Removing invasive mice will benefit storm-petrels through reduced owl predation

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We used Point Blue’s long-term data to examine the complex relationship between house mice, burrowing owls, and ashy storm-petrels on the Farallon Islands National Wildlife Refuge and to provide a quantitative estimate of the anticipated benefit to ashy storm-petrels from a proposed house mouse eradication project.

Surveys by Point Blue biologists revealed a strongly seasonal pattern among the three species. Owls arrive at the refuge in the fall when mice are super-abundant as prey. But the mouse population crashes mid-winter each year due to seasonal rains and cold temperatures. This causes the owls to switch to preying upon storm-petrels which return to the refuge at this time. As a result, owl predation on storm-petrels is highest in late winter.

Analysis of storm-petrel capture/recapture data revealed a declining population trend in recent years and showed that annual adult survival is inversely related to owl abundance, especially during winter.

We used a population-dynamic model to estimate the change in storm-petrel population trends resulting from reductions in owl predation. Under current conditions (i.e., owl predation the same as in recent years) the storm-petrel population is expected to decline by 63% over the next 20 years. However, a 50% reduction in burrowing owl abundance (and related predation) would reduce that decline to approximately 26%, whereas a reduction of 80% would result in a stable or increasing storm-petrel population.

Reducing burrowing owl abundance, through elimination of their house mouse prey, will have a substantial and significant effect in reducing overall storm-petrel mortality and will promote stable or increasing future population trends.

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| **Main Points** |
| * Migrating owls remain on island due to high density of mice during the fall season * Owls switch from mice to storm-petrels as prey when mouse population crashes in winter * Owl abundance has a significant negative impact on storm-petrel survival and population trajectory. * Removing house mice is likely to reduce owl abundance and promote a stable or increasing storm-petrel population. |

Nadav Nur, Russell W. Bradley, Leo Salas, Pete Warzybok, and Jaime Jahncke. 2019. Evaluating population impacts of predation by owls on storm petrels in relation to proposed island mouse eradication. *Ecosphere*. (In Press)