contaminants, and oil pollution are affecting the entire population on both harvested and un-harvested islands.

There are few feasible management alternatives to restore shearwaters other than predator eradication. Reducing harvesting rates has political, social, and economic complexities. The alternative of managing harvest levels is the sole jurisdiction of Rakiura Mäori tribal management groups, and they have begun their own evaluation of the real need (or otherwise) for harvest management by initiating the *Kia Mau Te Tïtï Mo Ake Tōnu Atu* Research project. First estimates of sustainability are due in 2006. We conclude that harvest-management for this species is simply not an alternative that should be considered within the scope of *Command* spill restoration goals and funding availability. We must deal with one threat at a time.

There is no reliable direct count of the harvest level on the islands proposed for eradication, but we estimate 10-20% of the chicks available on the manu (breeding areas) are taken. The model for restoration projections included the estimated harvest levels, so the predicted results take this factor into account.

Other mortality factors continue to affect the population of sooty shearwaters such as fishery by-catch. The Japanese salmon gillnet fishery was estimated to have taken 3,899 and 8,324 Sooty Shearwaters per year[1]. A recent review of fishery by-catch in the North Pacific found Sooty Shearwater mortality in 14 of 17 fisheries, including gillnets, trawl nets and longline fisheries[2]. These fisheries result in thousands to tens of thousands of shearwater deaths each year.

Oil pollution is another source of mortality of sooty shearwaters during the non-breeding season. Total moralities of shearwaters killed in oil spills are rarely estimated because they are considered a migratory species although they inhabit foraging areas in great

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[1] DeGange 1978, Ainley *et al.* 1981
[2] Uhlmann 2003

numbers and densities within the California Current predictably every year. However, both catastrophic oil spills and chronic oiling continue to kill shearwaters. This restoration project, if funded, will be the first to seek compensation for shearwaters killed in an oil spill. The most effective means of reducing this mortality factor is through efforts to prevent pollution.

Rats and other non-native predators are known to devastate seabird colonies worldwide and particularly in NZ where there are also high numbers of other endemic species. Removing introduced predators is perhaps the most feasible and effective means to replace and restore the amount of shearwaters damaged by the *Command* spill.

6) What is the population of Sooty Shearwaters? Where else do they breed?

The worldwide estimate of Sooty Shearwaters is estimated at ca. 20 million birds, with the main colony of 2.5 million on the sub-Antarctic Reserve, Snares Island. However, many breed in southern South America and systematic surveys are needed before the relative proportion of NZ to South American birds is known. 200,000 pairs breed in Australia. From few band returns (such as NZ banded bird recovered in *Command* spill) and at-sea surveys, the NZ population is thought to use the California Current region extensively each summer (May – August), whereas the part of the South American non-breeding population may migrate into the Humbolt Current and North Atlantic.

Many sooty shearwater breeding colonies on the mainland of New Zealand have been extirpated by introduced predators, the few that remain are below carrying capacity[3]. Breeding sites on offshore islands, therefore, provide important refuges.

7) How far away are these Tïtï Islands, is this logistically feasible? Are there other islands, why these ones?

These particular islands were chosen for several reasons, (1) high potential for success, (2) the greatest multi-species ecological benefit for the entire South Cape Island Group, (3) relatively low threat of re-introduction of rats due to remoteness and limited accessibility, (4) because of the "rat spill" on Tauhikepa island in 1964 was a national tragedy, this project will receive good public support if implemented.

Mainland breeding colonies of shearwaters are subject to far greater potential for decimation by introduced predators; however the risk of re-invasion of these mainland sites is very high. Furthermore mainland colonies have many different introduced mammals (stoats, cats, ferrets, rats), which adds greater complexity to restoring a predator free nesting habitat. Restoration of mainland colonies is likely to require over 100 years of continuous predator control – focusing restoration there is simply not practical nor cost-effective for the *Command* funds.

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[3] Small populations are at greater extinction risk than larger ones due to density dependent affects of large colonies buffering against predation (see Jones 2002, Biol. Cons. 108:1-12.).

The Big South Cape Group (60 km/38 mi south NZ mainland) is much more accessible than the remote Campbell Island (700 km/440 mi south NZ) which was by far the largest scale eradication implemented to date. The DoC has just publicly announced the success on the eradication at Campbell this week[4]. The Campbell Is. eradication was implemented by the same NZ team that would be doing this work (see video). This gives us great hope that our proposed project will be well implemented and successful at restoring a rat-free nesting habitat for tens of thousands of shearwaters.

Please take your time to review the attached materials and contact Hannah Nevins in the US at (lab) 831-771-4422 or (h) 831-684-9317, hrnevins@hotmail.com, or Henrik Moller in NZ via email (henrik.moller@stonebow.otago.ac.nz) or phone +64-3-4797991 for further clarifications or justification.

The four scientists writing this letter are not mandated to make decisions for the RTIAB kaitiaki (environmental guardians) or DoC, we can just advise on a range of options at this stage. When given a solid commitment for funding by the *Command* Trustees, we will work with these groups to negotiate final budgets and contracts with the *Command* Trustees. The RTIAB have indicated their willingness to travel to California to meet the Trustees if that were wanted by you this is a measure of how important they consider the project to be for their community, culture, future population, and for the Tïtï Island's ecology.

The tïtï harvesters have just arrived back from the islands and are scheduled to meet with the research team in the last week of June. Firm decisions and detailed guidance could be sought from them then. If the *Command* Trustees require more urgent guidance, please advise Dr Moller. He will then gather the kaitiaki for a meeting to discuss the project.

We would greatly appreciate advice on your expected timetable for the process of choosing projects for restoration. This will help us draw the relevant stakeholders together in New Zealand and finalize plans and logistics.

We look forward to your comments and hope that you will choose to support the Rakiura Tïtï Islands Restoration project.

Hannah Nevins
Josh Adams
Henrik Moller
Jamie Newman

Attached:
Table 1. Budget Scenarios for funding
Excel Worksheet: RTRP_budget_revamp.xls

Cc: Charlene Hall, USFWS; Jen Boyce, NOAA

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[4] This news ran in the *Otago Daily Times* 27th May 2003.

Table 1. Three budget scenarios for the Rakiura Tïtï Islands Restoration Project (US$). (A) Full budget without modifications, (B) Middle scenario, some changes to mainly 3-4, (C) Minimal scenario, with reductions in all but primary objective. See attached excel worksheet for projection across years. Percent of project funded is with respect to entire budget including in kind contributions by RTIAB and DoC, and Oikonos.

	Scenario					
	A		B		C	
	Full	% of Full	**Middle**	% of Full	**Minimal**	% of Full
***Command* Funded**						
Eradication	236700	100	236700	100.0	236700	100.0
Quarantine	71000	100	50480	71.1	39720	55.9
Monitoring	199500	100	118700	59.5	87000	43.6
~~Education~~	30800	100	15400	50.0	7700	25.0
Command funded	538,000	100	421,280	78.3	371,120	69.0
% Project	65		51		45	
In Kind Funded				*% incr.*		*% incr.*
Eradication	$ 119,500		$ 119,500	*0.0*	$ 119,500	*0.0*
Quarantine	$ 11,000		$ 31,520	*186.5*	$ 42,280	*284.4*
Monitoring	$ 155,500		$ 236,300	*52.0*	$ 268,000	*72.3*
Education	$ -		$ 15,400	-	$ 23,100	-
In kind funded***	$ 286,000		$ 402,720		$ 452,880	
% Project	35		49		55	
Total Project	$ 824,000		$ 824,000		$ 824,000	

*** this table shows the increased amounts of help in kind that would need to be sought from other sources if the same level of service was to provided but reduced funding was offered by the *Command* Trustees.

