



## **PRBO Endorses USFWS Efforts to Restore the Farallones by Removing Invasive House Mice**

June 1, 2011

[PRBO Conservation Science](#) (PRBO) strongly supports efforts by the U.S. Fish and Wildlife Service (USFWS) to restore native wildlife and a healthy ecosystem to the [Farallon National Wildlife Refuge](#), California's "Galapagos," by removing the non-native house mouse.

The Farallones, just 27 miles west of San Francisco, are vital to the region's marine wildlife. The islands host over 300,000 breeding seabirds, the largest colony in continental U.S., as well as 5 species of seals and sea lions, and other unique animals and plants.

Yet, Farallon wildlife are [only now beginning to recover](#) from hundreds of years of human activities, including fur trading in the 1800's that wiped out elephant and fur seals from the islands; Common Murre egg harvesting that reduced the population to less than 1% of its original numbers by 1910; and intense human building and disturbance during WWII.

House mice and other non-native predators were first introduced to the Farallones by 18<sup>th</sup> century mariners. The removal of European hares and cats in the 1970s along with other protection efforts since then have resulted in the return of 4 species that had not bred on the Farallones for over 100 years: Furs Seals, Elephant Seals, Black Oystercatchers, and especially Rhinoceros Auklets.

Freeing the islands of introduced house mice will benefit native wildlife populations over time, as [eradication efforts on other islands](#) led by our partners at [Island Conservation](#) have demonstrated.

"There are trade-offs," explained Ellie Cohen, PRBO President and CEO. "If mouse removal is approved, some non-target animals will likely die. However, if no action is taken, the unique Farallon ecosystem will continue to suffer, especially [Ashy Storm-petrels](#). Hundreds die each year, hunted by a dozen or so visiting [Burrowing Owls](#) that stay only because they can feed on the significant numbers of invasive house mice."

"By ridding the Farallones of these detrimental mice, native bird populations can rebound and the wildlife of California's "Galapagos" can continue to be restored," said Ms. Cohen.

The USFWS is currently preparing a [draft environmental impact statement](#) (EIS) to help protect and restore the Farallon ecosystem by eradicating non-native house mice and preventing their future reintroduction. PRBO will review the EIS and comment on the recommended management action(s) to best conserve this national treasure.

Reducing human-caused impacts on seabirds and other marine wildlife populations is especially important to their ability to respond to the challenges of accelerating climate change, ocean variability and acidification.

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For more information, click on the links below and visit [www.restorethefarallones.org](http://www.restorethefarallones.org).

[The Farallones: A Unique CA Ecosystem in Recovery](#)

[Non-native Effects on the Farallones](#)

[Direct Effects of the House Mouse](#)

[Indirect Effects of the House Mouse](#)

[Ashy Storm-petrels](#)

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**The Farallon Islands: A Unique California Ecosystem in Recovery**

- Farallon wildlife are only beginning to recover from hundreds of years of human activities, such as fur trading in the 1800's, Common Murre egg harvesting in the early 1900's, and intense human building and disturbance during World War II.
- The Farallon Islands are a national wildlife refuge of the USFWS established in 1909 in recognition of their unique and extraordinary importance to ocean wildlife.
- The islands, 27 miles west of San Francisco, host the largest seabird breeding colony in the contiguous United States (over 300,000 seabirds of 13 species).
- The Islands are an important haul-out and breeding site for 5 species of seals and sea lions.
- The islands host other unique populations (salamanders, insects and plants) and are an important stopover site for hundreds of species of migrant and vagrant land birds.
- Protection efforts since the 1970s have resulted in the return of 4 species that had not bred on the Farallones for over 100 years: Northern Fur Seals, Northern Elephant Seals, Rhinoceros Auklets, and Black Oystercatchers.

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**Non-native Impacts on Native Species of the Farallones**

- Island ecosystems and wildlife are healthiest without non-native species.
- Island ecosystems and wildlife are the most vulnerable to negative effects of non-native species because they evolved in isolation without defenses to alien flora and fauna.
- Non-native animals have negatively affected native wildlife on the Farallon Islands.
- Past efforts by the USFWS and PRBO helped remove European hares and cats that were harming seabird populations and altering island habitat.
- Removal of non-native hares and cats helped to restore a colony of Rhinoceros Auklets on the Farallon Islands.
- There are ongoing efforts to control invasive plants, which reduce nesting habitat of burrowing seabirds such as the Cassin's and Rhinoceros Auklets.
- Farallon species need help to recover their populations to better respond to increasing human pressures on the ecosystem, including from climate change and negative food web impacts.

