Montrose Settlement Restoration Program
Record of Initial Restoration Ideas and Tier 1 (Screening) Evaluation

August 25, 2004

SECTION 1
INTRODUCTION AND INVENTORY OF INITIAL RESTORATION IDEAS

This report documents the initial restoration planning efforts of the Montrose Settlements Restoration Program (MSRP), from the completion of formal scoping efforts (including public workshops held in 2002 and 2003) to the conclusion of the Tier 1 evaluation of restoration ideas. Tier 1 is the sorting and screening evaluation of potential restoration actions performed by the MSRP Trustees and staff as an initial phase prior to detailed analysis. This information will be summarized in Chapter 5 of the MSRP Restoration Plan EIS/EIR, currently in preparation.

Through scoping activities, the MSRP initially compiled approximately 100 potential restoration ideas; however, the initial raw inventory required sorting and organizing before proceeding with a systematic evaluation. Many of the ideas in the initial inventory were variants of the same common idea, or were ideas that had been considered in past years but were no longer applicable. Others were ideas of a different nature, i.e. proposals for studies or general environmental outreach that were not appropriate for direct comparison with ideas intended to actually restore, replace, rehabilitate, or acquire the equivalent of the injured resources and the services those resources provide, as called for in the applicable federal natural resource damage assessment and restoration rules (43 CFR Part 11).

To facilitate evaluation and to ensure that a diverse set of restoration ideas are carried forward for further consideration, the Trustees organized the restoration ideas into general resource categories. At the outset of restoration planning in the public scoping document (MSRP 2001), the Trustees suggested the following general types of restoration actions:

a. *Continued reintroduction of bald eagles to Santa Catalina Island;*
b. *Expansion of efforts to reintroduce bald eagles to all the Northern Channel Islands;*
c. *Restoration of peregrine falcons on the Channel Islands;*
d. *Cleaner fish for anglers: projects to restore fishing injured by DDTs and PCBs;*
e. *Wetlands and estuarine projects to benefit resources injured in the Montrose case;*
f. *Seabird Projects.*

Based upon the input received during scoping and the initial planning phase, the Trustees refined the general categories of restoration actions into the following:

a. *Bald eagle restoration projects;*
b. *Peregrine falcon restoration projects;*
c. *Fishing and fish habitat restoration projects;*
d. *Seabird restoration projects.*

Ideas for general public outreach programs and research are not evaluated here, given that they differ in their fundamental nature from actions whose purpose is restoring birds, fish, and their habitats. These ideas are retained for future consideration by the Trustees as restoration progresses and specific needs of this nature are identified, as further described in the restoration plan.

The following table provides an inventory listing of each of the initial restoration ideas compiled by the MSRP, the sources for each listing, the action taken (i.e. whether the listing was evaluated

in Tier 1, combined with other similar ideas, or otherwise addressed), and the revised titles of the re-organized restoration ideas as they appear in the Tier 1 evaluation itself. Following this inventory table, there are copies of the original written submissions compiled by the MSRP.

Inventory of Initial Restoration Ideas
Part 1: Bald Eagles

#	Original Bald Eagle Ideas	Date Submitted	Source	Contact	Action	Revised Project Titles
1	Continued Bald Eagle reintroduction to Santa Catalina Island[1,2]	N/A 01/09/03	1994 Garcelon Report Bird Technical Workshop	N/A N/A	Pass to Tier 2 Evaluation	Restore Bald Eagles on Catalina Island
2	Reintroduce Bald Eagle to other Channel Islands[1,2]	N/A 01/09/03	1994 Garcelon Report Bird Technical Workshop	N/A N/A	Pass to Tier 2 Evaluation	Restore Bald Eagles on the Northern Channel Islands
3	Enhance Bald Eagle nesting habitat on mainland[1,3]	2003	No written submission	Doug McPhereson No contact information	Pass to Tier 2 Evaluation	Restore Bald Eagles on the Mainland
4	Reintroduce Bald Eagle to San Ynez Mountain[1]	N/A	1994 Garcelon Report	N/A	Combined with #3 for Tier 2 Evaluation	See #3
5	Reintroduce Bald Eagle to Baja California coastline[2]	01/09/03	Bird Technical Workshop	N/A	Combined with #3 for Tier 2 Evaluation	See #3
6	Enhance foraging habitat for Bald Eagles at Harbor Regional Park[2]	01/27/03	Public Workshop No written submission	Jess Morton Audubon Society 310-832-5601 jmorton@igc.org	Combined with #3 for Tier 2 Evaluation	See #3
7	Bald Eagle captive breeding program (SF Zoo, LA Zoo)[1,2,3]	N/A	1994 Garcelon Report	N/A	Consigned as potential future resource management option	- -
8	Construct artificial incubation facility on Santa Catalina Island[1]	N/A	1994 Garcelon Report	N/A	Consigned as potential future resource management option	- -
9	Marine mammal removal program[1]	N/A	MSRP files	N/A	Consigned as potential future resource management option	- -
10	Supplement diet with clean food[2]	01/09/03	Bird Technical Workshop	N/A	Consigned as potential future resource management option	- -

[1] = Restoration project idea gathered from Damage Assessment studies and reports
[2] = Restoration project idea gathered from public after Consent Decree
Sources: Garcelon 1994, Henny 2001, MSRP files, MSRP Scoping Document 2001, MSRP Bird Technical Workshop 2003

Inventory of Initial Restoration Ideas
Part 2: Peregrine Falcons

#	Original Peregrine Falcon Ideas	Date Submitted	Source	Contact	Action	Revised Project Titles
1	Restoration of Peregrine Falcons to the southern Channel Islands[1, 3]	N/A 04/12/03	1994 Walton Report Electronic submission	N/A Brian Walton Santa Cruz Predatory Bird Research Group 831-459-2466 walton@cats.ucsc.edu	Tier 1 Evaluation	Restore Peregrine Falcons to the Southern Channel Islands
2	Enhance Peregrine Falcon nesting habitat on Channel Islands[1]	N/A	MEC	N/A	Combined with #2 for Tier 1 Evaluation	See #1
3	Protection and restoration of seabird and Peregrine Falcon populations on Baja California peninsula islands	04/15/03	Electronic submission	Brad Keitt Island Conservation and Ecology Group 831-459-1565 bkeitt@islandconservation.org	Tier 1 evaluation	Restore Peregrine Falcon Populations on Baja California Peninsula Islands
4	Restore Peregrine Falcons on mainland B) Acquire and enhance new and existing foraging habitat for Peregrine Falcons in and around Portuguese Bend Regional Open Space Park (including Forrestal Property)[2] C) Enhance foraging habitat for Peregrine Falcons at White Point Nature Preserve[2]	01/27/03 01/27/03	Public workshop No written submission Public workshop No written submission	Barbara Dye Palos Verdes Peninsula Land Conservancy 310-541-7613 barbaradye@cox.net Barbara Dye Palos Verdes Peninsula Land Conservancy 310-541-7613 barbaradye@cox.net	Tier 1 Evaluation Tier 1 Evaluation	Acquire and Enhance Peregrine Falcon Habitat on the Palos Verdes Peninsula

#	Original Peregrine Falcon Ideas	Date Submitted	Source	Contact	Action	Revised Project Titles
5	Fund Peregrine Falcon management group[2]	09/30/03	No written submission	Loren Hays USFWS Carlsbad 760-431-9440 ext. 217 Loren_Hays@r1.fws.gov	Tier 1 evaluation	Create Peregrine Falcon Management Group
6	Enhance foraging habitat for peregrine falcons at Ken Malloy Harbor Regional Park[2]	01/27/03	Public workshop No written submission	Jess Morton LA Audubon Society 310-832-5601 jmorton@igc.org	Tier 1 Evaluation	Enhance Foraging Habitat for Peregrine Falcons at Ken Malloy Harbor Regional Park

[1] = Restoration project idea gathered from Damage Assessment studies and reports
[2] = Restoration project idea gathered from public after Consent Decree
Sources: Walton 1994, MSRP files, MSRP Scoping Document 2001, MSRP Bird Technical Workshop 2003

Inventory of Initial Restoration Ideas
Part 3: Seabirds

#	Original Seabird Ideas	Date Submitted	Source	Contact	Action	Revised Project Titles
1	Eradicate rats on San Miguel Island to reduce predation on Xantus's Murrelet and other seabird eggs[3,2]	01/09/03	Bird Technical Workshop No written submission	Kate Faulkner, National Park Service 805-658-5709 Kate_Faulkner@nps.gov	Tier 1 evaluation	Restore Seabirds to San Miguel Island
2	Xantus's Murrelet and Cassin's Auklet Restoration and Population Monitoring (on Santa Barbara Island) [2]	04/16/03 09/18/03	Electronic submission	Christine Abraham Point Reyes Bird Observatory 415-868-1221 ext. 334	Tier 1 evaluation	Restore Alcids to Santa Barbara Island
3	Restoring Cassin's Auklets to Santa Barbara Island[2]	09/29/03	Electronic submission	Paige Martin National Park Service 805-658-5764	Combined with #2 Tier 1 evaluation	See #2
4	Attract Xantus's Murrelet to historic nesting sites and artificially created nest sites on Santa Barbara Island; protect sites with predator exclusion fencing[1,2]	01/09/03 N/A	Bird Technical Workshop MEC	N/A N/A	Combined with #2 for Tier 1 Evaluation	See #2
5	Reintroduce/attract Cassin's auklet to historic nesting sites and artificially created nest sites on Santa Barbara Island; protect sites with predator exclusion fencing[2]	01/09/03	Bird Technical Workshop	N/A	Combined with #2 for Tier 1 Evaluation	See #2
6	Remove exotic vegetation on Santa Barbara Island to restore Cassin's auklet habitat[2]	01/09/03	Bird Technical Workshop	N/A	Combined with #2 for Tier 1 Evaluation	See #2
7	Install predator exclusion fences and remove exotic plants around colonies at San Nicolas Island to restore Brandt's cormorant and western gull populations[1,2]	N/A	1994 Carter and Gress Report	N/A	Tier 1 evaluation	Restore Seabird Colonies on Southern Channel Islands

#	Original Seabird Ideas	Date Submitted	Source	Contact	Action	Revised Project Titles
8	Reduce human disturbance at nesting/roosting areas at San Nicolas, San Clemente and Santa Catalina Islands[1,2]	N/A	1994 Carter and Gress Report	N/A	Combined with #7 for Tier 1 Evaluation	See #7
9	Eradicate feral cats on southern Channel Islands[2]	01/09/03	Bird Technical Workshop	N/A	Combined with #7 for Tier 1 Evaluation	See #7
10	Scorpion Rock Restoration	04/03	Letter	Josh Adams US Geological Survey 831-771-4422 josh_adams@usgs.gov	Tier 1 Evaluation	Seabird Habitat Restoration at Scorpion Rock
11	Protection and restoration of seabird and Peregrine Falcon populations on Baja California peninsula islands	04/15/03	Electronic submission	Brad Keitt Island Conservation and Ecology Group 831-459-1565 bkeitt@islandconservation.org	Tier 1 evaluation	Restore Seabird Populations on Baja California Peninsula Islands
12	Eradicate feral cats and domestic animals at North and South Coronado Islands to help restore Brown Pelican, cormorants, and other seabirds[1,2]	01/09/03	Bird Technical Workshop	N/A	Combined with #11 for Tier 1 Evaluation	See #11
13	Create Brown Pelican roost habitat (ex. Mugu Lagoon, Bolsa Chica, Batiquitos Lagoon, San Elijo Lagoon, San Diego Bay)[1,3]	N/A 01/09/03 N/A	1994 Carter and Gress Report Bird Technical Workshop American Trader RP	N/A N/A N/A	Tier 1 evaluation	Create/Enhance/Protect Brown Pelican Roost Habitat
14	Enhance brown pelican and cormorant roosts by increasing jetty height at Zuniga Point, Channel Islands breakwater and Ventura Harbor breakwater[2]	01/09/03	Bird Technical Workshop	N/A	Combined with #13 for Tier 1 Evaluation	See #13
15	Enhance brown pelican and cormorant roosts on Belmont Island and Rincon Island[1,2]	N/A	American Trader RP	N/A	Combined with #13 for Tier 1 Evaluation	See #13

#	Original Seabird Ideas	Date Submitted	Source	Contact	Action	Revised Project Titles
16	Enhance brown pelican and cormorant roosts at Moss Landing[2]	N/A	American Trader RP	N/A	Combined with #13 for Tier 1 Evaluation	See #13
17	Protect brown pelican and double-crested cormorant roosts with fencing and signage at tips of long jetties at King Harbor, Anaheim Bay, Dana Point and Oceanside[2]	N/A	1994 Carter and Gress Report	N/A	Combined with #13 for Tier 1 Evaluation	See #13
18	Protect brown pelican and double-crested cormorant roosts with signage at Malibu Lagoon and Santa Clara River, and on breakwaters at Ventura Harbor, Channel Islands Harbor and Marina Del Rey[1,3]	N/A	American Trader RP	N/A	Combined with #13 for Tier 1 Evaluation	See #13
19	Protect Brown Pelican and cormorant roosts by creating buffer zone (20 to 30 meters) with buoys around breakwaters at Ventura Harbor, Channel Islands Harbor, Marina Del Rey[1,3]	N/A	American Trader RP	N/A	Combined with #13 for Tier 1 Evaluation	See #13
20	Reduce disturbance to Brown Pelicans and other seabirds from jet skis, kayaks, boats, and overflights near major roosting sites[2]	01/09/03	Bird Technical Workshop	N/A	Combined with #13 for Tier 1 Evaluation	See #13
21	Replace historic barge/floating artificial structures in Santa Barbara Channel to serve as seabird roost sites[2]	01/09/03	Bird Technical Workshop	N/A	Combined with #13 for Tier 1 Evaluation	See #13

#	Original Seabird Ideas	Date Submitted	Source	Contact	Action	Revised Project Titles
22	Entanglement reduction and outreach program to protect seabird populations	01/09/03 N/A	Bird Technical Workshop American Trader RP	N/A N/A	Tier 1 Evaluation	Implement Entanglement Reduction and Outreach Program to Protect Seabird Populations
23	Reintroduce/attract Ashy Storm-Petrel to Anacapa Island[2]	01/09/03	Bird Technical Workshop	N/A	Tier 1 evaluation	Restore Ashy Storm-Petrels to Anacapa Island
24	Ashy Storm-Petrel Restoration on Southeast Farallon Island[2]	04/15/03	Electronic submission	Kyra Mills PRBO 415-868-1221 ext. 321, kyramills@sbcglobal.net	Tier 1 evaluation	Restore Ashy Storm-Petrels on Southeast Farallon Island
25	Eradicate non-native house mice from South Farallon Islands [2]	04/10/03 07/27/03	Electronic Submission	Joelle Buffa USFWS 510-792-0222 Joelle_Buffa@r1.fws.gov	Combined with #24 for Tier 1 evaluation	See #24
26	Enhance mainland nesting habitat for colonial seabirds[2]	N/A	No written submission	Jack Fancher USFWS Carlsbad Office 760-431-9440 ext. 215	Tier 1 Evaluation	Create Mainland Nesting Habitat for Colonial Seabirds
27	Create Double-crested Cormorant nesting platforms in San Pedro Bay (Island Grissom, near Terminal Island), Agua Hedionda Lagoon, Batiquitos Lagoon, San Diego Bay (salt works, Chula Vista Wildlife Reserve, south bay), San Diego River Flood Control Channel west of Interstate 5, Tijuana Estuary[1]	N/A	1994 Carter and Gress Report	N/A	Tier 1 evaluation	Create Cormorant Nesting Platforms
28	Fund Brown Pelican patrol/enforcement position[2]	N/A	No written submission	Loren Hays USFWS Carlsbad 760-431-9440 ext. 217	Tier 1 Evaluation	Fund Brown Pelican Patrol/Enforcement Position

#	Original Seabird Ideas	Date Submitted	Source	Contact	Action	Revised Project Titles
29	Pelican Patrol "Rescue, Rehabilitation, Education"	10/20/03 12/11/03	Electronic submission	Lana Elmo International Bird Rescue Research Center 310-514-2573	Combined with #28 for Tier 1 Evaluation	See #28
30	Enhance nesting habitat for shearwaters in New Zealand[2]	01/09/03 04/03	Bird Technical Workshop Letter	N/A Josh Adams US Geological Survey 831-771-4422 josh_adams@usgs.gov	Tier 1 Evaluation	Enhance Nesting Habitat for Shearwaters in New Zealand
31	Reintroduce Tufted Puffin to Prince Island[2]	01/09/03	Bird Technical Workshop	N/A	Tier 1 evaluation	Reintroduce Tufted Puffins to Prince Island
32	Purchase Bird Rock off Santa Catalina Island to protect and manage seabird populations[2]	01/09/03	Bird Technical Workshop No written submission	Michael Caffey 818-502-0028	Tier 1 evaluation	Purchase Bird Rock off Santa Catalina Island
33	Create GIS atlas of roost sites to facilitate roost site protection[3]	N/A	American Trader RP	N/A	Tier 1 Evaluation	Create GIS Atlas of Brown Pelican Roost Sites
34	Enhance nesting habitat for grebes and loons in Northern California[2]	01/09/03 N/A	Bird Technical Workshop American Trader RP	N/A N/A	Tier 1 Evaluation	Enhance Nesting Habitat for Grebes and Loons in Northern California
35	Attract Common Murre to Prince Island[2]	01/09/03	Bird Technical Workshop	N/A	Tier 1 evaluation	Attract Common Murres to Prince Island
36	Attract Brown Pelican to Prince Island and Scorpion Rock[2]	01/09/03	Bird Technical Workshop	N/A	Tier 1 evaluation	Attract Brown Pelicans to Prince Island and Scorpion Rock
37	Develop fishery by-catch reduction program to protect seabird populations[2]	01/09/03	Bird Technical Workshop	N/A	Similar planning efforts exist or are under development by other entities; not evaluated	------

#	Original Seabird Ideas	Date Submitted	Source	Contact	Action	Revised Project Titles
38	Develop seabird conservation plan for the Southern California Bight[1,2]	01/09/03 N/A 04/03	Bird Technical Workshop 1994 Carter and Gress Report Letter	N/A N/A Josh Adams US Geological Survey 831-771-4422 josh_adams@usgs.gov	Similar planning efforts exist or are under development by other entities; not evaluated	------
39	Develop chronic oil reduction program to protect seabird populations[2]	01/09/03	Bird Technical Workshop	N/A	Similar planning efforts exist or are under development by other entities; not evaluated	------

[1] = Restoration project idea gathered from Damage Assessment Studies and Reports
[2] = Restoration project idea gathered from public after Consent Decree
[3] = Restoration project idea identified from other restoration planning documents
Sources: Carter and Gress 1994; MSRP restoration files; American Trader Trustee Council 2001; Jaques and Strong 2002; MSRP Bird Technical Workshop 2003; K. Faulkner, personal communication 2003

Inventory of Initial Restoration Ideas
Part 4: Fish/Fishing

#	Original Fish/Fishing Ideas	Date Submitted	Source	Contact	Action	Revised Project Titles
1	Create shallow-water reefs to enhance kelp forest along Palos Verdes peninsula (Abalone Cove, east Point Fermin, Malaga Cove) [1]	01/22/03 N/A	Fish Technical Workshop 1994 Ambrose Report	N/A N/A	Tier 1 evaluation	Construct Reefs that Enhance Kelp Forests
2	Construct reef around existing piers (Santa Monica Pier, Venice Pier, Hermosa Beach Pier, Redondo Sportfishing Pier, Cabrillo, Belmont Shores Pier, Seal Beach Pier) [1,2]	01/22/03 N/A	Fish Technical Workshop 1994 Ambrose Report	N/A N/A	Tier 1 evaluation	Construct Reefs around Existing Piers/Structures
3	Construct reef and/ or pier at new locations (e.g., Malibu)[2]	01/22/03	Fish Technical Workshop	N/A	Tier 1 evaluation	Construct Reefs and Improved Fishing Access to Them
4	Construct juvenile fish nursery reef (Santa Monica Bay, Orange County, Palos Verdes) [1]	N/A	1994 Ambrose Report	N/A	Tier 1 evaluation	Construct Juvenile Fish Nursery Reefs
5	Program to inform public on fishing areas with low DDT/PCB contaminant concentrations based on results of data gap study[1,2]	01/22/03	Fish Technical Workshop	N/A	Tier 1 evaluation	Provide Public Information that Promotes Wholesome Fishing and Fish Consumption
6	Public campaigns to inform public of ways to prepare fish to reduce contaminant exposure, and inform public of different ways to prepare less preferred ("fish tasting"), but "clean" fish to be more palatable[2]	01/22/03	Fish Technical Workshop	N/A	Combined with #5 for Tier 1 evaluation	See #5

#	Original Fish/Fishing Ideas	Date Submitted	Source	Contact	Action	Revised Project Titles
7	Restore wetlands (Bolsa Chica, Ballona, Famosa Slough, Los Cerritos/Hellman/ Los Alamitos, Mission Bay, Santa Ana River mouth, Santa Margarita River mouth). [1]	N/A	MSRP files No written submission	Jack Fancher USFWS Carlsbad Office 760-431-9440 ext. 215	Tier 1 evaluation	Restore Wetlands (several potential locations)
8	Recover fish populations and fishing opportunities at the Northern Channel Islands through protection, evaluation, and interpretation of newly established Marine Protected Areas[2]	04/25/03 08/05/03	Fax Electronic submission	Kate Faulkner National Park Service 805-658-5709 Kate_Faulkner@nps.gov	Tier 1 evaluation	Augment Funds for Implementing Marine Protected Areas (MPAs) in the Northern Channel Islands
9	Install barge over constructed reef at Pier Point Landing (Rainbow Harbor) [1,2]	01/22/03	Fish Technical Workshop	N/A	Tier 1 evaluation	Operate Fishing Barge(s) over Existing or Constructed Reef(s)
10	Extend breakwater at Los Angeles-Long Beach Harbors to convert open-water habitat to shallow-water protected habitat[1]	N/A	MSRP files Fish Technical Workshop	N/A	Tier 1 evaluation	Create Protected Shallow-water Habitat a. Extend breakwaters at Los Angeles-Long Beach Harbors to create more shallow-water habitat b. Create more shallow-water habitat within existing deep-water areas of Long Beach Harbor or San Diego Bay
11	Create shallow water habitat in deep water harbors (Long Beach Harbor, San Diego Bay) [2]	01/22/03	Fish Technical Workshop	N/A	Combined with #10 for Tier 1 evaluation	See #10