	Scenario						
Objective	Full (optimal)	% of Full	Middle	% of Full	Minimal	% of Full
Eradication	**$ 236,700**	*100.0*	**$ 236,700**	*100.0*	**$ 236,700**	*100.0*
Quarantine	**$ 71,000**	*100.0*	**$ 50,480**	*71.1*	**$ 39,720**	*55.9*
Monitoring	**$ 199,500**	*100.0*	**$ 118,700**	*59.5*	**$ 87,000**	*43.6*
Education	**$ 30,800**	*100.0*	**$ 15,400**	*50.0*	**$ 7,700**	*25.0*
Total funding sought	$ 538,000	*100.0*	$ 421,280	*78.3*	$ 371,120	*69.0*

Reduction from orginal budget	Middle	Minimal
	$ -	$ -
	$ 20,520	$ 31,280
	$ 80,800	$ 112,500
	$ 15,400	$ 23,100
Total reduction	$ 116,720	$ 166,880

Help in kind***	Full (optimal)	Middle	% incr.	Minimal	% incr.
Eradication	$ 119,500	$ 119,500	*0.0*	$ 119,500	*0.0*
Quarantine	$ 11,000	$ 31,520	*186.5*	$ 42,280	*284.4*
Monitoring	$ 155,500	$ 236,300	*52.0*	$ 268,000	*72.3*
Education	$ -	$ 15,400	-	$ 23,100	-
Total value of help in kind	$ 286,000	$ 402,720		$ 452,880	

*** this table shows the increased amounts of help in kind that would need to be sought from other sources if the same level of service was to provided but reudced funding was offered by the Command Trustees.

Objective	Scenario: Full (optimal)	% of Full	Middle	% of Full	Minimal	% of Full
Eradication	**$ 236,700**	*100.0*	**$ 236,700**	*100.0*	**$ 236,700**	*100.0*
Quarantine	**$ 71,000**	*100.0*	**$ 50,480**	*71.1*	**$ 39,720**	*55.9*
Monitoring	**$ 199,500**	*100.0*	**$ 118,700**	*59.5*	**$ 87,000**	*43.6*
Education	**$ 30,800**	*100.0*	**$ 15,400**	*50.0*	**$ 7,700**	*25.0*
Total funding sought	$ 538,000	*100.0*	$ 421,280	*78.3*	$ 371,120	*69.0*

Reduction from orginal budget	Middle	Minimal
	$ -	$ -
	$ 20,520	$ 31,280
	$ 80,800	$ 112,500
	$ 15,400	$ 23,100
Total reduction	$ 116,720	$ 166,880

Help in kind***	Full (optimal)	Middle	% incr.	Minimal	% incr.
Eradication	$ 119,500	$ 119,500	*0.0*	$ 119,500	*0.0*
Quarantine	$ 11,000	$ 31,520	*186.5*	$ 42,280	*284.4*
Monitoring	$ 155,500	$ 236,300	*52.0*	$ 268,000	*72.3*
Education	$ -	$ 15,400	-	$ 23,100	-
Total value of help in kind	$ 286,000	$ 402,720		$ 452,880	

*** this table shows the increased amounts of help in kind that would need to be sought from other sources if the same level of service was to provided but reudced funding was offered by the Command Trustees.

What drops out of each objective

Middle funding option

Objective 1 - Eradication

no change

Objective 2 - Quarantine

Involvment of quarantine officer reduced (in later years)
Less features produced for the titi times
No funding for the production of a documentary on the project

Objective 3 - Monitoring

Reduced number of benchmark plots established
Reduced study and modelling of rat impacts
Reduced monitoring programme by Rakiura Maori Scientist
Exhange visits between US and NZ teams reduced from five to one

Objective 4 - Education

No funding for the production of a documentary on the project
The number of eduction packages produced by Oikonos reduced from three to tw
The number of exchange visits by US researchers reduced from 4 to 2

Minimal funding option

Objective 1 - Eradication

No change

Objective 2 - Quarantine

Involvment of quarantine officer further reduced (in later years)
~~*Even less features produced for the titi times*~~
No funding for the production of a documentary on the project

Objective 3 - Monitoring

Reduced number of benchmark plots established
No study and modelling of rat impacts
Further reduced monitoring programme by Rakiura Maori Scientist
No exhange visits between US and NZ teams

Objective 4 - Education

No funding for the production of a documentary on the project
The number of eduction packages produced by Oikonos reduced from three to o
The number of exchange visits by US researchers reduced from 4 to 1

Eradication Optimal - only option													
Budget Item	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**		
Preparation of plans, negotiating contracts with Command Trustee Council, public submissions in consent application, reporting outcomes (Univ. research team)	$15,000	$5,000	$5,000	$5,000									
Rakiura Maori kaitiaki help in eradication operation, planning, negotiation, reporting and film making (RTIAE)	$8,000	$8,000	$8,000										
Rodent eradication costs		$180,000											
Monitoring: Establishment of benchmark monitoring plots on Mokonui, Rerewhakauopoko and northern Taukihepa (Univ research team)													
Investigation of rat predation rates, reporting and modelling outcomes (Univ research team)													
Employment of Rakiura Maori monitoring scientist and quarantine officer ($17 k p.a.) and expenses ($7k) for intensive monitoring years (2003 - 2006), $5K for quarantine pa in intervening years													
Titi Times Special edition (2004) and subsequent features (to Univ production team)													
Preparation of a Television documentary													
Facilitation/public education/exchange visits by USA researchers (Adams, Nevins to NZ)	$2,700												
Facilitation/public education/exchange visits by USA researchers (Veit to NZ)													
Preparation of educational packages (USA and NZ) - to Oikonos													
Exchange visits (Moller or Newman) to USA													
SUMMARY BY OBJECTIVE - Command													
												Optimal	
Year	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**All years**	
Objective 1 Eradication	$25,700	$193,000	$13,000	$5,000	$0	$0	$0	$0	$0	$0	$0	**$236,700**	

Quarantine optimal														
Budget Item	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**			
Preparation of plans, negotiating contracts with Command Trustee Council, public submissions in consent application, reporting outcomes (Univ. research team)														
Rakiura Maori kaitiaki help in eradication operation, planning, negotiation, reporting and film making (RTIAB)														
Rodent eradication costs														
Monitoring: Establishment of benchmark monitoring plots on Mokonui, Rerewhakauopoko and northern Taukihepa (Univ research team)														
Investigation of rat predation rates, reporting and modelling outcomes (Univ research team)														
Employment of Rakiura Maori monitoring scientist and quarantine officer ($17 k p.a.) and expenses ($7k) for intensive monitoring years (2003 - 2006), $5K for quarantine pa in intervening years	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000	$5,000			
Titi Times Special edition (2004) and subsequent features (to Univ production team)	$880	$2,200	$880	$880	$880	$880	$880	$880	$880	$880	$880			
Preparation of a Television documentary		$5,000												
Facilitation/public education/exchange visits by USA researchers (Adams, Nevins to NZ)														
Facilitation/public education/exchange visits by USA researchers (Veit to NZ)														
Preparation of educational packages (USA and NZ) - to Oikonos														
Exchange visits (Moller or Newman) to USA														
												Optimal		
Year	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**All years**		
Objective 2 Quarantine	$5,880	$12,200	$5,880	$5,880	$5,880	$5,880	$5,880	$5,880	$5,880	$5,880	$5,880	**$71,000**		
Quarantine middle														
Budget Item	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**			
Preparation of plans, negotiating contracts with Command Trustee Council, public submissions in consent application, reporting outcomes (Univ. research team)														

