



'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 2015

By Linda M. B. Paul, President Hawai'i Audubon Society

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



The Hawai'i Audubon Society celebrated its 76th year of operations in 2015. It was established in 1939 by a small group of dedicated birders to further the protection and conservation of Hawaii's native wildlife and the ecosystems that support it. In 1967 it was granted non-profit §501(c)(3) status by the U.S. Treasury Dept. It is now a state-wide conservation organization with a mem-

bership of approximately 2,000. Although it became a chapter of the National Audubon Society (NAS) in 1978, it is independent of that organization in matters of governance, policy, financial control, 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 Articles of Incorporation, Constitution and By-laws. The Society is governed by a Board of Directors and Officers elected by the membership at the end of the year. The 2015 officers included President Linda Paul, First Vice President Elizabeth Kumabe, and Directors Thorne Abbott, Phil Bruner, Lance Tanino, Don Drake, Alice Roberts, Anna Pickering and Anthony Leiggi. Wendy Johnson served as the Society's Executive Director.

Education and Outreach

The Society has a number of standing committees headed by Directors. In 2015, Thorne Abbott continued to serve as Chair of the Conservation Policy Committee and Wendy Johnson was Chair of the Education Committee. The 'Elepaio and Field Activities Committees included all Board members. Committee membership is open to all members of the Society (Visit our website for more information).

The 'Elepaio: Our peer-reviewed journal focuses on research and conservation work in Hawai'i and the Central Pacific and provides educational outreach to the Society's membership and subscribers. Amy Thompson served as Managing Editor and Glenn Metzler as the 'Elepaio's Scientific Editor. Six bi-monthly issues were published in 2015. The 'Elepaio can be received by members both electronically and by mail. Scientific articles in 2015 included *Feral honey bees cause abandonment of endangered Hawaiian Petrel burrow on Kaua'i* by Andre F. Raine & Brooke McFarland; *Wedge-tailed Shearwater breed-*

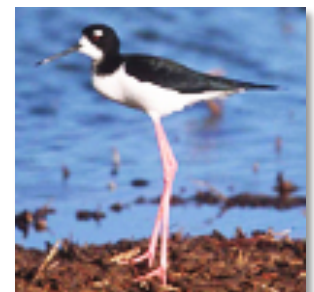
ing phenology at the Freeman Seabird Preserve, O'ahu, Hawai'i by Harrison Pravder, Christopher Prestridge, & K. David Hyrenbach; *Mixed ancestry and admixture in Kauai's feral chickens; invasion of domestic genes into ancient Red Junglefowl reservoirs* by E. Gering, M. Johnsson, P. Willis, T. Getty & D. Wright; *Institutional Memory and Kealia Pond* by Mike Nishimoto; and *Scott Barchard Wilson* by Arleone Dibben-Young & Jonathan S. Crocker.

www.hawaii-audubon.com: 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, field trips, service projects, programs, meetings, volunteer opportunities, membership information, an on-line store, information on birding in Hawai'i, a gallery of beautiful bird photos, and links to a number of related organizations and issues. Office Coordinator Amy Thompson managed the website and Directors Anna Pickering, Lance Tanino and Tony Leiggi administered the Society's Facebook page.

www.freemanseabirdpreserve.com: As part of a grant from the Disney Worldwide Conservation Fund, the Hawai'i Audubon Society launched a new website in 2014, which remains operational. It focuses on the habitat restoration, scientific research and educational components of the Society's conservation programs at the Preserve.

Kawainui Marsh and Waterbird Ponds: The Kawainui-Hamakua Marsh Complex on windward O'ahu is the largest remaining wetland in the State. Society members have been working for years for its protection, including advocating for state matching funds to construct habitat ponds for endangered waterbirds. After completion of the construction of the 11 waterbird habitat ponds by the Army Corps of Engineers, the Society adopted Pond #10 and in 2015 Society volunteers, Returned Peace Corps Volunteers of Hawai'i, and volunteers from many other organizations as well as the public continued assisting DLNR's Division of Forestry & Wildlife in habitat creation and maintenance of the Ponds.

