



'ELEPAIO

Journal of the
Hawaii Audubon Society

For the Protection of
Hawai'i's Native Wildlife

VOLUME 81, NUMBER 2

MARCH / APRIL 2021

State of the Society: Annual Report for 2020

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

The Hawaii Audubon Society (HAS) celebrated its 81st year of conservation in 2020. It was founded by George C. Munro and first organized by Charles M. Dunn in 1939 "*For the Better Protection of Wildlife in Hawaii*". Incorporated in 1954, it was granted nonprofit U.S.C. §501(c)(3) status by the U.S. Department of the Treasury in 1967.

It became the Hawaii 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. The Society's mission: *To foster community values that result in protection and restoration of native wildlife and ecosystems and conservation of natural resources through education, science and advocacy in Hawaii i and the Pacific.*

Society Governance

The Society's programs, policies, and activities are guided by its Mission Statement. Its purpose, organization, and procedures are set forth in its Constitution and By-laws. The Society is governed by a Board of Directors. During 2020, the Board included Officers President Linda Paul, First Vice President Elizabeth Kumabe-Maynard, Secretary Kaily Wakefield, and Treasurer John Harrison and Directors Alice Roberts, Rich Downs, Wendy Kuntz, Pat Moriyasu, Susan Scott, Yvonne Chan, and Colleen Soares. Wendy Johnson served as the Society's volunteer Executive Director.

The Office and Communications Manager (OCM) Laura Zoller served as Recording Secretary. Susanne Spiessberger was the *Elepaio's* Managing Editor and Glenn Metzler its Scientific Editor. Virtual Board meetings began in March because of the COVID-19 threat and continued until the end of the year.

The Society has a number of standing committees headed by Officers and Directors. In 2020, the Conservation Policy Committee was chaired by Linda Paul. The Education, *Elepaio*, Field Activities, Fundraising, Membership, Program and Scholarships and Grants committees were directed by all Board members. Committee membership is open to all members of the Society. Alice Roberts and Wendy Johnson co-managed the Freeman Seabird Preserve and its website www.freemanseabirdpreserve.com. Susan Scott and Rich Downs managed the websites for the HAS citizen science projects www.koleacount.org and www.whiteterns.org. OCM Laura Zoller managed the Society's website www.hawaii-audubon.org.

Education and Outreach

In 2020, the Society continued its mission by providing virtual

programs, covid-safe field trips and habitat restoration opportunities, and through its publications, websites, and social media.

The *Elepaio*: Our peer-reviewed scientific journal focuses on research and conservation work in Hawaii i and the Pacific and provides educational outreach to the Society's membership and subscribers. Six bi-monthly issues were published in 2020. 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.

2020 scientific articles and notes included: *Elepaio* January/February 2020: *Invasive Insect is Rapidly Spreading Across Hawaii i and Threatening Nao Plants at Free Seabird Preserve*; *The Honolulu Seabird: The Manu-o-K* by Kim Kessler; March/April 2020: *2019 Shearwater Nesting at Freeman Seabird Preserve: Highest breeding pairs, average chick success, and first eggs in ceramic homes* by K. David Hyrenbach & Michelle Hester; '*Elepaio* May/June: *Alal Project Looks to Next Stage of Recovery*, Dept. of Land and Natural Resources (DLNR) Press Release; *Promise Continues in the Wild for One of the World's Rarest Birds* [Maui Parrotbill], DLNR Report Nov. 12, 2019; '*Elepaio* July/August: *Coronavirus and the trade in wildlife* by Vivienne Halleux, European Parliamentary Research Service, May 2020; '*Elepaio* September/October: *Can Asia end its uncontrolled consumption of wildlife? Here's how North America did it a century ago* by Roland Kays, Research Assoc. & Professor of Wildlife, North Carolina State; *Initial Field Report on Hawaiian Cladonia (lichenized Ascomycota)* by Carly Anderson Stewart; '*Elepaio* November/December: *Seabird Entanglement in Marine Debris and Fishing Gear in the Main Hawaiian Islands (2012-2020)* by David Hyrenbach, Linda Elliott, Carissa Cabrera, Kristina Dauterman, Jon Gelman, and Afsheen Siddiqi.

