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Mosquito Control Project to Save Honeycreepers Underway on Maui and Kaua‘i Method Aims to Prevent Hawaiian Honeycreeper Extinctions



‘Ākohekohe © Jim Denny

Press Release from Birds, Not Mosquitoes

Several Hawaiian honeycreepers are facing imminent extinction due to avian malaria carried by invasive southern house mosquitoes. Members of the multi-agency partnership Birds, Not Mosquitoes (BNM) have begun releasing non-biting male southern house mosquitoes on Maui and Kaua‘i to reduce their populations. Following years of rigorous study and analysis, the releases began in November 2023 after regulatory approval from state and federal agencies.

“This really is a critical milestone as it demonstrates the strength of our partnerships to ensure the long-term survival of our island’s honeycreepers,” says Dr. Earl Campbell, U.S. Fish and Wildlife Service Field Supervisor for the Pacific Islands Fish and Wildlife Office. “It is made even more momentous as our collaborative efforts occur

during Makahiki o Nā Manu Nahele, the Year of the Forest Bird.”

This work is part of the U.S. Department of Interior’s Strategy to Prevent the Extinction of Hawaiian Forest Birds and it is urgent: Hawai‘i’s forest birds have declined from more than 50 different native honeycreepers to just 17 species remaining today.

“Manu are revered as our ‘ohana and for too long, their songs have been declining,” says Ulalia Woodside Lee, Executive Director, The Nature Conservancy Hawai‘i and Palmyra. “We have a kuleana, a responsibility, to give nā manu nahele a chance to nourish Hawaiian culture and spirit, as well as pollinate our forests and keep them growing. We are looking forward to the day when honeycreepers aren’t rare in Hawai‘i’s forests.”

Mosquitoes are rapidly moving to higher elevations as the climate changes and native forests get warmer and drier. Without significantly reducing mosquito populations, multiple native bird species are likely to go extinct in the wild in less than 10 years, including the kiwikiu and ‘ākohekohe on Maui, and ‘akikiki and ‘akeke‘e on Kaua‘i.

“After decades without the tools to solve this problem, this project is our best chance to save the birds and native forests for future generations,” says Dr. Chris Farmer, Hawai‘i Program Director for American Bird Conservancy (ABC). “I am excited and honored to be part of this historic collaboration to address difficult, previously intractable conservation problems, and commit to long-term solutions.”

The male southern house mosquitoes, which do not bite or transmit disease, carry a strain of the common, naturally occurring Wolbachia bacteria. When they mate with females in the wild, which carry a different strain of this bacteria, their eggs don’t hatch, causing the mosquito population to decrease. No new species are being introduced to Hawai‘i; both the mosquitoes and the Wolbachia bacteria are already here. This method has been safely used to control the spread of human diseases by mosquitoes around the world.

“This project is our best opportunity to reverse the trend of shrinking bird populations for these species that are found only in Hawai‘i,” says Dr. Lindsey Nietmann, Forest Bird Recovery Coordinator for the Hawai‘i Department of Land and Natural Resources Division of Forestry and Wildlife. “In addition to protecting the birds that remain in our forests, we hope these efforts will one day lead to the release of captive populations that are currently in conservation breeding facilities and awaiting re-introduction to the wild.”

Monitoring is an essential part of this project. It helps determine if mosquito populations are decreasing, malaria prevalence is decreasing, and native bird populations are stabilizing or increasing. Maui Forest Bird Recovery Project (MFBRP) has been leading implementation on Maui. Landscape level deployment has begun over a few thousand acres of remote forests on East Maui.

“Our monitoring is driven by science and is designed to gather the best possible data,” says Dr. Christa Seidl,



‘Akikiki © Jim Denny

MFBRP’s Mosquito Research and Control Coordinator. “Our field team provides essential boots on the ground and in the air, spending long, often wet days in remote forests checking mosquito traps and collecting data.”