The Society is a founding member of Ho'olaulima Ia Kawanui, which is a network of conservation organizations whose collective mission is to foster public awareness and under-



standing of the natural, historical, cultural, and scenic resources of the Kawainui-Hamakua Marsh Complex to ensure the long-term protection, restoration and stewardship of its resources. In addition to planning the World Wetlands Day celebrations, the network worked on a resources interpretive plan and an update of the 1994 Kawainui Master Plan. In June 2014 the draft Plan was released by DOFAW for public comment and the Society recommended that it be redrafted into a 25-year plan with the goal of restoring the Marsh to the condition it was 250 years ago. It also recommended the State Department of Health allow DOFAW to permit water from the ponds to flow out of the ponds and to not allow the expansion of the industrial park located along Kapa'a Stream just upstream from the Marsh, which was recently approved by the City Council. A revised Plan is expected to be released by DOFAW in 2016.

Conservation

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. In 2015 new signage designed by local artist and environmental educator Patrick Ching and paid for with the Disney grant was installed at the entrance to the Preserve. The research and lesson plans supported by the Disney grant were also completed. Society board member and botanist Alice Roberts put together a 4-color native plant guide for use on the Preserve by volunteers

for habitat restoration and maintenance purposes.

(See 2015 Updates by Dr. David Hyrenbach.)

Pacific Fisheries Coalition (PFC): The PFC, a project of the Society, is a unique collaboration between conservationists and fishermen who found common ground in their desire to promote the conservation and responsible use of living marine resources in Hawai'i and the Pacific Basin. It began in 1998 and over the years received grants from several foundations and other sources. The project is administered by Linda Paul, who serves as project administrator and policy analyst on a *pro bono* basis. Linda, who has represented the Society on the U.S. delegation to the Western & Central Pacific Fisheries Commission since 1999, was reappointed to the U.S. Advisory Council to the Commission in 2015. Our participation on the delegation over the years has resulted in observers being allowed to attend and speak at Commission meetings, and conservation and by-catch control and mitigation measures, which have helped to conserve populations of seabirds, turtles, sharks, and highly migratory pelagic fish species.

The Society is also a member of the Marine Fish Conservation Network. The Network advocates for national policies to achieve healthy oceans and productive fisheries. It works on the periodic

reauthorization of the Magnuson Stevens Act and its implementation, as well as by-catch measures, observer coverage and marine spatial planning. Linda also represents the Society and the broader conservation community on the Northwestern Hawaiian Islands Coral Reef Ecosystem 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 PFC in 1999. The Society is also represented on the Multi-Agency & Partner Marine Debris Cleanup Group and the state Alien Aquatic Organism Task Force, which was created by the Legislature as a result of PFC efforts, and was a sponsor of the Pacific Rim Marine Debris Conference, which was held at the State Capitol in 2014. The PFC has produced a number of educational reports, brochures and posters, which are distributed to policy makers, resource managers, fishermen, students and the general public.

Legislature

Society members Thorne Abbott and Linda Paul monitored environmental bills related to the Society's mission statement. During the 28th Legislative session of 2015 the Society submitted testimony opposing the elimination of dedicated funding for DLNR's Natural Area Reserve Fund and the important programs it supports. The Society also submitted testimony in favor of much-needed administrative inspections within the West Hawai'i regional fishery management area. In August Linda was invited to participate in the "We the People" legislative workshop that included presentations by Suzanne Case (DLNR Director), Mark Fox (TNC) and Senator Laura Thielen on the legislative budget process. Unfortunately DLNR funds set aside for forest stewardship and natural area reserves have been diverted to other projects and those funds need to be restored. Thorne submitted testimony for the Society to the Board of Variances and Appeals opposing a measure that would delete the sea cliffs shoreline right-of-way in Wailuku, Maui. The sea cliffs are within the State Land Use Conservation District. In 2015 Thorne was appointed to the Legacy Land Conservation Commission on Maui. He previously served on the O'ahu Commission.

