ANNUAL REPORT 2021

PACIFIC RIM CONSERVATION
RESTORING BIODIVERSITY

2021 was truly an exceptional and busy year for Pacific Rim Conservation! In the second year of a global pandemic, we feel incredibly fortunate that our work not only didn't slow down, but it was our most successful and productive year yet. Highlights include international translocations, translocated birds returning to breed for the first time, and completing three fencing projects in one year. In partnership with multiple organizations and agencies, we successfully completed the first international translocation of Black-footed Albatross between the USA and Mexico. We also were incredibly excited to see the first successes realized in some of our long-term projects: the first translocated Hawaiian Petrel pair breeding at Nihoku on Kauai, the first ever Black-footed Albatross nest at Kaena Point after a decade of social attraction, and multiple nests of translocated Bonin Petrel at James Campbell National Wildlife Refuge on Oahu. We also completed not only the first montane predator exclusion fences on the island of Kauai, but three of them in one year, to protect Newell's Shearwaters and Hawaiian petrels! We could not achieve these goals without our fantastic partners, generous funders, and dedicated staff and volunteers.

In the following pages we summarize our project results for 2021. We thank everyone who has been involved in our work the past year.

Aloha and Mahalo,

Lindsay Young
Executive Director

Eric VanderWerf
Director of Science

Board of Directors:
Alex Wegmann, Christen Mitchell, David Duffy, David Johnson, Lindsay Young

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Adrien Pesque, Allene Henderson, Cody Lane, Dave Hanna, Dena Spatz, Dylan Blanchard, Eric VanderWerf, Erika Dittmar, Hallie Daly, Laura Heartwood, Leilani Fowlke, Lindsay Young, Molly Monahan, Robby Kohley, and Suzanne Pluskat, Wesley Is

Interns:
Brianna Bonsack, Caitlin Mahon, Christine Lonie, Claire Atkins, Mark Duffield, Sophia Lodigiani

PACIFIC RIM CONSERVATION YEAR IN REVIEW

BIRDS

15 bird species we worked with or protected in 2021, of which 8 are endangered locally, nationally, or globally.

325 nests of native Hawaiian birds monitored and protected in 2021 **(133 Laysan Albatross, 46 Wedge-tailed Shearwater, 43 Oahu Elepaio, 103 Red-tailed Tropicbird).**

110 wild birds banded as part of our research in 2020.

3 species species of Hawaiian seabirds translocated in 2021 to create breeding populations that are safe from climate change and non-native predators: **Black-footed Albatross, Laysan Albatross, and Bonin Petrel.**

10 (!) papers we published in scientific journals in 2021, multiple management and monitoring plans, and many project reports.

ECOSYSTEMS

18 Acres

of habitat restored by removing non-native weeds and replacing them with native plants.

140 Acres

of forest bird nesting habitat protected by removal of non-native rats

PEOPLE

12 Full-time & **2** seasonal staff

18 Partners and funders

10 public and professional presentations

7+ media articles

15 research and translocation interns

FUN FACTS:

The first ever international seabird translocation between the USA and Mexico of Black-footed Albatross.

The first ever cross fostering of Black-footed Albatross eggs with Laysan Albatross parents in Mexico.

First nesting Hawaiian Petrel in a predator free area at Nihoku, Kauai.

748 visits by wild Laysan Albatrosses to our social attraction site at JCNWR *(compared to 366 in 2020)*

11 returning Bonin Petrels to JCNWR

8 returning Tristram's Storm-petrels to JCNWR

1000+

miles hiked for conservation work

1000+

non-native predators trapped in bird nesting areas

463

Hours of auditory surveys for Hawai'ian Petrel and Newell's Shearwater since 2018

~1400

resources reviewed and 600 experts contacted to identify active seabird restoration activities worldwide

800+

records of seabird social attraction and translocation documented worldwide

NO NET LOSS:

James Campbell National Wildlife Refuge Seabird Translocation Project

PARTNERS: U.S. Fish and Wildlife Service, James Campbell National Wildlife Refuge (JCNWR), Midway Atoll National Wildlife Refuge, Papahānaumokuākea Marine National Monument, U.S. Navy, and Hawai'i Department of Land and Natural Resources .