#	Original Fish/Fishing Ideas	Date Submitted	Source	Contact	Action	Revised Project Titles
12	Hatchery and stocking programs to increase availability of clean fish to catch in certain locations: California halibut, and potentially kelp bass, sheephead, and white croaker[2]	04/14/03	Electronic submission	Mark Drawbridge Hubbs-Sea World Research Institute (610) 226-3943 mdrawbridge@hswri.org	Tier 1 evaluation	Supplement Near-shore Fisheries in Contaminated Areas with Clean, Hatchery-raised Fish
13	Spotted sand bass hatchery and stocking program[2]	01/22/03 11/25/03	Fish Technical Workshop Electronic submission	N/A Eric Miller CSU Northridge 818-677-4037 tunaguy@hotmail.com	Tier 1 evaluation	Spotted Sand Bass Hatchery Program
14	Restoration of depleted kelp beds of Malibu and Palos Verdes[2]	04/14/03	Electronic submission	Heather George Santa Monica Baykeeper 310-305-9645 ext. 2 watergirl@smbaykeeper.org	Tier 1 evaluation	Restore Depleted Kelp Beds of Malibu and Palos Verdes
15	Use of decommissioned oil and gas platforms and shell mounds as artificial reefs[2]	04/17/03	Electronic submission	Charles Phillips Science Applications International Corporation 858-826-7491 charlesrphillips@saic.com	Tier 1 evaluation	Convert Decommissioned Oil Platforms to Artificial Reefs
16	Recover fish populations and fishing opportunities by establishing new MPAs within the Palos Verdes Shelf region	N/A	No written submission	MSRP Trustee Council	Tier 1 evaluation	Establish New MPAs within the Palos Verdes Shelf Region
17	Restoration of overgrazed seashore in Abalone Cove[2]	04/25/03	Fax	Rimmon Fay Earth Alert 805-271-4848	Combined with #11 for Tier 1 evaluation	Restore Overgrazed Seashore in Abalone Cove
18	Provide transportation to areas with "clean" fish[2]	01/22/03	Fish Technical Workshop	N/A	Tier 1 evaluation	Provide Transportation for Anglers to Areas with "Clean" Fish

#	Original Fish/Fishing Ideas	Date Submitted	Source	Contact	Action	Revised Project Titles
19	Pt. Vicente, White Point Beach, Pt. Fermin, Marina Del Rey fishing access and improvement projects[2]	04/16/03 04/24/03	Electronic submission Revised Email	Joseph Chesler LA County Dept. of Beaches and Harbors 310-305-9533 jchesler@dbh.co.la.ca.us	Tier 1 evaluation	Improve Public Amenities and Fishing Access at Marina Del Rey, White Point Beach, Pt. Vicente and Pt. Fermin
20	Giant sea bass hatchery and stocking program[1]	01/22/03 N/A	Fish Technical Workshop MSRP files	N/A N/A	Tier 1 evaluation	Giant Sea Bass Hatchery Program
21	White abalone restoration[2]	04/15/03	Electronic submission	Tom McCormick Channel Islnads Marine Resource Institute 805-798-2505 t_mccormick@oj.ai.net	Tier 1 evaluation	Restore White Abalone
22	Restoration of marine algae (kelp) along the coast of the Palos Verdes peninsula [2]	04/25/03	Fax	Rimmon Fay Earth Alert 805-271-4848	Tier 1 evaluation	Restore Algae (Kelp) on the Palos Verdes Coast
23	Preserve Ormond Beach Wetlands[2]	04/25/03	Fax	Rimmon Fay Earth Alert 805-271-4848	Tier 1 evaluation	Protect and Restore Ormond Beach Wetlands
24	Cleanup of Consolidated Slip[2]	04/15/03	Electronic submission	Michael Lyons CA Regional Water Quality Control 213-576-6718 mlyons@rb4.swrcb.ca.gov	Tier 1 evaluation	Clean up Consolidated Slip
25	Restore/ create 50 acre wetlands and wildlife preserve within the Consolidated Slip of Los Angeles Harbor[2]	N/A	Written proposal	Jesse Marquez Wilmington Coalition for a Safe Environment 310 609-9198	Tier 1 evaluation	Contribute to Proposed Wilmington Leeward Bay Promenade, Marina and Wetlands Redevelopment
26	White croaker certification program to increase awareness of which locally caught white croaker are safe to eat[2]	01/22/03	Fish Technical Workshop	N/A	Tier 1 evaluation	White Croaker Commercial Market Certification Program

[1]= Restoration project idea gathered from Damage Assessment studies and reports
[2] = Restoration project idea gathered from public after Consent Decree
Sources: Ambrose 1994, Josselyn 1994, MSRP files, MSRP Scoping Document 2001, MSRP Fish Technical Workshop 2003

Inventory of Initial Restoration Ideas
Part 5: Data Gap

#	Original Data Gap Ideas	Date Submitted	Source	Contact	Action	Revised Project Titles
1	Determine origin of visiting, wintering Peregrine Falcons by satellite tracking[1]	N/A	Brian Walton, Restoration and Long Term Monitoring of Peregrine Falcons on the Channel Island, Sept. 1994	Brian Walton Santa Cruz Predatory Bird Research Group 831-459-2466 Walton@cats.uscs.edu	All ideas will be retained for future consideration as described in Chapter 5 of the draft Restoration Plan	Determine Origin of Visiting, Wintering Peregrine Falcons by Satellite Tracking
2	Monitor DDT/PCB concentrations in Peregrine Falcons[2]	01/27/03	Bird Technical Workshop	N/A	"	Monitor DDT/PCB Concentrations in Peregrine Falcons
3	Marine mammal monitoring/ sampling program in the Los Angeles Area[2]	07/29/03	Fax	Jackie Jaakola Marine Mammal Care Center 310-548-5677 jackjaak@aol.com	"	Marine Mammal Monitoring/ Sampling Program in the Los Angeles Area
4	Enhancement of restoration efforts for Bald Eagles, Peregrine Falcons and seabirds through collection and assessment of pinniped (seal and sea lion) carcasses	04/15/03	Electronic submission	Pamela Yochem, Brent Stewart Hubbs-Sea World Research Institute 619-226-3874 pyochem@hswri.org	"	Enhancement of Restoration Efforts for Bald Eagles, Peregrine Falcons and Seabirds through Collection and Assessment of Pinniped (Seal and Sea Lion) Carcasses
5	Seabird Monitoring A) Implement comprehensive seabird monitoring program (contaminant concentrations, population, effectiveness of marine protected areas in protecting populations) [1,2]	01/27/03	Bird Technical Workshop	N/A	"	Seabird Monitoring A) Implement comprehensive seabird monitoring program (contaminant concentrations, population, effectiveness of marine protected areas in protecting populations)
	B) Expand monitoring of seabird populations at Northern Channel Islands[2]	4/25/03 8/5/03	Fax Electronic submission	Kate Faulkner, Paige Martin National Park Service 805-658-5709 Kate_Faulkner@nps.gov	"	B) Expand monitoring of seabird populations at Northern Channel Islands
	C) Augment seabird monitoring of Anacapa Restoration Program	01/27/03	Bird Technical Workshop	N/A	"	C) Augment seabird monitoring of Anacapa Restoration Program

#	Original Data Gap Ideas	Date Submitted	Source	Contact	Action	Revised Project Titles
	funded by American Trader Restoration Council[2] D) Conduct surveys and censuses of seabird colonies to establish information necessary to detect baseline trends in populations	04/03	Letter	Josh Adams US Geological Survey 831-771-4422 josh_adams@usgs.gov	"	funded by American Trader Restoration Council D) Conduct surveys and censuses of seabird colonies to establish information necessary to detect baseline trends in populations
6	Seabird Egg Residue Data Gap Study	01/20/03	Written Proposal	Michael Fry UC Davis dmfry@ucdavis.edu	"	Seabird Egg Residue Data Gap Study
7	Analysis of Impacts to Seabirds from Chronic Releases of DDT and PCBs into the Southern California Marine Environment[2]	04/15/03	Electronic submission	Laird Henkel H.T. Harvey & Associates Ecological Consultants 831-786-1700 ext. 104 lhenkel@harveyecology.com	"	Analysis of Impacts to Seabirds from Chronic Releases of DDT and PCBs into the Southern California Marine Environment
8	Research to identify levels of DDT and PCBs in Pacific mole crab and surf scoter from contaminated nearshore areas of Southern California Bight	04/03	Letter	Josh Adams US Geological Survey 831-771-4422 josh_adams@usgs.gov	"	Research to Identify Levels of DDT and PCBs in Pacific Mole Crab and Surf Scoter from Contaminated Near-shore Areas of Southern California Bight
9	Population Status and Ecology of Ashy Storm-petrels in Channel Islands National Park: assessing one of the most vulnerable endemic seabirds in the California Current	05/11/04	Electronic submission	Josh Adams US Geological Survey 831-771-4422 josh_adams@usgs.gov	"	Population Status and Ecology of Ashy Storm-petrels in Channel Islands National Park: Assessing one of the most vulnerable endemic seabirds in the California Current

[1]= Restoration project idea gathered from Damage Assessment studies and reports
[2] = Restoration project idea gathered from public after Consent Decree
Sources: MSRP files, MSRP Bird Technical Workshop 2003

Note: Implementation of data gap studies will be based on a different set of criteria relative to importance of information to Trustees.

Inventory of Initial Restoration Ideas
Part 6: Outreach and Education

#	Original Outreach and Education Ideas	Date Submitted	Source	Contact	Action	Revised Project Titles
1	"Marine Mammal Mysteries"- Comprehensive Educational Outreach Program of the Marine Mammal Care Center (Hire 2 part-time educators at Marine Mammal Care Center)	07/29/03	Fax	Jackie Jaakola Marine Mammal Care Center 310-548-5677 jackjaak@aol.com	All ideas will be retained for future consideration as described in Chapter 5 of the draft Restoration Plan	"Marine Mammal Mysteries"- Comprehensive Educational Outreach Program of the Marine Mammal Care Center
2	Develop curricula and public presentation materials to expand the National Park and Marine Sanctuary's existing educational outreach to students in Ventura and Santa Barbara Counties	04/25/2003 08/05/2003	Fax Electronic submission	Kate Faulkner National Park Service 805-658-5709 Kate_Faulkner@nps.gov	"	Expand the National Park Service and Marine Sanctuary's Existing Educational Outreach to Students in Ventura and Santa Barbara Counties
3	Construction of nature center at White Point Nature Center. Funding of onsite naturalist[2]	04/15/2003	Electronic submission	Barbara Dye Palos Verdes Land Conservancy 310-541-7613 barbaradye@cox.net	"	Construct New Nature Center at White Point Nature Center/Fund Onsite Naturalist
4	"Protecting Our Wildlife": Public education designed to lessen impact on marine wilidlife. (Provide transportation, curricula materials, and laboratory supplies for teachers/students at the Center for Marine Studies for a 3 hour onsite program)	N/A	Fax	Jeanine Mauch Center for Marine Studies 310-547-9888 jmauch@lausd.12.ca.us	"	"Protecting Our Wildlife": Public Education Designed to Lessen Impact on Marine Wildlife.

#	Original Outreach and Education Ideas	Date Submitted	Source	Contact	Action	Revised Project Titles
5	"Marine Science at Fort MacArthur": Intensive marine science program to lessen human impact on the environment (Provide program costs including transportation, teacher training, curricula materials, laboratory supplies, and student overnight residency requirements at the Center for Marine Studies)	N/A	Fax	Jeanine Mauch Center for Marine Studies 310-547-9888 jmauch@lausd.12.ca.us	"	"Marine Science at Fort MacArthur": Intensive Marine Science Program to Lessen Human Impact on the Environment
6	Interdisciplinary curriculum guide and "naturalist in-school" program for middle school grades	08/03	Written submission	Samantha Whalen MSRP 562-980-3236 Samantha.whalen@noaa.gov	"	Interdisciplinary Curriculum Guide and "Naturalist In-School" Program for Middle School Grades

Submissions

Peregrine Falcons

Montrose Settlements Restoration Program
NOAA, 501 West Ocean Blvd, Suite 4470
Long Beach, CA, 90802

11 April 2003

The UC Santa Cruz Predatory Bird Research Group (SCPBRG) would like to submit the following project idea to the Montrose Settlements Restoration Program. This project would directly benefit injured resources by restoring peregrine falcons to the southern Channel Islands as a natural and integral part of the islands' ecosystem after decades of absence, and monitoring the progress of the species' recovery and contaminant levels throughout the area. Part of project will take place on the southern Channel Islands within the Southern California Bight to reestablish the peregrine as a breeding species there following their long extirpation. Others aspects will monitor the status and current contaminant levels of peregrines breeding on the northern islands, and movements of peregrines within and around the ecosystem.

We bring to the effort over 25 years of established and proven techniques and experience in peregrine restoration on the West Coast, including the Channel Islands, and extensive databases on all aspects of peregrine biology in California reaching back decades that were collected during statewide recovery efforts. Our long experience in this field will help to ensure a cost-effective program. In addition, SCPBRG has ongoing peregrine recovery mitigation and monitoring efforts in California, including coordinating post-delisting monitoring for the US Fish and Wildlife Service (USFWS). SCPBRG has a long-standing relationship with both the USFWS and California Department of Fish and Game (CDFG), and have held all relevant state and local permits to conduct peregrine restoration activities for many years. SCPBRG has also been releasing young peregrines at Vandenberg Air Force Base and near Buelton in recent years, in part to help bolster the nearby Channel Islands peregrine population until Montrose restoration funding became available.

We are including a draft proposal that was submitted to the Justice Department and the USFWS in 1994, which outlines the proposed program in some detail. It has been very slightly modified. As the process moves forward, it will need to be brought up to date and refined, including budgets, but it clearly states our long-term objectives in regard to peregrine restoration on the Channel Islands. This introduction is meant to directly address the screening and evaluation criteria provided with the request for ideas.

Organization Background

The Santa Cruz Predatory Bird Research Group was formed in 1975 to restore an endangered peregrine falcon population in California. The peregrine falcon was removed from the federal endangered species list in 1999, and we are proud to have played a leading role in that success. Peregrines remain classified as endangered, and Fully Protected, in California. In 1970, a partial survey of historical peregrine sites in the state revealed only two actively breeding pairs, and it was estimated that the species had declined by over 95% statewide (Herman, 1971). In the ensuing years the species has increased substantially in numbers, but there remain pockets of vacant breeding habitat where recovery has not been complete. In addition, in some areas, notably the Southern California Bight, eggshell thickness is still at a level of concern, although pairs are now breeding with some success on the northern Channel Islands.

We helped bolster the peregrine's recovery through release of hundreds of young falcons in California and other West Coast states. These were released by direct fostering into wild peregrine nests from which we had removed thin-shelled eggs for artificial incubation, cross-fostering into prairie falcon nests, and hacking. Many of these individuals joined the wild breeding population, including re-founding breeding sites on the northern Channel Islands. In addition, in a large cooperative program with a variety of agencies, we collected eggshell fragments, addled eggs, and prey remains, leading to an extensive history of peregrine contamination and natural history in California, including the Channel Islands.

Project Summary

Prior to the DDT era, peregrines are known to have bred historically on most, if not all, of the California Channel Islands (Kiff 1980). To date, no known post-DDT peregrine re-colonization has occurred on the southern Channel Islands (Santa Catalina, San Nicholas, and San Clemente) since they disappeared as a breeding species decades ago. We will use the proven techniques of peregrine restoration on these islands to bring about or speed the reestablishment of peregrine falcons as a breeding species there. We will primarily employ the time-tested method of "hacking", releasing fledgling peregrines from a hack box and covertly providing food for them until they instinctively learn to hunt on their own and no longer return to the hack site. This was the technique successfully used to release thousands of peregrine falcons by SCPBRG and others worldwide, and to re-establish breeding bald eagles on Santa Catalina Island by the Institute of Wildlife Studies.

While the natural natal dispersal distances of peregrine falcons make it likely that not all peregrines released on the islands will breed there, the history of recolonization of the northern islands after similar releases there shows that some will, and that others will

likely be attracted there from the mainland to enter the islands' breeding population. For example, the first known reoccupation of a historic peregrine site on the Channel Islands was at Hoffman Point on San Miguel Island. A male that we had released at a hacksite there in 1985 remained in the area, and attracted an unbanded immature female by the next spring. He remained and bred there for many years. Many of the peregrines that formed pairs on the islands during the late 1980s and the 1990s contained falcons released by our program, either on the nearby coastal mainland through hacking and fostering to existing nests, or on the islands through similar means (Walton 1997).

We will release pure *anatum* peregrines of West Coast origin, either bred in captivity by cooperators, or removed from eyries on urban structures with a history of high mortality at fledging. We have used this latter technique for several years to salvage fledglings produced at urban sites such as large bridges where many of the young perish from fledging mishaps such as being blown downwind and into the water by strong crosswinds.

Once established, barring catastrophic population decline such as that caused by DDE, peregrine territories generally remain occupied indefinitely, with new adults recruiting from the "floating" population to replace lost breeders over time. This is true in California, where most territories established early in the species' recovery remain active decades later. Thus, there is no reason to believe that the benefit of reintroduction efforts will not be permanent in reestablishing territorial peregrines as an integral part of the islands' ecosystem as an apex predator.

Given the difficulties bald eagles are currently experiencing with reproduction on Santa Catalina, it remains to be seen whether peregrines will immediately be able to breed successfully on the southern islands. However, since they are now breeding to the north, and peregrines are somewhat less sensitive to DDE than bald eagles, there is reason to expect that peregrines could reproduce currently or in the near future on the southern islands. Certainly as contaminants levels are eventually alleviated this will occur. Even barring unaided breeding success in the near-term though, restoring peregrines as a presence will replace a missing component of the islands' natural ecosystems.

We also plan to collect samples from the northern islands' current breeding sites to compare with previously collected data. In the short term, we plan to collect a statistically sound sample from sites from which we have previous data, to ascertain whether there has been any improvement in the years since a concerted effort was made to collect samples, approximately a decade. Given the seeming improvement in reproductive success in recent years, we expect this may be the case.

Given the many successes of peregrine reintroduction efforts worldwide, including those carried out by SCPBRG, the reintroduction portion of the project is extremely likely to be successful in the long term. Although nothing is certain in wildlife work, hacking has been shown to be successful in reintroducing peregrines and other species worldwide, and in our experience is as successful in providing recruits to the breeding population as other methods such as fostering and cross-fostering. There is also evidence that

peregrines "imprint" on release habitat, tending to a degree to nest in areas similar to those in which they were released or fledged.

Evidence of success will be the establishment of peregrines breeding on the southern Channel Islands, likely within less than five years of project inception. Others can be expected to nest nearby on the mainland or the northern islands, adding to the overall abundance of peregrines in the region. All released peregrines will be banded with both USFWS bands and alpha-numeric bands that can be read at a distance. Banded falcons will be identified, confirming whether or not releases contribute directly to reestablishment. Collecting egg and eggshell samples for measurement and analysis is a time-tested method, and results will be evident in the data collected by the effort.

Given that we will be using established techniques, and that captive-bred or salvaged young peregrines are readily available, we feel that this effort will be a cost-effective method to restore a resource lost to the islands for many decades. Productivity and eggshell information from pairs already established will be a cost-effective and parsimonious way to track changes in present and future levels of contaminants in peregrine falcons within the region.

We appreciate your consideration of these ideas.

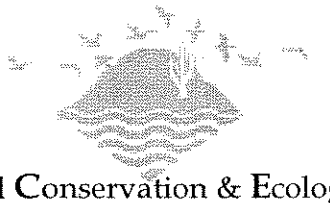
Sincerely,

Brian James Walton
Coordinator, SCPBRG

Protection and restoration of seabird and Peregrine Falcon populations on Baja California Peninsula islands

Ideas for the Montrose Settlements Restoration Program

by the



Island Conservation & Ecology Group

Executive Summary: The seabird and Peregrine Falcon populations injured by DDT and PCB contamination from Montrose et al. do not recognize international boarders. Instead, they form a metapopulation that spans the US / Mexico boarder with many individuals using islands and marine foraging areas on both sides. This is because the Southern California Bight is an oceanographic region that extends south of the US boarder to Punta Baja, and because the seabirds that breed on Mexican islands outside the Southern California Bight use the bight for foraging.

There are tremendous opportunities for the restoration and protection of Southern California Bight seabirds and Peregrine Falcons on Baja California Pacific Islands. This is because these islands have larger populations of impacted species than the US islands, they are legally protected, there has been almost no investment in their management and conservation, and finally, operational costs are lower in Mexico than in the US.

We propose a comprehensive five-year, $3 million seabird and Peregrine Falcon protection and restoration program for the ten northernmost islands off the Pacific coast of the Baja California Peninsula. The program integrates nine components of seabird conservation from introduced species removal to conservation marketing, from placing warden-like conservation monitors on the island to decreasing light pollution around colonies.