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*', 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.

Kolea Count: a Hawaii Audubon Society Citizen Science Project: In March, HAS Board member Susan Scott launched a citizen science project to count Hawai'i's Pacific Golden Plover (K lea) via the interactive website, www.koleacount.org. The purpose of the pilot study is to test the feasibility of having residents and visitors to count Hawai'i's K lea, to learn where the

birds forage, and to increase awareness of these native shorebirds in Hawai‘i. The last K lea count was an estimated 74,000 individuals in 1949. No one today, therefore, knows if the plover population in Hawai‘i is increasing, decreasing, or stable. Data analysis from this year’s pilot project will guide the future years of K lea Count.

The Hui Manu-o-K : The Manu-o-K (White Tern) is a very unique bird, especially for an urban center like Honolulu. The Hui Manu-o-K was formed to watch over the official bird of Honolulu and developed a citizen science program to help track the growing White Tern population in the City. It has produced and frequently updates three maps to visualize the location of the City’s White Tern population. See www.whiteterns.org. The Hui partners with the Aloha Arborist Association, the DLNR, and the U.S. Fish and Wildlife Service (USFWS) to provide tree trimming companies training in best management practices that allow the trees to be maintained without disturbing breeding white terns.

The Hui also manages a 24-hour Manu-o-K Hotline and a corps of trained volunteers that responds to calls from the public to assist injured or grounded white terns. Together, the Hui and citizen scientists ensure that the population is protected and cared for so that it continues to thrive in Honolulu.

Wildlife and Ecosystem Conservation

Kawainui-H m kua Marsh Complex: In December 2020, the Governor signed the Final Environmental Impact Statement (FEIS) for DLNR’s Kawainui-H m kua Master Plan Project even though it does not meet the requirements of Hawai‘i’s Environmental Policy Act (HRS § 343) or the federal Clean Water Act. Pollution from the Kapa‘a Industrial Park and the now-closed municipal landfill still flows into the wetland. The Society’s comments on the EIS are posted on the HAS website. Instead of a comprehensive ecosystem restoration plan for this severely degraded wetland ecosystem, the Project plans to develop the last wild edges of Kaiwainui Marsh along Kapa‘a Quarry Road for human use even though the restrooms will not be connected to the Kailua wastewater treatment plant.

The Kawainui-H m kua Marsh Complex on windward O‘ahu is the largest remaining wetland in Hawai‘i and recognized as a biosphere reserve site under the auspices of UNESCO and as a Wetland 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, a municipal landfill, 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 parcels 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 recommended that the Master Plan: (1) close the Marsh to all visitors during the endangered and migratory wetland

birds nesting seasons; (2) prohibit leasing or granting permits to build on state land makai of the Quarry Road, Kalaniana‘ole Highway between the Quarry Road and Castle Hospital and Kailua Road between the Highway and Hamakua Drive; (3) prohibit commercial activity on state land in and around the Marsh Complex; (4) require all toilets within 2,000 feet of the Marsh and on adjacent state land uphill from the wetlands to be connected to the Kailua wastewater treatment plant; (5) prohibit any further expansion of the Kapa‘a Industrial Park; (6) restore the historic water volume and flow through the wetlands and prioritize the removal of the central peat mat to prevent future flooding of the Coconut Grove residential area; and (7) develop detailed, comprehensive wetlands ecosystem restoration and habitat management plans to protect endangered and migratory species.

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 (FSP) is home to the island’s only remaining south shore nesting colony of Wedge-tailed Shearwaters (‘ua‘u kani, *Puffinus pacificus*).



Group of volunteers at FSP with ocean mist spraying in the air above lava rocks, photo credit: Alice Roberts.