Kaua‘i Forest Bird Recovery Project has been leading efforts on Kaua‘i, and has completed small scale pilot releases to assess how far the male mosquitoes travel. Next steps include releases over a few thousand acres of forest on the Alaka‘i Plateau.

This project could not have happened without substantial state and federal partnership and funding. In particular, the Biden administration’s Investing in America Agenda committed nearly \$16 million through the Department of the Interior to catalyze extinction prevention in Hawai‘i. This funding is part of the broader Hawaiian Forest Bird Conservation Keystone initiative. The National Fish and Wildlife Foundation is also a major supporter.

“This effort represents the culmination of decades of collaborative research between the Department of the Interior and State biologists, non-governmental organizations, and private enterprises,” says Dr. Dennis LaPointe, Research Ecologist at United States Geological Survey Pacific Island Ecosystems Research Center. “The timely development of this safe and effective tool to suppress mosquito populations in forest bird habitats brings new hope for the preservation of the remaining Hawaiian honeycreepers.”

In 2024, the partnership will continue releases on Maui, expand releases on Kaua‘i, and prepare a Statewide Environmental Assessment. The State Department of Health will lead that assessment, which will address application of this method for both conservation and public health.

Birds, Not Mosquitoes: Partner Organizations

American Bird Conservancy is a nonprofit organization dedicated to conserving wild birds and their habitats throughout the Americas. With an emphasis on achieving results and working in partnership, we take on the greatest problems facing birds today, innovating and building on rapid advancements in science to halt extinctions, protect habitats, eliminate threats, and build capacity for bird conservation.

The Nature Conservancy, Hawai'i and Palmyra: The Nature Conservancy is a global non-profit organization dedicated to conserving the lands and waters on which all life depends. Informed by science and guided by traditional values and practices, we apply innovative, nature-based solutions to our world's toughest challenges so that nature and people can thrive. TNC has forged partnerships to manage 14 preserves and other sites in Hawai'i and Palmyra Atoll, working with government, private parties and communities to protect Hawai'i's and Palmyra's forests and coral

reefs for their ecological value and for the many benefits they provide to people.

The U.S. Fish and Wildlife Service works with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. The Service works closely with partners to conserve fish, wildlife, plants, and their habitats throughout Pacific Islands. The areas we help to protect include the state of Hawai'i, the Territory of Guam, the Territory of American Samoa, the Commonwealth of the Northern Mariana Islands, and the islands and waters located within Papahānaumokuākea Marine National Monument, Rose Atoll Marine National Monument, and the Pacific Remote Islands Marine National Monument.

Maui Forest Bird Recovery Project (MFBRP): MFBRP is a project of the Pacific Cooperative Studies Unit (PCSU) of the University of Hawai'i at Mānoa in association with Hawai'i Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW). It is funded and supported by numerous partners including the U.S. Fish and Wildlife Service and Nā Koa Manu

Conservation Inc. MFBRP is driven by science and dedicated to the conservation of Hawai'i's native forest ecosystems. Our mission is to develop and implement techniques that recover Maui's endangered birds and to restore their habitats through research, development, and application of conservation techniques.

Kaua'i Forest Bird Recovery Project (KFBRP): KFBRP is a project of the Pacific Cooperative Studies Unit (PCSU) of the University of Hawai'i at Mānoa in association with Hawai'i Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW). It is funded and supported by numerous partners including the U.S. Fish and Wildlife Service, DOFAW, and several other organizations and individuals. The Kaua'i Forest Bird Recovery Project is committed to promoting knowledge, appreciation, and conservation of Kaua'i's native forest birds, all of which are unique to Hawai'i; several are endemic to (found only on) Kaua'i.

Pacific Cooperative Studies Unit (PCSU): PCSU's mission is to protect and restore Hawai'i's native species, ecosystems, and cultural resources.