This program will provide immediate, long-term protection for 29,000 ha of existing and potential seabird and Peregrine Falcon habitat. It will protect an estimated 2.3 million seabirds (ten times the number on the US California islands) of 15 species including Brown Pelicans, Xantus's Murrelets, Cassin's Auklets, Black-vented Shearwaters, Brandt's and Double-crested Cormorants. It will also protect at least 26 breeding Peregrine Falcons. In addition, the proposed actions will restore new seabird habitat by removing introduced mammals and decreasing human disturbance, thus allowing substantial increases in seabird populations. This comprehensive program is highly cost effective at $104 per ha of seabird habitat or $1.30 / individual bird.

This is the single most significant project that can be done to protect and restore Southern California Bight seabird populations. Indeed, it will be one of the world's most significant seabird conservation projects.

Table of Contents

Justification

Wild animals do not recognize international borders, and the seabirds and Peregrine Falcon populations injured by DDT and PCB contamination from the Montrose et al. discharges are no exception. Both the Peregrine Falcons and many of the seabird species occurring in this region form a metapopulation, with individuals breeding on both sides of the US Mexico border. Other affected seabird species breed only on the Mexican side of the border, but spend significant time during the non-breeding season in the Southern California Bight and adjacent waters.

Because wildlife do not recognize international borders, wildlife protection and conservation funds should be invested wherever they can yield the largest return. Consequently, there has been an increasing trend by US Federal and California State agencies to invest in international projects (e.g. the USFWS's Wildlife Without Borders Program; USFWS region 1 & 2 NAFTA related funding for conservation in Mexico; and California DFG's funding of Xantus's Murrelet conservation in Mexico).

Recently, Wolf (2002) compared conservation and restoration opportunities for Southern California Bight seabirds breeding on both sides of the US Mexico border (Table 1).

Table 1. Summary of Southern California Bight seabird conservation opportunities in the US and Mexico (from Wolf, 2002).

	US	Mexico
Islands	9	13
Potential seabird breeding habitat (hectares)	<1,000	120,000
Species & Subspp.	15	22
Endemics	4	10
Number breeding birds	~350,000	~2,300,000
Threats	Low-Medium	Medium-High
Conservation Investment/ breeding bird	~$3.12	~$0.09

Wolf found that there are 24 islands in 12 island groups off the Pacific coast of California and Baja California, Mexico (Fig. 1). These islands support breeding populations of 27 seabird species and subspecies. The most northerly Mexican islands support 20 breeding seabird taxa, including 15 species and 8 subspecies. A large proportion (10 species) of these also breed on the California islands and many of these colonies act as meta-populations. Furthermore, the remaining 5 species that do not breed in California regularly disperse into the Southern California Bight during the non-breeding season. The three northernmost islands (Los Coronados, Todos Santos, and San Martin) are oceanographically considered a part of the Southern California Bight. The remaining seven island groups (San Jeronimo, San Benito, Cedros, Guadalupe, Natividad, Asuncion, San Roque) support globally significant seabird populations, all of which are clearly tied during breeding and/or non-breeding seasons to the region affected by DDT and PCB contamination from Montrose discharges.

The conservation status of the Baja California Peninsula Islands is similar to those in the US 50 years ago. Almost all of the Mexican Islands support unregulated human settlements; several still contain feral populations of cats or large ungulates. Furthermore, there are limited regulations to control new introductions of damaging species and little enforcement for the limited legal protections that do exist for the islands. Ongoing disturbance to breeding and roosting populations severely limits numbers of seabirds utilizing these islands for breeding and roosting. Most of these problems can be easily rectified and will provide large conservation gains in relation to money spent.

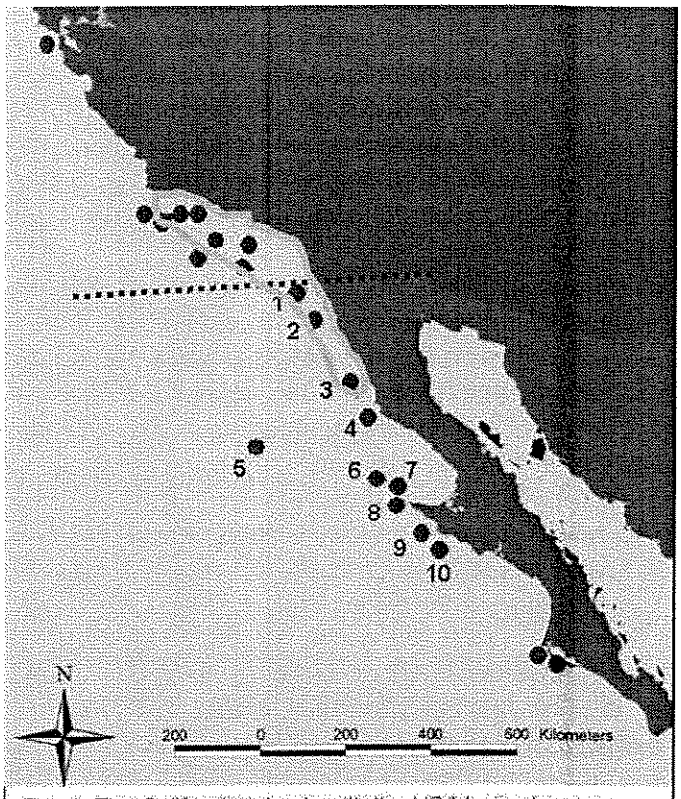


Fig. 1. The California islands with the US/Mexico border (dashed black line), and the oceanographic boundaries of the southern California bight (solid orange line). Island groups 1-10 are included in the proposed Protected Area and this proposal: 1=Los Coronados 2=Todos Santos 3=San Jeronimo 4=San Martin 5=Guadalupe 6=San Benito 7=Cedros 8=Natividad 9=San Roque 10=Asuncion.

Despite the greater opportunities for Southern California Bight seabird conservation and restoration in Mexico when compared to California, Wolf (2002) found that about 30 times more money for management was spent per bird in the US ($3.12) than in Mexico ($0.09). Thus, both the asymmetries in past conservation investment and in current conservation opportunities indicate that protecting Southern California Bight seabirds on Mexican islands will be cost effective.

Wolf's research focused on seabirds, but the situation is similar for Peregrine Falcons, which also breed on almost all the California islands- in both the US and Mexico. Peregrine Falcons are not directly limited by foxes on the US Channel Islands, but in Mexico, they may be limited by reduced populations of seabirds, one of their primary prey items, and by direct human disturbance around nest sites. Currently, every island numbered in figure 1 support at least 2 to 6 or more breeding Peregrine Falcons. Unregulated human access clearly negatively affects some breeding pairs.

Capacity for Effective Seabird and Peregrine Falcon Protection & Restoration in Mexico
The Island Conservation & Ecology Group is a science-driven non-profit organization that works with local island users and relevant government agencies to prevent extinctions and protect natural processes on islands. We were founded in 1994 and became a 501(c) (3) in 1997. We are based at the University of California Santa Cruz's Center for Ocean Health. Our largest project in the United States is the Anacapa Island Restoration Project funded by the American Trader Trustee Council.

In Mexico we formed an affiliated non-profit organization, Grupo de Ecología y Conservación de Islas, based in Ensenada, Mexico. Together, we have worked with government and local partners to remove introduced mammals from 25 islands in Northwest Mexico in only eight years. This has protected 120 populations of seabirds in 30 species and subspecies. Twelve of these islands were located off the Pacific coast of the Baja California Peninsula and had breeding Southern California Bight seabirds. These conservation actions also protected 50 endemic vertebrate species and subspecies, and 29 endemic plant taxa. To secure these conservation gains, we designed and successfully promoted a new national protected area for all the islands off the Pacific coast of the Baja California Peninsula which will be decreed in three stages over the next two years (120,000 ha of island and 10 surrounding marine protected areas). In 2002, President Fox awarded the Grupo de Ecología y Conservación de Islas the first Enrique Beltran prize for their contribution to biodiversity conservation in Mexico.

Grupo de Ecología y Conservación de Islas (GECI) has a proven track record of real conservation successes. They are funded primarily by pass-through grants from the Island Conservation & Ecology Group who insure fiscal responsibility and GAO audit standards. GECI's offices in Ensenada are in the same building as the offices of the Mexican Natural Protected Areas Administration which manages all the protected islands. GECI also has excellent working relationships with all major island users in the region: the 10 fishing cooperatives that have permission to fish around the islands; the SCT which manages the manned and automated light houses on the islands; the Mexican Navy which has small garrisons on three of the islands; and PROFEPA, the enforcement branch of the Natural Resources Ministry. These long-term relationships have enabled GECI to complete the environmental compliance process and have existing permits to remove introduced species from the remaining California islands in Mexico and take a number of additional island management actions to protect and restore seabird and Peregrine Falcon populations.

Restoration Project Ideas
We propose a comprehensive five-year seabird and Peregrine Falcon protection and restoration plan that will provide immediate, long-term protection for 29,000 ha of existing and potential seabird and peregrine habitat on 10 island groups off the Baja California Peninsula, Mexico. Three of these island groups (910 ha) are in the Southern California Bight, and the remaining six islands (28, 090 ha) are outside the Southern California Bight, but are breeding and roosting sites for seabirds that use the Southern California Bight during the breeding and non-breeding season. All the islands form part of a larger metapopulation for both Southern California Bight seabirds and Peregrine Falcons.

The number of seabirds that will be protected by the proposed actions is an estimated 2,300,000 individuals (ten times the number of seabirds breeding on the US California islands). There are 15 species and subspecies including Brown Pelicans, Xantus's Murrelets, Cassin's Auklets, Black-vented Shearwaters, Brandt's and Double-crested Cormorants (see Table 2 at end of document). At least 26 breeding Peregrine Falcons will also be protected by these actions. In addition to protecting existing populations of seabirds and Peregrine Falcons, the proposed actions will restore new seabird habitat by removing introduced mammals and decreasing human disturbance, thus allowing substantial increases in seabird populations.

Specifically, we propose to expand GECI's existing conservation and restoration team to take the following actions on each islands:

1. Remove damaging introduced mammals (except on Cedros)
2. Decrease and eventually halt land conversion
3. Decrease direct human disturbance of seabirds
4. Decrease shore based light pollution in and adjacent to seabird colonies
5. Develop and post interpretive and warning signs
6. Develop and implement an environmental marketing program for island users
7. Implement an invasive species introduction prevention and response plan
8. Post two biologists on each island for extended periods every year to serve as conservation monitors that will be an effective force for protection
9. Produce draft biodiversity centered management plans for implementation once the protected area is decreed and fully staffed

GECI and ICEG have successfully implemented all of these conservation components on individual islands and have the capacity and partnerships needed to scale up to all 10 island groups. This is the single most significant project that can be done to protect and restore Southern California Bight seabird populations. Indeed, it will be one of the world's most significant seabird conservation projects.

This comprehensive project also meets the specific screening evaluative criteria established by the MSRP.

Screening Criteria:
Nexus to Injured Resources: Most of the seabirds breeding and roosting on these islands use the Southern California Bight during part or all of the year. The Peregrine Falcons feed on seabirds that use the Southern California Bight. Both the seabirds and Peregrine Falcons on these islands are part of the metapopulation that sustains Southern California Bight populations.

Geographic Location: Three of the island groups are in the Southern California Bight and several others are immediately down wind. All have important biogeographic affinities with the US Channel Islands.

Duplicate Funding: There is no duplicate funding. Eight years of funding from a variety of sources have enabled GECI to develop the capacity, track record, and reputation necessary to carry out this comprehensive project. Funding from the Mexican Government and private foundations for the goat eradication project on Guadalupe will provide much of the infrastructure needed for the Guadalupe projects in this proposal.

Legality: Environmental compliance for major components of this project has been completed and the project has the full support of all of the relevant government agencies, including the Mexican Secretaries of the Environment (SEMARNAT, see attached letter), the Navy (SEMAR), and Communication and Transportation (SCT). It has the full support of the main fishing cooperatives that use the islands.

Evaluative Criteria:
Nexus to Injured or Equivalent Resources: See above.

Duration of Benefits: This project combines conservation actions at different temporal scales to achieve region-wide long-term benefits for injured resources. For example, introduced species removal, signage, light shielding, and the presence of conservation monitors all have immediate and long-lasting benefits to seabird and Peregrine Falcon populations. Introduction prevention programs, environmental marketing, and management plan development all take longer to benefit seabird and Peregrine Falcon populations, but are necessary for long-term protection.

Likelihood of Success: Over the last eight years GECI and ICEG have developed the experience and network of contacts necessary to successfully carry out this program. Each of the components has been successfully completed on at least one island in the region and most on several islands.

Technical Feasibility: The projects are technically feasible and will be conducted by an international team of experts who will be taking advantage of GECI / ICEG's extensive experience in the region.

Cost Effectiveness: The cost effectiveness of this proposal is approximately $1.30/ individual seabird protected and $103.5/ hectare of seabird habitat protected. It would be impossible to achieve similar returns on conservation investment on the US California islands.

Environmental Acceptability: None of the project components have potential long-term adverse impacts on the environment and associated natural resources.

Level of Benefit: The project will provide immediate, long-term benefit for 29,000 ha of existing and potential seabird and peregrine habitat on 10 island groups. An estimated 2,300,000 individuals (ten times the number of seabirds breeding on the US California islands) in 15

species and subspecies including Brown Pelicans, Xantus's Murrelets, Cassin's Auklets, Black-vented Shearwaters, Brandt's and Double-crested Cormorants will benefit. At least 26 breeding Peregrine Falcons will also benefit. The proposed actions will restore new seabird habitat by removing introduced mammals and decreasing human disturbance, thus allowing substantial increases in seabird populations. In addition, it will protect critical habitat for the more than 23 endemic terrestrial vertebrates and 59 endemic plants found on these islands.

Multiple Resource Benefits: The project will benefit 15 species and subspecies of seabirds and Peregrine Falcons. It will also benefit osprey, and endemic terrestrial plants and vertebrates.

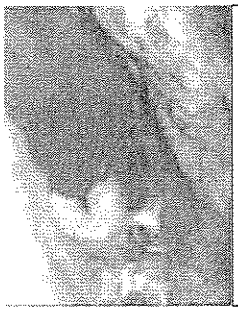
Opportunities for Collaboration: The project will receive in-kind support from the Mexican Navy, several of the fishing cooperatives that use the islands, the Mexican Environmental Ministry (see attached letter), and several private donors. In addition, the $1.2 million necessary for the goat eradication from Guadalupe island will greatly facilitate cat eradication there. The support will leverage two-years of work supported by two foundations and the USFWS-International to design and gain approval for the Pacific Islands Protected Area.

Specific short-term performance criteria are available for each component of the project, but the medium- and long-term performance criteria will be measured increases in seabird and Peregrine Falcon populations in the Southern California Bight and adjacent California Islands.

Public Health and Safety: The project poses no health and safety threats to island users or residents.

Overview of the Islands, Threats and Restoration Opportunities

Los Coronados Islands:
Four islands, 360 ha, ~4,000 breeding seabirds of 10 species, 4-6 breeding Peregrine Falcons. Los Coronados Islands support what is probably the world's largest Xantus's Murrelet colony, as well as important pelican, cormorant and storm-petrel colonies. In 2001 a Mexican company submitted a proposal to collect rocks from Los Coronados for the lucrative landscaping retail business. This would have destroyed large amounts of murrelet habitat as well as disturbed pelicans and other species. GECI was able to stop this project by lobbying government agencies. Cassin's Auklet and storm-petrel populations appear to be recovering following GECI's feral cat eradication. However, feral goats and donkeys, and pet dogs still threaten surface nesting seabirds, and reoccurring proposals for constructing cell phone towers and mining threaten all the island's seabirds.



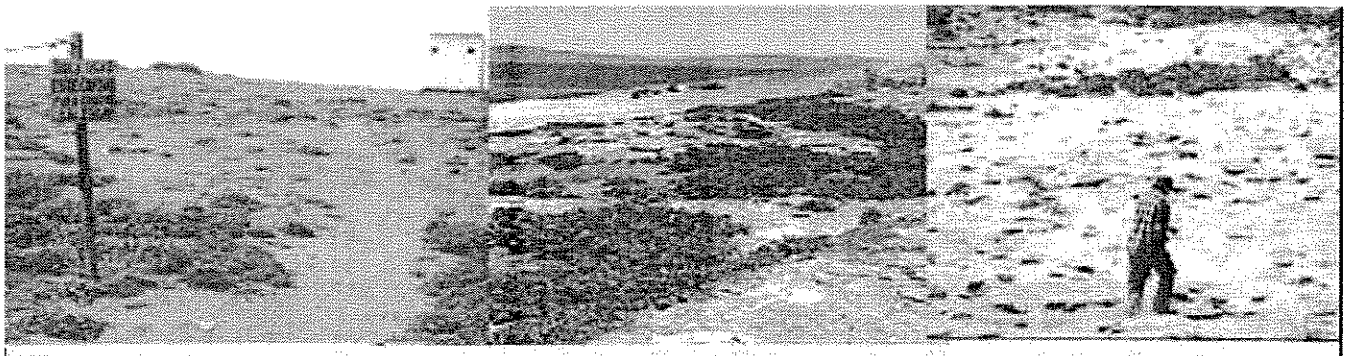
Islas Los Coronados supports what may be the largest breeding colony of Xantus's Murrelet in the world.

Todos Santos Islands:
Two islands, 190 ha, ~3,500 breeding seabirds of 6 species, 2-4 breeding Peregrine Falcons. Todos Santos Islands historically supported important Southern California Bight seabird

colonies. However, they have been heavily impacted by introduced cats and rabbits, regular human use and development, and occasional human-caused wildfires. Cats and rabbits were eradicated by GECI, yet cormorants only breed on the most inaccessible corners of the island and pelicans still do not breed on the island due to disturbance by humans, introduced donkeys, and pet dogs. Human use of the islands is unregulated and an illegal surf camp is operating on the north island.

San Martin Island:
One island, 300 ha, ~5,000 breeding seabirds of 6 species, 2-4 breeding Peregrine Falcons. San Martin Island formerly supported very large colonies of Double-crested Cormorants (perhaps several hundred thousand) and Brown Pelicans. While these breeding populations have increased slowly in recent years after the successful removal of cats by GECI, disturbance by humans continues to limit the birds' ability to rebound. Additionally, the continued threat of introductions of cats and rats threaten the future viability of these seabirds.

San Jeronimo:
One island, 68 ha,~10,000 breeding seabirds of 5 species, 2 breeding Peregrine Falcons. On San Jeronimo Island a large colony of Brandt's Cormorant (many thousands of birds) was wiped out

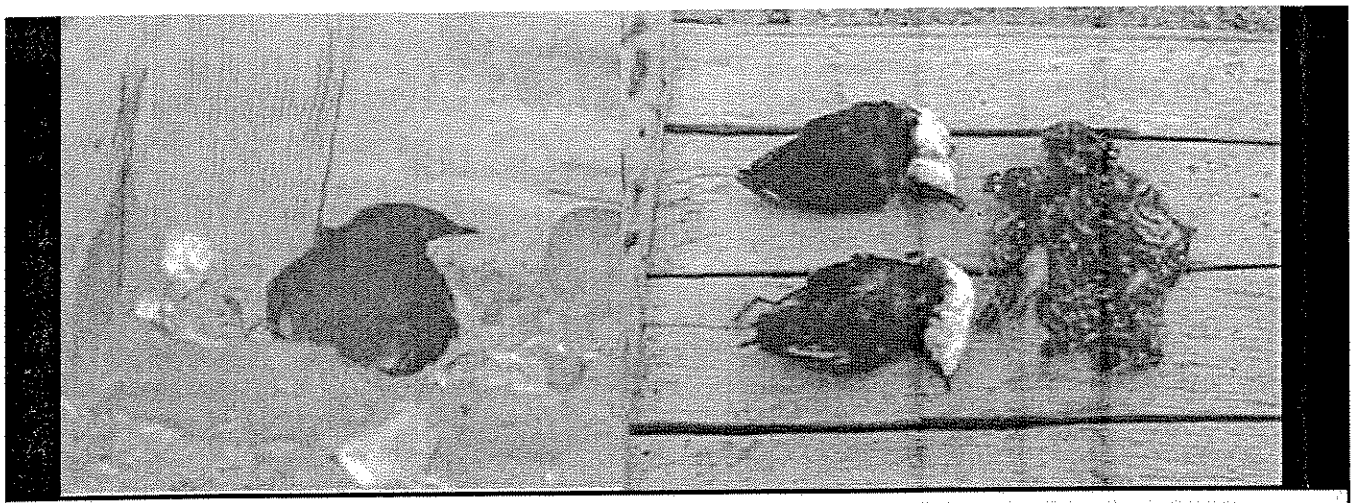


The construction of an outhouse and signs designating trails have reduced human destruction of Cassin's Auklet burrows surrounding the fishing camp on San Jeronimo Island (left).

A historical nesting colony of Brandt's Cormorants and Brown Pelicans was extirpated by a guano mining operation on the north end of San Jeronimo in 1999. Nesting birds have not yet re-colonized, most likely because humans flush roosting birds at the colony site on a daily basis (center).

Fishermen cross the extremely dense Cassin's Auklet colony on a daily basis, crushing fragile nesting burrows and destroying nesting attempts (right).

and large sections of the Cassin's Auklet colony were destroyed during an unauthorized guano mining operation in 1999. GECI has since stopped all guano mining operation on the island. Feral cats, which threatened the Cassin's Auklet colony, were also eradicated by GECI. However, human disturbance still keeps the BRCO and BRPE colonies from re-establishing, destroys CAAU burrows, disrupts a large (many thousands of birds) BRPE roosting population, and threatens continued introductions of mammalian predators.



