

Presidential Migratory Bird Federal Stewardship Award

1. Applicant: National Park Service (NPS)

2. Co-applicant(s): Nineteen co-applicants are listed: US Fish and Wildlife Service; Tomales Bay Watershed Council; Point Reyes Station Village Association; National Oceanic and Atmospheric Administration – NOAA Restoration; Department of Defense – U.S. Navy; California State Lands Commission; California Department of Fish & Game; California State Water Resources Control Board; Point Reyes National Seashore Association; Audubon Canyon Ranch; San Francisco Bay Joint Venture; Gordon and Betty Moore Foundation; California Coastal Conservancy; Wildlife Conservation Board; National Fish and Wildlife Foundation; The Nature Conservancy; Island Conservation; California Institute for Environmental Sciences; and the Institute for Wildlife Services. Without these partners, success could not have been achieved.

3. Action: The action described herein is a programmatic body of habitat restoration and cooperative coastal migratory bird conservation at Channel Islands (CHIS), Point Reyes (PORE) National Parks, and adjacent landscapes where NPS has taken the lead. By working closely with a broad array of partners and stakeholders, the NPS has undertaken a suite of integrated ecological restoration actions that are unprecedented in the United States to generate direct and highly meaningful effects on reestablishment of coastal migratory bird species of concern at CHIS, PORE, and adjacent public and private lands. At CHIS, this program has resulted in the elimination of predatory non-native rats and subsequent recovering populations of nesting Xantus's murrelets and Cassin's auklets on Anacapa Island; reestablishment of over 50 nesting bald eagles and 25 nesting peregrine falcons to the CHIS; elimination of predatory feral cats from San Nicolas Island that will result in recovery of federally threatened western snowy plover, Brandt's cormorant, and western gull; restoration of terrestrial habitat to support increased nesting of rare seabirds ashy storm-petrels, Cassin's auklets, and Xantus's murrelets on Santa Barbara and Santa Cruz Islands. The suite of restoration actions implemented have resulted in the protection of designated critical habitat, expansion of suitable habitats previously degraded by non-native species and past land uses, and reestablishment of species that were extirpated or substantially reduced at both sites.

CHIS Action Details: Anacapa Island's steep, lava rock cliffs incorporate numerous caves and crevices that are particularly important for the increasingly rare seabird species, Xantus's murrelet and ashy storm-petrel. The largest breeding colony of the California brown pelican in the United States also occurs on Anacapa Island. Unfortunately, the Anacapa ecosystem had been degraded by the nonnative black rat (*Rattus rattus*) that preyed on reptiles, amphibians, marine and terrestrial invertebrates, and the young and eggs of island nesting seabirds. On Anacapa Island these ravenous predators prevented two rare bird species, the Xantus's murrelet (*Synthliboramphus hypoleucus*) and ashy storm-petrel (*Oceanodroma homochroa*), from nesting successfully. Following eradication, subsequent monitoring has demonstrated beneficial impacts to the endemic island deer mouse, native reptiles and amphibians, and nesting seabirds including the Xantus's murrelet nesting population which has expanded substantially. Nearly half (48%) of all pre-eradication clutches were depredated by rats, but only 3% of clutches were depredated or scavenged post-eradication by endemic deer mice (*Peromyscus maniculatus anacapae*). Hatching success for Xantus's murrelets has doubled since the eradication of rats and the colony is growing. Bald eagles are a very important component of the CHIS ecosystem; however, human harassment, collection of eggs, and DDT resulted in the complete extirpation of the species from the islands. The bald eagle restoration