Rakiura Maori kaitiaki help in eradication operation, planning, negotiation, reporting and film making (RTIAB)														
Rodent eradication costs														
Monitoring: Establishment of benchmark monitoring plots on Mokonui, Rerewhakauopoko and northern Taukihepa (Univ research team)														
Investigation of rat predation rates, reporting and modelling outcomes (Univ research team)														
Employment of Rakiura Maori monitoring scientist and quarantine officer ($17 k p.a.) and expenses ($7k) for intensive monitoring years (2003 - 2006), $5K for quarantine pa in intervening years	$5,000	$5,000	$5,000	$4,000	$4,000	$4,000	$4,000	$3,000	$3,000	$3,000	$3,000		Reduced involment of quarantine officer	
Titi Times Special edition (2004) and subsequent features (to Univ production team)	$880	$2,200	$880		$880		$880		$880		$880		Less regular features	
Preparation of a Television documentary													Removed documentary	
Facilitation/public education/exchange visits by USA researchers (Adams, Nevins to NZ)														
Facilitation/public education/exchange visits by USA researchers (Veit to NZ)														
Preparation of educational packages (USA and NZ) - to Oikonos														
Exchange visits (Moller or Newman) to USA														
SUMMARY BY OBJECTIVE - Command														
												Middle		
Year	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**All years**		
Objective 2 Quarantine	$5,880	$7,200	$5,880	$4,000	$4,880	$4,000	$4,880	$3,000	$3,880	$3,000	$3,880	**$50,480**		

Quarantine minimal														
Budget Item	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**			
Preparation of plans, negotiating contracts with Command Trustee Council, public submissions in consent application, reporting outcomes (Univ. research team)														
Rakiura Maori kaitiaki help in eradication operation, planning, negotiation, reporting and film making (RTIAB)														
Rodent eradication costs														
Monitoring. Establishment of benchmark monitoring plots on Mokonui, Rerewhakauopoko and northern Tauklhepa (Univ research team)														
Investigation of rat predation rates, reporting and modelling outcomes (Univ research team)														
Employment of Rakiura Maori monitoring scientist and quarantine officer ($17 k p.a.) and expenses ($7k) for intensive monitoring years (2003 - 2006), $5K for quarantine pa in intervening years	$5,000	$5,000	$5,000	$3,000	$3,000	$3,000	$2,000	$2,000	$2,000	$2,000	$2,000		Reduced quarantine roel after first few years	
Titi Times Special edition (2004) and subsequent features (to Univ production team)	$880	$2,200	$880		$880			$880					Removed Titi times features after eradication	
Preparation of a Television documentary													Removed documentary	
Facilitation/public education/exchange visits by USA researchers (Adams, Nevins to NZ)														
Facilitation/public education/exchange visits by USA researchers (Veit to NZ)														
Preparation of educational packages (USA and NZ) - to Oikonos														
Exchange visits (Moller or Newman) to USA														
SUMMARY BY OBJECTIVE - Command														
												Minimal		
Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	All years		
Objective 2 Quarantine	$5,880	$7,200	$5,880	$3,000	$3,880	$3,000	$2,000	$2,880	$2,000	$2,000	$2,000	**$39,720**		

Monitoring Optimal													
Budget Item	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**		
Preparation of plans, negotiating contracts with Command Trustee Council, public submissions in consent application, reporting outcomes (Univ. research team)													
Rakiura Maori kaitiaki help in eradication operation, planning, negotiation, reporting and film making (RTIAB)											$4,000		
Rocent eradication costs													
Monitoring: Establishment of benchmark monitoring plots on Mokonui, Rerewhakauopoko and northern Taukihepa (Univ research team)	$5,000	$5,000											
Investigation of rat predation rates, reporting and modelling outcomes (Univ research team)	$7,000	$7,000	$7,000	$17,000							$10,000		
Employment of Rakiura Maori monitoring scientist and quarantine officer ($17 k p.a.) and expenses ($7k) for intensive monitoring years (2003 - 2006), $5K for quarantine pa in intervening years	$19,000	$19,000	$19,000	$19,000						$19,000	$19,000		
Titi Times Special edition (2004) and subsequent features (to Univ production team)													
Preparation of a Television documentary													
Facilitation/public education/exchange visits by USA researchers (Adams, Nevins to NZ)		$2,700	$2,700							$5,400	$2,700		
Facilitation/public education/exchange visits by USA researchers (Veit to NZ)		$2,500		$2,500									
Preparation of educational packages (USA and NZ) - to Oikonos													
Exchange visits (Moller or Newman) to USA			$2,500								$2,500		
SUMMARY BY OBJECTIVE - Command													
												Optimal	
Year	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**All years**	
Objective 3 Monitoring	$31,000	$36,200	$31,200	$38,500	$0	$0	$0	$0	$0	$24,400	$38,200	**$199,500**	
Monitoring Optimal													
Budget Item	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**		
Preparation of plans, negotiating contracts with Command Trustee Council, public submissions in consent application, reporting outcomes (Univ. research team)													

Rakiura Maori kaitiaki help in eradication operation, planning, negotiation, reporting and film making (RTIAB)											$4,000		
Rodent eradication costs													
Monitoring: Establishment of benchmark monitoring plots on Mokonui, Rerewhakauopoko and northern Taukihepa (Univ research team)	$4,000	$4,000										Reduced monitoring	
Investigation of rat predation rates, reporting and modelling outcomes (Univ research team)	$7,000	$7,000										Reduced study	
Employment of Rakiura Maori monitoring scientist and quarantine officer ($17 k p.a.) and expenses ($7k) for intensive monitoring years (2003 - 2005), $5K for quarantine pa in intervening years	$15,000	$15,000	$15,000	$15,000						$15,000	$15,000	Reduced Monitoring programme	
Titi Times Special edition (2004) and subsequent features (to Univ production team)													
Preparation of a Television documentary													
Facilitation/public education/exchange visits by USA researchers (Adams, Nevins to NZ)											$2,700	Reduced visits	
Facilitation/public education/exchange visits by USA researchers (Veit to NZ)												No visits	
Preparation of educational packages (USA and NZ) - to Oikonos													
Exchange visits (Moller or Newman) to USA												No visits	
SUMMARY BY OBJECTIVE - Command													
												Middle	
Year	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**All years**	
Objective 3 Monitoring	$26,000	$26,000	$15,000	$15,000	$0	$0	$0	$0	$0	$15,000	$21,700	**$118,700**	

Monitoring Minimal													
Budget Item	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**		
Preparation of plans, negotiating contracts with Command Trustee Council, public submissions in consent application, reporting outcomes (Univ. research team)													
Rakiura Maori kaitiaki help in eradication operation, planning, negotiation, reporting and film making (RTIAB)											$4,000		
Rodent eradication costs													
Monitoring: Establishment of benchmark monitoring plots on Mokorui, Rerewhakauopoko and northern Taukihepa (Univ research team)	$4,000	$4,000											
Investigation of rat predation rates, reporting and modelling outcomes (Univ research team)												No rat impact monitoring and modelling	
Employment of Rakiura Maori monitoring scientist and quarantine officer ($17 k p.a.) and expenses ($7k) for intensive monitoring years (2003 - 2005), $5K for quarantine pa in intervening years	$15,000	$15,000	$15,000							$15,000	$15,000	Minimal monitoring	
Titi Times Special edition (2004) and subsequent features (to Univ production team)													
Preparation of a Television documentary													
Facilitation/public education/exchange visits by USA researchers (Adams, Nevins to NZ)												No visits	
Facilitation/public education/exchange visits by USA researchers (Veit to NZ)												No visits	
Preparation of educational packages (USA and NZ) - to Oikonos													
Exchange visits (Moller or Newman) to USA												No visits	
SUMMARY BY OBJECTIVE - Command													
												Minimal	
Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	All years	
Objective 3 Monitoring	$19,000	$19,000	$15,000	$0	$0	$0	$0	$0	$0	$15,000	$19,000	$87,000	