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 2020 updates in the ‘*Elepaio* and www.freemanseabirdpreserve.com). Volunteers continued to implement habitat restoration, scientific research and educational components of the Society’s conservation programs at the Preserve. In 2020, we celebrated yet another increase in active nests, and chick counts reached a new high. Experimental clay nesting modules at the site continued to be studied and improved in an effort to minimize disturbance and

predation by neighborhood cats, dogs, and rodents. In addition an exciting new lesson plan *Way of the Wedgie: Survival Lessons from a Seabird Preserve* for middle and high school students was launched on the FSP website in 2020.

The Hawaiian Black-necked Stilts or "Ae'ō" on Rim Island 2: Rim Island 2 (RI-2) is a small, isolated island in the middle of the urban Hawaii Kai marina. Old maps indicate the island was a bird sanctuary before the surrounding wetlands and Hawaiian fish pond were urbanized. During 1959-61, a developer dredged out and filled in the wetlands to create waterfront housing and a marina. The bird sanctuary island was reconfigured as "Rim Island 2" by excavating a large depression in its center to be used as a future dump site for dredge spoils. The depression quickly filled with water. A couple of years later wetland birds returned to the island and the endangered Hawaiian Black-necked Stilt or "Ae'ō" began nesting there. In 1996, the Hawaii Kai Marina Community Association (HKMCA) partially filled in RI-2's internal lagoon with dredge spoils, but again the Ae'ō returned to nest.

Ae'ō numbers are less than 2,000 individual breeding birds in the entire State. It was listed as "endangered" in 1967 and remains endangered, most probably 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.

The Hawaii Audubon Society and Concerned Citizens of Hawaii (CCH) members have been observing and monitoring Ae'ō foraging and nesting activity in the marina for over fifty years. In 2017, they sent a 60-day notice letter to the responsible government agencies stating their intent to file suit, pursuant to the citizen suit provisions of the Endangered Species Act, 16 U.S.C. §§ 1531 et seq, for failure to enforce federal laws applicable to the depositing of dredge spoils onto the nesting habitat of the endangered Ae'ō on RI-2. Since then, HAS and CCH have continued to monitor RI-2 during the Ae'ō nesting season, which begins in mid-February and ends at the beginning of September, and the HKMCA has not been observed dumping dredge spoils on the island during nesting season.

In 2019 and again in 2020, HAS and CCH undertook periodic drone flights to observe, monitor and videotape Ae'ō activity on RI-2 during nesting season. The drone was small and quiet, and the videos indicate that it did not disturb the Ae'ō. As a result, we were able to record nesting groups of stilts feeding at RI-2. On August 16 and 17, 2020, seven nesting groups of Ae'ō were observed on the island and another 22 or more Ae'ō circulating over and around the island. Based on current and long term observations, there is ample evidence that RI-2 still provides good Ae'ō foraging and nesting habitat, but the HKMCA must not deposit any more dredge spoils onto the island, or it will destroy the habitat.

Northwestern Hawaiian Islands Ecosystem Protection: Linda Paul has represented the Society and the broader conservation community on the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve Advisory Council (NWHICRER) since 2001 and has been its vice chair since 2004. The NWHICRER and the Papahānaumoku kea Marine National Monument are the result of an initiative to protect the NWHI begun by the Society in 1999 with the support of four national foundations. The Society supports the conversion of the Reserve into a NWHI National

Marine Sanctuary as mandated on December 4, 2000 by Executive Order ("EO") 13178, when the Reserve was created by President William J. Clinton. (Federal Register/Vol.65, No. 236/Thursday, December 7, 2000/Presidential Documents).

The NWHI is a unique world treasure that is protected in part by a series of state, federal, and international legal instruments. However, this very special area still needs the protection of the full authority of the National Marine Sanctuaries Act. At its meeting on December 9, 2020, the NWHICRER Advisory Council approved sending a letter to the Office of the National Marine Sanctuaries (ONMS) requesting it to move forward with the designation of a NWHI National Marine Sanctuary pursuant to EO 13178 (see www.papahānaumokuākea.gov for more information about the Monument and the Reserve).

