



SAVING HAWAI‘I’S ENDANGERED PLANTS WITH BIRD SONG

On O‘ahu, native plants struggle to survive with the extinction of fruit-eating birds. Researcher Sean MacDonald while a Master’s student at the University of Illinois, hypothesized that introduced birds could be attracted to rare and endangered plants that no longer have native birds to disperse seeds. By playing bird calls, non-native birds could be encouraged to investigate and feed on the plant’s fruit, which would result in dispersal of the plant’s seeds (Velazquez 2018).



Sean MacDonald watches for birds in O‘ahu, Hawai‘i. Photo courtesy of Sean MacDonald and The Daily Illini.

To test his hypothesis, he recorded bird visits to 25 different native and introduced plants during a control period and while playing the bird calls of non-native birds that eat fruit and live in O‘ahu, including the Japanese White-eye, Red-billed Leiothrix, Red-vented Bulbul, and Red-whiskered Bulbul (MacDonald et al. 2018). While conducting this research, MacDonald would sit motionless in the forest for two hours wearing full camouflage to prevent birds from noticing him and flying off (Velazquez 2018).

His experiment showed that audio lures could be used to bring birds to fruiting plants with birds attracted to plants during 30% of the played calls (MacDonald et al. 2018) and more likely to be attracted by calls of their own species (Rogers 2018). Research findings also indicated that birds were more likely to eat fruit from common plants, which composed 90% of foraging events (MacDonald et al. 2018). MacDonald concluded fruit familiarity appears to be a driver in bird foraging (MacDonald et al. 2018). But the experiment also indicated that even though the bird species that plants evolved with are now extinct, other birds could disperse seeds using bird calls as lures (Velazquez 2018). “Birds do associate with other bird calls, even outside their own species when foraging — and for fruit in particular,” MacDonald said. “That behavior is important, and it can be manipulated to our advantage.” (Velazquez 2018).

Japanese White-eye composed over half of the fruit-eating birds attracted by the bird calls and composed 97 of the 129 birds that consumed fruit from focal plants. This suggests some species may be more likely to use social cues to obtain foraging information (MacDonald et al. 2018). Once birds are

aware of a plant's location, MacDonald is hopeful that the information would be spread through the population and generations.

Even though Japanese White-eye were most readily attracted to the plants by bird calls, MacDonald believes they are not the best species to ensure the survival of many native plant species long-term in Hawai'i (Rogers 2018). Approximately half of the native fruit-bearing plants on O'ahu have seeds that are too large for non-native forest birds, said MacDonald (Rogers 2018). Instead 'Alalā (Hawaiian crow) may be more suited for seed dispersal on the island (Rogers 2018); these birds have no problem with large seeds. 'Alalā were extinct in the wild in Hawai'i until recently, but now through captive breeding have been reintroduced on the Big Island. Other crow species are known to pass foraging information to young, said MacDonald (Rogers 2018). Consequently, the intelligent 'Alalā may be the ideal bird to save these plants and pass foraging information through future generations (Rogers 2018). If 'Alalā are reintroduced to O'ahu, MacDonald's techniques of luring birds with calls could help the 'Alalā locate endangered fruiting plants and ensure their survival into the future.

This article reports on research that may have application in guiding reintroduced 'Alalā to fruit-bearing plants that no longer have native birds that may disperse their seeds. The methods are not without controversy; however, HAS believes there is value to reporting current research to our members.

Citations

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Conservationists Honored at Hawaii Audubon Annual Dinner

On November 28, the Hawaii Audubon Society hosted our annual dinner and membership meeting at the Waikiki Yacht Club. During this event the HAS Board of Directors honored those who have furthered the Society's mission "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".

First, Board President Linda Paul recognized Governor Ige with the President's Award, which honors public leaders in conservation. Governor Ige has advocated for the resolution of many of the environmental issues that face Hawai'i's native wildlife and ecosystems and has supported and developed plans to protect these valuable resources well into the future. His environmental leadership was especially demonstrated by the groundbreaking legislation signed this year to combat climate change. Scott Glenn, Director of the State of Hawai'i Office of Environmental Quality Control and Co-Chair of Governor Ige's Sustainable Hawai'i Initiative, and Susan Case, Chair of the State of Hawai'i's Department of Land and Natural Resources, received the award for Governor Ige.