Xantus's Murrelets (*S. h. scrippsi*) nest in unoccupied houses in the fishing camp on San Jeronimo. Their nesting efforts are jeopardized by human disturbance and introduced cats. Nest boxes could help protect nesting birds (left).

Xantus's Murrelets die from collisions with buildings in the fishing camp where they become disoriented from light pollution. They are also easily depredated by introduced cats. (Burrowing owl also pictured) (right)

San Benito Islands: Three islands, 850 ha, ~2 million breeding seabirds of 12 species, 4 breeding Peregrine Falcons. San Benito Islands are the most diverse (12 breeding seabird species) and largest (estimated at over 2 million breeding birds) seabird colony in the California Islands. GECI has already removed feral goats and rabbits from the three islands. However, donkeys still wander freely on West San Benito, crushing seabird burrows and disturbing surface nesting species. GECI has been successful at regulating various proposed development projects on the island that have destroyed seabird habitat. However, ongoing education and monitoring

Burros (donkeys) used to carry diesel to the lighthouse on San Benitos are regularly released from their corral. They browse native vegetation and crush seabird burrows (left).

Seven nocturnal seabird species, including the Cassin's Auklet pictured above, nest in crevices and burrows that honeycomb the three San Benito Islands. The nesting population of Cassin's Auklet is estimated at 75,000 breeding birds (center).

Ongoing construction of a new lighthouse on West San Benito Island has widened approximately 2 miles of trail leading to the construction site and has introduced heavy usage of 2 ATVs, oil, generators, and machinery at the site (right).

are needed to help protect these globally important seabird islands. ICEG and GECI have sponsored students to live on the island for extended periods over the past 5 years and have made numerous conservation gains. When an algae harvest company began drying their product in the middle of a dense Cassin's Auklet colony, GECI worked with government agencies to restrict algae drying to a designated zone outside the colony the following year. Furthermore, GECI provided an observer to watch the company and make sure they abided by the agreement. When the secretary of transportation proposed to build a new lighthouse on the island, GECI lobbied hard to get strict guidelines in place for the construction, including the location of the structure, clean up of the old lighthouse and discarded batteries, use of access roads to the construction site, and limits on materials brought to the island to reduce likelihood of introductions of rodents, plants and insects. The main threat is the potential introduction of rats or mice. Other threats include ongoing mortality of nocturnal seabirds at unshielded light sources in the fishing community, and expansion of fishing community activities into the adjacent petrel and alcid colony.

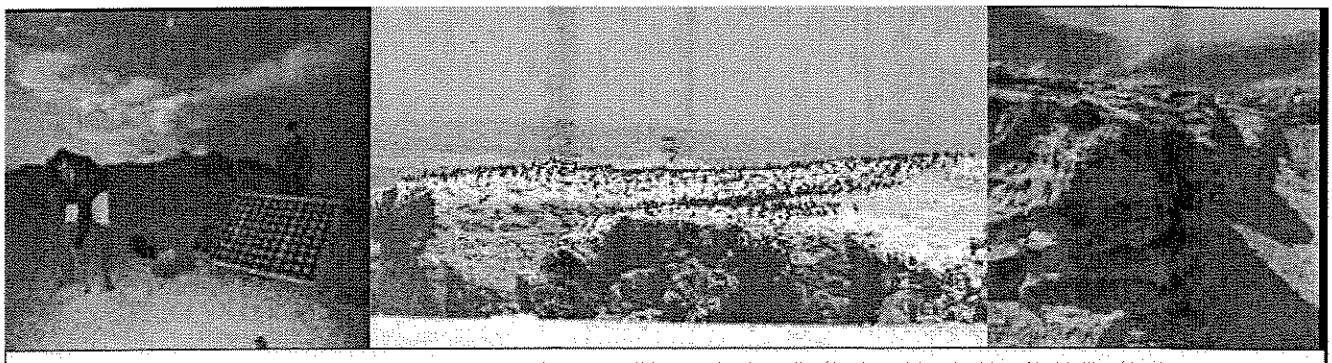
Cedros Island: One island 37,000 ha, three main satellite islands <100 ha. 400 breeding seabirds in 4 species. Unknown number of breeding Peregrine Falcons, but probably 10 or more. Cedros is the largest of the California Islands, but has no introduced fox. Although not an important seabird colony due to the presence of feral dogs, cats, goats, rats, mice and donkeys, Cedros does have small breeding colonies of cormorants, and possibly of brown pelicans and nocturnal hole nesting petrels and alcids. Because it is the largest and most populous island in the region and there is regular transport between Cedros, Natividad and the San Benito Islands, Cedros is an important location for community education of island users and a likely source location for the introduction of rats and mice to the San Benito Islands.

Natividad Island: One island 1,000 ha, ~160,000 breeding seabirds in 5 species, 4-6 breeding Peregrine Falcons. Natividad Island supports over 95% of the world's Black-vented Shearwaters, as well as important colonies of pelicans and cormorants. Black-vented Shearwaters are an important member of the southern California avifauna in the fall and winter, when large numbers use the Southern California Bight to feed. On Natividad Island ICEG placed a graduate student on the island for extended periods over two years. Through environmental education this student

95% of the world's population of the Black-vented Shearwater (left) breed on Natividad Island. Introduced cats were killing over 1,000 adults each month (center) and threatening the whole colony with extinction. GECI removed cats from the islands and the Black-vented Shearwater is now freed from the immediate threat of extinction (right).

was able to (1) convince residents of the need to remove feral and pet cats from the island to protect the black-vented shearwater colony (2) establish a quarantine program to keep new animals from being introduced to the island (3) close selected roads that passed through the shearwater colony (4) stop construction of new roads and limit human use on the uninhabited north end of the island to protect nesting pelicans and cormorants (5) convince residents to remove goats and sheep from the island that were destroying habitat and disturbing nesting pelicans and cormorants. GECI then worked with local residents to remove feral cats, goats, and sheep and domestic rabbits and pigs from Natividad with large benefits to nesting seabirds. However, ongoing education work with the over 500 residents is needed to stop future introductions of cats and rodents. In addition, unregulated road building, off road vehicle use, and disturbance of pelican and cormorant breeding and roosting sites by island residents and tourists continue to limit the number of breeding seabirds on Natividad Island. Cassin's Auklets and possibly Xantus' Murrelets and storm petrels were extirpated from the island by cats. These species could be reintroduced to the island from source populations on the nearby San Benito Islands

Asunción and San Roque Islands: Two islands 150 ha, 400 breeding seabirds in 5 species, 4-6 breeding Peregrine Falcons. On Asuncion and San Roque Islands, GECI removed cats and rats in 1994 and stopped human visitation to the island through education and placement of signs on the island. These actions had immediate results by providing more secure roosting habitat for thousands of pelicans and cormorants. In 2001 Brandt's Cormorants (over 2,000 nests) and Brown Pelicans (about 10 nests) had begun breeding again on San Roque Island. Unfortunately, in 2002 after a long lapse in education efforts, local fishermen began visiting the island again on a regular basis and virtually all of the cormorants and pelicans abandoned their breeding efforts.



GECI and ICEG personnel maintain a playback station intended to attract Black Vented Shearwaters, Leaches Storm Petrels, Cassin's Auklets and, Xantus's Murrelets to recolonize Asuncion Island (left).

Brant's Comorants formerly nested by the thousands on San Roque Island (center).

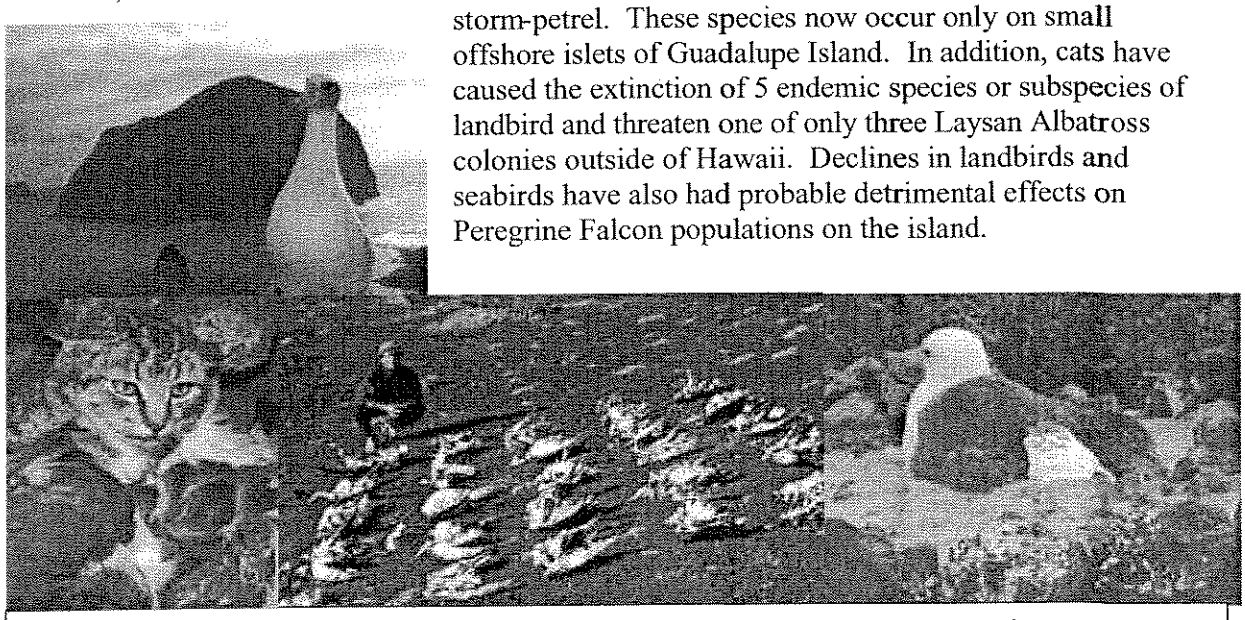
Evidence of historic guano mining that devastated the seabird colonies of San Roque Island is still apparent (right).

Continued environmental education and monitoring of human use on the islands is needed to develop a plan to mitigate human disturbance. Furthermore, Cassin's Auklets, and perhaps other nocturnal alcids and petrels were extirpated from the island by cats. They have failed to re colonize naturally during the last eight years, but could be reintroduced from source populations on the nearby San Benito Islands.

Guadalupe Island: One main island 26,000 ha, three satellite islands <100 ha, 15,000 breeding seabirds of 7 species, unknown number of breeding Peregrine Falcons. Guadalupe is the largest seabird restoration opportunity in the California Islands and one of the most important in the world.

Guadalupe Island is biogeographically affiliated with coastal Southern California and a part of the critically endangered California Coastal Sage and Chaparral ecoregion. This 26,000 ha island has no significant development and in addition to seabirds supports 34 endemic plants (including two endemic genera), ten endemic land birds, 11 endemic land snails, and at least 18 endemic insects. It harbors one of the last significant remnants of the rich lichen flora that was once common and is now rare in southern California and northern Baja California. The overwhelming threat to this ecosystem is introduced cats and goats. Goats have completely transformed the island, much of which has been browsed down to bare rock leaving many of the endemic plants surviving only on inaccessible cliffs. The top of the island, once covered with an endemic Guadalupe Island pine forest, is now sparsely vegetated with only about 200 adult trees. Each of these remaining trees is over 100 years old because goats eat all the new seedlings every year.

Cats caused the extinction of the endemic Guadalupe storm-petrel and the likely extirpation from the main island of Guadalupe of many other seabird populations, including the Xantus's Murrelet, Black-vented Shearwater, Cassin's Auklet, and two endemic subspecies of Leach's storm-petrel. These species now occur only on small offshore islets of Guadalupe Island. In addition, cats have caused the extinction of 5 endemic species or subspecies of landbird and threaten one of only three Laysan Albatross colonies outside of Hawaii. Declines in landbirds and seabirds have also had probable detrimental effects on Peregrine Falcon populations on the island.



Nesting Laysan Albatross on Guadalupe Island (top). Introduced cats killed and ate more than 30 adult albatross (left & center) and rainfall on the goat denuded slopes flooded the colony (right). Albatross mortality stopped after cat control was initiated around the colony.

The combined impact of cats and goats can be seen on the small colony of Laysan Albatross. During the most recent breeding season, cats killed over 30 adults of these very long-lived birds in less than one month, threatening the colony with extirpation. Then, heavy rains flooded the colony because the goats have left almost no vegetation to dampen the runoff.

In 2001-03 we initiated the first terrestrial conservation action on Guadalupe Island. We worked with the local community to remove a small group of free ranging pet rabbits and all but two of the pet dogs from the island. We controlled feral cats around the albatross colony to prevent its near certain extirpation. We stopped the import of potentially invasive plants and seeds to the

A goat exclosure on Guadalupe Island is visible from the air after only one year (left). On the ground the difference on either side of the fence is striking (center). Only about 200 endemic Guadalupe Island pines adults remain and all are over 100 years old, but inside our exclosure there are 151 seedlings (right).

island, and built 14 goat exclosures within which there has been a dramatic recovery of endemic plants. The goat exclosures demonstrate the remarkable natural recovery that will take place once goats are removed. Important seabird colonies and plant populations still occur on small offshore islets of Guadalupe. These populations will re-colonize the main island of Guadalupe once cats are removed. Recent work demonstrates that prospecting birds still fly around the main island and suggest there may be small breeding populations of murrelets, shearwaters, auklets, and petrels restricted to areas inaccessible to cats.

In 2002 visited the island with a team of international experts from Australia, New Zealand, Mexico, the United States, and Ecuador, to develop a plan for goat and cat eradication. This plan has the full support of the Mexican National Institute of Ecology and the Mexican National Protected Areas Commission. It has the full support of the Mexican Navy, which has pledged ship transportation and housing on the island. And, it has the full support of the local fishing community who see the benefits of protecting their watershed and living in a more aesthetically pleasing environment.

Removing goats and cats from Guadalupe Island provides a rare opportunity to restore and permanently protect 26,000 undeveloped hectares of the critically endangered California coastal sage and chaparral ecoregion.

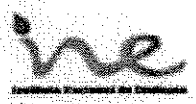
Goat eradiation will be funded by the Mexican Government and private donors. The logistical infrastructure put in place for the goat eradication, including the long-term use of a helicopter, will dramatically reduce the cost of a cat eradication program.

Degree of benefit and time line of benefits:
Eradication of cats from Guadalupe Island will have both immediate and permanent conservation benefits for the seabirds on the islands. For example, in 2003 GECI conducted a local removal of cats around the Laysan Albatross colony on Guadalupe Island to protect it from heavy predation pressure. Mortality from cats decreased from more than 30 birds found dead in the previous 60 days to zero over the ensuing 60 days. This local removal also spared prospecting storm-petrels, Xantus's Murrelets, and Black-vented Shearwaters from predation in the area. Once eradication is complete the result will be permanent protection for seabirds.

The removal of goats will provide some immediate benefits to seabirds on the island, although, the main benefits will occur over time. Goats have denuded vast areas of Guadalupe Island and this loss of plant cover has de-stabilized nest sites. For example, during the heavy rains encountered in 2003 on Guadalupe, many albatross nests were lost to flooding and small landslides of the fragile nesting substrate. As vegetation recovers on the main island, habitat quality will increase around the island.

Once cats are removed, Guadalupe Island will become the largest island in the region, and possibly in North America, without mammalian predators. Guadalupe has the potential to support enormous numbers of seabirds. Because of its remote location, status as a Mexican Navy island and imminent protection as a Mexican federal protected area, Guadalupe will never face the pressures of human disturbance or development that are so prevalent on other seabird islands.

Letter of support from Mexican Environmental Ministry:



Mexico City, March 25, 2003

To Whom It May Concern.-

Re: Guadalupe Island Conservation

Dear Guadalupe Island supporters:

We are very pleased to inform you that our agencies are working closely with the bi-national Island Conservation & Ecology Group / Grupo de Ecología y Conservación de Islas to protect and restore one of our nation's most important natural protected areas, Guadalupe Island. As you are probably aware, the island is a stupendous natural territory. Its endememism is one of the highest in Mexico. It includes unique varieties of a Monterey pine, cypress and oak, marine and land birds, as well as many flora species and a great diversity of invertebrates. Ecoregionally, the island is strongly linked to the California coastal chaparral of Southern California and Northern Baja California which has been largely lost due to development.

The first and most urgent conservation challenge is the eradication of feral goats. The goats, now present in the island for nearly one century and a half, have done extensive damages to the unique forests of cypresses, pines and oaks. Secondly, cats, which have already caused four bird extinctions, must be removed from the island so that remaining native and endemic bird populations can recover. Fortunately, the forests, other components of the plant community, and the remaining birds can recover once goats and cats are removed. Because of its size (250 Km^2), high biodiversity, and lack of direct human habitat modification, Guadalupe Island has the potential to be one of the most significant global success stories around island conservation and ecological restoration.

The restoration and protection of Guadalupe Island is our highest priority on-the-ground project for 2003/04. We are very eager to see it started as soon as possible to take advantage of the support offered by the Mexican Navy, the local community, and our own agencies. Therefore, we are pleased to announce that the Mexican Government, through the National Institute of Ecology and the National Commission of Natural Protected Areas, has committed US$600,000 towards this project. We hope that this seed money will help leverage additional private and foundation funds for this nationally and globally important conservation project.

Sincerely,

Dr. Ernesto Enkerlin Hoeflich
President
National Commission of
Natural Protected Areas

Dr. Exequiel Ezcurra
President
National Institute of Ecology

cc: Island Conservation and Ecology Group / Grupo de Ecología y Conservación de Islas, A.C.
cc: file

Appendix 1.

Listing status and number of breeding individuals on the Baja California Pacific Islands mentioned in the proposal. Un-italicized font indicates that the estimate is based on a direct nest count or standard sampling method. Italicized font indicates that the estimate is based on an incomplete or preliminary census. EXT, extinct; END, endangered; THR, threatened; SP, special protection; CR, critically endangered; VU, vulnerable; LR/nt, lower risk/near threatened; E, extirpated, occurred historically; PE, possibly extirpated, possibly occurred historically; B, breeder, no population estimate available; P, probable breeder, breeding suspected but not confirmed. Table adapted from Wolf, 2002.

	US Listing Status	CA Listing Status	México Listing Status[3]	IUCN Status[4]	San Martín	San Jerónimo	San Benitos	Natividad	San Roque	Asunción	Totals	Total extirpated taxa
Black-vented Shearwater (*Puffinus opisthomelas*)			END	VU			*250-1200*	153140			**153740**	0
Leach's Storm-petrel (*Oceandroma leucorhoa chapmani*)			THR				*~1200000*				**1200000**	0
Black Storm-petrel (*Oceanodroma melania*)		SSC	THR				*~580000*				**580500**	0
Least Storm-petrel (*Oceanodroma microsoma*)			THR				*~270000*				**270000**	0
Brown Pelican (*Pelecanus occidentalis*)	END	END			60		394	*75-150*	<20	E	**570**	1
Double-crested Cormorant (*Phalacrocorax auritus*)		SSC			1200	40	126	115	E	20	**1500**	1
Brandt's Cormorant (*Phalacrocorax penicillatus*)					50		158	1500	<200	50-100	**1870**	0
Heermann's Gull (*Larus heermanni*)			SP	LR/nt			200		75		**275**	0
Western Gull (*Larus occidentalis*)					600	*500*	1150	*5000-10000*	B	B	**9800**	0
Elegant Tern (*Sterna elegans*)			SP	LR/nt					E	E	**0**	2
Royal Tern (*Sterna maxima*)									E		**0**	1
Xantus's Murrelet (*Synthliborampus scrippsi* sbsp)	SSC	SSC	END		50-250	100-500					**1375**	0
Xantus's Murrelet (*Synthliborampus hypoleucus* sbsp)	SSC	SSC	END	VU		B		PE	PE	PE	**?**	0-3
Craveri's Murrelet (*Synthliboramphus craveri*)			THR				*<1000*				**1000**	0
			THR		*1000-5000*	*>10,000*	75334	E	E	E	**88734**	3
Total breeding individuals[1]					**5060**	**10,840**	**2130450**	**162368**	**295**	**95**	**2309364**	
Total breeding taxa (species/subspecies)					**6**	**5**	**13**	**5**	**4**	**3**	**15**	
Total extirpated taxa (species/subspecies)[2]					**0**	**0**	**0**	**1-2**	**4-5**	**3-4**	**11-14**	

[1] Total breeding individuals calculated by adding estimates from all islands using the mean of the range where ranges of individuals are given.

[2] Does not include historical extirpations where species/subspecies has since recolonized.

[3] Norma Oficial Mexicana, NOM-059-ECOL-2000.

[4] 2000 IUCN Red List of Threatened Species.

Seabirds

Alcid Habitat Augmentation and Restoration on the Channel Islands, CA

In an effort to augment and restore breeding habitat, we propose to install and monitor (in cooperation with the National Park Service) artificial cavities (nest boxes) for breeding alcids (Cassin's Auklets and Xantus' Murrelets) on the Channel Islands, California. The main objectives of this long-term study will be as follows: (1) establish and maintain a population of known-age individuals by banding all chicks, (2) resight banded birds to estimate survivorship, site and mate fidelity, natal dispersal, and other population parameters, (3) determine occupancy, timing of breeding, hatching success, fledging success, reproductive performance, and chick growth of birds breeding in nest boxes, and (4) relate patterns observed to both local and large-scale variability in ocean climate. Monitoring protocols of birds nesting in artificial cavities will follow those created by PRBO for alcids breeding on Southeast Farallon Island, California.