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Nēnē.org and the Role of Community in Conservation

by Jordan Lerma

Nēnē Research and Conservation organization

Nēnē were once abundant across the Hawaiian Islands with a population estimated to be around 25,000. A cascade of threats including hunting, habitat destruction, and the introduction of alien predators such as dogs, pigs, cats, rats, and mongoose precipitated a devastating

collapse. By 1945, this decline culminated in a mere 30 individuals clinging to survival in the wild, secluded in the high elevations of Hawai'i Island. This dire situation sparked intensive conservation efforts, including captive breeding programs initiated in Hawai'i and as far afield as Slimbridge, England. Today, while their numbers are increasing on Kaua'i, they remain stagnant on Hawai'i Island and in decline on Maui and Molokai. Current population estimates are compiled by the Nēnē Recovery Action Group and based on biannual surveys mainly conducted by Hawai'i Department of Land and Natural Resources (DLNR) with additional counts from U.S. Fish and Wildlife managed refuges and the National Parks. Despite over 50% of the nēnē population being banded, no public sighting database existed for the species before we started nēnē.org and no current community repository like eBird or iNaturalist is used to contribute to understanding habitat usage and population dynamics.

In early 2023, the Nēnē Research and Conservation organization set out with a mission to supplement the existing effort being done with nēnē by aggregating data

in a useful way. We decided to start nēnē.org and gather all of the publicly accessible sightings from tools like eBird, iNaturalist and social media websites like Facebook, X (formerly Twitter), Instagram, and Tik Tok. We also were able to access some data through the FAA bird strike database and the United States Geological Survey Bird Banding Lab shared all of the sightings that have been reported to them through their online form. We then continued searching for nēnē records and are collaborating with DLNR, Hakalau Forest National Wildlife Refuge, Hawai'i Volcanoes National Park, and Haleakalā National Park to obtain sighting, banding, and mortality records. We also conduct our own dedicated surveys to increase the coverage of the population and provide ground truthing for community aggregated data. We are also working on methods to better estimate counts of unbanded birds by using known associates, molt patterns, habitat usage and more. All of this is to say we are seeking to use all available data to measure the population in real time.

The dataset we've compiled is actively being used to enhance protection measures for the nēnē. In March 2023, a 20-year-old female nēnē banded C10 was fatally struck by a vehicle on Kalaniana'ole Street, on the east side of Hawai'i Island. This tragic event prompted a deeper investigation, revealing that over 10% of the nēnē subpopulation in Hilo had been victims of vehicle collisions along that same stretch in recent years. To tackle this issue, we utilized community-sourced sighting data to perform a critical habitat analysis. This process not only shed light on the number of nēnē frequenting these areas but also helped us brainstorm effective solutions to

mitigate such collisions. Reducing vehicle speeds is a key factor in minimizing collisions so we took innovative steps to gather concrete speed data. We developed low-cost radar speed sensors and strategically placed them in areas identified as high risk based on the sighting data. The data collected confirmed our suspicions: a significant number of drivers exceeded the posted speed limits. Armed with this evidence, we approached the County with our findings and presented our recommendations leading to the successful reduction of the speed limit and the installation of speed tables and raised crosswalks in the identified high-risk zones. We're extending our monitoring initiatives to assess how effective these strategies are in reducing nēnē-vehicle collisions across additional locations identified through community-contributed data.

In addition to vehicle collisions, mongoose, pigs, and cats pose significant threats to the recovery of the nēnē on Hawai'i Island and Maui. In April 2023, the Maui-based nonprofit group Kāko'o Haleakalā initiated a petition aimed at ceasing cat feeding activities at Queen's Marketplace in Waikōloa. This action was spurred by social media revelations showing nēnē feeding from cat stations located in the rear parking area. Utilizing community sightings, we identified over 40 individual nēnē who had frequented these stations since as early as 2019. In collaboration with Kāko'o Haleakalā, Alexander and Baldwin, and the DLNR, we monitored the site and successfully got the feeding stations removed and banned cat feeding on the premises. Additionally, we employed various statistical methods to estimate the feral cat population within this colony more accurately. Our conservative estimates suggested a minimum of 157 feral cats in the parking area alone, with the broader resort complex harboring at least 453. We are committed to ongoing surveys of the area, monitoring both the nēnē known to visit the site previously and the fluctuations in the cat population over time.