Conservation Advocacy: In 2020, Conservation Policy Committee chair Linda Paul monitored and reviewed legislation, proposed rules and requests for comments and support on matters related to the Society's mission statement. Testimony, comments, letters, and other support were given to the following:

On July 3, 1918, the U.S. enacted the Migratory Bird Treaty Act (MBTA) to protect migratory birds, see 16 U.S.C. §§ 703-12. The original Act was a means of implementing a 1916 treaty between the U.S. and Canada and later Mexico, Japan and Russia, which was intended to ensure the preservation of migratory bird species that were being decimated by hunting. The Act helped restore populations of many birds, ranging from herons, egrets, and raptors to seabirds, shorebirds, and waterfowl. The Act's prohibition on the killing or "taking" of migratory birds has long been understood to extend to "incidental take" - meaning unintentional, but predictable and avoidable mortality from threats such as habitat loss stemming from development, collisions with wind turbines, power lines, and glass-covered skyscrapers, drowning in toxic waste pits, etc. These hazards to birdlife are foreseeable, preventable, and increasing.

In response to the request for comments on the USFWS draft Environmental Impact Statement (EIS) on the legal scope of the MBTA, the Society strongly urged the Service to choose Alternative "B" (the Service shall withdraw M-Opinion 37050, which restricted the legal scope of the MBTA to the intentional take of migratory birds, and implement the MBTA under the prior interpretation, which prohibited the incidental take of migratory birds).

The Ala Moana Park historic green open space protection and urban bird habitat conservation effort by Oahu Island Park Conservancy, the Society, the Outdoor Circle, & others was successful following a final virtual meeting with City officials. The historic Keyhole Circle will not be turned into a parking lot.

With the help of a letter of support from the Society, the Trust for Public Land received a \$500,000 grant from the National Fish and Wildlife Foundation for the acquisition of 13,130 acres of koa forest on the east slope of Mauna Kea to be conveyed to the State. The property is habitat for 28 listed species.

Events, Field Excursions, Service Opportunities and Educational Programs

Freeman Seabird Preserve 2020 Fieldwork Season at Black Point on O'ahu. Every Saturday morning 8:30-11:30 a.m. from January through March, when the Wedge-tailed Shearwaters are

at sea, volunteers helped to restore and maintain a rare coastal refuge in urban Honolulu for the protected seabirds. Through ongoing native plant and dryland forest restoration, predator control, and nest monitoring, the Society's habitat restoration and management activities continued in 2020 with the removal of invasive species, maintenance of native plants and artificial nesting structures, along with the annual accumulation of trash and debris from the coastline area. In 2020, approximately 101 volunteers contributed 1,377 hours of service work.

White Tern (Manu-o-K) walks, January 18, February 15, and March 14, 2020, led by Rich Downs.

Earth Day "Protect Our Species", April 22, 2020.

Presentations co-sponsored by the Hanauma Bay Nature Preserve and the Society, April 2020, held virtually due to COVID-19:

- **"The Miracle of Midway: A million albatrosses and counting"**, April 2, by Susan Scott
- **"Energy from the Ocean: It's complicated"**, April 9, by John Harrison

Manu o K Festival, May 16 through 22, held virtually.

World Albatross Day, June 19, 2020, held virtually due to COVID-19, celebrated the Agreement on the Conservation of Albatrosses and Petrels, which was signed this day in 2001. We have three species of albatrosses in the U.S., and all can be found in Hawai'i. The Black-footed and Laysan albatrosses breed mostly at the Midway Atoll National Wildlife Refuge; the Short-tailed Albatross, listed as endangered under the Endangered Species Act, breeds mostly in Japan. The world's oldest known wild bird, Wisdom, is a Laysan Albatross banded at Midway Island in 1956. At the age of 70, she is still rearing chicks.

27th Hawai'i Conservation Conference, September 1-3, 2020. The Society's participation was virtual.

HAS Annual Members' Meeting, November 18, 2020. The Society's 81st Anniversary Annual Members' Meeting was held virtually. Following an update on the activities of the Society by President Linda Paul and a report on the financial condition of the Society by Treasurer John Harrison, the evening featured a preview of the new and expanded 7th Edition of *Hawaii's Birds* and presentations by photographers Ann Tanimoto, Tom Flake, Susan Scott, and Eric Vanderwerf, whose photos appear in the new edition. It is available for sale from the Society's website store for \$15.95.