Contact: Christine Abraham
Point Reyes Bird Observatory
4990 Shoreline Highway
Stinson Beach, CA
94970
email: cabraham@prbo.org
phone: (415) 868-1221 (ext. 334)

Restoring Cassin's Auklets to Santa Barbara Island

Submitted by Channel Islands National Park

By 1908 the Cassin's Auklet population at Santa Barbara Island (SBI), the southern most of the 5 islands which comprise Channel Islands National Park, was decimated by cats brought to the island in the late 1800's. A few Cassin's were regularly observed on Elephant Seal Point throughout the early to mid – 90's. An expedition to Sutil Island (an offshore islet of Santa Barbara) in 1999 specifically to net for auklets resulted in the capture of five individuals.

Using taped recordings of Cassin's Auklet vocalizations, it may be possible to encourage birds investigating the SBI area to recolonize the terrace.

I recommend attracting birds to the hillside to the west behind the Park Service Ranger Station and to the summit and southeastern bluffs of Signal Peak (see map). We will place 100 nest boxes each area and an additional 50 boxes will be placed on the terrace adjacent to the bluff south of Cave Canyon (along the presumed flyway).

Seeds from native plants (*Coreospsis*, *Eriogonum*, and *Nacella*) are being cultivated for the area above the Ranger facility. These native plants and the nest boxes will be planted in an area approximately 100m x 100m.

The Western Gull population at SBI continues to increase, therefore I am not recommending we encourage Cassin's into areas where gulls are known to nest in numbers (e.g. Elephant Seal Point).

"Flower pot" nest boxes with wooden lids will be fashioned by the maintenance division at Channel Islands National Park. These nest boxes are successfully colonized by alcids in Alaska and are currently being used by Cassin's Auklets at San Miguel and Santa Cruz Islands. Mortar may provide better insulative properties in the more sub-tropical climate at Santa Barbara and the use of "Adobe" nest boxes made from mortar will be explored.

Nest boxes and playback systems will be transported to SBI on NPS vessels and staged in the restoration areas via helicopter. NPS personnel certified in Heli-tak operations will coordinate and supervise deployment of materials.

A volunteer work group will prepare areas for vegetation restoration, plant native plants and install nest boxes. Monitoring of the nest boxes will fall under the guise of the Seabird Monitoring Program already in place at SBI.

Ideally a GS-7 Wildlife Biologist will be hired to assist with coordination and implementation of the project. This person would also monitor nest box colonization for the first year. It may be advisable to hire the GS 7 position as a 4 year Term position which would cover the expected period of colonization.

One year project

Materials needed:

Playback systems	4	$ 3000/ea	$3000
Shipping?		$ 200	$ 200
Flower pot nest boxes	250	$ 10/ea	$2500
Adobe clay nest boxes 200	*??*		
Sub**Total materials**			**$ 5,700**

Labor:

Nest box construction	$ 750 (2 ½ days temporary WG employee)	
Nest box installation		
5 volunteers – 1 week	$ 800	
1 WG employee (temp)	$ 2560 (on island)	
GS – 7 Wildlife Biologist (9 mos)	*$38,748*	
Stipend, OT and housing	*$ 7,664*	
Sub**Total labor without GS 7biologist**		**$ 4,100**
*Sub**Total labor with GS 7 biologist***		***$50, 522***

Transportation:

Nest box installation		
Boat	$ 1600	
Helicopter	~$12500	
Personnel costs	~$ 5000	
Sub**Total transportation**		**$19,100**

Total without GS 7	**$28,900**
Total with GS 7	***$75,322***

Four year project

All of the above, with GS 7 + **$290,375**

Salary for Gs 7 for 4 years

Yr 1 $48436 , Yr 2 $51827, yr 3 $55454, yr 4 $59336

Xantus' Murrelet and Cassin's Auklet Restoration and Population Monitoring

A Proposal Submitted to the Montrose Settlements Restoration Program

By

PRBO Conservation Science
4990 Shoreline Hwy.
Stinson Beach, CA 94970
(co PIs C. Abraham and W.J. Sydeman)

And

Channel Islands National Park
Ventura, CA 93111
(co PI Paige Martin)

September 17, 2003

(A) Technical Feasibility and Expected Benefits of the Proposed Project

PRBO has pioneered the use of nest boxes and and other forms of habitat augmentation as a restoration and conservation tool for seabirds. In northern California, we have enhanced the population growth rate of several cavity-nesting alcid species at various sites by increasing recruitment of breeding-age birds, improving productivity, and decreasing mortality. This demographic approach has been successful, with offspring born in nest boxes are now returning to natal colonies to breed; some of these second generation individuals have also fledged young (Thayer et al. 2000).

Currently, we are monitoring 446 Cassin's Auklet, 80 Rhinoceros Auklet and 15 Pigeon Guillemot nest boxes and artificial crevices on Southeast Farallon Island; 28 Cassin's Auklet and 76 Rhinoceros Auklet nest boxes on Año Nuevo Island, and 140 Cassin's Auklet nest boxes on West San Benitos Island, Mexico (the latter in conjunction with UCSC/Island Ecology group). In addition, PRBO previously conducted breeding biology studies for Cassin's Auklets on the Channel Islands (Prince Island) for 2 years (1998-99) in cooperation with the National Park Service.

We expect Cassin's Auklets to colonize nest sites in the first or second year of deployment, and for occupancy of artificial sites to reach 80% by the end of program (Sydeman et al. 2000). We expect murrelets to occupy artificial crevices within 3 years, and for occupancy to reach 50%. Because the auklet has been extirpated on SBI, the expected response to habitat augmentation and social facilitation (vocalization playback, see below) will be unpredictable. It is possible that both species will use nest sites during the first year of deployment.

The project timeline is five (5) years (from 2005 to 2009). To quantify the efficacy of our restoration efforts, a minimum of five years of monitoring is necessary. Years four and five will focus on end products (publications and similar). At the end of five years, an advisory committee (to be created) will assess the value of additional habitat augmentation and monitoring. Our hope to is to re-establish an active Cassin's Auklet breeding population, and improve the recruitment and productivity of Xantus' Murrelet to safe nesting sites on Santa Barbara Island. In addition to providing safe breeding habitat on this island, these efforts will help to quantify the response of these seabird populations to habitat quality and provide valuable knowledge on island habitat restoration techniques which may be applicable elsewhere. By providing additional breeding habitat, we hope to increase the number of breeding pairs on the island, thereby increasing the number of offspring produced successfully and decreasing mortality. Increasing our knowledge and ability to restore natural processes on extreme island environments will increase our ability to conserve populations, biodiversity, and precious island ecosystems.

It is important to employ these conservation strategies to provide and monitor nesting sites and to replace individuals affected by the Montrose chemical discharge and ongoing contamination from other sources. Boxes/artificial rock crevices will provide a stable, secure habitat for nesting and productivity. Productivity was shown to be a primary determinant of the declining Xantus' Murrelet population on SBI (Sydeman, Martin and Nur 1996). Moreover, through these efforts we will acquire biological information that is not well known for these species. We will evaluate the success of our restoration efforts (relative to population dynamics and demography) by collecting simultaneous information on reproductive success, site occupancy (i.e., recruitment), and mortality of eggs/chicks (from mouse predation) in relation to variability in ocean conditions in the Southern California Bight.

(B) Specifics of Nest Box/Artificial Crevice Restoration Program

In an effort to augment and restore breeding habitat, we propose to design, construct, install and monitor artificial cavities for breeding alcids (Cassin's Auklets and Xantus' Murrelets) on the Channel Islands (Santa Barbara Island), California. The main objectives of this habitat restoration effort will be to (1) increase recruitment, (2) increase reproductive output, and (3) decrease egg and chick mortality by providing safe breeding habitat for more breeding individuals of these species. Monitoring protocols of birds nesting in artificial cavities will follow those created by PRBO and followed by CINP for cavity-nesting alcids.

Methods

Methodology for monitoring nest boxes will be similar for both Xantus' Murrelets (XAMU) and Cassin's Auklets (CAAU). However, due to the status and sensitivity to disturbance of Xantus' Murrelets, none of the adults of this species will be handled.

Nest Box/Artificial Crevice Design and Installation: In each of Years 1 and 2 of the project, we will build and install 100 artificial nest sites, for a total of 200 for each species (400 artificial sites in total). We will design unobtrusive artificial rock crevices for Xantus' Murrelet by working with the Meadowsweet Dairy, a group of artists

specializing in the link between biological restoration and art). A partnership between PRBO and Meadowseet resulted in a habitat "sculpture" on the Farallon Islands in 2001, with 32 artificial nest sites embedded in the habitat. As of 2003, 19 of the nest sites were occupied. with breeding pairs of Cassin's Auklets and one pair of Pigeon Guillemots. (PRBO is currently developing a habitat "cliff" for murres in conjunction with Meadowsweet for the Farallones as well.) Nest sites for auklets will be placed near previously utilized areas on Signal Peak and near the Bunkhouse on SBI (P. Martin, personal observation). Two vocalization playback systems will be used to attract auklets to these areas, since they have not been occupied for many years.

Nest sites for Xantus's Murrelet (rock crevices) will be deployed in the Cat Canyon area as well as along the island edge from the Boat Landing north. Artificial sites will be insulated against the elements (heat is more of a concern than cooling) with dirt, sand or rocks, depending on local topography.

Incubation: Beginning in mid-February each year, all restoration sites will be checked for occupancy and egg-laying at 5-day intervals (following established protocols for monitoring). PRBO and CINP found that less frequent monitoring resulted poor estimates of occupancy and reproductive success for Xantus' Murrelets on SBI in 1994-1999 (Wolf et al. 1999). If an adult is present, we will carefully and quickly ascertain whether it is incubating an egg before the adult is handled (note that XAMU will not be handled, only observed). If an adult CAAU incubating an egg is present, it will be checked for bands, banded if necessary, measured (bill length and depth, relaxed wing cord) and weighed, and the egg will be measured at this time as well. Because CAAU mates typically alternate nights of incubation, we will return to all nest boxes with a new adult incubating an egg on the first day to take measurements of the mates on the second day, when we will record all the information listed for the first mate above. Once a CAAU egg has been confirmed, we will leave the site undisturbed (except for mate confirmation) for 25 days before returning to determine hatching date. Once a XAMU egg is confirmed, we will check the site on two more 5-day check periods to determine whether a second egg has been laid (period between laying first and second egg may be up to 9 days), then leave the site undisturbed for 20 days before returning to a 1-day check schedule to determine hatching date. These methods are proven to result in accurate estimates of recruitment and reproductive success.

Chick Rearing: To confirm hatching date, we will resume a 5-day check schedule for CAAU and a 1-day check schedule for XAMU once the above conditions have been observed. Adult CAAU brood their chicks throughout the day for a period of about 4 days after hatching. If an adult is found, we will determine if it is incubating an egg or brooding a chick. We will not handle adult CAAU again at this time. Once a CAAU chick has been confirmed, we will record weight and feathering stage of the chick every 5 days. Once the CAAU chick is partly to mostly-feathered, we will band the chick and start recording relaxed right wing cord in addition to weight and feathering stage daily (between 1200 and 1500) until fledging. We will monitor for the recruitment of offspring raised in our nest boxes. Once a XAMU chick (or chicks) is found, we will check the nest site once daily to determine fledging success and date of departure.

(C) End Products

We will produce a report at the end of the project detailing the success of the restoration efforts, and discussing any unanticipated results. We will discuss rates of re-establishment, occupancy rates by species and site, rates of productivity, and mortality of eggs and chicks in artificial nest sites. Moreover, we will develop a web page and educational video for this project in cooperation with the Montrose Trustees. Eventually, we will publish results of this program in a peer-reviewed journal such as *Ecological Applications*.

References

Thayer, J.A., M.M. Hester, and W.J. Sydeman. 2000. Conservation biology of the Rhinoceros Auklet. Endangered Species Update.

Sydeman W.J., J.A. Thayer, M.M. Hester, K.L. Mills, and S. Wolf. 2000. Nest boxes as a tool for seabird population restoration. Unpublished report to the National Fish and Wildlife Foundation.

Sydeman, W.J., N. Nur, and P. Martin. 1996. Population viability analyses for endemic seabirds of the California Current system: the Ashy Storm-Petrel and Xantus' Murrelet. Unpublished report to the USGS/BRD.

Wolf, S., J.E. Roth, W.J. Sydeman, and P. Martin. 1999. Population size, phenology, and productivity of seabirds on Santa Barbara Island, California, 1999. CINP Technical Report.

Santa Barbara Island Alcid Restoration and Population Monitoring
DRAFT 5-yr Budget Table
2005 to 2009

Salary	Year 1 2005	Year 2 2006	Year 3 2007	Year 4 2008	Year 5 2009
Costs presented inlcude: Salary, benefits, overhead and 5% annual increase					
Mean annual base salary rates:					
PRBO – C.L. Abraham, coPI @ $5050 salary, 2 mo./yr in Y1-Y3, 3mo./yr in Y4-Y5					
PRBO - one TBA Field Biologist @ $4320 salary; 11 mo./yr in Y1-Y5					
PRBO - one TBA Field Intern @ $1200 stipend; 9 mo./yr in Y1-Y5					
PRBO - W.J. Sydeman, coPI @ $6750 salary; 1.5 mo./yr in Y1, 0.5 in Y2-Y3; 1.5 in Y4-Y5					
Project Planning, Study Design, & Coordination (Jan) Restoration plan and study design review, staff coordination, mainland staging of equipment and supplies (coPI P. Martin salary contributed by NPS)	16,120	9,838	10,331	10,847	11,389
Nesting Habitat Augmentation and Monitoring (Feb - Sept) Nest/crevice installation, repair and maintenance, recruitment/nest success monitoring	49680	52164	54774	57510	60390
Results and Reporting (Jan - Dec) Data management, data summaries, restoration progress reports, scientific meeting preparation, peer-reviewed manuscript, final products	12,745	13,382	14,052	28,414	29,835
Total Annual Salary, Benefits, Overhead	78,545	75,384	79,157	96,771	101,614
Expenses & Equipment					
Transportation (Charter and/or National Park Service, helos) Transportation to and from Santa Barbara Is. - 10+ trips/yr	15,000	16,000	17,000	18,000	19,000
Housing & Food (on island biologist costs) Biologist and intern housing in bunkhouse on Santa Barbara Is. - $20/d	12,000	12,500	13,000	13,500	14,000
Nest Box/Rock Crevice Construction and Maintenance wood, paint and supplies, cinder blocks, labor costs for 200 boxes/crevices for each species	12,000	13,000	1,000	1,500	2,000
Travel scientific meetings, PI meetings, mileage	7,250	7,500	7,750	8,000	8,250
Outreach and Education/Publication digital camera, video camera, editing, reports, reproduction costs	3,000	3,500	4,000	5,000	6,000
Operating Supplies playback systems(2); GPS, general supplies (notebooks, scales, rulers etc.)	12,000	6,000	1,200	1,400	1,600
SubTotal Expenses	61,250	58,500	43,950	47,400	50,850
Indirect Costs (29.%)	17,763	16,965	12,746	13,746	14,747
Total Operating Expenses w/ Indirect	79,013	75,465	56,696	61,146	65,597
Total Project Annual Cost	157,558	150,849	135,853	157,917	167,210

Total 5 year Project Cost = $769,386

337,916

769,386

04/14/03

From: Josh Adams
US Geological Survey
831-771-4422
josh_adams@usgs.gov

Full text of letter can be found with other submission for "Seabird Monitoring" within the Data Gap ideas.

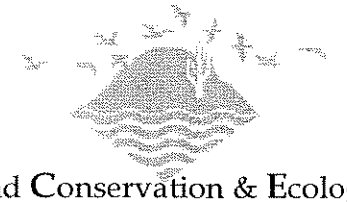
Eliminate alien species from nesting islands

Scorpion Rock restoration. Scorpion Rock, off Santa Cruz Island is one of only a few nesting islands available to burrow-nesting seabirds in California. This small islet is under the jurisdiction of the National Park Service and is identified as a National Monument. Scorpion Rock supports a diverse community of seabirds, and could be improved as seabird habitat by restoring vegetation to the main islet. Elimination of invasive plants and restoration of native plants will benefit burrow-nesting species, by providing increased habitat and stabilization of the rapidly eroding soil horizon. This project would directly benefit the following nesting species: Cassin's Auklet, Ashy Storm-petrel, Xantus's Murrelet and potentially Brown Pelican, Double-crested Cormorant, and Rhinoceros Auklet. The restoration of this island would complement and mutually benefit the CINP island vegetation restoration program, interpretation program, ongoing seabird research and monitoring, and promote seabird education. Cassin's Auklet was monitored at Scorpion Rock during 2000 and 2001. Monitoring at Scorpion and Prince during these years demonstrated the effective use of novel artificial burrows to enhance degraded nesting habitat, and facilitate monitoring for this species in the Channel Islands (USGS unpublished data). These sites are now being monitored by the CINP, and could be used in conjunction with native plant restoration as a complementary method to restore, and enhance Scorpion Rock thereby creating a significant breeding colony for Cassin's Auklets, and potentially Rhinoceros Auklets and Xantus's Murrelets.

Protection and restoration of seabird and Peregrine Falcon populations on Baja California Peninsula islands

Ideas for the Montrose Settlements Restoration Program

by the



Island Conservation & Ecology Group

Executive Summary: The seabird and Peregrine Falcon populations injured by DDT and PCB contamination from Montrose et al. do not recognize international boarders. Instead, they form a metapopulation that spans the US / Mexico boarder with many individuals using islands and marine foraging areas on both sides. This is because the Southern California Bight is an oceanographic region that extends south of the US boarder to Punta Baja, and because the seabirds that breed on Mexican islands outside the Southern California Bight use the bight for foraging.

There are tremendous opportunities for the restoration and protection of Southern California Bight seabirds and Peregrine Falcons on Baja California Pacific Islands. This is because these islands have larger populations of impacted species than the US islands, they are legally protected, there has been almost no investment in their management and conservation, and finally, operational costs are lower in Mexico than in the US.

We propose a comprehensive five-year, $3 million seabird and Peregrine Falcon protection and restoration program for the ten northernmost islands off the Pacific coast of the Baja California Peninsula. The program integrates nine components of seabird conservation from introduced species removal to conservation marketing, from placing warden-like conservation monitors on the island to decreasing light pollution around colonies.

This program will provide immediate, long-term protection for 29,000 ha of existing and potential seabird and Peregrine Falcon habitat. It will protect an estimated 2.3 million seabirds (ten times the number on the US California islands) of 15 species including Brown Pelicans, Xantus's Murrelets, Cassin's Auklets, Black-vented Shearwaters, Brandt's and Double-crested Cormorants. It will also protect at least 26 breeding Peregrine Falcons. In addition, the proposed actions will restore new seabird habitat by removing introduced mammals and decreasing human disturbance, thus allowing substantial increases in seabird populations. This comprehensive program is highly cost effective at $104 per ha of seabird habitat or $1.30 / individual bird.

This is the single most significant project that can be done to protect and restore Southern California Bight seabird populations. Indeed, it will be one of the world's most significant seabird conservation projects.

Table of Contents

Justification

Wild animals do not recognize international borders, and the seabirds and Peregrine Falcon populations injured by DDT and PCB contamination from the Montrose et al. discharges are no exception. Both the Peregrine Falcons and many of the seabird species occurring in this region form a metapopulation, with individuals breeding on both sides of the US Mexico border. Other affected seabird species breed only on the Mexican side of the border, but spend significant time during the non-breeding season in the Southern California Bight and adjacent waters.

Because wildlife do not recognize international borders, wildlife protection and conservation funds should be invested wherever they can yield the largest return. Consequently, there has been an increasing trend by US Federal and California State agencies to invest in international projects (e.g. the USFWS's Wildlife Without Borders Program; USFWS region 1 & 2 NAFTA related funding for conservation in Mexico; and California DFG's funding of Xantus's Murrelet conservation in Mexico).

Recently, Wolf (2002) compared conservation and restoration opportunities for Southern California Bight seabirds breeding on both sides of the US Mexico border (Table 1).

Table 1. Summary of Southern California Bight seabird conservation opportunities in the US and Mexico (from Wolf, 2002).

	US	Mexico
Islands	9	13
Potential seabird breeding habitat (hectares)	<1,000	120,000
Species & Subspp.	15	22
Endemics	4	10
Number breeding birds	~350,000	~2,300,000
Threats	Low-Medium	Medium-High
Conservation Investment/ breeding bird	~$3.12	~$0.09

Wolf found that there are 24 islands in 12 island groups off the Pacific coast of California and Baja California, Mexico (Fig. 1). These islands support breeding populations of 27 seabird species and subspecies. The most northerly Mexican islands support 20 breeding seabird taxa, including 15 species and 8 subspecies. A large proportion (10 species) of these also breed on the California islands and many of these colonies act as meta-populations. Furthermore, the remaining 5 species that do not breed in California regularly disperse into the Southern California Bight during the non-breeding season. The three northernmost islands (Los Coronados, Todos Santos, and San Martin) are oceanographically considered a part of the Southern California Bight. The remaining seven island groups (San Jeronimo, San Benito, Cedros, Guadalupe, Natividad, Asuncion, San Roque) support globally significant seabird populations, all of which are clearly tied during breeding and/or non-breeding seasons to the region affected by DDT and PCB contamination from Montrose discharges.

The conservation status of the Baja California Peninsula Islands is similar to those in the US 50 years ago. Almost all of the Mexican Islands support unregulated human settlements; several still contain feral populations of cats or large ungulates. Furthermore, there are limited regulations to control new introductions of damaging species and little enforcement for the limited legal protections that do exist for the islands. Ongoing disturbance to breeding and roosting populations severely limits numbers of seabirds utilizing these islands for breeding and roosting. Most of these problems can be easily rectified and will provide large conservation gains in relation to money spent.