Education Optimal													
Budget Item	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**		
Preparation of plans, negotiating contracts with Command Trustee Council, public submissions in consent application, reporting outcomes (Univ. research team)													
Rakiura Maori kaitiaki help in eradication operation planning, negotiation, reporting and film making (RTAB)													
Rodent eradication costs													
Monitoring: Establishment of benchmark monitoring plots on Mokonui, Rerewhakauopoko and northern Taukihepa (Univ research team)													
Investigation of rat predation rates, reporting and modelling outcomes (Univ research team)													
Employment of Rakiura Maori monitoring scientist and quarantine officer ($17 k p.a.) and expenses ($7k) for intensive monitoring years (2003 - 2006), $5K for quarantine pa in intervening years													
Titi Times Special edition (2004) and subsequent features (to Univ production team)													
Preparation of a Television documentary		$5,000											
Facilitation/public education/exchange visits by USA researchers (Adams, Nevins to NZ)	$2,700	$2,700	$2,700								$2,700		
Facilitation/public education/exchange visits by USA researchers (Veit to NZ)													
Preparation of educational packages (USA and NZ) - to Oikonos		$5,000	$5,000								$5,000		
Exchange visits (Moller or Newman) to USA													
SUMMARY BY OBJECTIVE - Command Trustees													
												Optimal	
Year	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**All years**	
Objective 4 Educational Outreach	$2,700	$12,700	$7,700	$0	$0	$0	$0	$0	$0	$0	$7,700	**$30,800**	
Education Middle													
Budget Item	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**		
Preparation of plans, negotiating contracts with Command Trustee Council, public submissions in consent application, reporting outcomes (Univ. research team)													

Rakiura Maori kaitiaki help in eradication operation, planning, negotiation, reporting and film making (RTIAB)													
Rodent eradication costs													
Monitoring: Establishment of benchmark monitoring plots on Mokonui, Rerewhakauopoko and northern Tatkihepa (Univ research team)													
Investigation of rat predation rates, reporting and modelling outcomes (Univ research team)													
Employment of Rakiura Maori monitoring scientist and quarantine officer ($17 k p.a.) and expenses ($7k) for intensive monitoring years (2003 - 2006), $5K for quarantine pa in intervening years													
Titi Times Special edition (2004) and subsequent features (to Univ production team)													
Preparation of a Television documentary												No documentary	
Facilitation/public education/exchange visits by USA researchers (Adams, Nevins to NZ)	$2,700										$2,700	reduced visits	
Facilitation/public education/exchange visits by USA researchers (Veit to NZ)													
Preparation of educational packages (USA and NZ) - to Oikonos		$5,000									$5,000	Less education packages	
Exchange visits (Moller or Newman) to USA													
SUMMARY BY OBJECTIVE - Command Trustees													
												Middle	
Year	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**All years**	
Objective 4 Educational Outreach	$2,700	$5,000	$0	$0	$0	$0	$0	$0	$0	$0	$7,700	**$15,400**	

Education Minimal													
Budget Item	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**		
Preparation of plans, negotiating contracts with Command Trustee Council, public submissions in consent application, reporting outcomes (Univ. research team)													
Rakiura Maori kaitiaki help in eradication operation, planning, negotiation, reporting and film making (RTIAB)													
Rodent eradication costs													
Monitoring: Establishment of benchmark monitoring plots on Mokonui, Rerewhakauopoko and northern Taukihepa (Univ research team)													
Investigation of rat predation rates, reporting and modelling outcomes (Univ research team)													
Employment of Rakiura Maori monitoring scientist and quarantine officer ($17 k p.a.) and expenses ($7k) for intensive monitoring years (2003 - 2006), $5K for quarantine pa in intervening years													
Titi Times Special edition (2004) and subsequent features (to Univ production team)													
Preparation of a Television documentary												No documentary	
Facilitation/public education/exchange visits by USA researchers (Adams, Nevins to NZ)	$2,700											Minimal visits	
Facilitation/public education/exchange visits by USA researchers (Veit to NZ)													
Preparation of educational packages (USA and NZ) to Okonos		$5,000										Just one eductional package	
Exchange visits (Moller or Newman) to USA													
SUMMARY BY OBJECTIVE - Command Trustees													
												Minimal	
Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	All years	
Objective 4 Educational Outreach	$2,700	$5,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$7,700	

Budget Item	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
Preparation of plans, negotiating contracts with Command Trustee Council, public submissions in consent application, reporting outcomes (Univ. research team)	$15,000	$5,000	$5,000	$5,000								
Rakiura Maori kaitiaki help in eradication operation, planning, negotiation, reporting and film making (RTIAB)	$8,000	$8,000	$8,000								$4,000	
Rodent eradication costs		$180,000										
Monitoring: Establishment of benchmark monitoring plots on Mokonui, Rerewhakauopoko and northern Taukihepa (Univ research team)	$5,000	$5,000										
Investigation of rat predation rates, reporting and modelling outcomes (Univ research team)	$7,000	$7,000	$7,000	$17,000							$10,000	
Employment of Rakiura Maori monitoring scientist and quarantine officer ($17 k p.a.) and expenses ($7k) for intensive monitoring years (2003 - 2006), $5K for quarantine pa in intervening years	$24,000	$24,000	$24,000	$24,000	$5,000	$5,000	$5,000	$5,000	$5,000	$24,000	$24,000	
Titi Times Special edition (2004) and subsequent features (to Univ production team)	$880	$2,200	$880	$880	$880	$880	$880	$880	$880	$880	$880	
Preparation of a Television documentary		$10,000										
Facilitation/public education/exchange visits by USA researchers (Adams, Nevins to NZ)	$5,400	$5,400	$5,400							$5,400	$5,400	
Facilitation/public education/exchange visits by USA researchers (Veit to NZ)		$2,500		$2,500								
Preparation of educational packages (USA and NZ) - to Oikonos		$5,000	$5,000								$5,000	
Exchange visits (Moller or Newman) to USA			$2,500								$2,500	
Total cost to Command Trustee Council	$65,280	$254,100	$57,780	$49,380	$5,880	$5,880	$5,880	$5,880	$5,880	$30,280	$51,780	
Grand Total to Command Trustee Council	$538,000											
Percent of project funded by Command Trustees	65%											
Uncosted Time - 'Help in kind'												
University - preparation of plans and proposal	$7,500											
University - sampling of non-treatment sites (via FRST Contract to RTIAB)	$50,000	$50,000	$50,000									
DoC Help in kind		$101,000										
Kaitiaki overview	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	
Total Help in kind	$60,000	$153,500	$52,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	$2,500	
Grand Total for help in kind	$286,000	35										
Percent of project funded by other partners	35%											
Grand Total for project	$824,000											
SUMMARY BY OBJECTIVE - Command Trustees												

