



# 'ELEPAIO

Journal of the  
Hawai'i Audubon Society

For the Protection of  
Hawai'i's Native Wildlife

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## State of the Society: Annual Report for 2018

By Linda M. B. Paul, President Hawaii Audubon Society

*Mission Statement: To foster community values that result in the protection and restoration of native wildlife and ecosystems and conservation of natural resources through education, science and advocacy in Hawai'i and the Pacific.*

The Hawaii Audubon Society celebrated its 79th year of operations in 2018. It was established in 1939 as a private charity by a small group of dedicated birders to further the protection and conservation of Hawai'i's native wildlife and the ecosystems that support it. It was incorporated in 1954 and was granted non-profit U.S.C.§501(c)(3) status by the U.S. Department of the Treasury in 1967. It became the Hawai'i state chapter of the National Audubon Society by contract in 1976, although it is independent of that organization in matters of governance, policy, financial control, budget, and programs.

### Society Governance

Programs, policies, and activities are guided by our Mission Statement and the purpose, organization, and procedures are set forth in our Constitution and By-laws. The Society is governed by a Board of Directors. In 2018, the Board included Officers President Linda Paul, First Vice President Elizabeth Kumabe, and Treasurer Anthony Leiggi, and Directors Alice Roberts, Rich Downs, Wendy Kuntz, Pat Moriyasu, and Kaily Wakefield. Wendy Johnson served as the Society's unpaid Executive Director. The Office and Communications Manager served as the Recording Secretary.

### Education and Outreach

The Society has a number of standing committees headed by Officers and Directors. In 2018, Linda Paul headed the Conservation Policy Committee and Wendy Johnson headed the Education Committee. The 'Elepaio and Field Activities Committees included all Board members. Committee membership is open to all members of the Society. (Please see [www.hawaii-audubon.org](http://www.hawaii-audubon.org) for more information.)

The 'Elepaio: Our peer-reviewed science journal focuses on research and conservation work in Hawai'i and the Pacific and provides educational outreach to the Society's membership and subscribers. In 2018, Rheanne Berg and subsequently Jennifer Stahl served as Managing Editor and Glenn Metzler as Scientific Editor. Six bi-monthly issues were published in 2018. The 'Elepaio can be received by members both electronically and by mail. Past issues have been indexed and digitized. The 'Elepaio article submission procedures are posted on our website. Scientific articles and notes in 2018 included 'Akeke'e (*Loxops caeruleirostris*) Foraging Techniques: Targeting psyllid nymphs in 'ōhi'a galls by Ann Tanimoto & Patrick J. Hart;

2017: Peak Colony Count During Another Year of Average Productivity and Provisioning at the Freeman Seabird Preserve by K. David Hyrenbach, and Wetland Conservation in Hawai'i and the Need for Flagship Species by Charles B. van Rees.

**[www.hawaii-audubon.org](http://www.hawaii-audubon.org)**: The Society's website provides a comprehensive source for up-to-date information on the Society and its activities. It includes electronic versions of the 'Elepaio, information on field trips, service projects, programs, meetings, volunteer opportunities, membership, birding in Hawai'i, an online store, a gallery of beautiful bird photos, and links to a number of related organizations and issues. Office Managers Rhea Berg and Jenny Stahl managed the Society's website and Facebook page, assisted by Director Wendy Kuntz.

### Wildlife and Ecosystem Conservation

**Kawainui-Hāmākua Marsh Complex:** In January 2018, the Society reviewed the Draft Environmental Impact Statement (DEIS) for DLNR's Kawainui-Hāmākua Master Plan Project and found that it did not meet the requirements of Hawai'i's Environmental Policy Act and submitted comments accordingly. Instead of a plan for the restoration of this severely degraded wetland ecosystem, the Project proposed that the last wild edges of Kaiwainui Marsh be developed for human use.

The Kawainui-Hāmākua Marsh Complex on windward O'ahu is the largest remaining wetland in Hawai'i and share international recognition as biosphere reserve sites under the auspices of UNESCO and as Wetlands of International Importance under the RAMSAR Convention. These wetlands are part of a single mountain-to-ocean ecosystem that has been degraded by upstream and downstream water diversions, pollution from an industrial park, ranching and stables, introduced alien species, and human over-use.

