

Population Viability of Western Gulls

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A proposed invasive house mouse eradication project on the Farallon National Wildlife Refuge has identified western gulls as a species at risk of non-target mortality.

Using Point Blue's long-term datasets, we conducted a population viability analysis (PVA) to model future trends for this population in the absence of an eradication project. We first classified future environmental conditions as: "optimistic", "realistic" and "pessimistic" based on long-term average productivity and differing frequencies of breeding failure associated with environmental conditions. We determined population trends under each scenario.

Under "optimistic" environmental conditions, the population would grow by 10.6% after 20 years; decline by 8.7% under

"realistic" conditions; and decline by 27% under the "pessimistic" scenario.

We then assessed the potential impacts of the proposed eradication project by re-running the PVA with varying levels of project-related gull mortality. This was done in order to determine the maximum level of mortality associated with an eradication that would yield population trends ecologically indistinguishable from trends in the absence of the eradication project ($\geq 95\%$ overlap in expected outcomes after 20 years).

The models suggest that a mortality event of less than 1,700 western gulls would be unlikely to alter projected population trends under any environmental conditions. We acknowledge uncertainty associated with this modeling exercise and

recommend against using the results as an absolute threshold but suggest that the results be used to help inform an ecologically responsible eradication effort. (Figure page 2)

Main Points

Gull trends are dependent on environmental conditions and likelihood of breeding failure.

Population will decline by 8.7% over 20 years if current environmental conditions persist.

Additional eradication related mortality up to 1,700 gulls would not significantly alter existing trends.

Nur, N., R.W. Bradley, D.E. Lee, P. Warzybok, and J. Jahncke. 2012. Population Viability Analysis of Western Gulls on the Farallon Islands in Relation to Potential Mortality Due to Proposed House Mouse Eradication. Unpublished report to USFWS.

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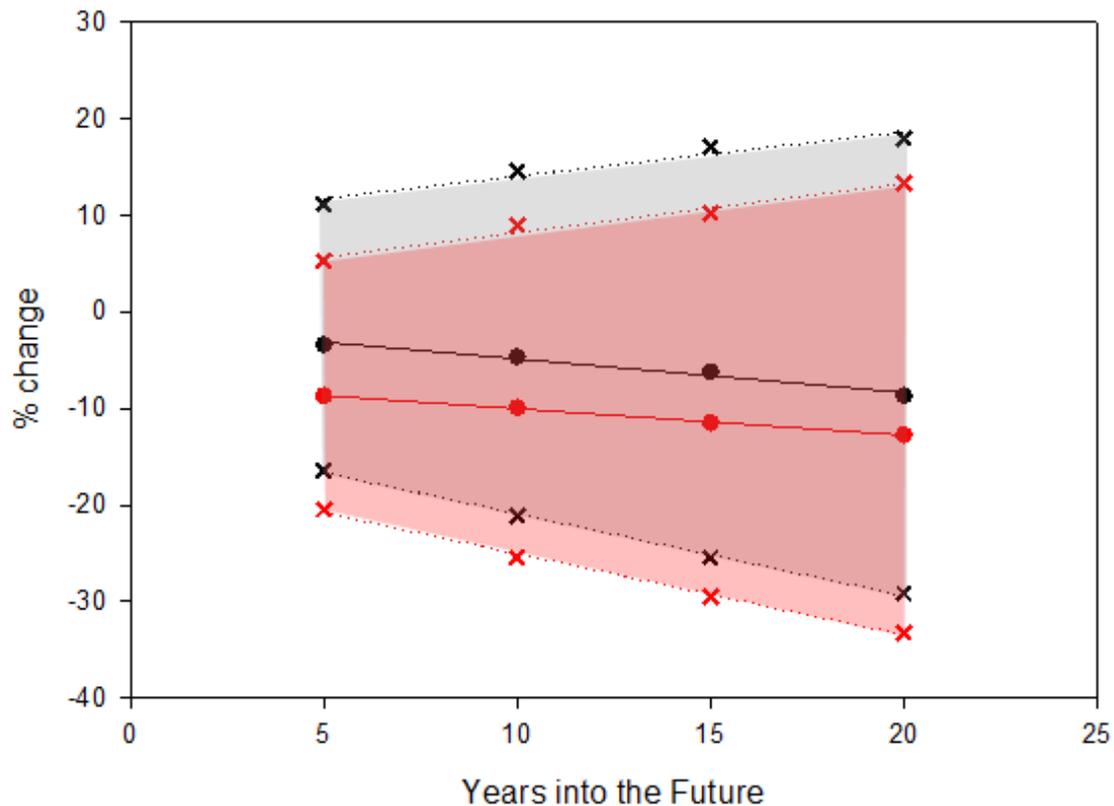


Figure 1. Estimated percent change in the Farallon Western Gull population over 20 years, assuming “Realistic” conditions (re-occurrence of near-failure years at historic frequency of, on average, 3 times per 26 years), with (red) and without eradication-associated mortality (black). Shown are the 25th percentile, 50th percentile (solid regression line and circles), and 75th percentile outcomes. Assumes a starting population of 32,200 birds. Mortality scenario removes 1700 birds in year 0.

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