Governor Ige signs bills on June 4, 2018 to set carbon-neutral goal and combat climate change.

Next, Nathan and Alana Eagle were presented with the Environmental Journalism Award for their multimedia presentation "The Last Wild

Place” (<https://www.civilbeat.org/projects/the-last-wild-place/>), which appeared in Honolulu Civil Beat. This story documents the natural wonders of Papahānaumokuākea Marine National Monument, including its seabirds and endemic birds, such as the Nihoa Millerbird. The awareness created by this story will help spur conservation efforts, which are needed more than ever in the face of climate change, pollution, politics, and natural disaster—this October a hurricane reduced the Monument’s habitat by burying East Island of French Frigate Shoals and a large proportion of green sea turtle nesting habitat.

In addition, two hard working individuals, Pat Moriyasu and Robynn Yim, were presented with the Volunteer Service Award. Pat digitized issues of the ‘Elepaio dating from 1939 to the present to create long-term accessibility of these historical conservation records. Robynn worked tirelessly at the Freeman Seabird Preserve to remove weeds and restore native habitat to improve this area for seabird nesting.

Continuing with a theme of conservation, author and biologist Susan Scott talked about the unique life history of the White Tern and how the community of Honolulu has gotten together to care for the White Tern. This seabird’s story is the basis of her new book, "Hawai‘i’s White Tern, Manu-o-Kū, An Urban Seabird", which is for sale at the Hawaii Audubon Society online store.



Recipients of Environmental Journalism Award and authors of “The Last Wild Place”, Nathan and Alana Eagle, with Hawaii Audubon Society President Linda Paul.

FREE-ROAMING CATS THREATEN SURVIVAL OF HAWAIIAN WILDLIFE

Many people know that feral and domestic outdoor cats are hunters and a threat to native birds; however, there is more to the story on how cats affect wildlife. Cats are selective and may prefer killing birds over rats (Parsons et al. 2018). In addition to hunting, they cause threats to wildlife by spreading the parasitic disease toxoplasmosis.

Choosy Hunters

Humans often use cats in an attempt to control rat populations; however, a new study (Parsons et al. 2018) indicates that cats are not good predators against rats. Only two rats in 79 days were killed by cats during a study at a New York City waste management plant. Rats were observed to actively avoid the cats by seeking shelter. The perception that cats control rat populations may be incorrectly based on this avoidance behavior which results in rats being less visible in the presence of cats (Parsons et al. 2018).

Cats may prefer smaller, more defenseless prey such as birds and other small wildlife over rats, which weigh an average of 330 g compared to 15 g for a small bird and 30 g for a mouse (Parsons et al. 2018). Even if cats are well-fed, they may still kill wildlife, which is instinctual as stated by the Hawaii Invasive Species Council (<https://dlnr.hawaii.gov/hisc/info/invasive-species-profiles/feral-cats/>).

There is strong evidence that cats influence native wildlife populations, especially on islands where species evolved with no similar predators. The greatest impacts are on endemic species with cats causing 14% of extinctions of birds, mammals and reptiles and posing threats to 8% of critically endangered species (Medina et al. 2011). In Hawai‘i, the Department of Land and Natural Resources (DNLN) lists cat prey to include endangered birds such as the Palila (*Loxioides bailleui*), ‘Ua‘u (Hawaiian Petrel; *Pterodroma sandwichensis*), ‘A‘o (Newell’s Shearwater; *Puffinus newelli*), Koloa (Hawaiian Duck; *Anas wyvilliana*), ‘Alae ‘ula (Hawaiian Moorhen; *Gallinula chloropus sandvicensis*), and Ae‘o (Hawaiian Stilt; *Himantopus mexicanus knudseni*).

The Truth about Toxoplasmosis

Cats are critical in the spread of the disease toxoplasmosis, which is a threat to wildlife and humans. Toxoplasmosis can infect many warm-blooded animals. The parasite *Toxoplasma gondii*

responsible for the disease can only sexually reproduce in cats; consequently, cats are essential to the spread of the disease through the environment. Parasite eggs are released through cat feces with one cat releasing millions of eggs that can survive for several months. If a warm-blooded animal ingests only one egg, they may become infected. Cats contract this disease by consuming an infected animal, such as a bird or mouse (NOAA Fisheries, March 2018).