Society members have been working for decades for its protection, including advocating for state matching funds to construct habitat ponds for endangered waterbirds and migratory birds, the return of city-owned parts of the marsh complex to DLNR, and for a master plan that has as its primary focus comprehensive wetlands ecosystem restoration and habitat management in order to protect the four endangered Hawaiian waterbirds and several migratory waterbird species that live there. These birds and wetlands are protected by the Federal Endangered Species Act, the Federal Migratory Bird Treaty Act, the Federal Clean Water Act, the

Federal Coastal Zone Management Act, and their Hawai'i state law counterparts. The Society's position regarding any proposed development in the Marsh is:

(1) these wetlands should be closed to all visitors during the native wetland birds' nesting seasons; (2) no leasing or granting month-to-month permits to build on state land within 2000 feet of the wetlands should be allowed; (3) the Kapa'a Industrial Park should be relocated out of the Kawainui-Hāmākua complex watershed; and (4) the central peat mat should be removed and the historic natural water flow through the Complex should be restored.

**Freeman Seabird Preserve:** In September 2007, the Society was given a one-acre coastal property at Black Point on the southern coast of O'ahu thanks to an unprecedented gift from the Houghton Freeman Foundation. The Freeman Seabird Preserve is home to the island's only remaining south shore nesting colony of Wedge-tailed Shearwaters ('ua'u kani, *Puffinus pacificus*). With the valued guidance of experts and hundreds of volunteers over the years, this vacant residential property now supports over 24 native plants typical of Hawaiian coastal habitats before human disturbance and invasive species altered the natural landscape. (See 2018 Updates in the '*Elepaio* and [www.freemanseabirdpreserve.com](http://www.freemanseabirdpreserve.com).) Preserve volunteer work focused on the habitat restoration, scientific research, and educational components of the Society's conservation programs. Wedgies did not use the experimental ceramic nesting modules in the 2018 nesting season.

**The Pueo:** The State of Hawai'i has declared the Hawai'i's native Short-eared Owl or "Pueo" endangered on O'ahu due to extensive loss of habitat caused by urban development as well as mortality due to alien species predation, wind farms, and motor vehicle collisions. Board members have been monitoring the population status of the Pueo, which is deteriorating because of urban sprawl into its habitat on the 'Ewa plain. Pueo populations on the neighbor islands are also declining as indicated by the Society's Annual Christmas Bird Count. By how much and at what rate we don't yet know. Pueo are one of the least-studied endemic species and much more data is needed to inform management decisions.

In 2018, the Society submitted testimony in favor of Senate Bill 2078 for appropriation of funds for DLNR-DOFAW to conduct in collaboration with the University of Hawai'i College of Tropical Agriculture & Human Resources a two-year breeding ecology study and two-year foraging study on the Pueo so that informed decisions can be made that will prevent yet another of our endemic bird species from going extinct. Unfortunately, the bill did not pass.

**The Hawaiian Black-necked Stilts or "Ae'o" on Rim Island 2:** Ae'o numbers are less than 2000 individual breeding birds in the entire State. It was listed as endangered in 1967 and remains endangered largely because of the scarcity of predator-free wetland nesting habitat due to urban development. The last Five Year Review was completed on August 27, 2010. It did not recommend downlisting the species.

Rim Island 2 (RI-2) is a small, isolated island in the middle of the urban Hawai'i Kai Marina. Old maps indicate it was a bird sanctuary before the surrounding wetlands and Hawaiian fish pond were developed. During 1959-61, a developer dredged out and filled in the surrounding wetlands to build waterfront housing and

a marina. The island was reconfigured as "Rim Island 2" with a depression in the middle to be used as a dump site for dredge spoils. The depression quickly filled with water. A couple of years later, wetland birds returned to the island and the Ae'o began nesting there.

In 1996, the Hawai'i Kai Marina Community Association (HKMCA) partially filled in RI-2's internal lagoon with dredge spoils, but again the Ae'o returned to nest. Sometime after 2010, HKMCA began making plans to dredge the Marina again and deposit the spoils in RI-2's lagoon to fill it completely.

On July 29, 2017 the Society and the Concerned Citizens of Hawai'i sent a 60-day notice letter to the U.S. Fish & Wildlife Service (FWS), the U.S. Army Corps of Engineers (ACE), Honolulu District, the Environmental Protection Agency, the State of Hawai'i Department of Health (DOH), the State of Hawai'i Department of Land & Natural Resources (DLNR), the City & County of Honolulu, and the HKMCA notifying them of the intent to file suit pursuant to provisions of the Endangered Species Act, the Clean Water Act, and the Administrative Procedures Act to challenge the agencies' and HKMCA's failure to comply with all federal laws applicable to the depositing of dredge spoils onto the nesting habitat of an endangered bird on RI-2.

