

**From:** [Russell Bradley](#)  
**To:** [Grant, Colin](#)  
**Subject:** RE: overwintering burrowing owls.  
**Date:** Wednesday, December 12, 2012 10:20:56 AM

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Colin

The excerpted text below is from the following report

Russ

Nur, N., R. Bradley, P. Warzybok, and J. Jahncke 2012. Statistical Power Analyses to Detect Ecosystem Responses to Removal of House Mice on Southeast Farallon Island.

Unpublished report to the Island Conservation. PRBO Conservation Science, Petaluma, California. PRBO Contribution Number 1851.

## **A. Burrowing Owl Stopover**

### **Background**

Between fall 2007 and fall 2010, minimum stopover duration (date last seen – date first seen + 1, calculated so that minimum stopover was 1 day) was assessed for banded Burrowing Owls. In some cases, these birds were followed with radiotelemetry, in other cases they were resighted on the basis of their unique band combinations. Almost all first sightings were in fall months (September-November) so we restricted our analyses to these samples (n=46). Three individuals were first seen in December-March but were not used in these analyses. It is not clear if these owls were late migrants or if they had failed to be detected during earlier surveys, therefore stopover duration could not be accurately calculated.

Median stopover was 36 days and the mean was 70.2 days. The sample of 46 owls used in the analysis consisted of 14 “stopovers” of 1 to 4 days, and 32 that were 9 days or greater (up to 213 days). We therefore divided all stopovers into “short” (<7 days) and “long” (≥ 7 days). The statistical power analysis was carried on the proportion of long stopovers, which was = 0.696 for the sample of 46 stopovers. The only statistical parameters needed for the power analysis of a proportion is  $p$  (in this case, proportion of long stopovers) and  $n$ , the sample size (Fleiss 1981). Variance is strictly determined by  $p$  and  $n$ , and so is not a separate component of the power calculations.

We also carried out analysis adding stopover data currently being collected for 2011/2012 (n = 9 banded individuals; no telemetry) and anticipated data for 2012/2013. We assumed that in fall 2012, effort would be comparable to fall 2007

through fall 2010, during which data were gathered on 46 stopovers by 43 individuals over the four years. We assumed 11 stopovers could be assessed in fall 2012 for the 2012/2013 year. Thus under the second scenario, which adds two additional years, we assumed  $n = 66$  ( $46 + 9 + 11$ ) for the period fall 2007 through fall 2012.

## Results

Using data only through 2010/2011, a sample size of 31 individual owls is required to detect a 50% decrease in the proportion of long stays, about 2 years' worth at current levels of effort. To detect a 40% decrease in this proportion would require a sample size of 72, about 5 years' of data collection. It is not possible to detect a change of 30% or less in the proportion of long stays (Table 4).

If we add in additional data from the 2011/2012 season and anticipated data from the 2012/2013 season (i.e., pre-eradication sample size  $n = 66$ ), then the sample size post-eradication drops noticeably to only 26, assuming a 50% decrease in proportion of long stays, and a sample size of 49 assuming a 40% decrease in the proportion of long stays (Table 4). The latter sample size could be attained in 4 years, or even, possibly 3 years. Under this scenario, a 30% change in proportion of owls staying for long durations on the island requires a sample size of 174, which would presumably take at least 10 years to attain, even with high effort. In recent years, approximately 20 individual Burrowing Owls have been detected visiting the island per year, but only a fraction of these are captured. The shorter the true stopover duration, the more difficult it would be to catch and band and, possibly, radio mark these individuals.

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**From:** Grant, Colin [mailto:colin\_grant@fws.gov]  
**Sent:** Wednesday, December 12, 2012 9:34 AM  
**To:** Russell Bradley  
**Subject:** overwintering burrowing owls.

Hi Russ,

I was unable to find any data in the Nur. 2012 report that would update the statement below. Found a lot of average maximum abundance, but nothing that I could use to confirm this. Is this statement still accurate.

Burrowing owls do not breed on Southeast Farallon Island, but are regular fall migrants, and *a few individuals (two to five per year, on average) overwinter* at the island (DeSante and Ainley 1980, p. 30; Service 2008, p. 50).

Thanks

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