We're deeply thankful for the chance to work with numerous golf courses, notably the efforts at Makani Golf Club in 2023, where we removed at least 283 mongoose, confirmed by carcass counts. This achievement, made possible by employing various trapping techniques, not only aids in



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nēnē conservation but also benefits the broader ecosystem. Controlling predator populations helps create safer habitats for many native species, thereby enhancing biodiversity and the overall health of the ecosystem.

We constantly seek ways to scale our work by enhancing efficiency. With an extensive catalog of over 112,000 images, we are integrating AI and machine learning to expedite and refine the processing of sightings. During our field surveys, we aim to capture photographs of every nēnē we encounter. This practice not only facilitates post-survey analysis of potential field-oversights, such as eye injuries or molting patterns, but it also enhances the accuracy of our surveys. The vast number of images captured inevitably leads to a significant backlog requiring processing. Traditionally, a person could manually add around forty sightings to our database per hour. However, with the machine learning models we've developed, we can process a folder containing hundreds of sightings with over 95% accuracy in less than five minutes. Each processed sighting receives a probability rating between 0 to 100, guiding us in identifying images for manual review and ensuring the addition of highly accurate data to our database. We specifically review and sort images falling below a certain accuracy threshold, continually refining our model with every photograph to reduce the need for manual labor in conservation tasks. Additionally, these models have also been applied to our game camera photos for identifying predators and threats in critical habitats. By reducing the latency between capturing an image, recording a sighting, and implementing necessary actions, we aim to continually enhance our response efficiency to protect nēnē and their habitats.

Our latest endeavor focuses on the meticulous tracking of injuries among the nēnē population, with the aim of establishing criteria to discern the types and severities of injuries that necessitate human intervention. To facilitate this, we have developed an injury tracking system where any detected injury is automatically logged. This system is designed to update the status of each injured nēnē upon subsequent sightings, allowing resource managers to effectively prioritize their efforts based on the most critical cases. Additionally, this invaluable data is shared with experts, enabling us to concentrate on delivering the most pertinent information to resource managers. This, in turn, helps them to allocate care and attention where it's most needed, ensuring that the nēnē receive timely and appropriate intervention for their injuries.

Despite the progress we made in 2023, native species in Hawai'i continue to face a myriad of challenges. Utilizing community-sourced sighting data has been crucial for monitoring the dispersed nēnē populations, pinpointing specific issues they face, and devising appropriate solutions. As we move forward, leveraging cutting-edge technology will play a crucial role in enhancing these solutions, expanding our reach, and providing the conservation community with innovative tools to make a greater impact. The need for more predator control, increased human labor, additional funding, and more collaboration is ever-present. The necessity of collective action is clearer than ever, emphasizing that the effectiveness of our conservation efforts is deeply rooted in our ability to come together as a community.

Hawai'i Audubon Society Big Island Hui: Palila Discovery Trail Hike

by Mike Carion

On February 18, 2024, the HAS Big Island Hui led a bird hike to the Palila Discovery Trail on the west side of the Big Island.

Twenty-five members joined us on the search for one of Hawai'i Island's most endangered birds, the palila (*Loxioides bailleui*). This area of dry forest is part of the last remaining stands of māmane trees (*Sophora chrysophylla*) on the island. The māmane tree is a critical part of the palila diet. In fact, the palila is one of the only birds able to feed on the green māmane seed pods. The seed pod is toxic to other bird species. Unfortunately, the māmane forest is threatened by invasive hoofed animals that eat the young māmane tree saplings. This, along with mosquito-borne diseases and predation by feral cats and mongoose, all add to the diminishing number of palila.