In January 2018, HKMCA began reconfiguring RI-2 again. The work continued even after Ae'o nesting began in mid-February. The Society complained to FWS and submitted a Freedom of Information Act request to FWS and ACE. The activity stopped, but resumed after the 2018 nesting season ended in August.

**Northwestern Hawaiian Islands Ecosystem Protection:** Linda Paul represents the Society and the broader conservation community on the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve Advisory Council (RAC) and has been its vice chair since 2004. The Papahānaumokuākea Marine National Monument was the result of an initiative to protect the NWHI begun by the Society in 1999. The RAC is strongly opposed to any executive action that would reduce or rescind the Marine National Monument created in 2006 and expanded in 2016. The Society continues to support the conversion of the Reserve into a Northwestern Hawaiian Islands National Marine Sanctuary as mandated by Executive Order 13178 when the Reserve was created by President Wm. J. Clinton. (For more information about the Monument and the Reserve, see [www.papahanaumokuakea.gov](http://www.papahanaumokuakea.gov))

**Conservation Advocacy:** In 2018, the Society signed on to or sent letters in support of the Migratory Bird Treaty Act, the FWS Draft Environmental Assessment and its Midway Seabird Protection Plan, and against proposed Endangered Species Act rule changes. The Society supports the objectives and preferred alternative for the eradication of mice from Midway Atoll. Midway Atoll is an important nesting site for the Black-footed and Laysan Albatross and the Society was alarmed when it heard about the injuries and mortalities being caused by invasive mice attacking nesting albatrosses.

In 2018, Conservation Committee Chair Linda Paul reviewed and monitored environmental bills and resolutions introduced in the Legislature related to the Society's mission statement. In addition to submitting testimony in support of Senate Bill 2078, the Society supported Senate Concurrent Resolution 146, which urged DLNR and DOH to take action to restore and preserve the Kawainui-

Hāmākua Marsh Complex and prepare a comprehensive wetlands ecosystem restoration plan, a detailed waterbird habitat restoration plan, and a comprehensive wetlands management plan to protect Hawai'i's four endangered waterbirds and visiting migratory waterbirds in the Marsh Complex. SCR 146 passed out of the committees, but was not scheduled for a floor vote so it went no further.

#### **Events, Field Excursions, Service Opportunities and Educational Programs**

**Christmas Bird Count:** The CBC is a census of birds performed annually in the early Northern-hemisphere winter by volunteer birdwatchers. The data is published on the National Audubon Society website. The Society, the state chapter of NAS, has been participating in the nation-wide CBC for several decades. The last Society CBC count of the 2017-2018 season was held on 1/5/2018.

**Freeman Seabird Preserve 2018 Fieldwork Season,** January - March, 2018. Through ongoing native plant and dryland forest restoration, predator control, and seabird nest monitoring, the Society is preserving a rare urban refuge for protected Wedge-tailed Shearwaters at Black Point on O'ahu. After documenting that breeding seabirds in this colony will readily use artificial nests, the Hawai'i Pacific University and the Society began a new partnership with the Ceramic Nest Program to improve and customize these nests. This year, new ceramic nests were installed at the Preserve with the help of students at Windward Community College. Habitat restoration activities continued with the maintenance of native plants and man-made nesting structures, and removal of invasive species, along with the annual accumulation of trash and debris from the coastline area. In 2018, approximately 133 volunteers contributed 1334 hours of service work. In mid-March, **Sunset and Shearwaters Volunteer Appreciation Night** was held to show our thanks to all of our steadfast volunteers.

**World Wetlands Day celebration in Hawai'i Kai,** 2/3/2018. Together with Livable Hawai'i Kai Hui and others, the Society co-sponsored the WWD event at the Hāwea Heiau Complex & Keawāwa Wetland. This year's theme was "Wetlands for a Sustainable Urban Future".

**White Tern (Manu-o-Kū) Walks, Honolulu, O'ahu,** 3/17/2018, 6/16/2018, 8/18/2018, and 10/20/2018. Rich Downs led the walks, followed by an orientation session on the White Tern citizen science program for those interested in learning how to monitor White Tern nests and submit reports on their observations.

**Presentations co-sponsored by the Hanauma Bay Nature Preserve and the Society in April:**

**Rebounding From the Edge of Destruction - A Successful Community Effort to Protect and Restore Our Last Fishponds.** 4/5/2018. Chris Cramer. Abstract: The inspiring story of an 11-year community effort to protect and restore Maunaloa's ancient ponds at Kalauha'iha'i Fishpond and Kānewai Spring.

