Finances and Fundraising

As the Society has slowly grown over the years the number of tasks needed to be accomplished began to outpace the time and ability of our volunteers. Accordingly, more and more tasks are now done professionally, including office management, bookkeeping, and the distribution of our peer-reviewed journal and educational products. Office coordinator Thompson was hired in August to manage member services and edit the *`Elepaio*. However, volunteers and donors still provide essential leadership, assistance, and support to the Society. We currently derive the majority of our operating and programmatic funding from membership dues, generous gifts, and sales of our educational products. These include our incomparable handbook *Hawaii's Birds* and its audio companion *Voices of Hawaii's Birds* (2 vol. CD), *Treasurers of O'ahu* birding & family hiking map, *Hawaii's Rare & Endangered Birds* Art Collection greeting cards illustrated by Patrick Ching (pkg of 8), Van Zyle Nene lithograph print, ‘Elepaio patches, check lists of the birds of Hawaii, Micronesia, and the Mariana Islands, a field check card, and `Elepaio, Kolea & Ruddy Turnstone "Akekeke" T shirts.

In August the Society held its Third Annual Shearwater Soiree, which included a presentation by Dr David Hyrenbach on the Wedge-tailed Shearwater monitoring program at the Freeman Preserve, a potluck dinner and silent auction. It generated not only a good time for the participants, but funds to support the conservation work of the Society. We also received many generous donations and matching gifts from our members and benefactors.

Grants

Funding for enhanced research, public awareness and education activities at the Freeman Seabird Preserve was received in September of 2013 from the Disney Worldwide Conservation Fund, for work that took place during 2014. The project included the creation of an informational website (www.freemanseabirdpreserve.com) featuring the conservation history of the site, including data and images of the Shearwaters and native plants, as well as lesson plans for teachers based on the research and monitoring data generated at FSP. The grant also covered informational signage at the site and increased photographic/film monitoring of the Wedge-tailed Shearwater colony at Black Point.

The Society entered into a fiscal sponsorship agreement with the Kauai Forest Bird Recovery Project (KFBRP) in 2014. A pass-through grant from the Mohamed bin Zayed Species Conservation Fund (MBZ) was received by the Hawaii Audubon Society for the purpose of funding KFBRP research on the movements of the critically endangered Akikiki and Akekee within their forest habitats on Kauai. The prioritization and spatial targeting of conservation actions, like habitat restoration and fencing, will be impacted by the identification of specific areas critical to the birds for feeding and reproduction.

2014: Another Record Population Count at the Freeman Seabird Preserve During a Year of Average Breeding

By K. David Hyrenbach, Associate Professor of Oceanography, Hawai'i Pacific University, khyrenbach@hpu.edu

We briefly report on the ongoing restoration and research efforts of the Freeman Seabird Preserve by Hawai'i Audubon since 2009, provide updates on the findings from the 2014 breeding season, and briefly discuss the plans for future monitoring, habitat restoration, and predator control at the site.

2014 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 colony-wide census during the peak egg-incubation period (July 14) yielded 216 nests, 7% higher than the 2013 annual count. This record incubation nest count was followed by a post-hatching count of 129 nests (September 14).

Wedge-tailed Shearwater nesting in an artificial nest site with a ceramic tile roof. (Photo taken by David Hyrenbach, July 2014)

Altogether, the annual population counts continue to show a statistically significant trend ($F = 27.55$; $df = 1, 4$; $p = 0.006$) with an annual average increase of 27.5 (+/- 5.2 SD) nests per year, which captures 84% of the year-to-year variability in the time series (Fig. 1). While this trend suggests that the ongoing habitat restoration efforts continue to support a growing number of breeding Wedge-tailed Shearwaters, the low rate of annual increase observed in 2013 (10%) and 2014 (7%), suggests the colony may be reaching an asymptote (maximum size).

The demographic monitoring also revealed that 2014 was characterized by average conditions, similar to those documented in previous years. In 2014, chick hatching dates spanned from August 1 to 18, with a mean of August 7 (+/- 5.8 SD days). These hatching dates fell in line with those from the previous years (2009, 2011, 2012, 2013) except 2010, when the mean hatching date was delayed substantially (August 19 +/- 9.0 SD days). Chick peak masses were also comparable to those from recorded in the past. In 2014, chick peak masses ranged from 345 to 600 grams, with a mean of

507.1 grams (+/- 78.8 SD). Again, the value for 2014 fell in line with previous observations during "average" years (2010, 2012, 2013), and were above those during a year of poor provisioning (2009) and below those during a year of good provisioning (2011).