- Reducing unnaturally high predation is one of the best strategies to help native populations to recover.
- The house mouse is an introduced non-native species on the South Farallon Islands that is affecting the well being of endemic native species, including seabirds, salamanders, crickets, plants, and the overall health of this unique island ecosystem.
- The last remaining non-native animal on the Farallon Islands is the house mouse.

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### **Direct Effects of Non-native House Mouse on Farallon Species**

- Mice are frequently encountered inside burrows, including Ashy Storm-petrel burrows, causing disturbance to nesting seabirds.
- Shells from predated eggs have been found with rodent bite marks.
- Using decoy eggs made of modeling clay, biologists confirmed that mice would chew on eggs when they are available.
- Chicks of storm-petrels and auklets have been found with toes or feet eaten off by mice (David Ainley, pers. Comm.).
- Mice prey on native camel crickets (*Farallonophilus cavernicolus*).
- Mice consume native plants and disperse non-native plant seeds.

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### **Indirect Effects of Non-native House Mouse on Farallon Seabirds**

- Mice compete for food with the native Farallon Salamander (*Aneides lugubris farallonensis*).
- Migrating Burrowing Owls stay on the Farallon Islands to feed on the abundant non-native mice during the fall. After the abundant mice population crashes in the winter, owls switch to predate on Ashy Storm-petrels.
- As mice negatively impact native plant species and spread non-native grass seeds around the island, they reduce nesting habitat available for burrow- and crevice-nesting seabirds, such as Ashy Storm-petrels, Cassin's Auklets and Rhinoceros Auklets.

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### **Ashy Storm-petrels on the Farallones**

- Ashy Storm-petrels are a California Species of Special Concern.
- Ashy Storm-Petrels have been petitioned to be included in the federal list of threatened and endangered species.
- The largest breeding colony of Ashy Storm-petrels in the world is on the Farallon Islands. (Approximately 50% of the world population breeds here.)
- Large scale Ashy Storm-petrel population declines have been documented at both the Farallones and at sea over the last 30+ years.
- Every year, at least 225 to 270 Ashy Storm-petrels, out of a population on the Farallones that is likely in the low thousands, are predated within PRBO's study area, which covers less than 50% of the island's landmass. PRBO expects actual predation rate to be much greater.

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### **Burrowing Owls on the Farallones**

- The Farallon Islands are a regular migration stopover for Burrowing Owls.
- Burrowing Owls stay into the Ashy Storm-petrel breeding season on the Farallones because of the presence of abundant invasive house mice.
- Overwintering Burrowing Owls account for 40% of all documented predation on Ashy Storm-petrels at the colony.
- In recent years, the number of Ashy Storm-petrels killed by Burrowing Owls has been increasing.
- On an individual basis Burrowing Owls have about 750 times greater impact on Ashy Storm-petrels than native Western Gulls, their other main predator.
- A Population Viability Analysis (assessing the ability of a population to survive over time) conducted in the mid-1990s found that predation alone could account for the observed population decline in Ashy Storm-petrels.
- Although owls will continue to find their way to the island, removing the mice (an artificial food source) will greatly reduce the time owls spend on the island during the fall and in turn reduce their impact on the storm-petrels.
- Burrowing owls are also a California Species of Special Concern and are listed as endangered in Canada.
- The Farallones provide an unstable source of food for Burrowing Owls and some do not survive the winter after the mice crash and storm-petrels are their only remaining food option.
- Without mice, Burrowing Owls would likely not overwinter on the Farallon Islands and may move on to more reliable wintering grounds which may improve their chances for survival.
- Measures will be taken to ensure BUOW protection during the process.

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### **What Roles do USFWS, Island Conservation and PRBO Play in the Restoration?**

- The [USFWS](#) manages the refuge for sensitive wildlife populations, including several endangered, threatened, and vulnerable species.
- [Island Conservation](#) is a world-renowned non-profit organization specializing in island restoration projects with many successes over the 17 years since their founding. The mission of Island Conservation is to prevent extinctions by removing invasive species from islands.
- [PRBO](#) scientists have [worked on the Farallones](#) 24 hours a day, 7 days a week and 365 days a year since 1968 in partnership with the USFWS stewarding, monitoring and protecting seabirds, marine mammals and other wildlife.
- During these 44 years, PRBO has documented numerous direct and indirect impacts of mice on seabirds and the ecosystem.
- PRBO will continue to provide scientific expertise in the eradication planning process and will continue monitoring and stewarding Farallon wildlife.

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