program was implemented through a partnership among state and federal agencies, including the NPS and the Institute for Wildlife Studies where biologists imported 61 bald eagles and tagged eagles have provided essential data on mortality and movements of the birds following fledging and departure from release sites. Only four years after starting the restoration program there were two successful bald eagle nests on Santa Cruz Island, each fledging one chick. In 2007, one nest with one chick was documented and the chick fledged in late June. DDT also severely reduced numbers of peregrine falcons (*Falco peregrinus*), California brown pelicans (*Pelecanus occidentalis californicus*), and other seabirds. However, bald eagles, feeding higher on the food chain, have been the slowest to recover. In recent years the park and partners like The Nature Conservancy have eliminated nonnative animals, such as feral pigs, sheep, and rats, of which impacted migratory and resident bird populations and habitat. Species once threatened with extinction, like the island foxes, are moving toward recovery. Peregrine falcons were extirpated from the CHIS in the late 1940s due to high concentrations of DDTs and PCBs which resulted in thinning of egg shells. Populations were reestablished on the islands through a “hacking program”. As of 2007, there were 25 active peregrine falcon territories on 7 of the 8 CHIS. Introduced predators, particularly feral cats and rats, are one of the greatest threats to seabird populations on islands. Feral cats are directly responsible for a number of extinctions and extirpations on islands across multiple taxa. The last cat was eliminated from San Nicolas Island in June 2010. The elimination of cats involved a cooperative agreement with the U.S. Humane Society where cats were live-captured and transported to the mainland. The Human Society agreed to take permanent ownership of the cats where they are now “indoor cats” and will not be permitted to roam outdoors. Seabird biologists are using a variety of tools (social attraction vocalization playback, artificial nest boxes, removal of non-native vegetation, revegetation with native plants, and reduction of human disturbance) to recreate suitable terrestrial nesting habitat for rare seabirds such as Cassin’s auklet, Xantus’s murrelet, and ashly storm-petrel. The project is (1) increasing recruitment, (2) increasing reproductive output, and (3) decreasing egg and chick mortality by providing safe breeding habitat for these species. Since the project started over 17,000 plants have been planted in the restoration sites and the bird species of concern are utilizing the project’s restored habitats.

PORE Action Details: The project area lies at the very southern end of Tomales Bay, a 6,800-acre, 12-mile-long, 1-mile-wide estuarine embayment that runs along PORE’s northern perimeter. The Tomales watershed is known as a critically important resting and foraging area for migrating birds on the Pacific flyway. It is also a foraging ground for migrating shorebirds and is recognized as a wetland of regional importance by the Hemisphere Shorebird Reserve Network. Excessive sedimentation in the Tomales Bay watershed during the late 1800s from logging and agricultural development resulted in large-scale conversion of open water and mudflats to vegetated marsh. Many of Tomales Bay’s tidal marshes were subsequently filled or disconnected from creeks and the bay by levees or earthen berms. The largest loss of hydrologically connected wetlands in Tomales Bay came with diking of approximately 550 acres for operation of the Waldo Giacomini dairy ranch and pastures in 1946. While the Giacomini Ranch was still largely wetland even after being leveed, its value to the larger Lagunitas Creek and Tomales Bay ecosystems was greatly diminished by land degradation and the lack of hydrologic connectivity. This loss of functionality was crucial and resulting water quality issues in Tomales Bay have caused it be declared impaired under Section 303(d) of the Clean Water Act. The Giacomini Ranch was purchased by the NPS in February 2000 for the purpose of wetlands restoration and in 2007, restoration activities began. The project involved complete removal of levees in both the West and East Pastures, removal of agricultural infrastructure, tidal channel and freshwater marsh creation, grading to restore more natural creek banks, excavation to return higher elevation areas to active floodplain elevations, invasive plant removal, and active revegetation. The project also included restoration actions at Olema Marsh, south of the Giacomini Ranch, to improve hydrologic connectivity in this former tidal marsh. It not only has

improved resource conditions within the Giacomini Ranch, but is restoring functionality of the Giacomini Wetlands which is improving the health of the overall Tomales Bay ecosystem. Restoring these wetlands has not only benefited flooding and water quality, but has increased habitat and food resources for wildlife within the project area and the entire Tomales Bay watershed including the migrating black oystercatcher (*Haematopus bachmani*), and the long-billed curlew (*Numenius americanus*). The American peregrine falcon (*Falco peregrinus anatum*) (FSC, SE) is found in the park in the winter and numbers have increased as have the Bald eagles (*Haliaeetus leucocephalus*) (FE, SE) throughout Marin County. As bald eagle populations continue to expand, Tomales Bay is expected provide breeding sites in the future due to favorable habitat and the availability of food.