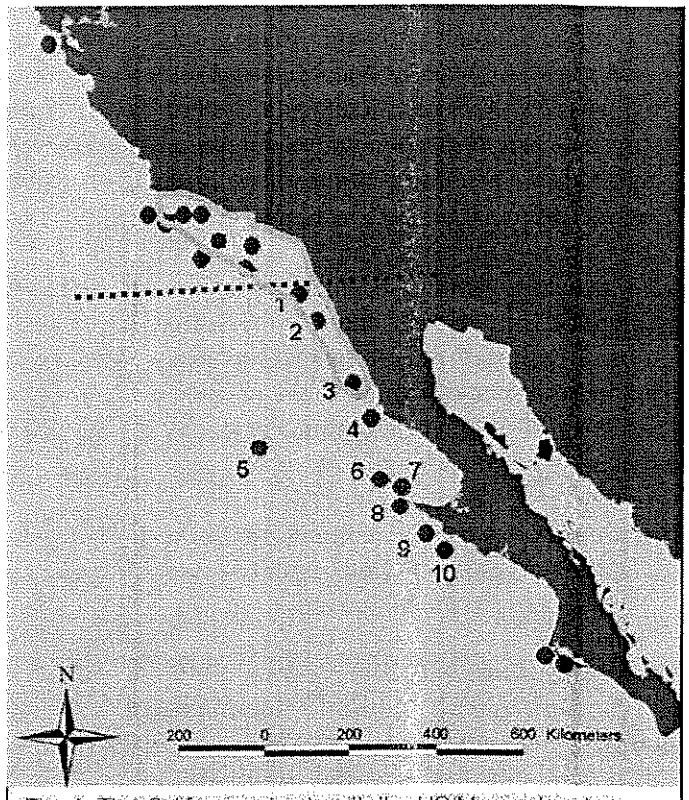


Fig. 1. The California islands with the US/Mexico border (dashed black line), and the oceanographic boundaries of the southern California bight (solid orange line). Island groups 1-10 are included in the proposed Protected Area and this proposal. 1=Los Coronados 2=Todos Santos 3=San Jeronimo 4=San Martin 5=Guadalupe 6=San Benito 7=Cedros 8=Natividad 9=San Roque 10=Asuncion.

Despite the greater opportunities for Southern California Bight seabird conservation and restoration in Mexico when compared to California, Wolf (2002) found that about 30 times more money for management was spent per bird in the US ($3.12) than in Mexico ($0.09). Thus, both the asymmetries in past conservation investment and in current conservation opportunities indicate that protecting Southern California Bight seabirds on Mexican islands will be cost effective.

Wolf's research focused on seabirds, but the situation is similar for Peregrine Falcons, which also breed on almost all the California islands- in both the US and Mexico. Peregrine Falcons are not directly limited by foxes on the US Channel Islands, but in Mexico, they may be limited by reduced populations of seabirds, one of their primary prey items, and by direct human disturbance around nest sites. Currently, every island numbered in figure 1 support at least 2 to 6 or more breeding Peregrine Falcons. Unregulated human access clearly negatively affects some breeding pairs.

Capacity for Effective Seabird and Peregrine Falcon Protection & Restoration in Mexico
The Island Conservation & Ecology Group is a science-driven non-profit organization that works with local island users and relevant government agencies to prevent extinctions and protect natural processes on islands. We were founded in 1994 and became a 501(c) (3) in 1997. We are based at the University of California Santa Cruz's Center for Ocean Health. Our largest project in the United States is the Anacapa Island Restoration Project funded by the American Trader Trustee Council.

In Mexico we formed an affiliated non-profit organization, Grupo de Ecología y Conservación de Islas, based in Ensenada, Mexico. Together, we have worked with government and local partners to remove introduced mammals from 25 islands in Northwest Mexico in only eight years. This has protected 120 populations of seabirds in 30 species and subspecies. Twelve of these islands were located off the Pacific coast of the Baja California Peninsula and had breeding Southern California Bight seabirds. These conservation actions also protected 50 endemic vertebrate species and subspecies, and 29 endemic plant taxa. To secure these conservation gains, we designed and successfully promoted a new national protected area for all the islands off the Pacific coast of the Baja California Peninsula which will be decreed in three stages over the next two years (120,000 ha of island and 10 surrounding marine protected areas). In 2002, President Fox awarded the Grupo de Ecología y Conservación de Islas the first Enrique Beltran prize for their contribution to biodiversity conservation in Mexico.

Grupo de Ecología y Conservación de Islas (GECI) has a proven track record of real conservation successes. They are funded primarily by pass-through grants from the Island Conservation & Ecology Group who insure fiscal responsibility and GAO audit standards. GECI's offices in Ensenada are in the same building as the offices of the Mexican Natural Protected Areas Administration which manages all the protected islands. GECI also has excellent working relationships with all major island users in the region: the 10 fishing cooperatives that have permission to fish around the islands; the SCT which manages the manned and automated light houses on the islands; the Mexican Navy which has small garrisons on three of the islands; and PROFEPA, the enforcement branch of the Natural Resources Ministry. These long-term relationships have enabled GECI to complete the environmental compliance process and have existing permits to remove introduced species from the remaining California islands in Mexico and take a number of additional island management actions to protect and restore seabird and Peregrine Falcon populations.

Restoration Project Ideas
We propose a comprehensive five-year seabird and Peregrine Falcon protection and restoration plan that will provide immediate, long-term protection for 29,000 ha of existing and potential seabird and peregrine habitat on 10 island groups off the Baja California Peninsula, Mexico. Three of these island groups (910 ha) are in the Southern California Bight, and the remaining six islands (28, 090 ha) are outside the Southern California Bight, but are breeding and roosting sites for seabirds that use the Southern California Bight during the breeding and non-breeding season. All the islands form part of a larger metapopulation for both Southern California Bight seabirds and Peregrine Falcons.

The number of seabirds that will be protected by the proposed actions is an estimated 2,300,000 individuals (ten times the number of seabirds breeding on the US California islands). There are 15 species and subspecies including Brown Pelicans, Xantus's Murrelets, Cassin's Auklets, Black-vented Shearwaters, Brandt's and Double-crested Cormorants (see Table 2 at end of document). At least 26 breeding Peregrine Falcons will also be protected by these actions. In addition to protecting existing populations of seabirds and Peregrine Falcons, the proposed actions will restore new seabird habitat by removing introduced mammals and decreasing human disturbance, thus allowing substantial increases in seabird populations.

Specifically, we propose to expand GECI's existing conservation and restoration team to take the following actions on each islands:

1. Remove damaging introduced mammals (except on Cedros)
2. Decrease and eventually halt land conversion
3. Decrease direct human disturbance of seabirds
4. Decrease shore based light pollution in and adjacent to seabird colonies
5. Develop and post interpretive and warning signs
6. Develop and implement an environmental marketing program for island users
7. Implement an invasive species introduction prevention and response plan
8. Post two biologists on each island for extended periods every year to serve as conservation monitors that will be an effective force for protection
9. Produce draft biodiversity centered management plans for implementation once the protected area is decreed and fully staffed

GECI and ICEG have successfully implemented all of these conservation components on individual islands and have the capacity and partnerships needed to scale up to all 10 island groups. This is the single most significant project that can be done to protect and restore Southern California Bight seabird populations. Indeed, it will be one of the world's most significant seabird conservation projects.

This comprehensive project also meets the specific screening evaluative criteria established by the MSRP.

Screening Criteria:

Nexus to Injured Resources: Most of the seabirds breeding and roosting on these islands use the Southern California Bight during part or all of the year. The Peregrine Falcons feed on seabirds that use the Southern California Bight. Both the seabirds and Peregrine Falcons on these islands are part of the metapopulation that sustains Southern California Bight populations.

Geographic Location: Three of the island groups are in the Southern California Bight and several others are immediately down wind. All have important biogeographic affinities with the US Channel Islands.

Duplicate Funding: There is no duplicate funding. Eight years of funding from a variety of sources have enabled GECI to develop the capacity, track record, and reputation necessary to carry out this comprehensive project. Funding from the Mexican Government and private foundations for the goat eradication project on Guadalupe will provide much of the infrastructure needed for the Guadalupe projects in this proposal.

Legality: Environmental compliance for major components of this project has been completed and the project has the full support of all of the relevant government agencies, including the Mexican Secretaries of the Environment (SEMARNAT, see attached letter), the Navy (SEMAR), and Communication and Transportation (SCT). It has the full support of the main fishing cooperatives that use the islands.

Evaluative Criteria:
Nexus to Injured or Equivalent Resources: See above.

Duration of Benefits: This project combines conservation actions at different temporal scales to achieve region-wide long-term benefits for injured resources. For example, introduced species removal, signage, light shielding, and the presence of conservation monitors all have immediate and long-lasting benefits to seabird and Peregrine Falcon populations. Introduction prevention programs, environmental marketing, and management plan development all take longer to benefit seabird and Peregrine Falcon populations, but are necessary for long-term protection.

Likelihood of Success: Over the last eight years GECI and ICEG have developed the experience and network of contacts necessary to successfully carry out this program. Each of the components has been successfully completed on at least one island in the region and most on several islands.

Technical Feasibility: The projects are technically feasible and will be conducted by an international team of experts who will be taking advantage of GECI / ICEG's extensive experience in the region.

Cost Effectiveness: The cost effectiveness of this proposal is approximately $1.30/ individual seabird protected and $103.5/ hectare of seabird habitat protected. It would be impossible to achieve similar returns on conservation investment on the US California islands.

Environmental Acceptability: None of the project components have potential long-term adverse impacts on the environment and associated natural resources.

Level of Benefit: The project will provide immediate, long-term benefit for 29,000 ha of existing and potential seabird and peregrine habitat on 10 island groups. An estimated 2,300,000 individuals (ten times the number of seabirds breeding on the US California islands) in 15

species and subspecies including Brown Pelicans, Xantus's Murrelets, Cassin's Auklets, Black-vented Shearwaters, Brandt's and Double-crested Cormorants will benefit. At least 26 breeding Peregrine Falcons will also benefit. The proposed actions will restore new seabird habitat by removing introduced mammals and decreasing human disturbance, thus allowing substantial increases in seabird populations. In addition, it will protect critical habitat for the more than 23 endemic terrestrial vertebrates and 59 endemic plants found on these islands.

Multiple Resource Benefits: The project will benefit 15 species and subspecies of seabirds and Peregrine Falcons. It will also benefit osprey, and endemic terrestrial plants and vertebrates.

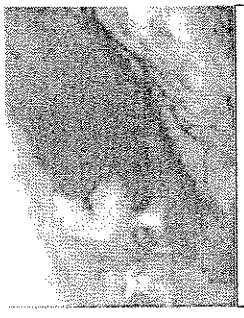
Opportunities for Collaboration: The project will receive in-kind support from the Mexican Navy, several of the fishing cooperatives that use the islands, the Mexican Environmental Ministry (see attached letter), and several private donors. In addition, the $1.2 million necessary for the goat eradication from Guadalupe island will greatly facilitate cat eradication there. The support will leverage two-years of work supported by two foundations and the USFWS-International to design and gain approval for the Pacific Islands Protected Area.

Specific short-term performance criteria are available for each component of the project, but the medium- and long-term performance criteria will be measured increases in seabird and Peregrine Falcon populations in the Southern California Bight and adjacent California Islands.

Public Health and Safety: The project poses no health and safety threats to island users or residents.

Overview of the Islands, Threats and Restoration Opportunities

Los Coronados Islands:
Four islands, 360 ha, ~4,000 breeding seabirds of 10 species, 4-6 breeding Peregrine Falcons. Los Coronados Islands support what is probably the world's largest Xantus's Murrelet colony, as well as important pelican, cormorant and storm-petrel colonies. In 2001 a Mexican company submitted a proposal to collect rocks from Los Coronados for the lucrative landscaping retail business. This would have destroyed large amounts of murrelet habitat as well as disturbed pelicans and other species. GECI was able to stop this project by lobbying government agencies. Cassin's Auklet and storm-petrel populations appear to be recovering following GECI's feral cat eradication. However, feral goats and donkeys, and pet dogs still threaten surface nesting seabirds, and reoccurring proposals for constructing cell phone towers and mining threaten all the island's seabirds.



Islas Los Coronados supports what may be the largest breeding colony of Xantus's Murrelet in the world.

Todos Santos Islands:
Two islands, 190 ha, ~3,500 breeding seabirds of 6 species, 2-4 breeding Peregrine Falcons. Todos Santos Islands historically supported important Southern California Bight seabird

colonies. However, they have been heavily impacted by introduced cats and rabbits, regular human use and development, and occasional human-caused wildfires. Cats and rabbits were eradicated by GECI, yet cormorants only breed on the most inaccessible corners of the island and pelicans still do not breed on the island due to disturbance by humans, introduced donkeys, and pet dogs. Human use of the islands is unregulated and an illegal surf camp is operating on the north island.

San Martin Island:
One island, 300 ha, ~5,000 breeding seabirds of 6 species, 2-4 breeding Peregrine Falcons. San Martin Island formerly supported very large colonies of Double-crested Cormorants (perhaps several hundred thousand) and Brown Pelicans. While these breeding populations have increased slowly in recent years after the successful removal of cats by GECI, disturbance by humans continues to limit the birds' ability to rebound. Additionally, the continued threat of introductions of cats and rats threaten the future viability of these seabirds.

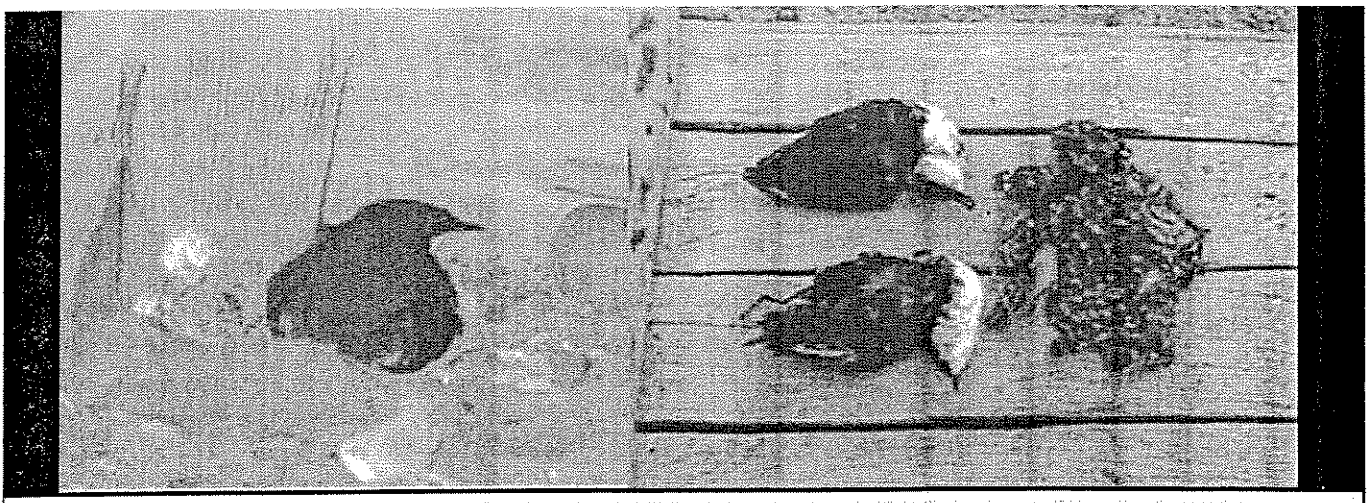
San Jeronimo:
One island, 68 ha,~10,000 breeding seabirds of 5 species, 2 breeding Peregrine Falcons. On San Jeronimo Island a large colony of Brandt's Cormorant (many thousands of birds) was wiped out

The construction of an outhouse and signs designating trails have reduced human destruction of Cassin's Auklet burrows surrounding the fishing camp on San Jeronimo Island (left).

A historical nesting colony of Brandt's Cormorants and Brown Pelicans was extirpated by a guano mining operation on the north end of San Jeronimo in 1999. Nesting birds have not yet re-colonized, most likely because humans flush roosting birds at the colony site on a daily basis (center).

Fishermen cross the extremely dense Cassin's Auklet colony on a daily basis, crushing fragile nesting burrows and destroying nesting attempts (right).

and large sections of the Cassin's Auklet colony were destroyed during an unauthorized guano mining operation in 1999. GECI has since stopped all guano mining operation on the island. Feral cats, which threatened the Cassin's Auklet colony, were also eradicated by GECI. However, human disturbance still keeps the BRCO and BRPE colonies from re-establishing, destroys CAAU burrows, disrupts a large (many thousands of birds) BRPE roosting population, and threatens continued introductions of mammalian predators.



Xantus's Murrelets (*S. h. scrippsi*) nest in unoccupied houses in the fishing camp on San Jeronimo. Their nesting efforts are jeopardized by human disturbance and introduced cats. Nest boxes could help protect nesting birds (left).

Xantus's Murrelets die from collisions with buildings in the fishing camp where they become disoriented from light pollution. They are also easily depredated by introduced cats. (Burrowing owl also pictured) (right)

San Benito Islands: Three islands, 850 ha, ~2 million breeding seabirds of 12 species, 4 breeding Peregrine Falcons. San Benito Islands are the most diverse (12 breeding seabird species) and largest (estimated at over 2 million breeding birds) seabird colony in the California Islands. GECI has already removed feral goats and rabbits from the three islands. However, donkeys still wander freely on West San Benito, crushing seabird burrows and disturbing surface nesting species. GECI has been successful at regulating various proposed development projects on the island that have destroyed seabird habitat. However, ongoing education and monitoring

Burros (donkeys) used to carry diesel to the lighthouse on San Benitos are regularly released from their corral. They browse native vegetation and crush seabird burrows (left).

Seven nocturnal seabird species, including the Cassin's Auklet pictured above, nest in crevices and burrows that honeycomb the three San Benito Islands. The nesting population of Cassin's Auklet is estimated at 75,000 breeding birds (center).

Ongoing construction of a new lighthouse on West San Benito Island has widened approximately 2 miles of trail leading to the construction site and has introduced heavy usage of 2 ATVs, oil, generators, and machinery at the site (right).

are needed to help protect these globally important seabird islands. ICEG and GECI have sponsored students to live on the island for extended periods over the past 5 years and have made numerous conservation gains. When an algae harvest company began drying their product in the middle of a dense Cassin's Auklet colony, GECI worked with government agencies to restrict algae drying to a designated zone outside the colony the following year. Furthermore, GECI provided an observer to watch the company and make sure they abided by the agreement. When the secretary of transportation proposed to build a new lighthouse on the island, GECI lobbied hard to get strict guidelines in place for the construction, including the location of the structure, clean up of the old lighthouse and discarded batteries, use of access roads to the construction site, and limits on materials brought to the island to reduce likelihood of introductions of rodents, plants and insects. The main threat is the potential introduction of rats or mice. Other threats include ongoing mortality of nocturnal seabirds at unshielded light sources in the fishing community, and expansion of fishing community activities into the adjacent petrel and alcid colony.

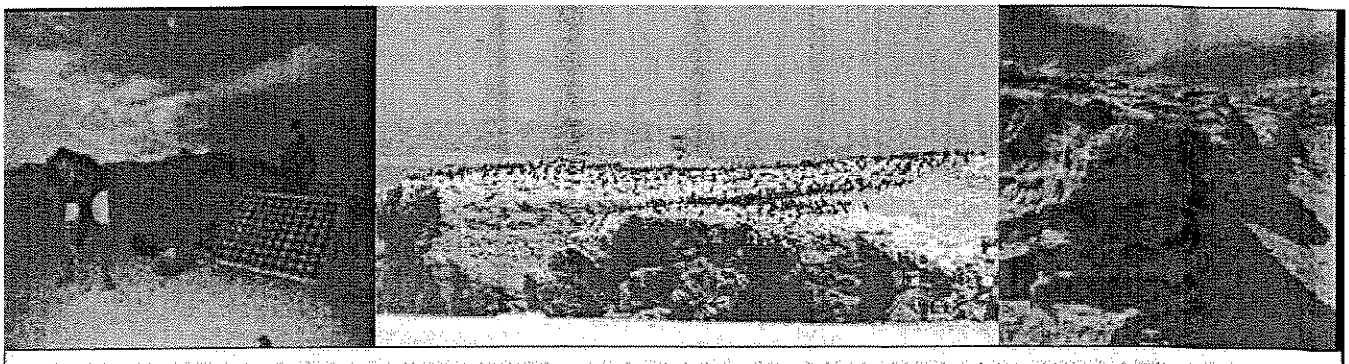
Cedros Island: One island 37,000 ha, three main satellite islands <100 ha. 400 breeding seabirds in 4 species. Unknown number of breeding Peregrine Falcons, but probably 10 or more. Cedros is the largest of the California Islands, but has no introduced fox. Although not an important seabird colony due to the presence of feral dogs, cats, goats, rats, mice and donkeys, Cedros does have small breeding colonies of cormorants, and possibly of brown pelicans and nocturnal hole nesting petrels and alcids. Because it is the largest and most populous island in the region and there is regular transport between Cedros, Natividad and the San Benito Islands, Cedros is an important location for community education of island users and a likely source location for the introduction of rats and mice to the San Benito Islands.