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	All years
Objective 1 Eradication	$25,700	$193,000	$13,000	$5,000	$0	$0	$0	$0	$0	$0	$0	$236,700
Objective 2 Quarantine	$5,880	$12,200	$5,880	$5,880	$5,880	$5,880	$5,880	$5,880	$5,880	$5,880	$5,880	$71,000
Objective 3 Monitoring	$31,000	$36,200	$31,200	$38,500	$0	$0	$0	$0	$0	$24,400	$38,200	$199,500
Objective 4 Educational Outreach	$2,700	$12,700	$7,700	0	$0	$0	$0	$0	$0	$0	$7,700	$30,800
Total for Year	**$65,280**	**$254,100**	**$57,780**	**$49,380**	**$5,880**	**$5,880**	**$5,880**	**$5,880**	**$5,880**	**$30,280**	**$51,780**	**$538,000**

Split of help in kind by objectives

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	All years
Objective 1 Eradication	$8,500	$102,000	1000	1000	1000	1000	1000	1000	1000	1000	1000	$119,500
Objective 2 Quarantine	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	$11,000
Objective 3 Monitoring	$50,500	$50,500	$50,500	500	500	500	500	500	500	500	500	$155,500
Objective 4 Educational Outreach	0	0	0	0	0	0	0	0	0	0	0	$0
Total for Year	**$60,000**	**$153,500**	**$52,500**	**$2,500**	**$2,500**	**$2,500**	**$2,500**	**$2,500**	**$2,500**	**$2,500**	**$2,500**	**$286,000**

Joelle Buffa

07/03/2003 06:52 PM

To: jennifer.boyce@noaa.gov, Tom Suchanek/SAC/R1/FWS/DOI@FWS, Charlene Hall/SAC/R1/FWS/DOI@FWS

cc:

Subject:

Command Trustee Council
c/o Jen Boyce

Hi Jen,
This is a follow-up to a phone conversation we had last month regarding the Project Proposal submintted to the Council entitled, "Seabird Nesting Habitat Restoration and Enhancement on the Farallon Islands". You mentioned that the Council wanted to know whether the Service had considered trapping/translocating burrowing owls (BUOW) as a potential solution to the owl/ashy storm-petrel (ASSP) predation problem. You suggested that I write up the comments that I had shared with you in an e-mail, so here it is. Please fell free to share this with the rest of the Council.

The Service has considered trapping/translocating BUOW as an option, and has attempted to do so without success. While it MAY be an interim solution (if we can find a successful way to trap them), we don't think it is a viable option to reduce petrel predation in the long-term because:

1. It would require trapping of owls every year in perpetuity.
2. BUOW and other owl locations are hard to find and change year to year.
3. Danger for personnel and transporting weed seed into weed free areas.
4. Translocation may not be successful for this state Species of Special Concern
5. Removing the mice would be better for owls as this would encourage them to return to mainland, increasing the probability of their survivorship.

In detail:

BUOW locations are not easily identified on the Farallons. As opposed to the mainland, where BUOW are mostly diurnal and often seen sitting outside their burrows, on the Farallons their presence is often detected only by the presence of owl pellets and remains of ASSP. Their behavior seems to be more nocturnal on the Farallons, perhaps in response to their prey , which is also nocturnal. Since they do not breed on the Farallons, they do not return to "traditional" burrows, but instead use crevices to hide in.

BUOW have proven very difficult to trap on the Farallons, and we have not yet successfully done so. Thousands of crevices on S. Farallon Island provide potential hiding places, and BUOW presence is often only detected after they have predated many petrels, by telltale petrel wing piles outside the crevice. Traps that work on the mainland are problematic on the Farallons. One-way door traps are designed for burrows on flat surfaces, not the creviced steep slopes that typify Farallon BUOW habitat. We are experimenting with a bow-type spring trap baited with a mouse. However we also forsee problems in making this work on the uneven, steep, rocky ground.

We are concerned about the welfare of BUOW, a state species of special concern. Most research that has been done on the subject shows low survival rates of trapped and translocated wildlife. It is our belief that if owls arrive on the Farallons and find no food source (i.e., mice), they will move off the island within a few days while they are still in good condition, continuing their dispersal/migration, and find more suitable habitat on their own. This will be better for the survival of BUOW, rather than having humans move them to a location (after they

are probably already in a stressed condition).

Barn owls have also been problematic predators of seabirds, although to a lesser degree. Trapping them on the steep, rocky habitat on the Farallons is also a challenge not yet surmounted.

In summary, trying to trap and relocate BUOW and barn owls would be labor intensive and expensive, have to take place indefinitly, potentially hazardous to personnel (climbing on cliffs), and would probably be ineffective. It could only be attempted with funding for a full-time professional trapper stationed on the island.

Finally, house mice are non-native and their removal supports the Refuge Goals of restoring native communities of plants and animals. House mouse are suspected to play a role in non-native plant seeddispersal. Trapping/translocating BUOW would therefore not achieve the beneficial results of restoring the native plants (which are used as seabird nesting material) that a mouse eradication project would.


BUOWTransArgu.d

The attached document is a short summary in WORD format.

Please let me know if you or the Council have any more questions.

Joelle Buffa
Manager, Farallon National Wildlife Refuge
Phone: 510-792-0222 x 32; FAX: 510-792-5828

MAILING ADDRESS:
San Francisco Bay NWR
PO Box 524
Newark, CA 94560

SHIPPING ADDRESS:
San Francisco Bay NWR
1 Marshlands Road
Fremont, CA 94536

Why remove the mice from South Farallon Islands when you can remove the owls?
For further questions: Joelle_Buffa@fws.gov

Reasons that mice should be removed:

1. Trapping alone may not work
    a. Difficult to capture every individual
    b. Single owls can have large proportional impact on seabirds.

2. Requires annual trapping program
    a. Hiring new people that need access to areas currently off limits to personnel, thereby risking weed seed dispersal .
    b. Cost of program spread into perpetuity.

3. Better for the owls.
    a. Currently a California Species of Special Concern, burrowing owls appear to die at end of season on the Farallons, likely because they lack a prey base. Removing mice would encourage owls to overwinter on the mainland, increasing probability of individual survivorship, thereby benefiting the owls and seabirds together.
    b. Translocating owls into occupied habitat increases chances that animals may die.
    c. Dispersing owls into unoccupied habitat may encourage owls to return in subsequent winters, or even establish breeding territories.

4. Island wide ecosystem benefits including seabird habitat,
    a. Reducing predation from owls,
    b. Reducing weed dispersal on island, by mice. Ongoing weed control will improve habitat quality.

Joelle Buffa

07/09/2003 01:49 PM

To: Jennifer Boyce <Jennifer.Boyce@noaa.gov>
cc: Charlene_Hall@fws.gov, Tom_Suchanek@fws.gov
Subject: Re:

The project prposal is for all of the South Farallon Island(s), islets... That includes SEFI, West End, Saddlerock, and other adjacent islets. We have evidence that there are mice on SEFI and West End. Mouse control experts that we have consulted with said that we should assume that the other adjacent islets either have mice , or that mice from SEFI or West End could migrate there during the treatment. We have no evidence of a mouse problem on No or Middle Farallons, so no treatment is proposed.

Jennifer Boyce <Jennifer.Boyce@noaa.gov>

Jennifer Boyce
<Jennifer.Boyce@noaa.gov>

07/08/2003 04:31 PM

To: Joelle_Buffa@r1.fws.gov
cc: Tom_Suchanek@fws.gov, Charlene_Hall@fws.gov
Subject: Re:

Thanks Joelle for summarizing the answers to the questions raised by the TC regarding the Farallon project. One other question that came up was is the proposed project for all of the islands or just SEFI? Are the mice on all of the islands or just Southeast? This is probably in the proposal but I didn't see it.