4. When was the action initiated? Lengthy restoration at CHIS was initiated in 2001, at PORE in 2006.

5. Is the action local, regional, national or international in scale? Restoration at CHIS and PORE is having local, regional, national and international consequences for migratory birds. The CHIS methods used for the eradication of rats from Anacapa Island have been exported to Mexico. To date, non-native rats have been eliminated from five Mexican islands for the protection and restoration of birds and their nesting habitat. Similarly, the elimination of feral cats from San Nicolas Island will guide similar restoration actions in numerous locations where cats are decimating bird populations. The actions at the CHIS have demonstrated that bold ecological restoration actions that are scientifically-based and meticulously planned can survive legal, political, and public scrutiny and serve as an exemplary model for restoration elsewhere. At PORE, Tomales is embedded in a system of interrelated coastal wetlands—San Francisco Bay, Bodega Harbor, Bolinas Lagoon, Drakes/Limantour Estero, Tomales Bay, Abbots Lagoon, San Antonio and Americano esteros— providing a mosaic of habitats that host as diverse an array of waterbirds as any coastal wetland system on the west coast of North America. Tomales Bay is not only part of the Golden Gate Biosphere Reserve and a California Critical Coastal Area, but was nominated as a "Wetland of International Importance" under an international treaty called the Convention on Wetlands (commonly known as the Ramsar Convention). Tomales Bay is also one of 16 wetland areas that qualify for inclusion as a wetland of regional importance under the Western Hemisphere Shorebird Reserve Network, because of its large number of wintering and migrating shorebirds. San Francisco Bay and its associated wetlands, including “the Point Reyes Esteros” and Tomales Bay, are known as wetlands of hemispheric importance. This network of habitats holds more total shorebirds in all seasons than any other wetland in the conterminous U.S. Pacific coast of North America. The PORE project is in an area recognized by all four of the major national bird conservation plans (Partners in Flight Land Bird Priority Area, US Shorebird Conservation Plan Pacific Coast and San Francisco Bay Wetland Focus Areas and site of Regional Importance, North American Waterbird Conservation Plan, Waterbird Priority Wetland Area, and North American Waterfowl Management Plan (NAWMP), San Francisco Bay Area of Continental Significance) as geographically significant and shares the landscape-level vision of these plans.

6. How does the action meet or exceed agency mandates or daily activities? The actions taken by CHIS, PORE and their partners has set the model for tackling landscape level activities such as invasive and exotic species control and reestablishment of extirpated species eradication. Non-native predators, such as rats and cats, are generally accepted as a “status-quo” situation which, at best, can be controlled. Anacapa Island was the first successful elimination of rats in the United States. Since this successful project, there have been numerous eliminations of non-native mammals from islands in the U.S. and elsewhere. At PORE, the speed with which bird populations have returned to the restoration site in just two years exceeds both agency mandates and expectations. Pre-restoration waterbird numbers were near zero for many species in the project area. By the third winter, 78 waterbird species used the project area, averaging 3,408 individuals per survey—an 84% increase over the first season. Within the first two years following the levee breach, higher numbers of Northern Shoveler, Gadwall, American Wigeon,

Northern Pintail, and Green-winged Teal were documented in the project area than were reported previously for Tomales Bay in its entirety (Kelly and Tappen 1998). Waterbird numbers in the fourth year were roughly similar to the third one, although shorebird numbers were the highest to date and breeding season surveys indicate that the restoration has also resulted in a remarkable increase in density and diversity of nesting passerines, including Song Sparrow, Savannah Sparrow, and Salt Marsh Common Yellowthroat (California Bird Species of Special Concern). Adult and immature Bald Eagle, once extremely rare in West Marin, began visiting the site in spring 2009.

7. Explain how the action promotes or results in effective migratory bird conservation.

This body of restoration directly addressed the NAWMP goals of meeting population objectives through actions guided by local and regional habitat conservation goals. It has improved important habitat for a diversity of migrating and wintering waterfowl and contributed to regional goals set by the San Francisco Bay Joint Venture to protect, restore, and enhance tidal flats, marshes, lagoons, and seasonal wetlands to benefit waterfowl. 1) 332 acres of saltmarsh and unvegetated estuarine shallows have been restored resulting in enhanced and sustained salt-tolerant emergent vegetation and brackish-water invertebrates that provide food for waterfowl including Northern Pintail, American Wigeon, Gadwall, Green-winged Teal, Cinnamon Teal, Bufflehead, American Coot. Increased use of restored habitat by dabbling ducks has exceeded abundances previously reported for all of Tomales Bay. 2) A reduction in sediment and improved water quality in southern Tomales Bay has positively influenced the abundance of photosynthetic organisms and filter-feeding benthic invertebrates, increasing food supplies for juvenile fish, benefiting include Surf Scoter, Black Scoter, White-winged Scoter, Greater/Lesser Scaup, Bufflehead, Common Goldeneye, Ruddy Duck, and Red-breasted Merganser. The Bay may be the single most important estuary for wintering Bufflehead south of the Columbia River. 3) Riparian Floodplain and Seasonal Marsh: The restoration of riparian floodplain and marsh has enhanced the availability of emergent aquatic vegetation and invertebrates used as forage by waterfowl, such as Canada Goose, Northern Pintail, Green-winged Teal, and Gadwall, and the development of suitable nesting habitat for waterfowl such as Mallard and Cinnamon Teal.