Our group consisted of old and new members of Hawai'i Audubon from the Big Island as well as one on vacation, and even included a group of students working on their master's program through Goshen College in Indiana.

We broke into two groups and covered the area thoroughly. Unfortunately we did not find the palila. We did see 'elepaio (*Chasiempis sandwichensis*), 'amakihi (*Chlorodrepanis virens*), and pueo (*Asio flammeus sandwichensis*), as well as a few non-native birds. The Japanese Bush Warblers serenaded us throughout the trail and the weather was beautiful.

This was during the Great Backyard Bird Count, and our photo submissions made it on the Cornell Lab of Ornithology webpage.

Overall, a beautiful day of birding on the west slopes of Mauna Kea.



© Mike Carion

Editor's note: In recognition of World Albatross Day on June 19, 2024, we are highlighting the work of one of our partner organizations, Pacific Rim Conservation. The theme this year is "Marine Protected Areas – Safeguarding our Oceans." Most of the world's mōli and ka'upu populations nest in the Papahānaumokuākea Marine National Monument, which is the largest contiguous fully protected conservation area under the U.S. flag, and one of the largest marine conservation areas in the world.

Albatross Translocation

by Erika Dittmar

Pacific Rim Conservation

To mitigate the loss of seabird habitat in the Northwestern Hawaiian Islands, Pacific Rim Conservation and US Fish & Wildlife Service (USFWS) conducted social attraction and translocation of two albatross species at James Campbell National Wildlife Refuge on O'ahu: ka'upu, or Black-footed Albatross (BFAL) and mōli, or Laysan Albatross (LAAL).

From 2015-2021, we translocated LAAL eggs from the Pacific Missile Range Facility on Kaua'i, where they attempt to nest on an active runway and pose a collision hazard for aircraft. From 2017-2021, we translocated BFAL chicks from Pihemanu (Midway Atoll), where they are threatened by sea level rise. In conjunction with translocation, we deployed social attraction systems consisting of decoys and broadcast sound recordings for each of the albatross species.

We successfully fledged 46/51 LAAL chicks for a 90% fledge rate. For BFAL, we successfully fledged 96/102 BFAL, for a 94% fledge rate. Both translocated albatross species have returned to the refuge with socially attracted LAAL breeding starting in 2019. We have socially attracted over 290 different LAAL with 46% of translocated LAAL (21 individuals) having returned to the refuge. Since 2022, we have resighted 29 translocated and 2 socially attracted BFAL. We expect BFAL to start nesting as soon as 2024.

We continue to monitor the successful return and nesting of these translocated individuals as the new seabird colony grows at James Campbell National Wildlife Refuge.

To learn more about this important project, visit: <https://www.islandarks.org/>

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Announcements

Volunteers needed to help survey or rescue fallen White Terns. Email huimanuoku@gmail.com

Events

For more details, visit hiaudubon.org/events or email events@hiaudubon.org

May 11 Global Big Day ebird.org/globalbigday

May 18 Kids to Parks Day at Lē'ahi Diamond Head State Monument

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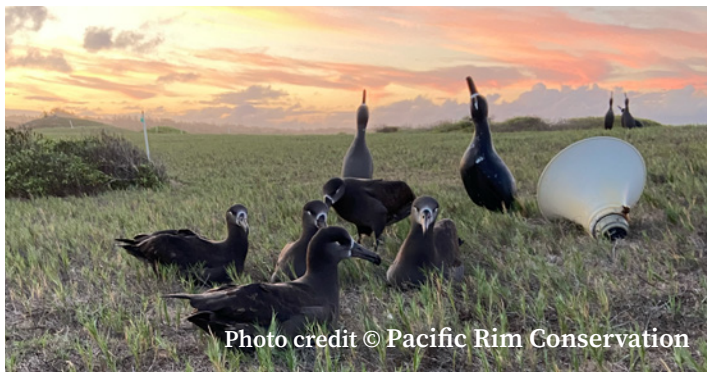


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