**Endangered Waterbird Conservation at the Hawai'i Wildlife Ecology Lab.** 4/12/2018. Carmen Antaky & Kristen Harmon. Abstract: Sharp declines in waterbird populations in the Hawaiian Islands have occurred over the last 1100 years, since the arrival of humans. Species are threatened due to habitat loss, invasive predators, human impact, and climate change.

**Increasing Our Understanding of O'ahu's White Terns with Citizen Science.** 4/19/2018. Yvonne Chan & Rich Downs. Abstract: Introduction to the population of White Terns that breed on O'ahu and the citizen science activities underway that are focused on helping to better understand the unique relationship that exists between this seabird and the greater Honolulu area.

**Art & Science Collaborations Improve Nesting Habitat for Seabirds.** 4/26/2018. Michelle Hester. Abstract: Sharp declines in waterbird populations in the Hawaiian Islands have occurred over the last 1100 years, since the arrival of humans. Species are threatened due to habitat loss, invasive predators, human impact, and climate change.

**Paikō Lagoon Wildlife Sanctuary Farewell to Our Shorebirds,** 4/14/2018. Tour led by Alice Roberts. Society members and other interested participants explored the lagoon while learning about Hawai'i's visiting shorebirds. The highlight was seeing two adult Hawaiian Black-necked Stilts (*Himantopus mexicanus knudseni*) or Ae'o and their four chicks.

**White Tern Walks, in Waikīkī,** 4/28/2018 and 12/1/2018. Led by Rich Downs, these walks provided an orientation to the Official Bird of the City and County of Honolulu and showcased some of the White Tern nesting locations in Waikīkī.

**Manu o Kū Festival,** 5/12/2018. Held at the Honolulu Zoo. Featured: *It Takes a Hui: How citizen scientists, researchers, government staff, educators, wildlife groups, writers, photographers, tree trimmers, birders and others have come together to help Honolulu's White Terns*, by Susan Scott; *Honolulu's Seabird: Manu o Ku*, by Eric VanderWerf; and *CHICK DOWN! Manu o Ku Rescue & Rehabilitation*, by Keith Swindle and Rae Okawa.

**Marine Corps Base: Tour of the Red-footed Booby Colony,** 5/19/2018. Led by Todd Russel & Wendy Kuntz. Participants had a rare chance to view the colony, which is located on the seaward edge of an active training range on the Base, one of only two large booby colonies in the Main Hawaiian Islands. (The other colony is managed by the USFWS on Kauai.) About 2500 boobies rest or nest in the Ulupa'u Crater Wildlife Management Area.

**Just a Summertime Low Low Tide: Paikō Lagoon Wildlife Sanctuary,** 6/14/2018. Led by Alice Roberts. Participants learned about the many native plants at the waters' edge and saw the stay-behind shorebirds as well as a resident pair of Hawaiian Black-necked Stilts, year round 'Iwa, egrets, herons, and lots of urban birds & ducks.

**O'ahu Forest Birds Hike**, 8/25/2018. Tony Leiggi led the hike through the forest looking and listening for native and introduced birds.

**Sunset Walk on Maui's Coastal Boardwalk at Keālia Pond National Wildlife Refuge, Maui**, 9/6/2018. Led by Yolanda Solorio. The tour explained why Keālia Pond NWR exists and what birds and other wildlife are benefiting from its protection. In addition to waterbirds, Pacific Golden-Plovers were observed.

**Welcome Home to Our Shorebirds: Paikō Lagoon**, 9/8/2018. Alice Roberts led a walk to look for wintering shorebirds recently returned to Hawai'i from their nesting grounds across the Pacific.

**Birds of Kapi'olani Park Walk**, 9/15/2018. Keith Swindle led a walk through the Park to discover a wide variety of urban birds that call Kapi'olani Park home.

**White Tern (Manu-o-Kū) Walk University of Hawai'i, Mānoa**, 9/3/2018. Rich Downs co-led the walk with the curator of the University of Hawai'i Campus Arboretum. The walk focused on White Terns breeding on the UH campus and the trees they nest in.

**Palehua Palikea Trail Hike**, 10/27/2018. Led by Lynnette Williams, participants saw and heard 'Elepaio, 'Amakihi, and 'Apapane on the 1.7 mile scenic hike up to the top of the Wai'anae range at Pu'u Palikea. Located in the Honouliuli Preserve the trail provides views of O'ahu's west coast overlooking Nānākuli and Wai'anae.