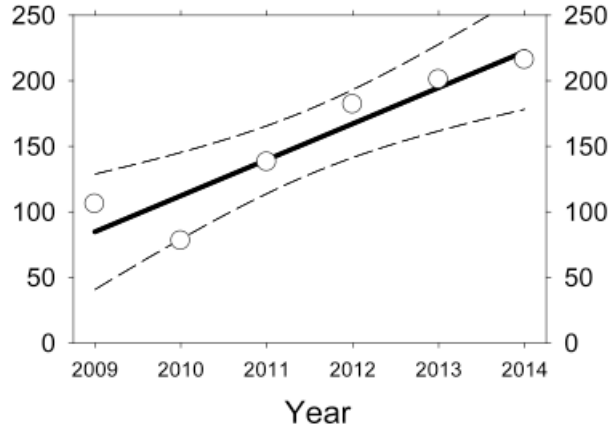

Figure 1. Trend in the number of Wedge-tailed Shearwater active nests at the Freeman Seabird Preserve, from the annual colony-wide census during the peak incubation period (July 14), showing the best-fit linear slope from linear regression (solid line) and the 95% confidence interval envelope (dashed line).

A more detailed investigation of the chicks' growth over time, through weekly monitoring, reinforced the notion that 2014 was a year of average provisioning. In spite of episodic periods of low trade winds in September and October, when chick body masses did not increase, parents continued to provision their chicks through early November, as evidenced by increasing body masses late in the breeding season (Fig. 2). This pattern contrasts with previous years, when chick masses declined by the end of the season (Hyrenbach 2011, Hyrenbach & Johnson, 2012).

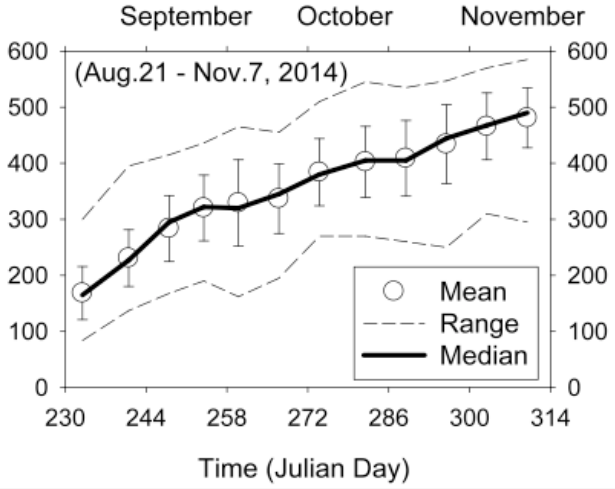

Figure 2. Time series of chick mass collected during the 2014 breeding season, showing the mean +/- SD, the median and the range of values (maximum – minimum). Sample size = 40 chicks.

In summary, these results suggest that 2014 was a year of average phenology and chick provisioning, in the context of the available time series (2009 – 2014). Thus, despite the warm-water conditions observed during the spring and summer, chick growth and productivity were not markedly lower in 2014. Unlike what occurred during the previous El Niño event in 2009 (Hyrenbach 2011), shearwater parents continued to provision their chicks through early November.

Currently, there is an approximately 50 - 60 % chance of an El Niño developing during the early spring of 2015, with neutral conditions being more likely thereafter (See NOAA Climate Prediction Center El Niño / Southern Oscillation Diagnostic Discussion,http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/). Based on these model predictions, we can anticipate that 2015 will be another "average" year for Wedge-tailed Shearwater breeding at the Freeman Seabird Preserve.

Ongoing Efforts

To investigate the carrying capacity of the Freeman Seabird Preserve, we characterized the type (natural or artificial) and the substrate (soil, boulders, vegetation) of every nest we observed during the egg-laying period (between June 2 and July 14). Of the 252 nests we documented, 93 (37%) and 159 (63%) were artificial and natural, respectively. The artificial nest sites involved "apartments" (rock piles, 21% of total) and "condos" (mounds of rock and soil, 16% of total). The natural nests sites involved birds nesting amidst lava boulders (44% of total), amidst the vegetation (17% of total), or underground in excavated burrows (2% of total). The high proportion of shearwaters nesting under lava boulders or native vegetation, suggests that the availability of nesting sites is not limiting the size of the breeding population.

Habitat restoration efforts continued during 2014. From January through March 2014, while the Wedge-tailed Shearwaters were at sea, Hawai'i Audubon Society members and other volunteers worked to remove alien plant species, to maintain natural nesting sites, and to create new artificial nesting sites. In particular, volunteers built 40 new "apartments" by digging burrows, reinforced with rocks and ceramic tile roofs.

Additional restoration and management efforts in 2015 will continue monitoring the colony and enhancing the breeding habitat at the Freeman Seabird Preserve.

Habitat Restoration: From January through March 2015 volunteers will remove alien plant species and will create new artificial nesting sites on the terrace.

Colony monitoring: Population censusing and nest monitoring for phenology, chick growth and reproductive success will continue in 2015, to augment the ongoing time series started in 2009.

Predator Control: Ongoing surveillance for predators is planned during the 2015 nesting season, to minimize and document cat predation on breeding shearwaters.

Literature Cited

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Hyrenbach, K.D., and Johnson, W. 2012. 2011: A Mixed Year at the Freeman Seabird Preserve. 'Elepaio 72(2): 13-14.