2012: Record breeding shearwater count at the Freeman Seabird Preserve

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We briefly report on the ongoing monitoring and revegetation program at the Freeman Seabird Preserve, and provide updates on the findings from the 2012 breeding season and the plans for future monitoring, habitat restoration, and predator control at the colony.

2012 Update

This year we documented a new record number of Wedge-tailed Shearwaters (*Puffinus pacificus,* 'Ua'u kani) nesting at the Freeman Seabird Preserve. The yearly July 14 colony-wide census yielded 176 nests, substantially higher than previous counts in 2009 (106), 2010 (78) and 2011 (123). This record incubation nest count was followed by the highest post-hatching count of 162 nests in September 14, underscoring the increase in the number of active nests at the colony.

A downy 2.5 month-old Wedge-tailed Shearwater chick being weighed as part of the weekly colony monitoring (Photo courtesy of Youngren & Rapp).

The demographic monitoring also revealed that 2012 was characterized by average conditions, similar to those documented in previous years (Hyrenbach 2011). Chick hatching dates spanned from July 31 to August 27, with a mean of August 14. When compared with the three previous years, hatching dates were significantly delayed in 2010 (Fig. 1A). There was a significant difference amongst years (One-way ANOVA, $F = 12.028$, $df = 3, 102$, $p < 0.001$), with post-hoc Tukey tests revealing that hatching occurred later in 2010 than in the other years (2009, 2011, 2012). Peak chick masses also varied from year to year (Fig. 1B) (One-way ANOVA, $F = 12.252$, $df = 3, 80$, $p < 0.001$), with post-hoc Tukey tests revealing that they were higher in 2011 than during the other years (2009, 2010, 2012).

In summary, these results suggest that 2012 was a "normal" year, with average phenology and chick provisioning, in the context of the last four years (2009 – 2012) (Fig. 1). Yet, the time series of weekly chick masses suggest that 2012 was a year of large contrasts (Fig. 2). There was substantial individual-level variability in chick provisioning, with the lowest (240 grams) and the highest (600 grams) peak masses recorded to date. Furthermore, the monitoring revealed high temporal variability, with periods of mass gain and loss spanning from mid September to mid November. Together, these results suggest that some shearwater parents were having difficulties provisioning their chicks during the latter part of the season.

Overall, 2012 was a year of very high chick productivity at the reserve, with the monitoring data revealing 92.2% and 90.3% hatching and fledging success, respectively. There was no evidence of predation, from either the monitoring of nests via cameras or visual checks. Thus, despite the suggestion of poor foraging during the late breeding season, the synergy of "normal" oceanographic conditions, that supported average breeding phenology and provisioning rates, and "good" conditions at the colony, with little loss of eggs and chicks, resulted in a year of high chick productivity.

Ongoing Efforts

This number of breeding shearwaters at the preserve is expected to continue to increase in the future, spurred by the habitat restoration and the ongoing predator control. In particular, given that wedge-tailed shearwaters start returning to the colony at four years of age (Whittow 1997), the chicks fledged in the years after the creation of the preserve are expected to start recruiting during the next breeding season (2013-14). To accommodate this enhanced influx of chicks in the next few years, three ongoing efforts will continue in 2013: habitat restoration, colony monitoring and predator control.

Habitat Restoration: From January through March 2013, while the birds were at sea, Hawai'i Audubon Society members and other volunteers worked to remove alien plant species from the preserve and to maintain wedge-tailed shearwater burrows and nesting sites. Weekly fieldwork opportunities attracted a wide variety of participants, ranging from wildlife conservationists and scientists, to gardening enthusiasts, neighbors and young student groups. Theses efforts support the work done in 2011 and 2012 by professional native plant landscapers from Hui Ku Maoli Ola, who transformed a vacant house-lot into a unique example of pre-contact Hawaiian dryland coastal habitat with multiple shearwater nesting sites. Repeat volunteers have found it extremely satisfying to

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witness, and contribute to, the resurgence of native Hawaiian coastal plants at the Freeman Seabird Preserve.

Colony monitoring: Population censusing and nest monitoring for phenology, chick growth and reproductive success will continue in 2013, starting with a colony-wide survey in July 14. These data will add to the ongoing time series started in 2009 (Fig. 1).