**Kona Coast Pelagic Bird Boat Trip**, 10/27/2018. Led by Lance Tanino, participants went on an 8-hour open ocean trip in search of seabirds and marine mammals off the Kona coast on a 46-foot boat, with some pelagic fish trolling also accomplished. Another trip was held on 12/29/2018.

**World Migratory Bird Day**, 11/3/2018. The Society and the U.S. Fish & Wildlife Service co-hosted the World Migratory Bird Day at James Campbell National Wildlife Refuge. Following habitat cleanup and restoration in the morning, which included invasive plant removal and out-planting, an informal discussion on migratory bird research was led by former Society President Dr. Phil Bruner.

**Beginning Birding**, 11/17/2018. Led by Madison Furlong, members of the public learned basic birding techniques to prepare for future birding excursions and for participation in the annual Christmas Bird Count where data is collected for the national bird population census.

**HAS Annual Member Meeting & Member Dinner**, 11/28/2018. Held at the Waikiki Yacht Club, members and guests enjoyed a delicious buffet meal followed by the presentation of awards to individuals who made exceptional contributions to the preservation of Hawai'i's wildlife and its habitat during 2018. Author Susan Scott gave a presentation on the unique life history of Hawai'i's White Tern, the writing of her latest book, *Hawai'i's White Tern, Manu-o-Ku, An Urban Seabird*, and described how

citizen scientists, researchers, government staff, educators, wildlife groups, writers, photographers, tree trimmers, birders, and others have come together to help Honolulu's White Terns, followed by a book signing.

**119th Annual Christmas Bird Count Citizen Science Opportunity**, 12/15/2018-1/5/2019. Society members and friends participated in the longest running citizen science survey in the world, which provides critical data on bird population trends. Society members and volunteers counted birds within historic circles in Honolulu, Volcano, North Kona, Waipi'o, and Hilo on Hawai'i Island, Lāna'i Boat Harbor, Hana Circle in Koki Beach State Park and 'Iao Circle (Keālia Coastal Boardwalk) and Hosmer Grove on Maui, and Kualapu'u on Moloka'i. Results were submitted to the National Audubon Society database and can be viewed on the NAS website.

### Society Awards and Grants

The Society's 2018 Winter/Spring Student Research Grant went to Sarah Donahue to support her project *Gifts from the Sky: diet and trophic position of provisioning white terns (Gygis alba, Manu o Kū) on Oahu, Hawaii*. The Fall Student Research Grant went to Carly Anderson Stewart for her project *Expedition Hawaii: Answering Major Questions about Cladonia Lichens in the Hawaiian Archipelago*.

At the 2018 Annual dinner the President's Award, which honors public leaders in conservation, went to Governor David Y. Ige for his "Sustainable Hawai'i Initiative". His award was accepted by Suzanne Case, Chair of the Board of Land & Natural Resources. Civil Beat reporters Nathan and Alana Eagle were presented with the Environmental Journalism Award. Volunteer Service Awards were given to Pat Moriyasu and Robynn Yim.

### Finances and Fundraising

The Society currently derives the majority of its operating and programmatic funding from membership dues, generous gifts, and sales of its educational products, which include the indispensable book *Hawaii's Birds* and its audio companion *Voices of Hawaii's Birds* (2 vol. CD). In 2018, work continued on the 7th Edition of *Hawaii's Birds* with the goal of publishing it in 2019, the 80th Anniversary of the Society.

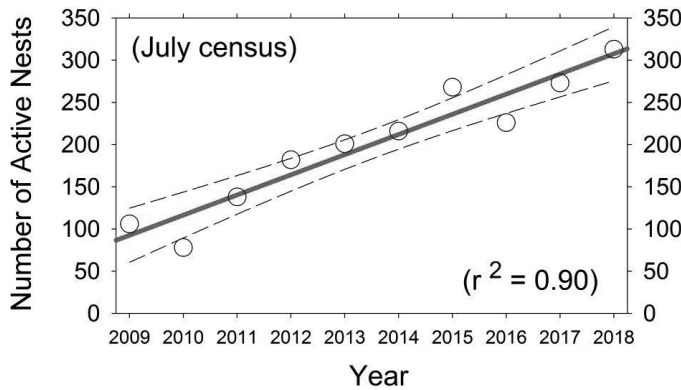
In 2018, Susan Scott published her beautiful new book *Hawai'i's White Tern Manu-o-Kū, an Urban Seabird*. Susan is generously donating the book's royalties to the Society. Susan's *Hawaii's White Tern* book as well as her *Hawai'i's Kōlea* book can be purchased online from the Society. Also on sale is the Society's book: *Hawaii's Birds*, as well as *Treasures of O'ahu*, a birding & family hiking map, *Hawaii's Rare & Endangered Birds* Art Collection greeting cards illustrated by Patrick Ching (pkg of 8), 'Elepaio patches, check-lists of the birds of Hawai'i, Micronesia, and the Mariana Islands, a field card, and 'Elepaio, Kōlea and Ruddy Turnstone "'Akekeke" T-shirts.