121st Annual Christmas Bird Count Citizen Science Opportunity, December 2020 - January 2021. Each year, Society members and friends participate in the longest running citizen science survey in the world, which has provided critical data on bird population trends over the past century.

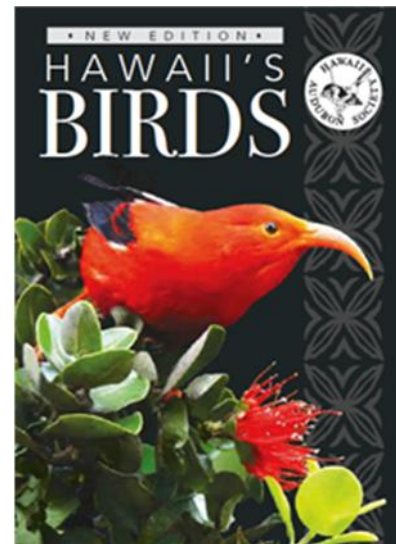
Because of the COVID-19 pandemic, the 121st Count went forward with reduced numbers of counters. Volunteers counted birds within historic circles in Volcano, North Kona, and Hilo on Hawai'i Island, Kapa'a and Waimea on Kaua'i, H na in Koki Beach State Park, ao Circle, and Hosmer Grove on Maui, Topside and Kalaupapa on Moloka'i, and Honolulu and Waipio (Central O'ahu) on O'ahu. Results were submitted to the National Audubon Society data base and can be viewed on their website.

Donations, Grants, Finances, and Fundraising

The Society depends on the many generous donations and matching gifts from our members and benefactors. The donations go directly to the Society's species conservation and ecosystem protection funds, which fund native species research and protection, native habitat restoration, conservation education, the Freeman Seabird Preserve, the Munro Dryland Ecosystem Fund, the Wetland Birds Fund, the Shorebirds Research Fund, the Forest Birds Conservation Fund, the Watershed Protection Fund, and the Marine Species Conservation Fund.

In 2020, donations of \$400 and over were gratefully received from Craig Thomas, Susan Scott, Alice Roberts, Kakuko Shoji, Mark Watanabe, Samantha Kaaua, and the Anderson-Beck Fund. Thanks is also due to Jim Dittmar, who financed the drone flight monitoring in 2019 and 2020.

The Society derives the majority of its operating and programmatic funding from membership dues, grants, and the proceeds from the sales of its educational products, which include its indispensable book *Hawaii's Birds* and its audio companion *Voices of Hawaii's Birds* (2 vol. CD). In November 2020, after years of tremendous hard work from dedicated volunteers, talented photographers, and the Board, we were thrilled to announce the release of the 7th Edition of *Hawaii's Birds*. A special thank you goes to Wendy Johnson, Pat Moriyasu, Alice Roberts, and Susan Scott for working countless hours on this latest edition of our new book, which is a beautifully restyled update of our popular publication.



The new edition of Hawaii's Birds contains new photos and new information and became available for purchase in December 2020 for \$15.95 + shipping, just in time for the holidays!

Also on sale and available for purchase on our website are Susan Scott's book *Hawai'i's White Tern Manu-o-K , an Urban Seabird*, who has generously donated the book's royalties to the Society, and her *Hawai'i's K lea* book, the Society's birding and family hiking map *Treasurers of O'ahu*, *Hawai'i'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, K lea & Ruddy Turnstone "Akekeke" T-shirts.

2020 Shearwater Nesting at Freeman Seabird Preserve: Highest breeding pairs, average chick success, and increasing occupation of ceramic homes

by

K. David Hyrenbach, Professor of Oceanography, Hawai'i Pacific University, khyrenbach@hpu.edu, and
Michelle Hester, Executive Director Oikonos Ecosystem Knowledge, michelle@oikonos.org

We report on the ongoing monitoring and restoration efforts of the Freeman Seabird Preserve by Hawaii Audubon Society and Hawai'i Pacific University since 2009, share findings from the 2020 breeding season, and briefly discuss the plans for future monitoring, habitat restoration, and predator control at the site.