Field Excursions, Service Opportunities and Educational Programs

Habitat Restoration at the Freeman Seabird Preserve (every Saturday, January through March). Volunteers helped maintain native plants and removed invasive species, cleared and reconstructed burrows for the Wedge-tailed Shearwaters, and removed trash and debris from the coastline area.

Kawainui Marsh Restoration (first Saturday of every month). Hawai'i Audubon Society volunteers worked in conjunction with DLNR's Division of Forestry & Wildlife to support Hawaii's endangered water birds. The Society has "adopted" pond #10, with volunteer efforts focused on keeping the pond clear of invasive plants and functioning as optimal habitat for the birds.

Ka'ena Point Hike (January 10). Participants saw many native plants, including several endangered species, Laysan albatross, Hawaiian monk seals, and humpback whales.

Moku'auia Service Project (January 31). The workday was led by the Division of Forestry & Wildlife.

Nature Hike, Kahuku Point & Wetlands, Turtle Bay (February 7 and March 21). Participants saw turtle nest sites, endangered and endemic plants, rare Hawaiian bee nesting areas, shore birds, sea birds, and endangered wetland birds.

Sunset & Shearwaters: Volunteer Appreciation Night, Freeman Seabird Preserve (March 21). After three months of hard work restoring native habitat for the Wedge-tailed Shearwaters, volunteers enjoyed a sunset at the Preserve with light pupus and drinks while learning about the success of the 2014 breeding season.

Wally Johnson, Pacific Golden Plover (March 23). Dr. Johnson, a world-renowned expert of the Pacific Golden-Plover discussed his 35 years of research including flight times to/from Alaska, where the birds breed in Alaska, survival rates in the Punchbowl, flight details beyond Hawai'i, and the dramatic spring stopover of plovers in Japan.

Introduction to Birding in Honolulu (March 26). Society board member Anna Pickering led a walk through Kapi'olani Park to learn how to watch for birds and become acquainted with some of the common birds of Honolulu.

Mt. Tantalus Discovery Hike (April 12). Hikers learned about the diversity of native and invasive flowering plants and ferns along the Mānoa cliff trail from UH botanists Tom Ranker and Don Drake. The hike ended at the Mānoa Cliff Restoration Area where Restoration Group leaders showed them the impressive results achieved through 10 years of work that volunteers have done to restore the native flora.

Paikō Lagoon Farewell to Shorebirds Tour (April 18). Society members and other interested participants explored the lagoon and learned about Hawaii's wintering shorebirds.

Native Plants of Kawainui Tour (May 2). Led by Rick Barboza of Hui Kū Maoli Ola Nursery, the tour visited Ulupō Heiau State Historic ethnobotanical restoration site and Nā Pōhaku o Hauwahine native forest and wetland restoration site.

International Migratory Bird Day (May 9). Participants met at Keahole Point Light for some sea watching and continued on to Kealahoe WWTP and Aimakapa Pond at Kaloko-Honokohau National Historical Park.

Tour of Kalaeloa Heritage Park, Barbers Point (May 23). Participants saw structures built in the style of Tahitian architecture, trails of upright stones and examples of ancient farming.

Paikō Lagoon Low Tide Reef Walk (June 13). Participants saw birds, limu and sea creatures.

Mokapu Peninsula Tour of the Red-footed Booby Colony (July 10). Society members and others enjoyed a guided tour of the Mokapu peninsula at Marine Corps Base Hawai'i. Approximately 2500 Red-footed Boobies loaf or nest in the Ulupa'u Crater Wildlife Management Area despite the live fire exercises that take place there. Birds were viewed roosting in the kiawe trees with their large chicks or soaring above the nesting site, the surrounding ocean and adjacent Moku Manu.

Paikō Lagoon Welcome Home to Our Shorebirds (August 29). Alice Roberts led an early morning walk to look for wintering shorebirds recently returning to Hawai'i from their nesting grounds across the Pacific.