Thanks

Jen

Joelle_Buffa@r1.fws.gov wrote:

> Command Trustee Council
> c/o Jen Boyce
>
> Hi Jen,
> This is a follow-up to a phone conversation we had last month regarding the
> Project Proposal submintted to the Council entitled, "Seabird Nesting
> Habitat Restoration and Enhancement on the Farallon Islands". You mentioned
> that the Council wanted to know whether the Service had considered
> trapping/translocating burrowing owls (BUOW) as a potential solution to the
> owl/ashy storm-petrel (ASSP) predation problem. You suggested that I write
> up the comments that I had shared with you in an e-mail, so here it is.
> Please fell free to share this with the rest of the Council.
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> has attempted to do so without success. While it MAY be an interim
> solution (if we can find a successful way to trap them), we don't think it
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> In detail:
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> BUOW locations are not easily identified on the Farallons. As
> opposed to the mainland, where BUOW are mostly diurnal and often seen
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> concern. Most research that has been done on the subject shows low
> survival rates of trapped and translocated wildlife. It is our belief
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"Julia Bott" <Julia@SupportParks.org>

09/08/2003 01:47 PM
Please respond to "Julia Bott"

To: <Charlene_Hall@fws.gov>
cc:
Subject: TV Command Restoration Fund Amendment

Table 1a shows how the South Farallon Island (SFI) murre breeding population has grown over the last decade. SFI populations are estimated by Point Reyes Bird Observatory (PRBO) using boat and land-based surveys. The US Fish and Wildlife Service (USFWS) also conducts aerial surveys of the Farallon murre colonies as part of the Apex-Houston Common Murre Restoration Project. USFWS preliminary population estimates for North Farallon Islands are shown on Table 1b.

Over the last 5 years, favorable oceanic conditions have resulted in rapid growth of the murre population. In 2002, The SFI colony exceeded 100,000 birds for the first time in over a century, and the total Farallon Islands breeding population currently exceeds over 150,000 individuals. This population increase, combined with reduced mortality from gill netting and oil spills, poises this colony on the brink of a dramatic population increase. Over the next decade it could rapidly approach pre-exploitation numbers last seen in the early 1800s. The Farallon Islands is already one of the two largest common murre breeding colonies in California, tied with Castle Rock in Humboldt Co.

At some point, however, lack of available, secure breeding habitat will become a limiting factor. The expansion of western gulls into previously unused areas, and the establishment of a permanent human presence on the island, have reduced the amount of available murre breeding habitat from historic times. All existing murre colonies on SFI are located in areas free from human disturbance, primarily the north side of SEFI, West End, and adjacent islets (Figure 1). The entire south side of SEFI, which probably historically supported nesting murres, is not likely to be re-colonized because it is now occupied by western gulls, and nearby to human activities of the small field station.

The murre colony at **Sea Lion Cove** (the site of the proposed project) has also been expanding over the last 5 years, from 66 breeding pairs in 1998 to 143 in 2003 (see Table 1c, which shows numbers of individuals, rather than pairs). However, it is limited in its capacity to expand by the lack of available habitat in the area and its proximity to a high traffic area (the path to North Landing). Staff working on SEFI cause disturbance to this colony (head bobbing and flushing of birds) in the course of ordinary, and necessary, daily activities, which include protection from human trespass. The Sea Lion Cove colony is located on the northwest side of SEFI, and also designated on Fig. 1 with the label, "(CB) 160".

Currently there are few projects that are able to directly enhance habitat for common murres, the species most commonly affected by oil spills. The proposed project would restore/enhance common murre habitat in two ways: 1) It would create additional ledge nesting habitat, and 2) Put a barrier between the murre colony and the path to North Landing, thereby reducing disturbance.

Project Description and Methods

Received via email 10/2003

MURRE NESTING LEDGE CREATION

Project Submitted by: Joelle Buffa, Manager Farallon National Wildlife Refuge
joelle_buffa@fws.gov; 510-792-0222: x-32; Cell: 510-377-5958

Goals and Nexus to Injury

The goal of this project is to benefit common murre populations, a species injured by the Command Oil Spill. Additional nesting habitat capable, of supporting 200-400 breeding murres, would be created on Southeast Farallon Island (SEFI) at the Farallon National Wildlife Refuge (FNWR).

Background

Southeast Farallon Island is home to one of the largest and most important colonies of common murres on the west coast of North America, south of Alaska. It is estimated that 400,000 murres once bred on the Farallon Islands. Extensive egging between 1849 and the late 1800s caused murre populations to plummet. By 1910, only 20,000 murres remained. Between 1911 and the late 1950s, the population remained in a seriously depleted state due to oil spills and human disturbance. By the 1950s, the population reached a low of 6,000 birds. (Ainley and Boekelheide 1990). The breeding population gradually increased over the next several decades, peaking at over 102,000 in 1982 (Briggs et al. 1983). During the mid to late 1980s, common murres again declined mainly due to the combined effects of the El Niño Southerly Oscillation (El Niño) and gill-net caused mortality. (Ainley and Boekelheide 1990). The near shore gill-net fishery was halted in late 1987 due to its significant impact on seabirds (primarily murres) and marine animals. Beginning in the early 1990s the murre population began to recover, but this was interrupted by the 1992 and 1998 El Niño events.

Table 1a. Common Murre breeding population size estimates on South Farallon Island From Warzybok et al. 2002. Data should not be cited without permission

1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
32,400	44,400	?	69,600	65,400	61,089	52,670	58,878	53,301	68,194	103,588	107,105

Table 1b. Common Murre breeding population size estimates on North Farallon Islands* 1999-2002 (USFWS-Common Murre Restoration Project, unpubl. data). Data are preliminary and should not be cited without permission

N/A	N/A	N/A	N/A	N/A	N/A	N/A	54,490	50,863	58,672	72,466	N/A

* Correction factor of 1.68 applied to raw numbers

Table 1c. Sea Lion Cove Murre Colony breeding population (SEFI)

N/A	N/A	N/A	N/A	N/A	N/A	N/A	132	134	225	246	285

examine parameters such as age at first breeding, recruitment, plumage variation, and age specific reproductive success.

Other bird species that will benefit from the project include Cassin's and Rhinoceros Auklets, Pigeon Guillemots, Leach's and Ashy Storm Petrels, Western Gulls, and migratory landbirds. The 650 square foot (27' x 24' x 3' high) concrete diesel secondary containment structure is an entrapment and drowning hazard for seabirds and landbirds. It holds water during the winter/spring rains, and although it is kept covered and periodically pumped out, birds find their way into it and drown. Also, since it is located on the Marine Terrace and surrounded by Cassin's nesting burrows, pumping it out runs the risk of flooding nesting burrows. Since the diesel tanks have been abandoned and emptied, the containment no longer serves a useful purpose.

B. Adverse Impacts

Seabirds have a well-defined breeding season on the FNWR (mid-March through mid-August), which can be avoided. Demolition of the containment wall and construction of the murre nesting ledges would be scheduled for September through early December, after most breeding seabirds have left the island, and when wildlife activity on SEFI is at is lowest point. Some post-breeding and non-breeding western gulls and Brandt's cormorants may be temporarily disturbed (flushed) from the project area during construction.

