Hi there

Just want to give everyone a heads up that there is a revised ASSP modeling report coming, updated with 2012 survival and pop index values. This will be a few more weeks. Executive summary here with yellow being the changes. We focus the pop modelling on 2000 to 2012, use AIC to select the best model to describe the data, and examine owl effects in multiple scenarios to asses the sensitivity in that decline. Much more robust than before. Gerry once this is done we can pass on to the ASSP listing folks. Then we make this into a pub.
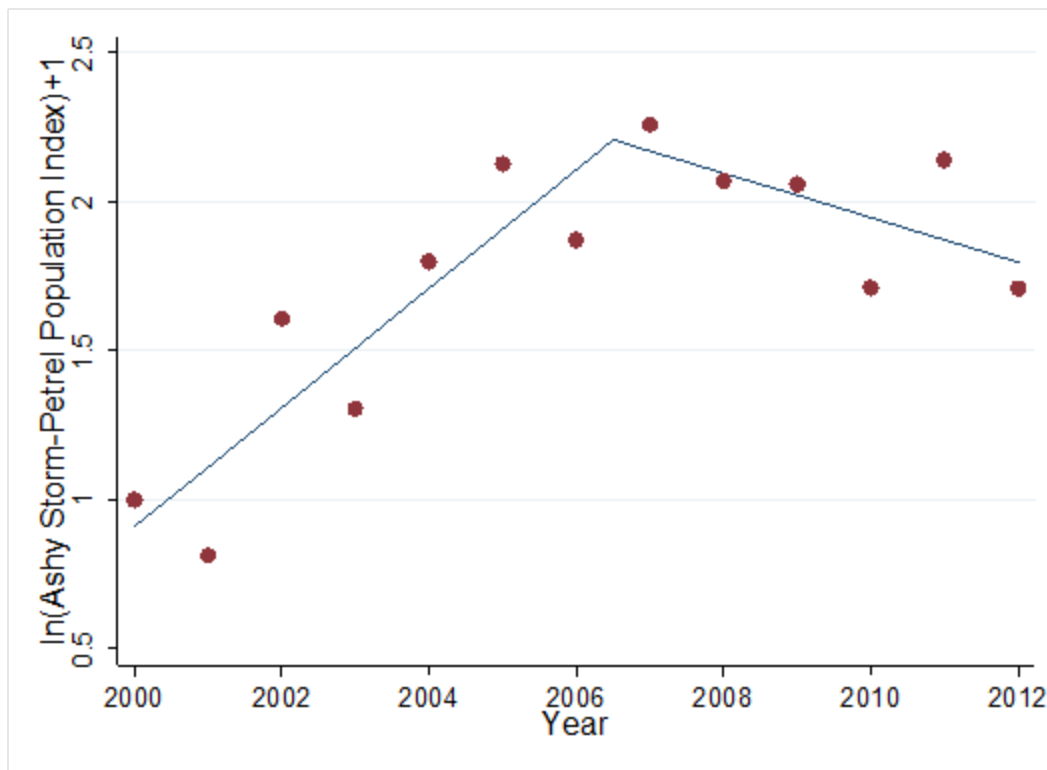
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Executive Summary

- This study provides quantitative estimates of the anticipated benefit to Ashy Storm-Petrels from proposed house mouse eradication on the South Farallon Islands.

- The objective of this study was to examine the ecological relationships between Farallon House Mouse abundance, Burrowing Owl abundance, Ashy Storm-Petrel predation by Burrowing Owls, and Ashy Storm-Petrel annual survival.

- Indices of House Mouse abundance, Burrowing Owl abundance, and Ashy Storm-Petrel predation by owls each showed a clear and distinctive seasonal pattern. Owls arrive at the island in the fall when mice are abundant. The owls then switch to preying upon storm-petrels after the mouse population crashes in December and January. There is a sharp peak observed in predation on Ashy Storm-Petrels by Burrowing Owls in February and March, during storm-petrel pre-breeding attendance

- On a monthly basis, owl predation on storm-petrels is strongly positively related to Burrowing Owl abundance and strongly negatively related to House Mouse abundance, reflecting the fact that mice are the primary prey and Ashy Storm-Petrels the secondary prey.

- Burrowing Owl abundance and predation on storm-petrels have increased in recent years, with especially high levels of both parameters in recent years. Annual variation in owl abundance and predation on storm-petrels are highly positively and significantly correlated.

- In assessing recent storm-petrel population index trends from 2000 to 2012, we evaluated twelve different models to determine the best parameterization

describing the change in population index over time, as determined by AIC. The preferred model was a two part linear spline with a change point between 2006 and 2007.This break is consistent with the observed increase in Burrowing Owl numbers. Prior to the change point, the storm-petrel population index had increased significantly (p<0.001). After the change point there was a significant change in trend (p=0.002), with a linear decrease in population (p=0.095).

- As the negative linear population trend of 7.19% annual decrease ("Observed Steep Decline" scenario) was not statistically significant, we also assessed the sensitivity of this result by examining recent annual declines of one and two standard error values above the 7.19% decline – a "Moderate Decline" scenario of 3.36% annual decline , and a "Near Stable" scenario of 0.63% annual increase. We used these scenarios in all future population modeling, to encompass the upper 95% confidence interval of the recent trend.

- Capture-recapture analyses reveal a strong and significant effect of Burrowing Owl abundance on annual Ashy Storm-Petrel adult survival. Results of the survival analysis indicates that a 50% reduction in owl abundance can be expected to reduce overall annual mortality by 27%.

- We estimate the change in population trend of Ashy Storm-Petrels as a result of anticipated reductions in Burrowing Owl predation on SEFI, using a population-dynamic model. A 50% reduction in Burrowing Owl abundance can be expected to change population growth rates by 2.3-3.9% depending on whether we assume the near stable or observed steep decline scenario, with the moderate decline scenario values in between. This corresponds to changing a population which is declining (7.19% annual decline to 0.63% annual increase across all scenarios) to more stable (3.26% annual decline to 2.90% annual increase across all scenarios). With a 71.5% reduction in the Burrowing Owl abundance index, population growth rates change by 3.1-5.3%, depending on the scenario. This greater reduction results in larger population benefits for storm-petrels (1.88% annual decline to 3.69% annual increase across all scenarios).

- In summary, reduction in Burrowing Owl abundance has strong positive population impacts in all scenarios examined. Under the "Observed Steep Decline" scenario, rates of decline are drastically reduced, under the "Moderate Decline" scenario the population trends change from moderate decline to stable or slight annual increase, and under the "near stable" scenario rates of annual population change from a very weak increase with owl reduction to a strong increase, a five-fold increase in the net population growth rate.

- Reducing Burrowing Owl abundance, through elimination of their house mouse prey, will have a long term, substantial and significant effect in reducing overall Ashy Storm-Petrel mortality and promoting stable or increasing future population trends.

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