The Society also depends on the many generous donations and matching gifts from our members and benefactors. Most of the donations go directly to the Society's species conservation and ecosystem protection funds, which focus on native species research and protection, native habitat restoration, and conservation education.

# 2018: Peak Colony Count During Another Year of Average Productivity and Provisioning at the Freeman Seabird Preserve

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

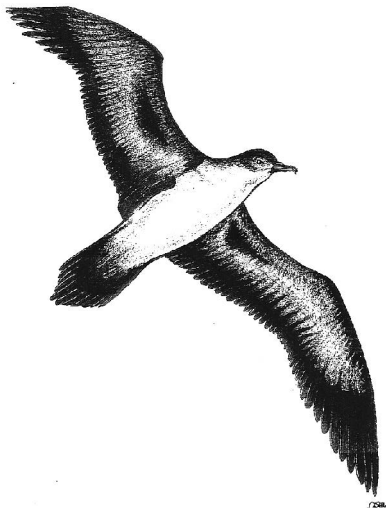
Upon reaching the 10th year anniversary of Wedge-tailed Shearwater (*Ardenna pacifica*, 'Ua'u kani) monitoring at the Freeman Seabird Preserve, we report on the ongoing efforts by Hawai'i Audubon since 2009, provide updates on the findings from the 2018 breeding season, and briefly discuss the plans for future monitoring, habitat restoration, and predator control at the site. The main take-home message is that, despite year-to-year changes in oceanographic conditions, the colony continues to grow (Fig. 1).



**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 slope from linear regression (solid line) and the 95% confidence interval envelope (dashed line).

## 2018 Update

This year we documented 313 active nests of Wedge-tailed Shearwaters at the Freeman Seabird Preserve, 15 % higher than the count of 273 nests in 2017 (Hyrenbach 2018). In fact, this is the highest count to date, over the last ten years (Fig. 1).

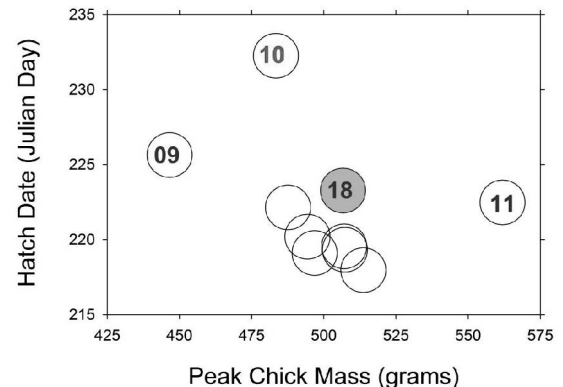


Wedge-tailed Shearwater  
By Ron Walker

Overall, the annual population surveys continue to show a statistically significant trend ( $F = 84.0860$ ;  $df = 1, 8$ ;  $p < 0.0001$ ) with an average increase of 23.9 (+/- 8.2 S.D.) nests per year, which captures 90 % of the year-to-year variability in the time series. Thus, despite the decrease in the number of active nests after the 2014-15 El Niño event, the population counts increased in 2017 and 2018, and the overall trend for the colony has not changed.

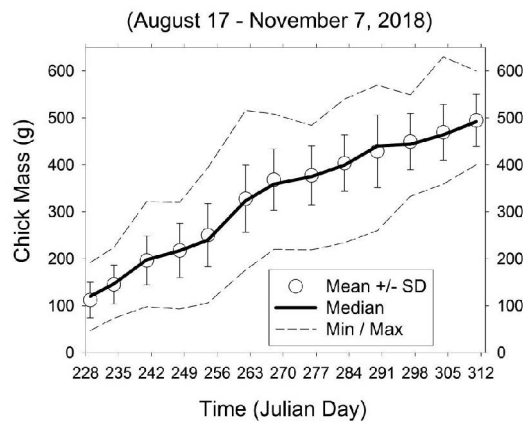
The July 14 count of 313 nests was followed by a count of 240 nests, after the peak hatching period (September 14). This decline represents a loss of 23.3 % of the nests during the two-month period spanning hatching and the first month of the chick's life. Furthermore, the weekly monitoring of 54 nests between July and November revealed that 2018 was characterized by low egg loss, with 16.7 % of the monitored eggs being lost. Furthermore, chick mortality was very low in 2018, with only 4.4 % of the monitored chicks being lost.