Five species of pinnipeds either breed or haul-out on the FNWR. Only the northern elephant seal and the federally threatened Steller's sea lion regularly breed on the island. Steller's pup during May through July, and elephant seals pup late December through early March. The proposed work window of September through early December will avoid impacts to breeding pinnipeds. Some seals and sea lions will likely be hauled out in Sea Lion Cove during this time period, however. Human activity and noise during construction of the murre nesting ledge may cause some of them to flush into the water. Few Steller's sea lions are usually present during the fall in the Sea Lion Cove area, however, there is a possibility that one or a few could be flushed, which is would be considered a "take" under the Endangered Species Act. Therefore, an internal Section 7 consultation will need to take place with the National Marine Fisheries Service prior to project implementation.

Probability of Success

Probability of success is considered high, and it is reasonable to expect that at least 129 murres (the number recovered injured or dead from the Command Spill) could colonize the newly created habitat. In September 2000, a Habitat Sculpture was constructed of a similar concrete rubble construction material as is proposed for the Murre Nesting Ledge, also in the North Landing Area. Concrete blocks were stacked upon one another in an design engineered to create habitat for crevice nesting birds (Figure 2). The Habitat Sculpture also incorporated an observation blind as part of its design - biologists can crawl inside the sculpture and monitor the

A series of murre nesting ledges, approximately 20 feet wide and 10 feet tall would be built across the saddle between the ridge of Little Lighthouse Hill and Ahab Hill, just north of "The Gap" on the trail to North Landing (Figure 1). Sections of concrete block (1'x2') would be stacked and tied together to create a wall with numerous terraced ledges (approximately 8" deep) that will simulate the natural (occupied) cliff habitat found on either side of the saddle. The blocks used in the construction are part of a retired containment berm for two large diesel tanks, and are already on the island. The US Coast Guard (USCG) plans to remove the tanks and break up the containment wall in October 2003. Elimination of this unused containment berm will also benefit other seabirds that breed on the island, because it fills with rainwater every winter and has posed a drowning hazard for decades.

The project consists of several steps or phases: 1) Breaking the concrete containment berm into "ledge-sized" (i.e., 12 - 18" diameter) blocks; the USCG has agreed to do this as part of their contribution to the project. 2) Performing minor upgrades to the North Landing path to facilitate passage of wheeled push cart/wheel barrow. 3) Moving the blocks (approximately 1,950 square feet of material) from their present location on the southeast side of SEFI to the Sea Lion Cove project site. 4) Stacking the blocks into an engineered design of murre nesting ledges. 5) Constructing a wooden monitoring blind that will be incorporated into the backside of the ledge structure in way that will allow biologists to monitor murre colonization without disruption.

Environmental Consequences (Adverse and Beneficial)

A. Beneficial Effects

The construction of this blind is expected to create new high quality nesting habitat, encouraging expansion and growth of the adjacent Sea Lion Cove Colony. It is estimated an additional 200-400 breeding murres (100-200 pairs) will eventually use the newly created habitat. In addition, murres and Brandt's cormorants nesting on natural cliff/ledge habitat in the area may also benefit from reduced human disturbance. The ledge wall will screen these existing colonies from human (pedestrian) traffic on the North Landing Path.

Since the Farallon murre colony is the largest in central California, and probably the largest in the state with the recent population increases, the Farallon breeding colony was probably directly affected by the Command Oil Spill. Thus, the project will have direct positive benefits to the resources damaged and lost. These positive effects will aid in the recovery of the northern California common murre population to pre-spill conditions.

The unique viewpoint afforded by this structure will allow monitoring of the reproductive success, population growth and feeding ecology of a recently established colony of murres. It will also allow the monitoring of a large and expanding colony of Brandt's cormorants. Brandt's cormorants have been banded at Sea Lion Cove colony sporadically throughout the past 15 years, and continuously since 1999. This provides us with a large, known age sample to

$7,400 per year. If murres do not begin colonizing the site after the first year, decoys or other social attractants may be added structure to entice murres.

Removable panels is another planned feature of the observation blind. These will allow access to the nesting murres from within the blind or behind the wall, and will facilitate banding of chicks and adults, study of chick growth, and examination of the effects of food limitation on reproductive parameters (i.e. supplemental feeding studies).

Budget

	Cost	Description	Comment
	$0	Breaking Containment Berm	USCG Donated
	$ 2,000	N. Landing trail improvements	labor/materials
	$ 500	Wheeled non-motorized vehicle to transport blocks	
	$10,415	Materials for habitat ledge/blind	materials
	$ 8,715	Labor: Moving blocks; constructing ledge wall/blind	265 hrs @$35/hr
	$ 2,400	Transport/per diem for personnel from mainland	To/From island
	$ 4,500	Transport of materials/equipment to island	
	$ 3,300	FWS Project Management	GS9 @ 2 PP
	$22,200	Monitoring success project (3 years @ $7,000/yr)	$7K-$22 Options for 1-3 years
Sub Tot	**$54,030**		
	5,943	11% FWS National/Regional Cost Recovery	
Total	**$59,973**		

Literature Cited

Ainley, D.G. and R.J. Boekelheide. 1990. Seabirds of the Farallon Islands. Stanford Univ. Press. Stanford, CA.

Briggs, K.T. W.B. Tyler, D.G. Lewis, and K.F. Dettman. 1983. Seabirds of central and northern California, 1980-1983: status, abundance, and distribution. Unpubl. report. Center for Marine Studies, University of CA, Santa Cruz.

Warzybok, P.M., R.W. Bradley, and W. J. Sydeman. 2002. Population size and reproductive performance of seabirds of Southeast Farallon Island, 2002. Unpubl. report. Point Reyes Bird Observatory. Stinson Beach, CA

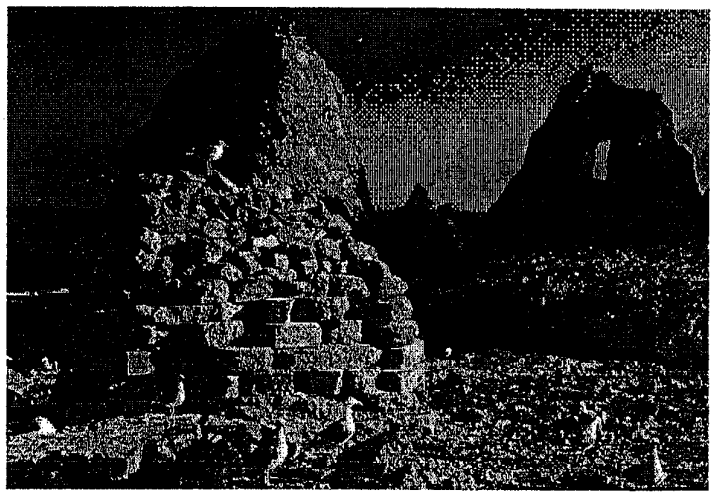

Figure 2. Habitat Sculpture built 2000 on SEFI

colonization of the newly created habitat through plexiglass windows, without disturbing the birds. The Habitat Sculpture was a resounding success. In the first year (2001), 9 of the 32 available sites were occupied by Cassin's auklets. In 2002, 12 Cassin's auklet pairs and 1 pigeon guillemot pair nested in the created habitat, and in 2003 there were 17 auklet pairs and 1 guillemot pair.

This project proposes to use the same organization, Meadowsweet Dairy, to design and implement Murre Nesting Ledges. This group is familiar with the challenging logistics and wildlife sensitivity of the island, and is creative yet practical in their design of habitat restoration projects.

Certain biological factors are also congruent with a high likelihood of success. The murre population is growing on the Farallon Islands, and expanding in the area where habitat would be created. Limiting factors to expansion of the Sea Lion Cove colony appear to be available nesting habitat and reduction of human disturbance, both of which would be addressed by this project.