Global Shorebird Counting (September 5). Led by board member Lance Tanino, participants met at Honokohau Harbor and visited shorebird areas along the Kona coast.

Bishop Museum Vertebrate Collections Tour (September 14). Molly Hagemann, manager of the Vertebrate Zoology section, led a tour of the Museum's collections of mammalogy, ornithology, herpetology and paleontology speci-

mens. The Hawai'i bird collection of approximately 7,200 specimens includes extinct native species, native breeding species, introduced species, and non breeding visitors.

Hawai'i Audubon Society Awards Dinner (October 15). Dr. Phil Bruner, associate professor at BYUH, spoke about the "Behavioral Ecology of Shorebirds." He shared the results of his years of summer research in Alaska and the natural history of some of our favorite birds. The dinner, volunteer awards and silent auction generated not only a good time for the participants, but funds to support the conservation work of the Society.

James Campbell National Wildlife Refuge Tour (October 17). Participants viewed the endangered wetland birds and migrant shore birds that inhabit this Refuge.

Maui Forest Bird Recovery Project Restoration (October 22-27). In order to get to the restoration site volunteers needed a helicopter ride in and out of the Reserve. (Talk about volunteer perks!)

Introduction to Bird Watching in Kapi'olani Park (December 12). Participants learned from Anna Pickering how to watch for birds and became acquainted with some of the common birds of Honolulu.

116th Annual Audubon Christmas Bird Count. Society members and friends participated in the longest running citizen science survey in the world, which provides critical data on population trends. All over the United States tens of thousands of people participate. From December 14th to January 5th, Society members and volunteers counted birds within historic circles in Honolulu and Waipio on O'ahu, and at several locations on the neighbor islands. The results will be officially announced by the Society later this year and also on the National Audubon Society website.

Hawai'i Audubon Society's Annual Members' Meeting, Bishop Museum (December 22). In addition to announcing the newly elected officers and board members, the meeting featured a presentation by Molly Hagemann, manager of the Museum's vertebrate collection, about Fossil Birds in Hawai'i, a brief history of the study of Hawaiian fossils and some of the unusual birds that are now extinct and are only known from the fossil record.

Society Awards and Grants

Awards for Student Research (March). Every year the Society presents two awards for outstanding research related to Hawaii's natural history at the Hawai'i State Science & Engineering Fair. In 2015 the HAS Senior Division Research Award went to Joshua Weible (Senior at Castle High School) for his project on the effect of rainfall on salinity in the He'ia and Waikalua Loko fishponds. The Junior Division Research Award went to Megan Nakamoto (Sixth Grade Waiakea Intermediate School) for her project entitled "What's Bugging the Māmane?" (See the May-June 'Elepaio for more details.)

Annual Awards Dinner (October 15). The Society honored five notable individuals for their contributions to the protection of Hawaii's wildlife and their habitats: Sean Moura, Volunteer Service Award; Patrick Ching, Environmental Education Award; Glen Metzler, Program Award; Rick Barboza, Conservation Award; and Dr. Hannah Mounce, Organization Conservation Award. (See November-December 'Elepaio for more information about these extraordinary people.)



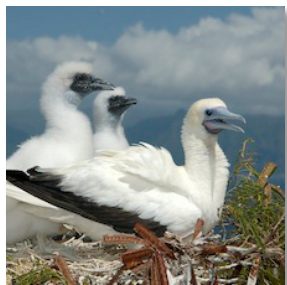
Finances and Fundraising

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 Amy Thompson managed member services and edited the *'Elepaio*. In October Amy accepted a job with the USFWS and Jody Smith was hired as the new office coordinator. However volunteers and donors still provide vital, critical and 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, which 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 (package of 8), Van Zyle Nene lithograph print, 'Elepaio patches, check lists of the birds of Hawai'i, Micronesia, and the Mariana Islands, a field check card, and 'Elepaio, Kōlea & Ruddy Turnstone "Akekeke" T shirts. We stock Kiwīkiu and 'Akohekohe toy birds with authentic birdsongs (from Wild Republic in support of Maui Forest Bird Recovery Project). We also received many generous donations and matching gifts from our members and benefactors.