Predator Control: Rat-bait stations have been maintained at the site since 2008, augmented by infrared cameras managed by Pacific Rim Conservation (Young et al. 2012). Rodent control using bait stations in place from late March through early December 2012 appeared to be effective at reducing predation on nesting wedge-tailed shearwaters in the Preserve. While no cat predation was observed, the frequency of domestic cat visitation, as recorded by remote infrared cameras, continues to be a potential threat to the shearwater colony. (Young and VanderWerf 2012). Planning is in process for ongoing predator control during the 2013 nesting season at Freeman Seabird Preserve.

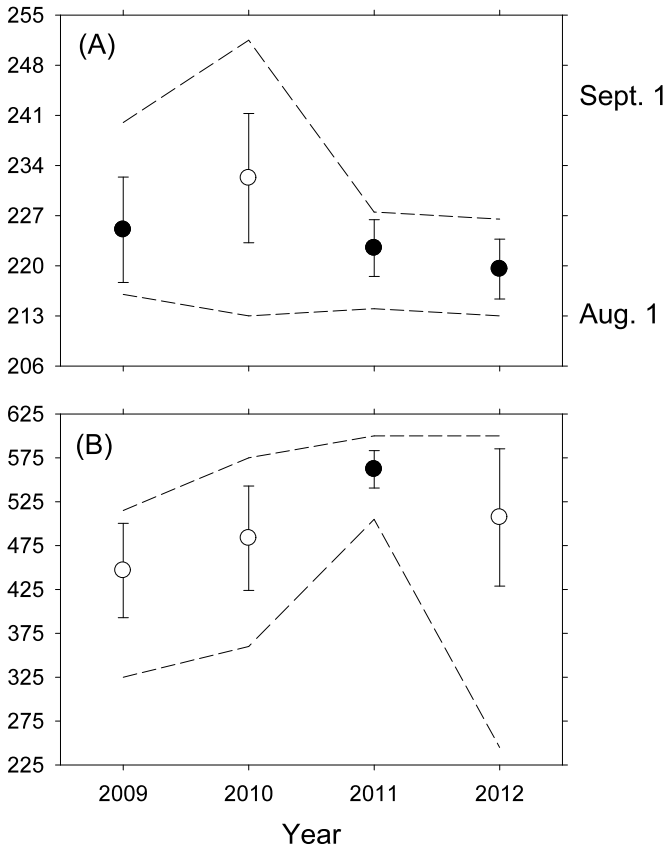

Figure 1. Time series of hatching dates (A) and peak chick masses (B) during four breeding seasons, showing the mean +/- SD (circles and error bars) and the range of values (hatched lines). The filled circles (black) denote significantly different years of delayed hatching (2010) and higher chick provisioning (2011).

Literature Cited

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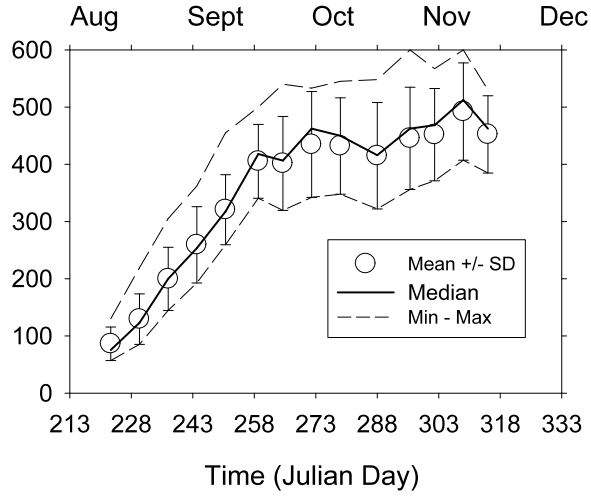

Figure 2. Time series of chick masses collected during the 2012 breeding season, showing the mean +/- SD, median and range of values (maximum – minimum). Sample size = 26 chicks.

Sunset and Shearwaters: Volunteer Appreciation Night!

Saturday, March 16th from 5pm-Sunset

We want to say MAHALO NUI to all of our current (and future) volunteers at the Freeman Seabird Preserve for all of their hard work restoring native habitat to prepare for the Wedge-tailed Shearwaters to return to at the end of March.

Join us for a potluck and BYOB at the Freeman Seabird Preserve at Black Point. RSVP to hiaudsoc@pixi.com or call 808-528-1432.