Natividad Island: One island 1,000 ha, ~160,000 breeding seabirds in 5 species, 4-6 breeding Peregrine Falcons. Natividad Island supports over 95% of the world's Black-vented Shearwaters, as well as important colonies of pelicans and cormorants. Black-vented Shearwaters are an important member of the southern California avifauna in the fall and winter, when large numbers use the Southern California Bight to feed. On Natividad Island ICEG placed a graduate student on the island for extended periods over two years. Through environmental education this student

95% of the world's population of the Black-vented Shearwater (left) breed on Natividad Island. Introduced cats were killing over 1,000 adults each month (center) and threatening the whole colony with extinction. GECI removed cats from the islands and the Black-vented Shearwater is now freed from the immediate threat of extinction (right).

was able to (1) convince residents of the need to remove feral and pet cats from the island to protect the black-vented shearwater colony (2) establish a quarantine program to keep new animals from being introduced to the island (3) close selected roads that passed through the shearwater colony (4) stop construction of new roads and limit human use on the uninhabited north end of the island to protect nesting pelicans and cormorants (5) convince residents to remove goats and sheep from the island that were destroying habitat and disturbing nesting pelicans and cormorants. GECI then worked with local residents to remove feral cats, goats, and sheep and domestic rabbits and pigs from Natividad with large benefits to nesting seabirds. However, ongoing education work with the over 500 residents is needed to stop future introductions of cats and rodents. In addition, unregulated road building, off road vehicle use, and disturbance of pelican and cormorant breeding and roosting sites by island residents and tourists continue to limit the number of breeding seabirds on Natividad Island. Cassin's Auklets and possibly Xantus' Murrelets and storm petrels were extirpated from the island by cats. These species could be reintroduced to the island from source populations on the nearby San Benito Islands

Asunción and San Roque Islands: Two islands 150 ha, 400 breeding seabirds in 5 species, 4-6 breeding Peregrine Falcons. On Asuncion and San Roque Islands, GECI removed cats and rats in 1994 and stopped human visitation to the island through education and placement of signs on the island. These actions had immediate results by providing more secure roosting habitat for thousands of pelicans and cormorants. In 2001 Brandt's Cormorants (over 2,000 nests) and Brown Pelicans (about 10 nests) had begun breeding again on San Roque Island. Unfortunately, in 2002 after a long lapse in education efforts, local fishermen began visiting the island again on a regular basis and virtually all of the cormorants and pelicans abandoned their breeding efforts.



GECI and ICEG personnel maintain a playback station intended to attract Black Vented Shearwaters, Leaches Storm Petrels, Cassin's Auklets and, Xantus's Murrelets to recolonize Asuncion Island (left).

Brant's Comorants formerly nested by the thousands on San Roque Island (center).

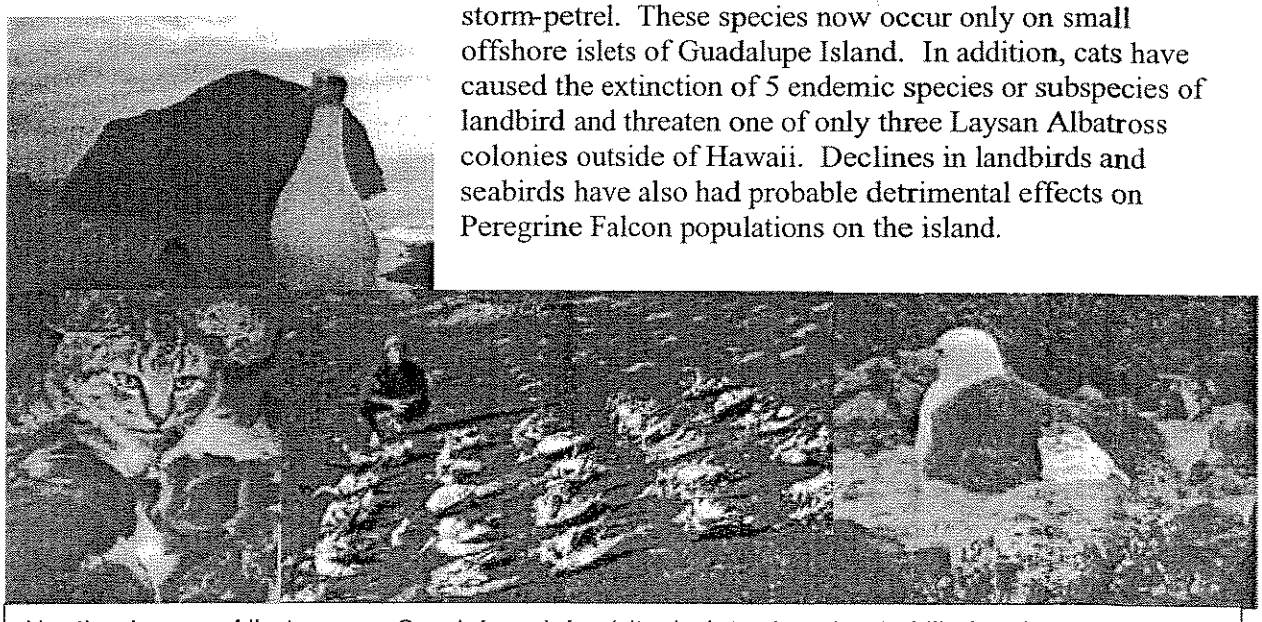
Evidence of historic guano mining that devastated the seabird colonies of San Roque Island is still apparent (right).

Continued environmental education and monitoring of human use on the islands is needed to develop a plan to mitigate human disturbance. Furthermore, Cassin's Auklets, and perhaps other nocturnal alcids and petrels were extirpated from the island by cats. They have failed to re colonize naturally during the last eight years, but could be reintroduced from source populations on the nearby San Benito Islands.

Guadalupe Island: One main island 26,000 ha, three satellite islands <100 ha, 15,000 breeding seabirds of 7 species, unknown number of breeding Peregrine Falcons. Guadalupe is the largest seabird restoration opportunity in the California Islands and one of the most important in the world.

Guadalupe Island is biogeographically affiliated with coastal Southern California and a part of the critically endangered California Coastal Sage and Chaparral ecoregion. This 26,000 ha island has no significant development and in addition to seabirds supports 34 endemic plants (including two endemic genera), ten endemic land birds, 11 endemic land snails, and at least 18 endemic insects. It harbors one of the last significant remnants of the rich lichen flora that was once common and is now rare in southern California and northern Baja California. The overwhelming threat to this ecosystem is introduced cats and goats. Goats have completely transformed the island, much of which has been browsed down to bare rock leaving many of the endemic plants surviving only on inaccessible cliffs. The top of the island, once covered with an endemic Guadalupe Island pine forest, is now sparsely vegetated with only about 200 adult trees. Each of these remaining trees is over 100 years old because goats eat all the new seedlings every year.

Cats caused the extinction of the endemic Guadalupe storm-petrel and the likely extirpation from the main island of Guadalupe of many other seabird populations, including the Xantus's Murrelet, Black-vented Shearwater, Cassin's Auklet, and two endemic subspecies of Leach's storm-petrel. These species now occur only on small offshore islets of Guadalupe Island. In addition, cats have caused the extinction of 5 endemic species or subspecies of landbird and threaten one of only three Laysan Albatross colonies outside of Hawaii. Declines in landbirds and seabirds have also had probable detrimental effects on Peregrine Falcon populations on the island.



Nesting Laysan Albatross on Guadalupe Island (top). Introduced cats killed and ate more than 30 adult albatross (left & center) and rainfall on the goat denuded slopes flooded the colony (right). Albatross mortality stopped after cat control was initiated around the colony.

The combined impact of cats and goats can be seen on the small colony of Laysan Albatross. During the most recent breeding season, cats killed over 30 adults of these very long-lived birds in less than one month, threatening the colony with extirpation. Then, heavy rains flooded the colony because the goats have left almost no vegetation to dampen the runoff.

In 2001-03 we initiated the first terrestrial conservation action on Guadalupe Island. We worked with the local community to remove a small group of free ranging pet rabbits and all but two of the pet dogs from the island. We controlled feral cats around the albatross colony to prevent its near certain extirpation. We stopped the import of potentially invasive plants and seeds to the

A goat exclosure on Guadalupe Island is visible from the air after only one year (left). On the ground the difference on either side of the fence is striking (center). Only about 200 endemic Guadalupe Island pines adults remain and all are over 100 years old, but inside our exclosure there are 151 seedlings (right).

island, and built 14 goat exclosures within which there has been a dramatic recovery of endemic plants. The goat exclosures demonstrate the remarkable natural recovery that will take place once goats are removed. Important seabird colonies and plant populations still occur on small offshore islets of Guadalupe. These populations will re-colonize the main island of Guadalupe once cats are removed. Recent work demonstrates that prospecting birds still fly around the main island and suggest there may be small breeding populations of murrelets, shearwaters, auklets, and petrels restricted to areas inaccessible to cats.

In 2002 visited the island with a team of international experts from Australia, New Zealand, Mexico, the United States, and Ecuador, to develop a plan for goat and cat eradication. This plan has the full support of the Mexican National Institute of Ecology and the Mexican National Protected Areas Commission. It has the full support of the Mexican Navy, which has pledged ship transportation and housing on the island. And, it has the full support of the local fishing community who see the benefits of protecting their watershed and living in a more aesthetically pleasing environment.

Removing goats and cats from Guadalupe Island provides a rare opportunity to restore and permanently protect 26,000 undeveloped hectares of the critically endangered California coastal sage and chaparral ecoregion.

Goat eradiation will be funded by the Mexican Government and private donors. The logistical infrastructure put in place for the goat eradication, including the long-term use of a helicopter, will dramatically reduce the cost of a cat eradication program.

Degree of benefit and time line of benefits:
Eradication of cats from Guadalupe Island will have both immediate and permanent conservation benefits for the seabirds on the islands. For example, in 2003 GECI conducted a local removal of cats around the Laysan Albatross colony on Guadalupe Island to protect it from heavy predation pressure. Mortality from cats decreased from more than 30 birds found dead in the previous 60 days to zero over the ensuing 60 days. This local removal also spared prospecting storm-petrels, Xantus's Murrelets, and Black-vented Shearwaters from predation in the area. Once eradication is complete the result will be permanent protection for seabirds.

The removal of goats will provide some immediate benefits to seabirds on the island, although, the main benefits will occur over time. Goats have denuded vast areas of Guadalupe Island and this loss of plant cover has de-stabilized nest sites. For example, during the heavy rains encountered in 2003 on Guadalupe, many albatross nests were lost to flooding and small landslides of the fragile nesting substrate. As vegetation recovers on the main island, habitat quality will increase around the island.

Once cats are removed, Guadalupe Island will become the largest island in the region, and possibly in North America, without mammalian predators. Guadalupe has the potential to support enormous numbers of seabirds. Because of its remote location, status as a Mexican Navy island and imminent protection as a Mexican federal protected area, Guadalupe will never face the pressures of human disturbance or development that are so prevalent on other seabird islands.

Letter of support from Mexican Environmental Ministry:

Mexico City, March 25, 2003

To Whom It May Concern:

Re: Guadalupe Island Conservation

Dear Guadalupe Island supporters:

We are very pleased to inform you that our agencies are working closely with the bi-national Island Conservation & Ecology Group / Grupo de Ecología y Conservación de Islas to protect and restore one of our nation's most important natural protected areas, Guadalupe Island. As you are probably aware, the island is a stupendous natural territory. Its endememism is one of the highest in Mexico. It includes unique varieties of a Monterey pine, cypress and oak, marine and land birds, as well as many flora species and a great diversity of invertebrates. Ecoregionally, the island is strongly related to the California coastal chaparral of Southern California and Northern Baja California, which has been largely lost due to development.

The first and most urgent conservation challenge is the eradication of feral goats. The goats, now present in the island for nearly one century and a half, have done extensive damages to the unique forests of cypresses, pines and oaks. Secondly, cats, which have already caused four bird extinctions, must be removed from the island so that remaining native and endemic bird populations can recover. Fortunately, the forests, other components of the plant community, and the remaining birds can recover once goats and cats are removed. Because of its size (250 Km^2), high biodiversity, and lack of direct human habitat modification, Guadalupe Island has the potential to be one of the most significant global success stories around island conservation and ecological restoration.

The restoration and protection of Guadalupe Island is our highest priority on-the-ground project for 2003/04. We are very eager to see it started as soon as possible to take advantage of the support offered by the Mexican Navy, the local community, and our own agencies. Therefore, we are pleased to announce that the Mexican Government, through the National Institute of Ecology and the National Commission of Natural Protected Areas, has committed US$600,000 towards this project. We hope that this seed money will help leverage additional private and foundation funds for this nationally and globally important conservation project.

Sincerely,

Dr. Ernesto Enkerlin Höeflich
President
National Commission of
Natural Protected Areas

Dr. Exequiel Ezcurra
President
National Institute of Ecology

cc: Island Conservation and Ecology Group / Grupo de Ecología y Conservación de Islas, A.C.
cc: File

Appendix 1.

Listing status and number of breeding individuals on the Baja California Pacific Islands mentioned in the proposal. Un-italicized font indicates that the estimate is based on a direct nest count or standard sampling method. Italicized font indicates that the estimate is based on an incomplete or preliminary census. EXT, extinct; END, endangered; THR, threatened; SP, special protection; CR, critically endangered; VU, vulnerable; LR/nt, lower risk/near threatened; E, extirpated, occurred historically; PE, possibly extirpated, possibly occurred historically; B, breeder, no population estimate available; P, probable breeder, breeding suspected but not confirmed. Table adapted from Wolf, 2002.

	US Listing Status	CA Listing Status	México Listing Status[3]	IUCN Status[4]	San Martin	San Jerónimo	San Benitos	Natividad	San Roque	Asunción	Totals	Total extirpated taxa
Black-vented Shearwater (*Puffinus opisthomelas*)			END	VU			*250-1200*	153140			**153740**	0
Leach's Storm-petrel (*Oceandroma leucorhoa chapmani*)			THR				*~1200000*				**1200000**	0
Black Storm-petrel (*Oceanodroma melania*)		SSC	THR				*~580000*				**580500**	0
Least Storm-petrel (*Oceanodroma microsoma*)			THR				*~270000*				**270000**	0
Brown Pelican (*Pelecanus occidentalis*)	END	END			60		394	*75-150*	<20	E	**570**	1
Double-crested Cormorant (*Phalacrocorax auritus*)		SSC			1200	40	126	115	E	20	**1500**	1
Brandt's Cormorant (*Phalacrocorax penicillatus*)					50		158	1500	<200	50-100	**1870**	0
Heermann's Gull (*Larus heermanni*)			SP	LR/nt			200		75		**275**	0
Western Gull (*Larus occidentalis*)					600	*500*	1150	*5000-10000*	B	B	**9800**	0
Elegant Tern (*Sterna elegans*)			SP	LR/nt					E	E	**0**	2
Royal Tern (*Sterna maxima*)									E		**0**	1
Xantus's Murrelet (*Synthliborampus scrippsi* sbsp)	SSC	SSC	END		50-250	100-500					**1375**	0
Xantus's Murrelet (*Synthliborampus hypoleucus* sbsp)	SSC	SSC	END	VU		B		PE	PE	PE	**?**	0-3
Craveri's Murrelet (*Synthliboramphus craveri*)			THR				*<1000*				**1000**	0
			THR		*1000-5000*	*>10,000*	75334	E	E	E	**88734**	3
Total breeding individuals[1]					**5060**	**10,840**	**2130450**	**162368**	**295**	**95**	**2309364**	
Total breeding taxa (species/subspecies)					**6**	**5**	**13**	**5**	**4**	**3**	**15**	
Total extirpated taxa (species/subspecies)[2]					**0**	**0**	**0**	**1-2**	**4-5**	**3-4**	**11-14**	

[1] Total breeding individuals calculated by adding estimates from all islands using the mean of the range where ranges of individuals are given.

[2] Does not include historical extirpations where species/subspecies has since recolonized.

[3] Norma Oficial Mexicana, NOM-059-ECOL-2000.

[4] 2000 IUCN Red List of Threatened Species.

Montrose Settlement Restoration Project Idea

Submitted by PRBO Conservation Science
4990 Shoreline Hwy., Stinson Beach, CA 94970

PROJECT: Ashy Storm-Petrel Restoration on Southeast Farallon Island

Project Description:

The main goal of this project is to increase the number of breeding Ashy Storm-petrels (*Oceanodroma homochroa*) in central and southern California (where most of the population breeds). We propose to create habitat from abandoned concrete, and restore habitat by eliminating predators through the removal of an exotic species, the House Mouse (*Mus musculus*). This species has negatively impacted Ashy Storm-petrels, both directly as well as indirectly. The population of the Ashy Storm-petrel has declined dramatically in the past several decades, and this restoration project will help mitigate the decline by increasing the size of the local nesting population on the Farallon Islands and, because there is an exchange of individuals between the Farallon Islands and the Channel Islands, will have direct positive impacts on both populations.

Location of Project:

The project will be located on Southeast Farallon Island, which is approximately 28 miles west of San Francisco in the Pacific Ocean. The Farallon National Wildlife Refuge supports the largest breeding population of the Ashy Storm-Petrel. Since its declaration as a National Wildlife Refuge in 1909, the U.S. Fish and Wildlife Service (USFWS) have managed the Farallon Islands. Since 1972, through a cooperative agreement with USFWS, PRBO Conservation Science has conducted research on the eleven seabird species that inhabit this island.

Species:

The Farallon Islands host the most significant proportion of this seabird population, although in combination with the population on the Channel Islands, over 90% of the world population is represented. Furthermore, netting studies have demonstrated that storm-petrels migrate between the Channel Islands and the Farallon Islands. Results from capture-recapture studies indicate that the population on the Farallon Islands has declined almost 40% in 20 years (1972-1992) (Sydeman et al. 1998).

Ashy Storm-petrels have several predators, all of which have contributed to this decline: Western Gulls, owls, and mice. Western Gulls are native to the island, but their population has been increasing as a result of human activities. Other avian predators of Ashys include Burrowing Owls, which migrate to the island in fall, when mouse populations are high. When mouse populations decline in late winter, owls switch their diet to seabirds (an indirect negative effect of mice on the Ashy Storm-petrel population). Another possible threat to the breeding Ashy population is the

presence of the introduced House mouse, an introduced species as a result of human activities, which is capable of entering crevices and taking eggs and even small chicks.

Proposed Project:

Habitat will be restored and created in two ways: (1) rock walls will be constructed with broken concrete to create nesting crevices (see Appendix A); (2) mice will be eliminated from the island (see Appendix B). The mouse is the only non-native mammal remaining on the island. Mouse control measures will be evaluated and used to control their population. The project will be completed in several phases, including a pilot study to identify a feasible means to control mice, a study of the annual cycle of the island mouse population to determine timing for control, the preparation of a mouse control plan, and implementation of this plan.

Success Criteria and Monitoring:

This project will be determined successful through the creation of new crevice-nesting habitat, substantially reduced or eliminated mouse populations, and an increase in the reproductive success of Ashy Storm-petrels. Thirty years of pre-project seabird breeding population and productivity data collected from Southeast Farallon Island will also allow comparisons of pre-and post-project changes in reproductive parameters, and colonization of newly created habitat.

Reference:

Sydeman, W. J., N. Nur, E. B. McLaren, and G. J. McChesney. 1998. Status and trends of the Ashy Storm-Petrel on Southeast Farallon Island, CA, based upon capture-recapture analyses. The Condor 100: 438-447.

Appendix A. Creation of nesting habitat through the collaboration with Meadowsweet Dairy artists, Henry Corning and Glenda Griffith (written by H. Corning).

In collaboration with PRBO Conservation Science, Meadowsweet Dairy proposes to construct on Southeast Farallon Island Ashy Storm-petrel habitat similar to the Cassin's Auklet/Pigeon Guillemot structure installed in August of 2000 (see Report below).

The design would be developed with PRBO biologists in a process similar to the one used in 1998 and 1999 for the first project. The resulting structure would create nesting habitat for Ashy Storm-petrels, and at the same time, would allow access for biologists to observe and band chicks.

In addition to the access, the Dairy suggests adding solar powered audio/video monitoring and sound making apparatus (to attract petrels to the structure) as part of the new structure and also added to the already existing auklet/guillemot structure.

The PRBO/Dairy relationship has proven itself with the breeding success of the first habitat. This proposal continues that collaboration.

REPORT ON THE FIRST YEAR AFTER INSTALLATION OF THE HABITAT SCULPTURE ON SOUTHEAST FARALLON ISLAND, CALIFORNIA

Kyra L. Mills
Farallon Island Seabird Biologist
PRBO Conservation Science, Stinson Beach, California

The Farallon Islands is a National Wildlife Refuge managed by the U.S. Fish and Wildlife Service and inhabited year-round by scientists from PRBO. Located 28 miles west of San Francisco, this group of islands constitutes the largest seabird breeding colony south of Alaska, with approximately 250,000 nesting seabirds belonging to twelve different species. The "Habitat Sculpture" on Southeast Farallon Island was designed and developed by a joint collaboration between a group of artists from the Meadowsweet Dairy and seabird biologists from PRBO. This project was conceived and designed with the general purpose of utilizing existing rock rubble from old island buildings to create a new structure that would help enhance seabird nesting habitat with the goal of attracting breeding seabirds such as Cassin's Auklets, Rhinoceros Auklets, Pigeon Guillemots, and Ashy Storm-petrels. A second goal of this project was to design a structure that would allow scientists to study the breeding behavior of the nesting seabirds, with minimal disturbance to the birds.

Artists from the Meadowsweet Dairy developed and installed the Habitat Sculpture

several months prior to the 2001 seabird breeding season on the Farallones. Three seabird species that nest in natural burrows and crevices, Cassin's Auklets, Rhinoceros

Auklets, and Pigeon Guillemots, breed in artificial boxes on the island. However, it usually takes at least one full season for the boxes to become "weathered" and for the birds to locate, occupy, and breed in the boxes. Despite this, a total of eleven Cassin's Auklets occupied boxes within the Habitat Sculpture, and were successful at raising chicks. These results were a somewhat unexpected but pleasant surprise in the first year of the existence of this structure. Another positive observation that was made during the 2001 seabird season was several Pigeon Guillemots were seen standing on the structure and even inspecting the crevices. It is possible that these are young birds that are likely to breed in the structure in the next few years.