The colony monitoring also revealed that 2018 was characterized by slightly delayed phenology, with chick hatching dates spanning from August 1 to September 1, and a mean hatching date of August 11 (+/- 5.8 S.D. days). These hatching dates fell in line with those from previous years, except 2010, when the mean hatching date was delayed substantially (August 19 +/- 9.0 S.D. days). Chick peak masses were also comparable to those recorded in the past. In 2018, they ranged from 400 to 630 grams, with a mean of 506.7 (+/- 53.7 S.D. grams). The 2018 mean value fell in line with observations during average years, and below those during a year of exceptional provisioning (2011) (Fig. 2).



**Figure 2.** Mean yearly hatch date and peak mass for Wedge-tailed Shearwater chicks at the Freeman Seabird Preserve, spanning from 2009 to 2018. Three reference years (2009, 2010, 2011) are labelled, and 2018 is highlighted with a filled symbol.

Furthermore, weekly monitoring of the chicks' growth suggests that parents provisioned their chicks through the beginning of November 2018, as evidenced by increasing body masses late in the breeding season (Fig. 3). This pattern mirrors the findings from previous years of poor provisioning (2009-2010 and 2014-15), when chicks attained their peak masses late in the season, in late October or early November (Hyrenbach 2015, 2016).



**Figure 3.** Time series of chick mass collected during the 2018 breeding season, showing the mean +/- S.D., the median and the range of values (maximum – minimum). Sample size = 39 chicks.

Overall, the monitoring data suggest that, in the context of the available time series (2009 – 2018), 2018 was a year of low egg losses and low chick losses, and with slightly delayed phenology and average chick provisioning.



**Photo Caption:** Partners from Hawaii Audubon Society, Oikonos Ecosystem Knowledge, Hawaii Pacific University and Windward Community College installed ten artificial ceramic nest modules at the Freeman Seabird Preserve in May 2018.  
Photo Credit: David Hyrenbach

The El Niño conditions currently underway are expected to strengthen, and to continue until the spring (April – May – June) of 2019 (See the International Research Institute for Climate and Society ENSO forecast available at: <https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/>). Based on these model predictions, we can anticipate that 2019 will be another year of “average” to “poor” Wedge-tailed Shearwater breeding at the Freeman Seabird Preserve.

Altogether, the findings from 2016 - 2018 underscore the continued growth of the colony, during a period of average breeding conditions, since the end of the 2015 -16 El Niño (Hyrenbach 2016, 2017).

### Ongoing Efforts

Habitat restoration efforts continued during 2018. From January through March, while the Wedge-tailed Shearwaters were at sea, Hawaii Audubon Society members and other volunteers worked to remove alien plant species, to maintain natural nesting sites, and to create new artificial nesting sites. Additional restoration efforts in 2018 involved the installation and monitoring of 10 artificial ceramic nest modules with motion-activated cameras and temperature loggers, through a grant from the Disney Research Foundation. While the nests were not occupied by breeding shearwaters in the 2018 breeding season, we will continue to monitor these artificial nest sites for occupancy starting in March of 2019.

**Habitat Restoration:** From January through March, volunteers will remove introduced plants and will create new artificial nesting sites on the terrace. Additionally, we will install five more artificial ceramic nest modules before the shearwaters return in March 2019.

**Colony Monitoring:** Population censusing and nest monitoring for phenology, chick growth and reproductive success will continue in 2019, to augment the ongoing time series started in 2009.

**Predator Control:** Ongoing surveillance for predators is planned during the 2019 nesting season, to minimize and document predation by rats, cats and mongooses on breeding shearwaters.

### Literature Cited

- Hyrenbach, K.D. 2016. 2015: Another Record Population Count at the Freeman Seabird Preserve During a Year of Low Productivity. ‘Elepaio 76(2): 13-14.
- Hyrenbach, K.D. 2017. 2016: A Year of Average Productivity and Provisioning at the Freeman Seabird Preserve. ‘Elepaio 77(2): 13-14.
- Hyrenbach, K.D. 2018. 2017: Peak Colony Count During Another Year of Average Productivity and Provisioning at the Freeman Seabird Preserve. ‘Elepaio 78(2): 12-13.