The goals of the No Net Loss initiative are twofold: 1) to protect as much seabird nesting habitat in the main islands as is being lost in the Northwestern Hawai'ian Islands because of the effects of climate change; and 2) to establish new breeding colonies of vulnerable seabird species that are safe from sea level rise and non-native predators. We do this by building predator exclusion fences, removing invasive predators, and then attracting or translocating birds into these protected areas. We currently are focusing these efforts at James Campbell National Wildlife Refuge (JCNWR) on O'ahu and have begun working on four priority species that are most vulnerable to sea level rise: Black-footed Albatross, Laysan Albatross, Bonin Petrel, and Tristram's Storm-petrel, all of which have a high proportion of their global population nesting in a small number of locations just a few meters above sea level.

From 2015- 2017, we translocated 51 Laysan Albatross chicks (raised from eggs) from the Pacific Missile Range Facility on Kauai (learn more here), where albatross nest close to a runway and are an aircraft collision hazard. A total of 47 Laysan Albatross chicks successfully fledged as a result of this program, and the first birds started returning as adults in 2018. We now have 8 Laysan Albatrosses regularly visiting the site from previous translocation cohorts. From 2017-2021, we moved 102 Black-footed Albatross chicks from Midway and Tern Island to JCNWR, of which 97 fledged. In 2018-2021, we moved 247 Bonin Petrel chicks and 112 Tristram's Storm-petrel chicks from Midway and Tern Island, of which 246 and 87 fledged, respectively. No Tristram's Storm-petrels were translocated in 2021 because logistical difficulties and quarantine requirements for Covid-19 prevented us from making the trip to Tern Island by ship.

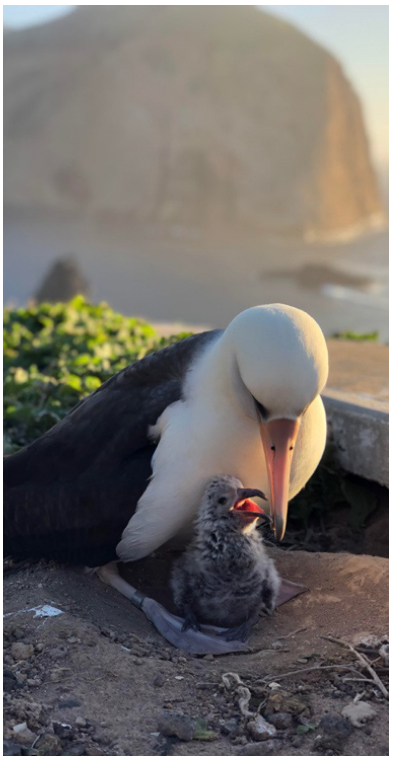
This year we moved 12 of the Bonin Petrel chicks to predator-free Moku Manu islet a few days before fledging in hopes that they will imprint on the islet and return to them as adults. A subset of Black-footed Albatross chicks was further translocated to Guadalupe Island in Mexico. Black-footed Albatross eggs were translocated in January as part of the Guadalupe project and three eggs which were too old to move to Mexico were put under foster Laysan Albatross parents at Ka'ena Point Natural Area Reserve. Chicks were brought to JCNWR and hand-raised from February-June.