Toxoplasmosis has killed eleven Hawaiian monk seals since 2001 (NOAA Fisheries, June 2018). This disease is a huge threat to the Hawaiian monk seal with only 1,400 remaining in the wild (Barbieri et al. 2016).

Toxoplasmosis does not only kill monk seals, it kills native birds. The death toll includes Nēnē (Hawaiian Goose, *Branta sandvicensis*) and ‘Alalā (Hawaiian Crow, *Corvus hawaiiensis*), with toxoplasmosis in part liable for the extinction of ‘Alalā in the wild (NOAA Fisheries, March 2018).

In addition, this disease is known to cause birth defects if a pregnant woman becomes infected. This can happen from accidentally ingesting eggs from cat feces (i.e. from cleaning litter box), unwashed produce, undercooked meat, or from the soil (NOAA Fisheries, March 2018).

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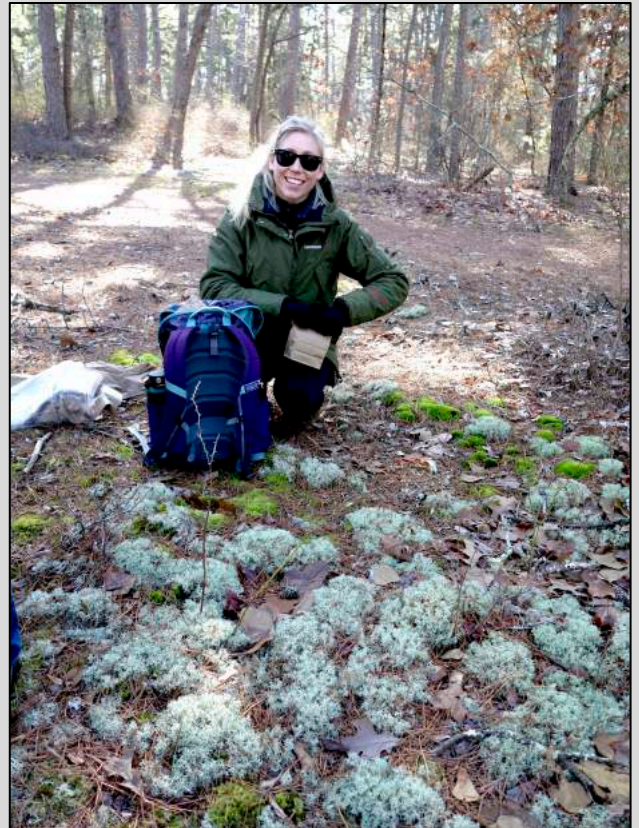
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2018 Fall Hawaii Audubon Society Research Grant Awardee

Carly Anderson Stewart

Project Title: Expedition Hawaii: Answering major questions about *Cladonia* lichens in the Hawaiian Archipelago

About Carly: Carly is a 3rd year PhD student at the University of Colorado at Boulder. She's currently assembling a global phylogeny of the large lichen genus *Cladonia*, towards the goal of studying correlates of speciation in lichenized fungi. Globally-distributed *Cladonia* have been recorded on the Hawaiian archipelago, but without subsequent confirmation. In contrast, approximately 12 species are thought to be endemic to the islands, including several that remain undescribed due to a lack of adequate material. Carly plans to search for new vouchers of these species for subsequent molecular and conservation analyses.



Upcoming Events, Field Trips, and Volunteer Opportunities

VOLUNTEER OPPORTUNITIES

2019 Freeman Seabird Preserve Fieldwork, Seeking Volunteers for Habitat Restoration

When: Saturdays, January through March, 8:30 AM to 11:30 AM

Freeman Seabird Preserve 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.

Where: Freeman Seabird Preserve located in Southeast O‘ahu at Black Point. Meet at Paikau St side of Triangle Park at 8:15 AM near Diamond Head Road and 22nd Avenue to carpool to Preserve. See below map.

Description: In November and early December, Wedge-tailed Shearwater adult birds and chicks leave the Freeman Seabird Preserve to forage at sea for several months before returning in the latter part of March to nest.

While the birds are absent from the Preserve, volunteers are needed for habitat restoration. Activities will include maintenance of native plants and man-made landscape features, along with removal of invasive plants, trash and debris.

What to bring: Please bring drinking water, sun and rain protection, gloves, weeding tools, clippers or loppers, if you have them. We also have gloves and tools to share.