Figure 1. A three-month chick exploring the world outside its nest, and getting ready to fledge (November 22, 2020).

2020 Update

This year we documented 358 active nests of Wedge-tailed Shearwaters (*Ardenna pacifica*, 'Ua'u kani) at the Freeman Seabird Preserve, 12.5 % higher than the count of 318 nests in 2019. This year's nest count is the highest to date, surpassing the previous peak documented in 2019 (Hyrenbach & Hester 2020). Overall, the annual population surveys continue to show a statistically significant trends ($F = 171.341$; $df = 1, 10$; $p < 0.001$) with an average increase of 23.4 (+/- 11.1 S.D.) nests per year, which captures 94 % of the year-to-year variability in the 12-year time series (2009-2020; Figure 2). Therefore, this trend suggests

that the colony continues to grow, in part due to our restoration efforts.

The July 14 count of 358 nests (representing assumed parents incubating eggs) was followed by a count of 262 chicks on September 14. This represents a loss of 26.8 % of the nests during the two-month period spanning hatching and the first month of the chick's life. Furthermore, the weekly monitoring of 70 nests between July and November revealed that 2020 was characterized by low egg loss, with 15.7 % of the monitored eggs being lost. Chick mortality was also fairly low in 2020, with 12.3 % of the monitored chicks disappearing. In contrast with 2019, when some chicks starved later in the season (mid-September; Hyrenbach & Hester 2020), this year all the chick mortality happened early in the season (by August 28). These observations suggest that the foraging conditions for provisioning shearwaters were better this year.

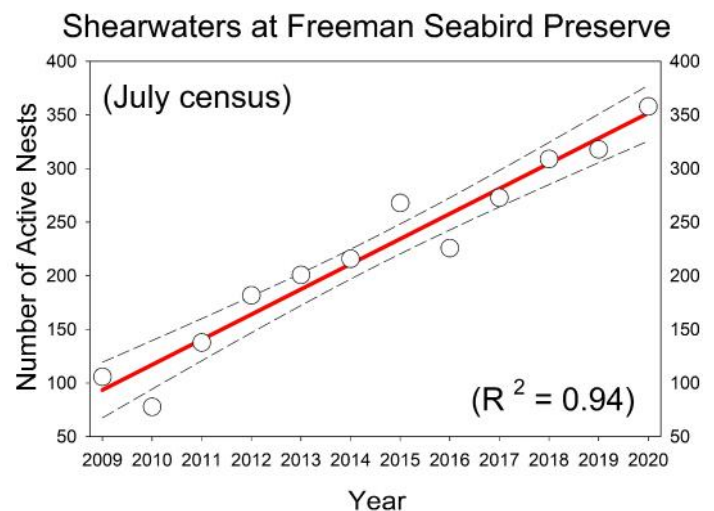


Figure 2. Trend in the number of Wedge-tailed Shearwater active nests at the Freeman Seabird Preserve, derived from the annual colony-wide census during the peak incubation period (July 14), showing the best-fit linear regression (solid line) and the 95% confidence interval envelope (dashed lines).

The weekly monitoring also revealed that 2020 was characterized by average timing of breeding (phenology), similar to previous years. In 2020, chick hatching dates spanned from July 28 to August 25, with a mean of August 5 (+/- 5.4 S.D. days).

Chick peak masses and growth patterns were also comparable to those recorded in the past. In 2020, the maximum chick weights ranged from 407 to 587 grams, with a mean of 511.3 (+/- 51.2 S.D. grams). Chick masses started declining in late October, and chicks started fledging the first week of November (Figure 3).