### Looking for Applications!

#### NEXT DEADLINE:

**April 1<sup>st</sup>, 2019 for Summer/Fall grants**

Learn more about our Student Research Grants at  
[www.hawaiiaudubon.org/programs](http://www.hawaiiaudubon.org/programs)

## Hawaii Audubon Society Membership/Donation Form

The mission of the Hawaii Audubon Society (HAS) is to foster community values that result in the protection and restoration of native ecosystems and conservation of natural resources through education, science and advocacy in Hawai'i and the Pacific. Founded in 1939, HAS is an independent non-profit 501(c)(3) organization and does not receive dues paid to the National Audubon Society.

Thank you for supporting your local Hawaii Audubon Society.

☐ \$25 Hawaii Audubon Society Regular Member

☐ \$15 Hawaii Audubon Society Student Member

☐ \$40 Hawaii Audubon Society Family Membership

☐ \$100 Hawaii Audubon Society Supporting Member

☐ \$\_\_\_\_\_ Donation

Donations are tax-deductible and greatly appreciated.

International Membership:

☐ \$28 Canada & Mexico

☐ \$33 Other

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

☐ Email me the 'Elepaio    ☐ Mail me the 'Elepaio    ☐ Email me volunteer opportunities, updates, & field trips.

Please make checks payable to **Hawaii Audubon Society**.

Mail form and payment to Hawaii Audubon Society, 850 Richards St, Suite 505, Honolulu, HI 96813.

Phone: (808) 528-1432, Email: [hiaudsoc@gmail.com](mailto:hiaudsoc@gmail.com), [hawaiiiaudubon.org](http://hawaiiiaudubon.org), [facebook.com/hawaiiiaudubonsociety](https://www.facebook.com/hawaiiiaudubonsociety)

### Upcoming Events, Field Trips, & Volunteer Opportunities

*For full descriptions of our Events, Field Trips, and Volunteer Opportunities, go to our website: <http://www.hawaiiiaudubon.org/>*

#### FIELD – OUTINGS

##### **Paikō Lagoon Walk**

**When:** April 20<sup>th</sup>, 2019, 9:30 am, East Honolulu

**Leader:** Alice Roberts (HAS Board Member)

*Please RSVP to Alice with your name and phone number at 808-864-8122.*

##### **White Terns Walks**

**When:** March 23<sup>rd</sup> and April 20<sup>th</sup>, 2019, 9 am

**Leader:** Rich Downs (Hawaii Audubon Board Member)

*Please text or call 808-379-7555*

##### **O'ahu Forest Birds Hike, Palikea Trail**

**When:** Saturday April 20<sup>th</sup>, 2019 7:30 am – 3:30 pm

**Leader:** Lynette Williams (Retired Nature Conservancy), Pat Moriyasu (HAS Board Member)

Participants: Participation is limited to 13 participants. Must be older than 12 years of age.

*Please RSVP at [hiaudsoc@gmail.com](mailto:hiaudsoc@gmail.com) with subject line Palikea trail*

### VOLUNTEER OPPORTUNITIES Freeman Seabird Preserve 2019 Fieldwork Season

*Seeking Volunteers for Habitat Restoration!*

Every Saturday morning

JAN through MAR 2019

In November and early December, Wedge-tailed Shearwater adult birds and chicks leave the Freeman Seabird Preserve at Black Point to forage at sea for several months before returning in the latter part of March to nest. Volunteers are needed for fieldwork at the site on Saturday mornings from 8:30 am-11:30 am. Activities will include maintenance of native plants and man-made landscape features, along with removal of invasive plants, trash and debris. Other dates and times can be arranged for groups wishing to contribute their time in an effort to preserve rare Hawaiian coastal vegetation and seabird nesting habitat.

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**Scientific Editor: Glenn Metzler**

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Hawaii Audubon Society

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2) Email [hiaudsoc@gmail.com](mailto:hiaudsoc@gmail.com) to receive password.

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## Table of Contents

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State of the Society:	
Annual Report for 2018.....	9
2018 Peak Colony Count During Another Year of Average Productivity and Provisioning at the Freeman Seabird Preserve .....	13
Upcoming Events, Field Trips, and Volunteer Opportunities.....	15