8. Provide details that demonstrate how the action is innovative. This project was innovative and controversial in several ways. The eradication of rats sparked widespread media coverage and a lawsuit. The NPS worked tirelessly with a myriad of partners to overcome the complex challenges, ensure sound science, and move forward to protect migratory birds. This body of work eschewed the traditional approach of focusing on habitat “creation” and instead focused on restoring processes and functions, which reduced both cost of implementation and long-term maintenance costs. It also relied on developing an extensive pre- and post-restoration monitoring program to enable managers to better document the benefits of restoration of not only to the project area, but to the watershed as a whole. NPS and partners also worked to develop an effective public outreach program which continues to the present through free field seminars and workdays.

9. Describe the roles and responsibilities of partners. At both of these parks, each partner played multiple roles, depending on the specific activity. At CHIS, NOAA, California Department of Fish & Game, and FWS played a critical role by being the first to apply Natural Resource Damage funds to the eradication of a non-native mammal from an island in order to protect and restore rare seabirds. These agencies have also provided primary scientific and legal support for all aspects of these projects. The U.S. Navy owns and manages San Nicolas Island. They approved and managed the project to eliminate feral cats from the island. The Nature Conservancy owns the majority of Santa Cruz Island and has been a critical partner for the reestablishment of bald eagles and scientific expertise for ecological restoration. The Institute for Wildlife Studies, Island Conservation, and California Institute for Environmental Sciences, as cooperators, provided scientific expertise and species-specific knowledge that has been critical to design, implementation, and assessment of the restoration projects. The PORE

restoration project involved the active participation of the California State Lands Commission and Audubon Canyon Ranch. With the assistance of the San Francisco Bay Joint Venture, Point Reyes National Seashore Association raised \$6.2 million dollars for the restoration phase from numerous sources, including major grants from the Gordon and Betty Moore Foundation, California Coastal Conservancy, California State Water Resources Control Board, Wildlife Conservation Board, National Fish and Wildlife Foundation, and the FWS. Additionally, the project actively involved the Tomales Bay Watershed Council and the Point Reyes Station Village Association.

10. How might the action be transferrable to other sites managed by this or other federal agencies? How is this being encouraged? The extensive planning that went into these restoration efforts provides a model for future efforts of this magnitude. The NPS offers assistance to managers of other federal and non-federal projects regarding planning, process, and implementation. The NPS has also presented information about the restoration project at a number of conferences attended primarily by land and restoration managers. More importantly, the extensive monitoring program that the NPS developed enables the service to provide quantitative information to restoration managers and scientists on how successful restoration efforts can improve conditions and functions. These projects have functioned as “training grounds” for conservationists who have studied and learned and transferred their knowledge to their home base. For example, the eradication of rats from Anacapa Island included biologists from Mexico who subsequently returned to Mexico and have conducted successful rat eradications using similar techniques or where biologists from the Alaska Maritime Refuge visited Anacapa Island and subsequently successfully eradicated rats from one of the Aleutian Islands.

11. How does/did the action impact your agency’s current migratory bird conservation practices? This body of work significantly enhances the NPS’s existing policy of working with partners to monitor and protect migratory birds within the region. PORE and Golden Gate Recreation Area provide critical migratory bird habitat due to their location within the Pacific Flyway. Specifically, PORE also enforces hunting prohibition within its lands, personal watercraft prohibitions within Tomales Bay, and dog/visitor restrictions to protect migratory birds. These restoration and protection projects have significantly expanded the acreage of critical avian habitat under protection in a region of critical importance to migratory and resident birds.

12. How does the action benefit migratory bird species of concern? The highlighted projects are ecosystem restoration projects which will have broad benefits to a large number of native species and ecosystems. The migratory bird species of concern which were the primary reasons and beneficiaries of the projects include: Ashy Storm-Petrel is IUCN Red-Listed as “Endangered;” Xantus’s Murrelet is a state listed threatened species and is IUCN Red-listed as “Vulnerable;” and Peregrine Falcon and Bald Eagle were formerly listed under the federal endangered species act. High priority species that will benefit from the project include, but are not limited to: Greater Scaup (*Aythya marila*); Lesser Scaup (*Aythya affinis*); Northern Pintail (*Anas acuta*); and Black Rail (*Laterallus jamaicensis coturniculus*).

Literature Cited

- Kelly, J. P., and S. L. Tappen. 1998. Distribution, abundance, and implications for conservation of winter waterbirds on Tomales Bay, CA. *Western Birds* 29:103-120.
- North American Waterfowl Management Plan, Plan Committee. 2004. North American Waterfowl Management Plan 2004. Implementation Framework: Strengthening the Biological Foundation. Canadian Wildlife Service, U.S. Fish and Wildlife Service, Secretaria de Medio Ambiente y Recursos Naturales, 106 pp.