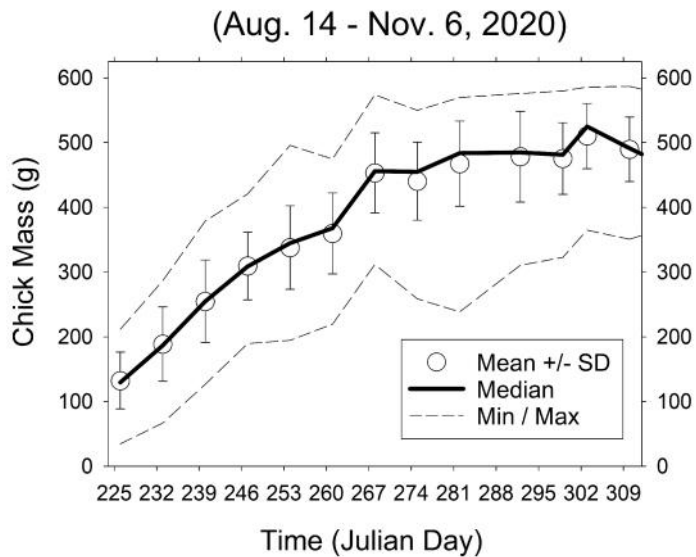


Figure 3. Time series of chick mass collected during the 2020 breeding season, showing the mean +/- S.D., the median, and the range (maximum – minimum) of weekly measurements. Sample size = 40 chicks.

We continue to learn how ocean conditions impact shearwater breeding success and 2020 added another La Niña year (the cool phase of the El Niño-Southern Oscillation climate pattern) to the time series. While La Niña conditions have persisted through mid-February 2021, forecasters estimate about a 60% chance that neutral conditions will return in April – June 2021 (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 anticipate that 2021 will be another “average” year for Wedge-tailed Shearwater breeding at the Freeman Seabird Preserve.

Ongoing Efforts

Habitat restoration efforts continued during 2020. 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 and improve natural nesting sites. This was also the second season the newly designed ceramic nests were deployed before shearwaters returned to prospect for breeding sites. In 2020, we monitored these 14 artificial nest sites

weekly for occupancy and daily with motion-activated infrared cameras.

Ten of the fourteen (71.4 %) artificial nests were occupied by pairs who laid eggs. Because most burrowing seabirds return to the same nest site every year, it can take many years for breeders to select new artificial nests. We are encouraged by the quick acceptance of the customized modules. We also documented this rapid occupation with the original artificial sites created with roofing tiles.

All ten eggs hatched and eight successfully fledged from the ceramic nests, with a hatching success of 100.0 % and a fledging success of 80.0 %. Overall, the reproductive success, expressed as the proportion of pairs that laid an egg in July and successfully fledged a chick in November, were not significantly different (Fisher’s Exact Test, Chi-squared = 0.23688, df = 1, p = 1), with 80.0 % (8 of 10) in the ceramic nests and 72.7 % (48 of 66) in the control nests. Thus, for the second year in a row, these results suggest that the breeding performance in the new ceramic nests is similar to that from existing natural and roof tile nests at the Freeman Seabird Preserve (Hyrenbach & Hester 2020).

Additional restoration and management efforts in 2021 will involve 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 improve some of the existing rock nesting sites on the terrace. Additionally, the irrigation system originally installed at the site in 2008 will be replaced with new pipes and faucets.

Colony Monitoring: Population censusing and nest monitoring for phenology, chick growth and reproductive success will continue in 2021, to augment the ongoing time series started in 2009.

Predator Control: Ongoing surveillance for predators is planned during the 2021 nesting season, to minimize and document predation by rats, cats and mongooses on breeding shearwaters.

Acknowledgements

Funding from Disney Conservation Fund and Atherton Family Foundation. We thank the many volunteers and students who contributed to the restoration and monitoring efforts.

Literature Cited

Hyrenbach, K.D., and Hester, M.M. 2020. 2019 Shearwater Nesting at Freeman Seabird Preserve: Highest breeding pairs, average chick success, and first eggs in ceramic homes. *‘Elepaio* 80(2): 13-14.

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 wildlife and ecosystems and conservation of natural resources through education, science and advocacy in Hawaii 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

International Membership:

\$28 Canada & Mexico

\$33 Other

Donations are tax-deductible and greatly appreciated.