Support 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 2014-2015. The project included the creation of an informational website (<http://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 Kaua'i Forest Bird Recovery Project (KFBPR) in 2014, which was completed in 2015. A pass-through grant from the Mohamed bin Zayed Species Conservation Fund (MBZ) was received by the Hawai'i Audubon Society for the purpose of funding KFBPR research on the movements of the critically endangered 'Akikiki and 'Akeke'e within their forest habitats on Kaua'i. 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.



Bird Observations: OCT 2015 - JAN 2016

Submitted by Lance Tanino

- Oct. 14 - During a one-hour seawatch at La'ie Point, 2,500 Brown Noddies and 2,000 Wedge-tailed Shearwaters were observed flying north (Peter Mathisen).
- Oct. 14 - A PEREGRINE FALCON (1 juvenile) was observed in downtown Honolulu (Jean Campbell)
- Oct. 17 - JUAN FERNANDEZ PETREL (1), Black-winged Petrel (1), Band-rumped/Leach's Storm-Petrel (1), Hawaiian Petrel (1), and Sooty Shearwater (5) were seen during a 10-hour pelagic trip off Kailua-Kona (Lance Tanino and 15 others).
- Oct. 18 - In the morning, Sooty Shearwaters (107) continued to be observed migrating past Keokea BP (Cheshta Buckley).
- Oct. 20 - BAR-TAILED GODWIT (1) was found at Kaunakakai WWTP on Moloka'i (Arleone Dibben-Young).
- Oct. 23 - WHITE-FACED IBIS (2) were seen headed to an evening roost with Cattle Egrets at Kaloko-Honokohau NHP (Jim Hully).
- Oct. 27 - SNOW GEESE (2 juveniles) were spotted at one of Turtle Bay Resort's golf courses (Turtle Bay Resort).
- Oct. 30 - A BRAMBLING (1 male; non-breeding plumage), WESTERN GULL (1; first-year juvenile) were observed at Midway Atoll NWR (Megan Dalton).
- Oct. 31 - A single BLACK TERN (1 juvenile) was seen on Moloka'i (Arleone Dibben-Young). Two MEW (Kamchatka) GULLS were photographed and a NORTHERN HARRIER was observed at Kure Atoll (Kure Atoll Conservancy).
- Nov. 3 - At least one JUAN FERNANDEZ PETREL was photographed off Kailua-Kona, Big Island (Robin Baird, Cascadia Research).
- Nov. 8 - SNOW GEESE (2 juveniles) were photographed at Whittington BP, Naalehu, Big Island (Laura Wilson). They may be same birds found on North Shore of O'ahu in late October.
- Nov. 19 - A BLACK-BELLIED PLOVER was spotted interacting with Pacific Golden-Plovers at South Point (Ka Lae), Big Island (Lance Tanino, Bob Dwyer, and Linda Appleby).
- Nov. 20 - An immature PEREGRINE FALCON was spotted at Ka'ena Point, O'ahu (Eric VanderWerf).
- Nov. 23 - A first-year BLACK TERN was seen at Ki'i Unit, JCNWR, Kahuku, O'ahu (USFWS).
- Nov. 28 - An adult female BELTED KINGFISHER was photographed at Lokowaka Pond, Hilo, Big Island (Brad Argue).
- Dec. 02 - On Moloka'i, a CINNAMON TEAL was seen at Kualapuu WWTP. Cackling Goose and Bonaparte's Gull at Ohiaipilo. WHIM-BREL at Koheo (Arleone Dibben-Young).
- Dec. 15 - First-winter gulls at Pacific Missile Range: GLAUCOUS-WINGED, HERRING, Ring-billed, and Laughing Gull were seen together along the coast (Eric VanderWerf).
- Dec. 19 - An adult PEREGRINE FALCON (tundrius subspecies) was seen along the coast of Pepeekeo, Big Island (Lance Tanino).
- Dec. 20 - A CASPIAN TERN was seen at Mokapu Peninsula (MCBH-Kaneohe Bay) during the Honolulu CBC (Pete Donaldson and others).
- Jan. 08 BLACK-FOOTED ALBATROSS offshore of O'ahu (Robin Baird, Cascadia Research Collective).
- Jan. 09 GLAUCOUS-WINGED GULL (first-winter) at Lana'i Lookout, O'ahu (Ken Matsuguma).
- Jan. 12 OSPREY at James Campbell NWR, Kahuku, O'ahu (Eric VanderWerf and Robby Kohley).
- Jan. 15 PEREGRINE FALCON at Halape, Hawaii Volcanoes NP, Big Island (Jean Campbell)
- Jan. 16 White-faced Ibis at Pouhala Wetland, Waipahu, O'ahu. A total of SEVEN were observed at once (Martha Kawasaki).
- Jan. 16 TUFTED DUCK (female) at Kuilima WWTP, Kahuku, O'ahu (Satoko Lincoln).
- Jan. 17 PEREGRINE FALCON (tundrius ssp.) at Makapu'u Beach overlook, O'ahu (Lance Tanino). Probably same falcon on 1.23 at Lana'i Lookout (Ken Matsuguma).
- Jan. 17 Masked Booby (42) at Makapu'u Beach overlook headed northwest (Lance Tanino).
- Jan. 31 Black-bellied Plover (2) were observed together foraging in tide pools at Ka Lae (South Point), Big Island (Lance Tanino).