RSVP: Contact Alice at 808-864-8122 in advance to participate. Leave name and phone number.



EVENTS

World Wetlands Day

When: Saturday, February 23, 9 AM to 2:30 PM

Where: Kailua United Methodist Church, Kailua (O‘ahu)

Description: World Wetlands Day is celebrated worldwide to raise awareness about the essential role of wetlands for the health of our planet and people with the primary purpose of preservation of wetland habitat. This year’s theme is “Wetlands and Climate Change”, which was selected to inform the public of the vital role wetlands have in mitigating the effects of climate change.

The event will include informational booths and activities for the keikis.



Hawaii Audubon Society booth at the 2018 World Wetlands Day event.

Upcoming Events, Field Trips, and Volunteer Opportunities

FIELD TRIPS

Aiea Loop Forest Hike

When: Saturday February 16, 2019 at 7:30 AM

Where: Aiea Loop Trail, O'ahu

Leaders: Mandy Talpas (Commercial Bird Guide)

Description: Easy to moderate hike. The trail can be muddy, but we will hike slowly. The entire trek will be about 4.8 miles.

On the hike we may encounter 'Elepaio, 'Amakihi, and Swiftlet.

RSVP: Please RSVP at hiaudsoc@gmail.com with subject line Aiea Loop Trail. Limited spots available.

Cost: No cost; however, donations to Hawaii Audubon Society are always welcome.

White Tern Walk

When: Saturday February 16, 2019. Time to be announced.

Where: Honolulu (specific location to be Announced).

Leader: Rich Downs (Hawaii Audubon Board Member)

Description: Join us for another White Tern Walk as we visit nests around town.

RSVP: Please text 808-379-7555 or email huimanuoku@gmail.com.

Paikō Lagoon Walk

When: Saturday April 20, 2019 at 9:30 AM

Where: Paikō Lagoon Wildlife Sanctuary (O'ahu). Meet at Kuli'ou'ou Road at water's edge.

Leader: Alice Roberts (Hawaii Audubon Board)

Description: This is the annual "Farewell to our Shorebirds". Visit Paikō Lagoon during a low tide and learn about native plants at the water's edge and spot shorebirds, resident Hawaiian stilts, 'Iwa, ducks, and more.

RSVP: Please RSVP with name and phone number at 808-864-8122

Cost: No cost; however, donations to Hawaii Audubon Society are always welcome.

Palikea Forest Hike

When: Saturday April 20 2019, 7:30 AM – 3:30 PM

Where: Palikea Trail, O'ahu

Leader: Lynette Williams

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

About the Hike: The Palikea Trail is a moderate hike, 3 miles round-trip with an elevation change of 300 feet to the summit ridgeline of the Wai'anae Mountains. People with a fear of heights are advised that there are sheer drop-offs next to the trail in some locations. The summit ridgeline affords spectacular views (weather permitting) of Nānākuli Valley, Lualualei Valley, and the central expanse of the Wai'anae Mountains. The ridge trail includes native forest of 'Ōhi'a and shrubs. Native forest birds such as 'Apapane, 'Elepaio and 'Amakihi may be spotted or heard.

RSVP: hiaudsoc@gmail.com with subject line Palikea Trail. Limited spots available.

Saying Goodbye To Paul Breese

Paul Leland Breese
Luminary of Hawaiian Conservation Efforts
October 16, 1922 - October 18, 2018

Paul L. Breese, Director Emeritus of the Honolulu Zoo, was active in Hawaiian conservation efforts for over 75 years. Born in Michigan and raised in Southern California, Breese received a degree in zoology in 1946 at the University of Hawai'i. For the next 20 years, he worked tirelessly as Director of the Honolulu Zoo and later became the Branch Chief of the Hawai'i State Division of Fish and Game. While at the zoo, Breese commenced the Nēnē Restoration Project (Hawaiian Goose,) and persuaded the Territorial Legislature to proclaim the Nēnē as the Official Bird of the Hawaiian Islands. Simultaneously, he initiated captive breeding programs for endemic Hawaiian 'Alae 'Ula (Hawaiian Gallinule), 'Io (Hawaiian Hawk), Koloa, (Hawaiian Duck), and the Laysan Duck.

Arleone Dibben-Young
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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.

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



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- 2) Email hiaudsoc@gmail.com to receive password.
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