The positive results from the first year of the existence of the Habitat Sculpture are an excellent indication that the seabirds find the structure an attractive breeding habitat. This successful and creative project is a good example of the use of seemingly "useless" material to create a useful structure that is not only a work of art and aesthetically pleasing, but also a useful structure for enhancing seabird breeding habitat on this important Wildlife Refuge.

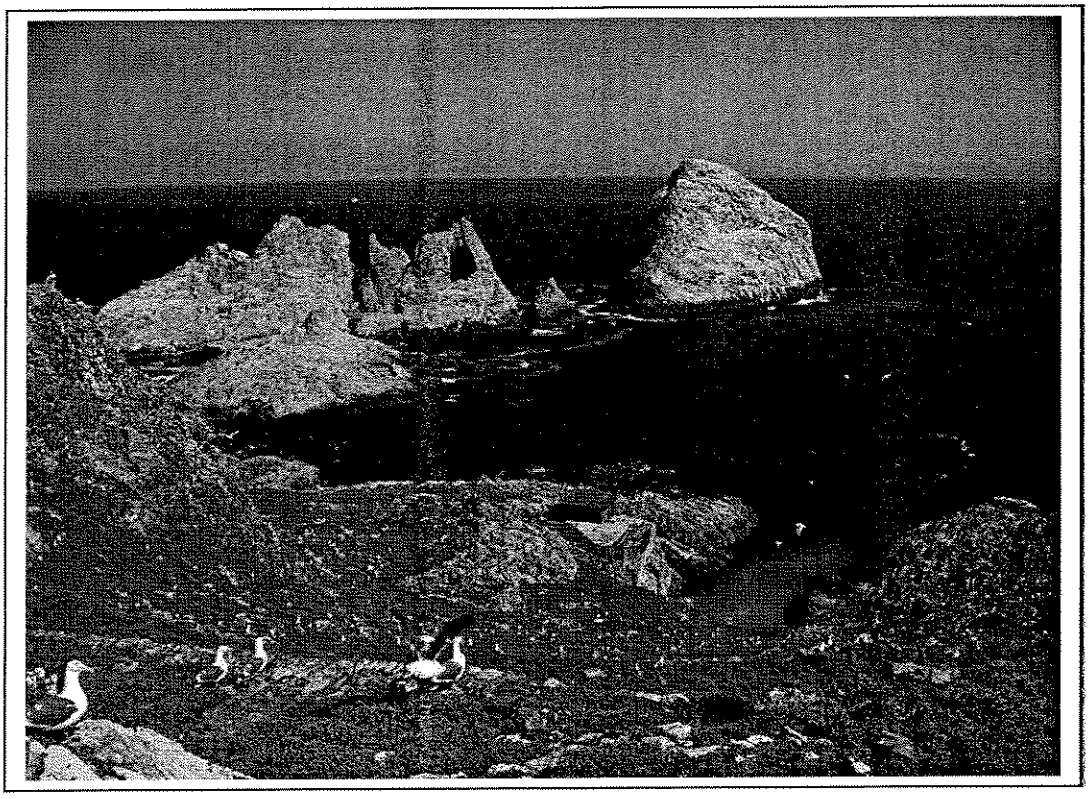
Appendix B. Habitat restoration through the elimination of the non-native house mice from South Farallon Island (written by U. S. Fish and Wildlife Service Refuge Manager, Joelle Buffa).

Removing mice would remove a predation factor for Ashy storm-petrels. Mouse are egg predators, however, their biggest effect on Ashy storm-petrels is through the indirect predation caused by burrowing owls.

Over the past 20-plus years, there has been a dramatic, and continued downward trend of the Ashy storm-petrel population on the Farallones. We have evidence that this decline is a result of predation on adults. Western gulls and wintering burrowing owls are the major predators. Burrowing owls do not breed on the island, however a few dispersing young-of-the-year owls always show up on the island in the fall. Enticed by an abundant supply of house mice (which peak in the fall), a few owls stay on the island and over-winter. When the mouse population crashes in the spring, the owls turn to eating the adult storm petrels, returning to the island to breed.

The Refuge (funding provided through Migratory Birds) is currently working with the Island Conservation Ecology Group (ICEG - group that planned and implemented the Anacapa Rat Eradication) to develop an eradication plan for Farallon house mice, which will detail the costs, steps, permits, and other requirements needed to eliminate mice from the Farallon NWR.

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
Refuge Manager
Farallon National Wildlife Refuge
Newark, California

Joelle_Buffa@fws.gov
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-

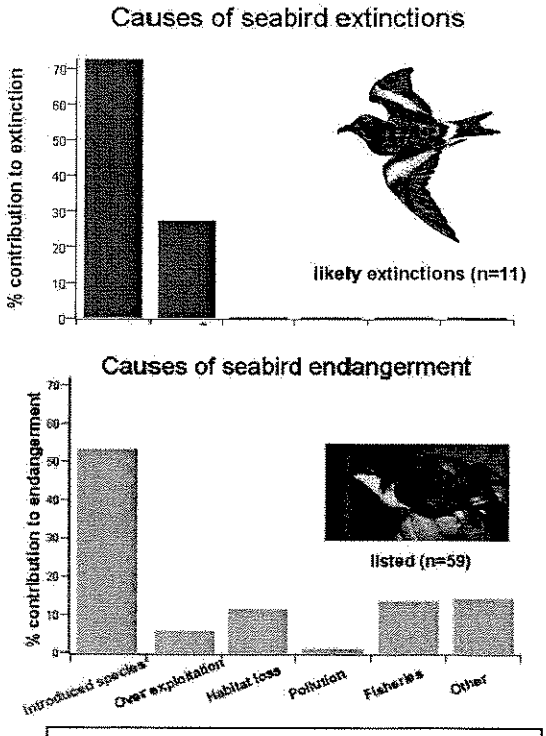


Figure 1. Causes of seabird extinction (a) and endangerment (b) based on IUCN global red list data.

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).

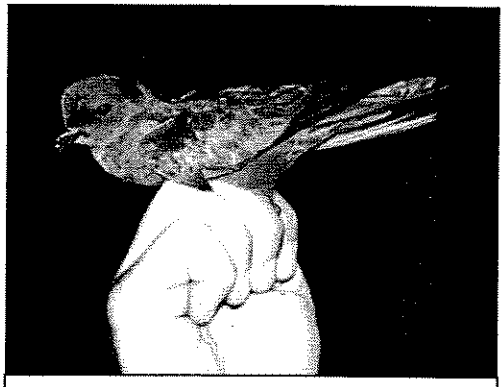


Figure 2. Ashy Storm-petrel

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.).

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.

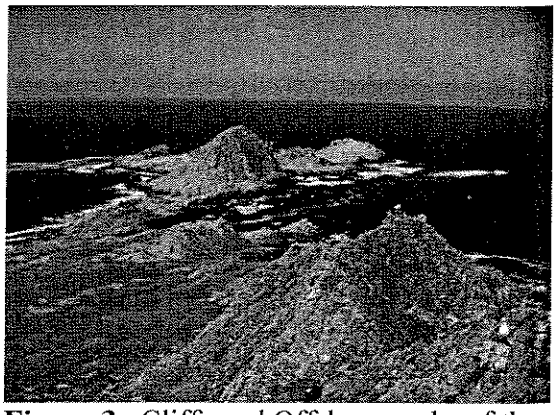


Figure 3. Cliffs and Offshore rocks of the Farallon Islands.

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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Lana Emo
Rehabilitation Manager
Los Angeles Oiled Bird & Education Center
P.O. Box2816, 3601 South Gaffey, San Pedro, CA 90731
Phone: (310) 514-2573
E-Mail: lana@ibrrc.org

2. Pelican Patrol "Rescue, Rehabilitation, Education" In the summer of 2001 International Bird Rescue Research Center (IBRRC) received 200 brown pelicans, from Santa Cruz, that had been entangled in fishing line and hooks during an anchovy run close to the fishing pier. Many of the birds were so severely injured that they had to be euthanized.
Even though the Santa Cruz anchovy run impacted the California brown pelicans for only a short time period, IBRRC consistently receives brown pelicans with fishing line/hook injuries throughout the year. This is consistent with wildlife rehabilitation centers in Florida findings who assess that 85 % of the pelicans they receive there have had encounters with fishing lines and/or hooks at some point in their lives.
It has become increasingly important to mount a campaign to not only to remind people that California brown pelicans are endangered and protected by both federal and state laws, but also to educate the general public, recreational fishermen, charter boat operators and pier managers alike that feeding them, hooking them and then cutting the lines, harassing them in any way are all extremely detrimental to their wellbeing. Since pelicans are not the only species affected by fishing line/hooks, benefits of the Pelican Patrol will help save the lives of many wild animals that compete with humans for fish.

3. Initial implementation area of the Pelican Patrol is Los Angeles Harbor (San Pedro Bay), but will be expanded to include other geographic areas in the Southern California Bight, as deemed necessary.

4. Primarily, brown pelicans are the focus of the rescue patrols, but other native injured aquatic bird species such as cormorants and western grebes will be aided as well. In general, rescuing and rehabilitating injured wildlife is a service to the general public that is both wanted and welcomed by the community; thus the Pelican Patrol will facilitate this service.

5. For example, in January of 2003 mysterious brown pelican mutilations in LA harbor stirred the community of San Pedro. There was an extreme outpouring of concern and support by the local population. International Bird Rescue Research Center was inundated with calls from the public inquiring about the birds health and offers to help. Interestingly enough, while the injuries suffered by the pelicans were horrific, birds can be found each day with various ailments attributed to human activities. Most of the affected birds die a slow and painful death. Only a fraction of these birds are ever rescued. This year alone the bird rescue center in San Pedro has received ca. 35 birds with fish hook injuries, 15 were brown pelicans. The theory behind Pelican Patrol is to rescue injured birds proactively. By patrolling high-risk areas, jeopardized birds can be collected before their health deteriorates to a critical level.

Furthermore, the plight of these birds can provide us as a platform for the creation of a public education campaign (public service announcements, articles, ads, signs, exhibits, lectures) for both the community and those involved in the recreational fishing industry. Operators in charge of bait barges and fishing piers will also be included in this effort of minimizing the impact of their activities on these wild animals.

6. Educating the recreational fishing industry on the proper disposal of fishing line/hooks and teaching behavior techniques when sea birds are present during fishing operations is not as straight forward a mission as it seems. Anecdotal evidence from Florida and Australia shows that positive behavioral changes in fishing etiquette take years to develop. Nevertheless, by controlling all aspects of the Pelican Patrol (rescue, rehabilitation, education) and implementing educational efforts in predetermined, smaller geographical areas (San Pedro) the success of the project should be measurable within a 3 - 5 year period.

7. Once a behavioral change has taken place, one can speculate that change could be permanent. However, because of the ever-changing demographics in southern California, a continual effort must be made to (re) educate the public. Under these circumstances, a general behavior change could potentially last 5 – 10 years.

8. The methodology of the Pelican Patrol would rely initially on actual boat patrols and rehabilitation protocols. International Bird Rescue Research Center will use its own public relations and education staff to administer a public relations campaign in English and Spanish.
International Bird Rescue Research Center already has a small zodiac for patrol duties. It needs to be repaired to be sea worthy. The facility (Los Angeles Oiled Bird & Education Center) has proper flight aviaries in place and a rehabilitation staff that has expertise in rehabilitating aquatic birds.

9. There have been similar patrols conducted in Australia (Queensland), Florida and California (San Diego). Their success is not clear, but further research will be conducted to garner ideas and statistical analysis.

10. The goal of this project is to protect brown pelicans and other sea birds from unnecessary injury and death through rescue, rehabilitation and education. The results of the patrols should be apparent through a decrease in the number of brown pelicans injured and killed by fishing line or hooks. As part of the research, IBRRC will conduct a baseline study and compare statistics from previous years to current and subsequent years. Also, surveys and observational studies could measure behavioral changes in the recreational fishing industry and general community.

11. The success of the project is highly dependant on a positive reception by the coastal communities where the Pelican Patrol is conducted. Judging from the positive and proactive response of the people of San Pedro, during recent pelican mutilation incidents, the Pelican Patrol should be well received in this area. Most of the close to 1,000 birds IBRRC annually receives at the center are found and brought in by the public.

12. There are no environmental impacts generated by this project.

13. Only auxiliary coast guard trained staff would be allowed to operate the boat. Most IBRRC personnel also have extensive experience in search and rescue procedures during oil spill events and have current 24-hour HAZWOPER certification.

14. Key costs include $ 3,000.00 to restore the IBRRC Zodiac. Operation and maintenance costs could be estimated at ca. $25,000 per year. That includes fuel cost, equipment, insurance, research, staffing and administration.

15. Initially, patrols every other week is potentially feasible. Treatment and care of the rescued animals would be ongoing. IBBRC is open 7 days a week, 365 days a year. The public relations and educational aspects of the project would require full time maintenance by staff and volunteers.

16. Currently, no additional funding sources have been identified. Nevertheless, IBRRC is always seeking donations. Once the patrols are under way, there is reason to believe that with proper campaigns additional funding through public support could be secured.

17. NA

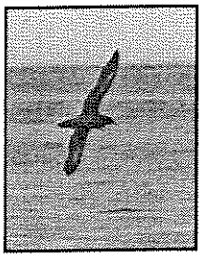
18. Due to liability issues, only IBRRC staff and volunteers will be permitted on the boat. Volunteers are currently a key component of the rehabilitation process and will continue to be highly involved during the public relations and educational components of the Pelican Patrol campaigns.

04/14/03

From: Josh Adams
US Geological Survey
831-771-4422
josh_adams@usgs.gov

Full text of letter can be found with other submission for "Seabird Monitoring" within the Data Gap ideas.

Migratory Species



One of the dilemmas associated with identifying appropriate restoration actions by the MSRP, is the extreme lack of information regarding the effects that were incurred by both resident and non-resident marine bird species. This information is required in order to identify specific impacts to be mitigated through effective restoration.

Shearwaters— Four species of shearwater inhabit the waters of the Southern California Bight throughout a significant portion of the year. The Sooty Shearwater is by far the most abundant.

Sooty Shearwater abundance has declined significantly off California in recent decades. During their stay off California shearwaters feed on abundant euphausiids, juvenile rockfishes, and rely especially on anchovies prior to migration and nesting. Anchovies are the predominant prey species for nesting Brown Pelican in the SCB, and served as the trophic link in the transfer of DDT and DDE to this species, causing dramatic reproductive failure and population decline. Therefore, it is assumed that Sooty Shearwaters off California were, and continue to be exposed to high concentrations of DDT and its break-down components. The effect of DDT contamination on the survival and reproduction of Sooty Shearwater was never documented. Sooty Shearwater collected off Japan showed relatively high concentrations of DDE. Whereas Sooty Shearwater also nest Chile and Tasmania, the populations that rely on the food resources of the SCB, are not specifically known.

The Black-vented Shearwater is restricted to several islands off Mexico, also has a low total population size, and is affected by introduced predators. Similar to Sooty Shearwater, Black-vented also rely seasonally on the abundant and potentially contaminated food resources of the SCB. Additionally, the Pink-footed Shearwater is considered globally threatened. It nests in reduced numbers only on several islands off Chile. Pink-footed Shearwater is vulnerable to introduced predators, human consumption, and habitat destruction.

Effective seabird restoration could be achieved by allocating funds to help remove introduced competitors and predators at shearwater colonies in Mexico, New Zealand, and Chile. In addition, seabird conservation efforts will benefit by establishing and funding educational outreach and community involvement related to restoration efforts, not only in Mexico, New Zealand, and Chile, but here in California as well.

We support allocation of funds to help eradicate introduced predators on seabird colonies to help restore populations in Mexico, New Zealand and Chile. We would also support funding for education and community outreach in these countries and in here California regarding the importance of our coastal marine ecosystem to a large number of migratory species. Along these lines, Moller et al. (2003) have identified Sooty Shearwater colonies in New Zealand that are impacted by introduced ship rats (*Rattus rattus*) and have drafted a complete eradication/restoration plan designed to recover the loss of adult Sooty Shearwaters killed during the 1998 *Command* oil spill. Similar eradication/restoration plans could be drafted and applied toward these same colonies and toward colonies in Mexico (Black-vented Shearwater) and Chile (Pink-footed Shearwater) to remove non-native predators, and thus recover losses incurred by or equivalent to losses from environmental contamination associated with DDT in the SCB. Furthermore, toxicological monitoring of the migratory species listed above provides the MSRP Trustees with potentially useful seabird bio-indicators that could be used to detect the effect of dump-site mitigation on the flux of DDE and PCBs to the ecosystem.

April 14, 2003

Pam Castens, Program Manager
Montrose Settlements Restoration Program (MSRP)
NOAA, 501 W. Ocean Blvd., Ste. 4470
Long Beach, CA 90802

Re: Seabird Restoration Project Ideas

Dear MSRP Trustees,

We attended the January 2003 MSRP scoping meeting in Sacramento, and would like to thank the Trustee council for making this process open and accessible to us for review and input. We believe that local community support, collaborations with experts in the fields of seabird ecology, raptor biology, ichthyology, marine science, and restoration ecology, will ultimately help you achieve the goals "to restore natural resources injured by chronic releases of DDT and PCBs into the Southern California marine environment". We present the following additional comments, concerns, and ideas for your review. Our comments are specifically directed toward restoration efforts for injuries to seabirds.

First, we suggest the Trustees consider the priorities for **seabird conservation** set by an international council of seabird specialists listed below[1].

1) **Conduct surveys and censuses of seabird colonies (esp. rare species) to establish information necessary to detect baseline trends in populations**
2) **Eliminate alien species from nesting islands**
3) **Establish new and improve existing reserves**
4) **Prevent or reduce habitat disturbance and destruction**
5) **Protect seabirds from over-exploitation**
6) **Educate the public and publicize seabird related issues**
7) **Establish and provide legal protection**
8) **Continue applied research**

To restore seabird populations affected by toxic pollutants, it may be necessary to mediate other threats to the population (e.g. fishery by-catch, oil pollution, introduced predators). Because seabirds are long-lived with high adult survival, reducing mortality factors which target adult birds will be the most successful means to increase the long-term viability of the affected populations.

Seabird population enhancement may require a combination of efforts. We suggest that projects considered within the MSRP incorporate aspects from the priorities listed above. Whereas education and research are often treated as separate and isolated activities not related to 'restoration' efforts, we suggest that both components are integral to the

[1] International Council for Bird Preservation (ICBP) Seabird Specialist Group 1984 Priorities for seabird conservation and associated research (Tech. Pub. No. 2, p. 771-778)

success of restoration, and should be included in final restoration plans. Without good education the public will remain uninformed and uninterested in seabird conservation and restoration. Without good research, population censusing, monitoring, we cannot evaluate population trends, and determine threats and negative impacts to mediate. Nor can we measure the effectiveness of our restoration efforts.

The dumping and flushing of DDT, and PCBs off Los Angeles affected marine birds at a geographic scale that extends beyond the Southern California Bight. Toxic pollutants off Southern California affected both resident and migratory marine birds, and may have contributed to the decline of species that breed in other states (e.g. Northern Fulmar, Alaska; Black-footed Albatross, Hawaii) and other countries (White-winged and Surf Scoter, Canada; Black-vented Shearwater, Mexico, Pink-footed Shearwater, Chile; and Sooty Shearwater, New Zealand).

Several seabirds that breed within the Southern California Bight (SCB) have undergone population declines or have significant threats to their breeding habitat, and therefore are of particular concern. These include the Ashy Storm-petrel, Xantus's Murrelet, and Brown Pelican. For these species it is essential to conduct at-sea and colony surveys to establish information necessary to detect baseline trends in populations and contaminants.

A comprehensive seabird monitoring program would make multi-project planning and implementation cost-effective and streamlined. There are several California-based seabird experts and conservation organizations which have successfully implement monitoring and restoration plans. It is important to draw upon these knowledgeable resources to implement proposed seabird projects. Seabird groups include the USGS Western Ecological Field Station (John Takekawa), PRBO Conservation Science, Island Conservation Group (), Oikonos Ecosystem Knowledge. Within these groups are seabird specialists experienced in field operations, monitoring and restoration activities. There are also seabird researchers in California including Harry Carter, and David Ainley who could provide professional consultation on project ideas. Persons at academic institutions include Dan Anderson and Eduardo Palacios (UC Davis), Don Croll (UC Santa Cruz), James Harvey (Moss Landing Marine Laboratories) and others.
We suggest that these persons be contacted to evaluate proposed project ideas. It is necessary to have a peer-reviewed process of screening projects to ensure non-biased and scientifically sound methods for restoration activities and effectively measuring the results.

To summarize our comments, we suggest that the MSRP should strive to integrate the ICBP's priorities into all proposed work. Due to the highly transitory nature of pelagic seabirds of California, a well-thought out plan will incorporate local and international efforts to reduce mortality factors (e.g. bycatch, oiling, harvest, introduced species) affecting seabirds populations. Such a plan will help to effectively restore, rehabilitate, replace or acquire the equivalent of the damages done to the California seabird populations and important migratory species affected by the Montrose *et al.* dumping and flushing of DDT and PCBs into the SCB.

Thank you for considering our comments and opinions. Should you have any questions or comments, we would appreciate further communication on the important issue of seabird restoration efforts related to the MSRP.

Sincerely,

Josh Adams
Seabird Biologist, USGS-WERC, josh_adams@usgs.gov

Hannah Nevins
Moss Landing Marine Laboratories, Moss Landing, CA 95039 hnevins@hotmail.com
and Oikonos Research Group, Bolinas, CA 94950 www.oikonos.org

(The full text of this letter, including other project submissions, can be found with the other submission for "Seabird Monitoring" within the Data Gap ideas.)