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.

Email: hiaudsoc@gmail.com <http://www.hawaiiadubon.org>

Mahalo for your concern and commitment to protecting Hawai'i's native wildlife and ecosystems.

Upcoming Events and Field Trips

Visit our website for details and regular updates

<http://www.hawaiiadubon.org/get-outside>

Hanauma Bay Presentations

HAS is co-sponsoring the following presentations in cooperation with Hanauma Bay Education Program, every Thursday from 6:30 to 7:30 pm, virtually; find updates and more information on <https://seagrant.soest.hawaii.edu/hanauma-talks-seminar-and-hbep-event-calendar/>

April 1: Susan Scott: K lea

April 8: Yvonne Chan: Mosquitoes and native forest birds

April 15: David Hyrenbach: Act Locally, but Think Globally: Considering Multiple Ocean Drivers of Wedge-tailed Shearwater Populations

April 22: Rich Downs: White Terns

April 29: Tom Fake: Bird Photography

Farewell to our Shorebirds, Paik Lagoon

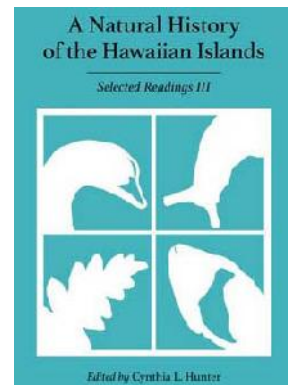
April 10, 8:25 am, meet at water end of Kuli ou ou Road
Explore the Lagoon area while learning about Hawai i's visiting shorebirds. We may see, e.g., K lea, Ruddy Turnstone, Wandering Tattler as well as Hawaiian Stilts, Iwa, Egrets, Herons, and lots of urban birds and ducks.

Leader: Alice Roberts

Please text 808-864-8122 or email MermaidsHI@aol.com

A Natural History of the Hawaiian Islands:

Selected Readings III, Edited by Cynthia L. Hunter



Published in October 2020 and available for \$ 54 on <https://uhpress.hawaii.edu/title/a-natural-history-of-the-hawaiian-islands-selected-readings-iii/>

'Elepaio ISN 0013-6069

Managing Editor: Susanne Spiessberger

Scientific Editor: Glenn Metzler

The Elepaio is printed on recycled paper and published six times per year.

Hawaii Audubon Society
850 Richards St, Suite 505, Honolulu, HI 96813

hiaudsoc@gmail.com

<http://www.hawaiiadubon.org>





HAWAII AUDUBON SOCIETY
 850 RICHARDS ST, SUITE 505
 HONOLULU, HI 96813-4709
 (808) 528-1432
<http://www.hawaii-audubon.org>
hiaudsoc@gmail.com

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‘ELEPAIO # 81:2# MARCH / APRIL 2021

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<p style="text-align: center;">VOLUNTEER OPPORTUNITY</p> <p style="text-align: center;">Fieldwork Habitat Restoration</p> <p>January through March, Saturdays from 8:00 am to 11:00 am Where: Freeman Seabird Preserve (FSP), located in Southeast O’ahu at Black Point.</p> <p>FSP is generally closed to public visitation to protect sensitive nesting habitat. Reservations may be arranged for work groups that would like to help restore Hawaiian coastal vegetation and seabird nesting habitat. For more information, visit https://www.freemanseabirdpreserve.com/.</p> <p>COVID-19 protocols will be applied; we will practice social distancing and require volunteers to wear a facemask. The number of volunteers on the habitat will be on the discretion of the Volunteer Coordinator.</p> <p>RSVP: Text Alice Roberts at 808-864-8122 in advance to participate.</p>	<p>State of the Society:</p> <p>Annual Report for 2020 _____ 9</p> <p>2020 Shearwater Nesting at Freeman Seabird Preserve: Highest breeding pairs, average chick success, and increasing occupation of ceramic homes _____ 13</p> <p>Upcoming Events and Field Trips _____ 15</p>
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