2015: Another Record Population Count at the Freeman Seabird Preserve During a Year of Low Productivity

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

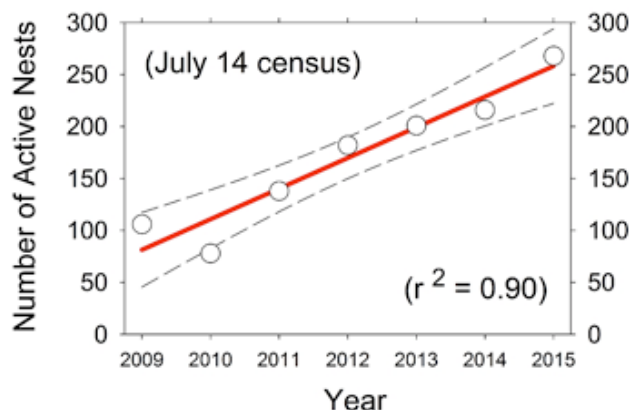
We briefly report on the ongoing monitoring and restoration efforts of the Freeman Seabird Preserve by Hawai'i Audubon since 2009, provide updates on the findings from the 2015 breeding season, and briefly discuss the plans for future monitoring, habitat restoration, and predator control at the site.

2015 Update

This year we documented a new record number of nesting 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 268 nests, 24% higher than the 2014 annual count of 216 nests. Altogether, the annual population surveys continue to show a statistically significant trend ($F = 57.85$; $df = 1, 5$; $p = 0.006$) with an average increase of 29.5 (± 10.3 S.D.) nests per year, which captures 90% of the year-to-year variability in the time series (Fig. 1). Thus, despite the low rates of increase observed in 2013 (10%) and 2014 (7%), the 2015 count suggests the colony continues to grow, without reaching an asymptote (maximum size).

The July 14 count of 268 nests was followed by a count of 92 nests, after the peak hatching period (September 14). This decline represents a loss of 65.7% of the nests during the two month period spanning hatching and the first month of the chick's life. Furthermore, the weekly monitoring of 60 nests between July and November revealed that 2015 was characterized by high egg loss and chick mortality, with 33.3% of the

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).