Performance Criteria and Monitoring

This project will be determined successful when common murres and/or Brandt's cormorants begin occupying the newly created nesting ledges. The observation blind, which is an integral part of the restoration project, will allow biologists to monitor colonization and reproductive parameters such as number of breeding sites, number of eggs, number of chicks produced and number of fledglings. Thirty-two years of pre-project murre and cormorant breeding population and productivity data collected from SEFI will also allow comparisons of pre-and post-project changes in reproductive parameters, and how the newly colonized site compares to older, more established colonies. Seabird monitoring will be conducted by biologists from PRBO through a cooperative agreement with the USFWS, San Francisco Bay National Wildlife Refuge Complex.

Monitoring would consist of observers visiting the blind daily during the breeding season, April through July, for approximately 2 hours per day. The proposed budget includes funding for 3 years of monitoring, which is considered the minimum amount of time to determine success. The Council could decide to fund additional or fewer years of post-project monitoring at a cost of

September 8, 2003

Charlene Hall
Command Oil Spill Trustee Council
C/O Fish and Wildlife Service
2800 Cottage Way, Suite 2605
Sacramento CA 95825

RE: Mirada Surf Acquisition

Dear Ms. Hall:

The Foundation appreciates the Council's continued interest in funding the acquisition of the Mirada Surf Oceanside parcel. This letter is to update the Trustees on the project and to amend our request for funds.

On August 4, 2003, the County of San Mateo took title to the Mirada Surf Oceanside parcel. The site will remain in permenent public ownership and dedicated for open space and recreational activities. The purchase allows us to move to the next phase --completion of the missing link of the coastal trail and coastal access improvements.

At this time, we would like to amend our request. We request $75,000 which would be allocated to the actual on-site improvements, projected to cost $325,000.

We have already secured a $100,000 grant to pay for the planning, design and permitting of the trail, access improvements and other amenities. A Request for Proposals for this effort is expected to be released in by November 1, 2003. It is expected that a consultant will be hired by January 30, 2004. It is anticipated that the planning, design and permitting process will take nine to twelve months and that actual improvements will begin in Spring of 2005.

During the planning process, the San Mateo County Parks and Recreation Foundation will also be seeking funds for the improvements.

As previously stated, the Trustees would be acknowledge in signage on the trail.

Sincerely,

Julia Bott
Executive Director
San Mateo County Parks and Recreation Foundation
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Common Murre Census

Date: 5/27/02 (Boat)
5/28/02 – 6/01/02 (Land)
PW, RB, WS

Total Counted: 67,265
Correction Factor #1: 1.54
Corrected Total #1: 103,588
Correction Factor #2: None
Final Corrected Total: 103,588

Counts from:
B=Boat
LH=Lighthouse
MB=Murre Blind
CB=Corm Blind
NL=North Landing
LP=Lookout Point
HS=USFWS House

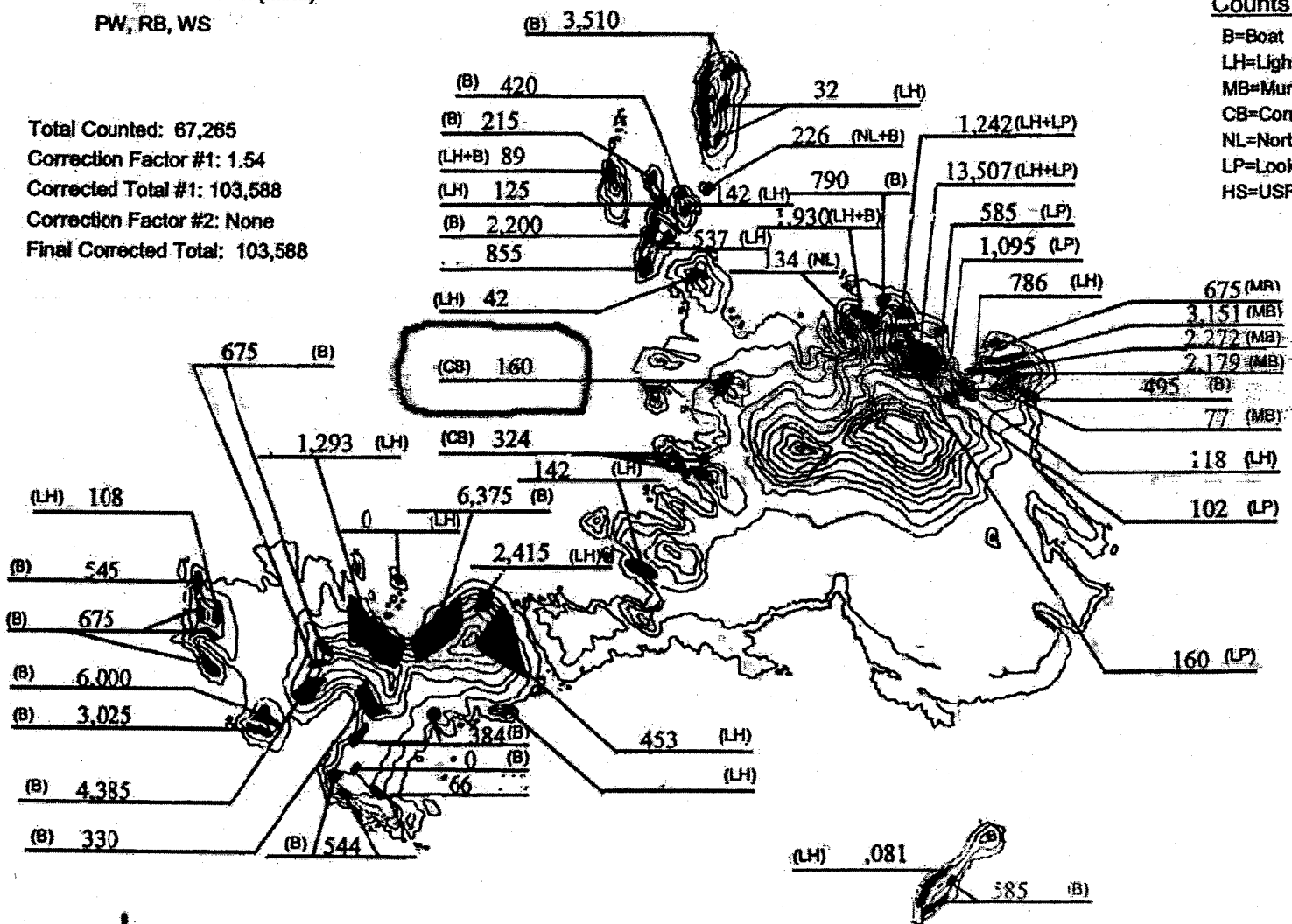

Figure 1 Counts of Common Murres on Southeast Farallon Island during the 2002 census. Surveys were conducted from the following locations: Lighthouse Hill (LH), Lookout Point (LP), Murre Blind (MB), Cormorant Blind (CB), North Landing (NL), USFWS House (HS), and the Boat (B).

Regression Summary for Dependent Variable: INIBI (Chp@BMINoLos6)
R= .99817436 R^2= .99635205 Adjusted R^2= .99392008
F(2,3)=409.69 p<.00022 Std.Error of estimate: .99354

N=6	Beta	Std.Err. of Beta	B	Std.Err. of B	t(3)	p-level
Intercept			61.4132	4.735156	12.9696	0.000990
LOGDRY	-1.32182	0.055010	-17.3832	0.723429	-24.0289	0.000158
ARC%SUMC	-0.47986	0.055010	-28.7953	3.301034	-8.7231	0.003172