'Ohai (*Sesbania tomentosa*) thrive on the Freeman Seabird Preserve
(Photo : D. Hyrenbach, June 2015)

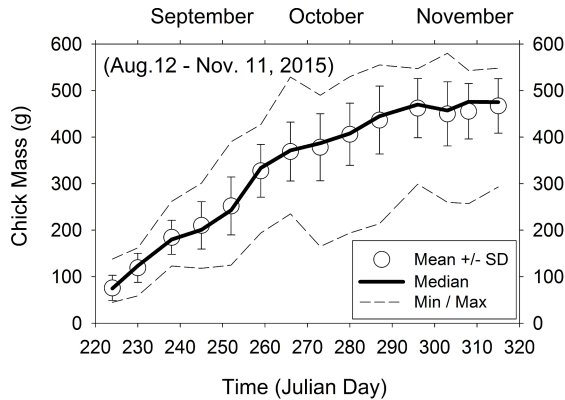


A substantial number of eggs were abandoned and did not hatch in 2015.

monitored eggs and 25.0 % of the monitored chicks being lost. While these large losses were caused by both predation and natural mortality, it is unclear to what extent the unusual precipitation events at the Freeman Seabird Preserve during the summer of 2015 were a determinant factor. A more in-depth analysis of egg and chick losses over the 7-year study period (2009 – 2015) will examine the events of 2015 within a larger context.

The colony monitoring also revealed that 2015 was characterized by average phenology, similar to those documented in previous years. In 2015, chick hatching dates spanned from August 2 to 15, with a mean of August 7 (± 3.7 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 2015, they ranged from 299 to 580 grams, with a mean of 496.8 (± 56.1 S.D. grams). Again, the 2015 value fell in line with observations during "average" years (2010, 2012, 2013, 2014), and were above those during a

Figure 2. Time series of chick mass collected during the 2015 breeding season, showing the mean \pm SD, the median and the range of values (maximum – minimum). Sample size = 26 chicks.



year of poor provisioning (2009) and below those during a year of good provisioning (2011).

Weekly monitoring of the chicks' growth over time reinforced the notion that 2015 was a year of average provisioning. In spite of episodic periods of low trade winds in August and September, 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, which mirrors the findings of the 2014 season, contrasts with the previous years, when chick masses peaked in late October / early November, and declined thereafter (Hyrenbach 2011, Hyrenbach & Johnson, 2012).

In summary, these results suggest that the low productivity documented in 2015 was caused by a combination of factors. The monitoring data suggest that 2015 was a year of high egg and chick losses, but average phenology and chick provisioning, in the context of the available time series (2009 – 2015). Thus, despite the warm-water conditions observed during the summer and fall, chick growth was not depressed in 2015. Unlike what occurred during the 2009 El Niño event (Hyrenbach 2011), shearwater parents provisioned their chicks through mid November in 2015.

While predation continues to pose a risk for shearwater chicks, the high mortality observed in 2015 was attributable to multiple causes. In particular, the monitoring suggests that the high losses of eggs and pipping chicks are attributable to natural causes. While it is unknown whether parent shearwaters left their eggs and chicks unattended more frequently in 2015, this year was characterized by high precipitation and storminess. Thus, we hypothesize that exposure and flooding contributed to the observed mortalities.

On average, between four and five tropical cyclones are observed in the Central Pacific every year, with the number ranging from zero to 11 in 1992 and 1994, respectively. In 2015, there were 8 hurricanes and 7 tropical storms in the Central Pacific. Hurricanes Guillermo and Hilda affected Hawai'i in August, and hurricane Ignacio passed by in early September (www.prh.noaa.gov/cphc). Ongoing research is needed to understand how these unusual atmospheric and oceanographic phenomena can impact the productivity and demography of the Wedge-tailed Shearwater.

The current strong El Niño is expected to weaken through 2016, and to transition to ENSO-neutral conditions during late spring or early summer. Yet, it is unknown whether La Niña conditions will follow (See NOAA's Climate Prediction Center ENSO Diagnostic Discussion, www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/). Based on these model predictions, we can anticipate that 2016 will be another "average" year for Wedge-tailed Shearwater breeding at the Freeman Seabird Preserve.

Ongoing Efforts

Habitat restoration efforts continued during 2015. From January through March, 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. Additional restoration and management efforts in 2016 will continue monitoring the colony and enhancing the breeding habitat at the Freeman Seabird Preserve.

Habitat Restoration: From January through March, 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 2016, to augment the ongoing time series started in 2009.

Predator Control: Ongoing surveillance for predators is planned during the 2016 nesting season, to minimize and document cat predation on breeding shearwaters.



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*Thank you for your concern and commitment to protecting
Hawaii's native wildlife and ecosystems.*

Rapid 'Ōhi'a Death

has the potential to kill 'Ōhi'a trees statewide

Clean your Gear * Wash your Vehicle * Don't Transport 'Ōhi'a

BIRDERS and HIKERS: Clean your shoes, and clothing.
Decontaminate shoes by dipping the soles in 10% bleach
or 70% rubbing alcohol to kill the ROD fungus. Other gear
can be sprayed with the same proven cleaning solutions.
Wash clothing in hot water and detergent.

Rapid 'Ōhi'a Death Fact Sheet:

<http://go.hawaii.edu/J1>

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Upcoming Events, Field Trips, & Volunteer Opportunities

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

EVENTS

Rapid 'Ōhi'a Death: A New Threat to Hawaii's Native Forests and Bird Habitat

Dr. J.B. Friday, Tropical Forestry Extension Specialist, UH CTAHR NREM
March 1 2016, 7:00 – 9:00 pm, UH Mānoa St John 110

Sunset & Shearwaters: Volunteer Appreciation Night

Saturday March 12, 2016, 5pm to Sunset

Lele O Nā Manu

Hawaiian Forest Birds

Bishop Museum Exhibit

Opens March 19, 2016

2015 Kōlea Research Update:

Dr. Wally Johnson

March 23 or 24, 2016

Check our website for updates.



FIELD TRIPS

Tour Kawainui Marsh State

Wildlife Sanctuary Restoration Ponds

March 5, 2016 9:00 am – 11:30 am

Leader: Ati Jeffers-Fabro, Wetland Coordinator

HAS members may see the 'Alae 'Ula (Hawaiian Gallinule),
'Alae Ke'oke'o (Hawaiian Coot), Ae'o (Hawaiian Stilt) and the
Koloa Maoli (Hawaiian Duck). Members may also see the Auku'u
(Black-crowned Night Heron) and a variety of migratory waterfowl
and shorebirds. *Please RSVP by MAR 1 to hiaudsoc@pixi.com,
subject line: Kawainui Restoration Ponds.*

Makapu'u Lighthouse Trail

March 19, 3:00 – 5:00 pm, Makapu'u Trailhead, East O'ahu

Join HAS for a guided tour of Makapu'u Lighthouse Trail.

Birds that can be seen on the trail include White terns, Sooty
terns, Great frigatebirds, Red-footed booby and others. If we are
lucky, we may also see whales. *Please RSVP by MAR 14 to hiaudsoc@pixi.com,
subject line: Makapu'u Lighthouse Trail*

Farewell to Our Shorebirds:

Paikō Lagoon Wildlife Sanctuary

April 9th, 10:00 am – 12:00 noon am, East Honolulu

Explore the lagoon while learning about Hawaii's visiting
shorebirds. We may see some shorebirds (Kōlea, Ruddy Turn-
stone, Wandering Tattler) as well as a resident pair of Hawaiian
Stilts, year round 'Iwa, Egrets & Herons, lots of urban birds &
ducks. *Please RSVP to Alice with your name and phone number
at 808-864-8122.*

ON-GOING VOLUNTEER OPPORTUNITIES

Volunteer Days at Freeman Seabird Preserve

Every Saturday through the end of March 2016

Kawainui Marsh Waterbird Habitat Restoration

Check DLNR Website for current schedule.

<http://dlnr.hawaii.gov/volunteer/>