In 2019, we saw the first individual Bonin Petrel and Tristram's Storm-petrel return after just one year. In 2021, we re-sighted returning translocated individuals of all four species, including at least one Black-footed Albatross, 11 Bonin Petrel, 8 Laysan Albatross, and 8 Tristram's Storm-petrels. This season we had two pairs of returning adult Bonin Petrels nest in artificial burrows and successfully fledge chicks. Five others Bonin Petrel pairs dug natural burrows inside the fence but were not known to have laid eggs in their burrows. We continued to employ three social attraction programs using solar-powered sound systems inside the predator fence: one for Black-footed Albatross, one for Laysan Albatross, and the third for Bonin Petrel and Tristram's Storm-petrel combined. The Laysan Albatross and Black-footed Albatross systems also included decoys. This season there were 748 documented visits and 4 nesting attempts by socially attracted Laysan Albatross, but none resulted in a fledged chick. Wedge-tailed Shearwaters have established a colony inside the predator fence, likely having been attracted by the sound systems. In 2020 we had 18 active burrows fledging 15 chicks. In 2021, Wedge-tailed Shearwater nesting increased with 46 active burrows fledging 43 chicks. When this project began in 2016, there were no seabirds of any kind visiting JCNWR. In 2021, three seabird species nested on the refuge (Bonin Petrel, Laysan Albatross, and Wedge-tailed Shearwater), and a fourth (Tristram's Storm-petrel) is beginning to visit regularly and hopefully will begin nesting soon. We plan to do one more year of translocations with Tristram's Storm-petrel and to continue the social attraction and monitor the return and nesting of all species.

NO NET LOSS:
Isla Guadalupe Black-footed Albatross Translocation Project

PARTNERS: Grupo de Ecología y Conservación de Islas (GECI), U.S. Fish and Wildlife Service, James Campbell National Wildlife Refuge, Midway Atoll National Wildlife Refuge, Papahanaumokuakea Marine National Monument, Comisión Nacional de Áreas Naturales Protegidas (CONANP), Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (CONABIO).

www.islandarks.org



The Black-footed Albatross (Phoebastria nigripes) has a total breeding population of about 57,500 pairs, 95% of which nest on low atolls in the Northwestern Hawaiian Islands. Inundation of breeding colonies from sea level rise and storm surge associated with climate change is its most serious long-term threat. Protection of suitable nesting habitat and creation of new colonies on higher islands are among the highest priority conservation actions. In collaboration with many partner agencies in the USA and Mexico, under the Canada/USA/Mexico Trilateral Island Initiative, in 2021 we translocated Black-footed Albatross eggs and chicks from Midway Atoll to Guadalupe Island, Mexico to create a new breeding colony. Guadalupe is a large, high island that is protected as a Biosphere Reserve and already supports a thriving colony of Laysan Albatrosses. We moved 21 eggs in January and placed them in Laysan Albatross foster nests. We moved 12 chicks in February that we raised by hand. Eighteen of the 21 eggs hatched, and all 18 of those chicks fledged. Nine of the 12 translocated chicks fledged, for a total of 27 chicks fledged from Guadalupe. In 2022, we plan to translocate 36 more eggs to Guadalupe, but not chicks. Black-footed Albatrosses already forage in the cold waters of the California Current around Guadalupe, which are less likely to be affected by climate change than most other regions of the Pacific. Creation of a breeding colony in the eastern Pacific would increase the breeding range of the species and enhance its resiliency to climate change.

NIHOKU ECOSYSTEM RESTORATION PROJECT

PARTNERS: Kauai Endangered Seabird Recovery Project, U.S. Fish and Wildlife Service, American Bird Conservancy, Hawaii Department of Land and Natural Resources, National Fish and Wildlife Foundation, and National Tropical Botanical Garden.

www.nihoku.org

Hawaiian Petrel returning to Nihoku


Bulwer's Petrel nest


First breeding pair of Hawaiian Petrels at Nihoku

Created in 2012 and located at Kilauea Point National Wildlife Refuge on Kauai, the Nihoku Ecosystem Restoration Project's mission is to establish the first fully protected colony of Newell's Shearwaters and Hawaiian Petrels in Hawaii. These are Hawaii's only endemic seabird species and are both listed under the Endangered Species Act of 1973. Causes of their declines include habitat degradation, invasive plants, predation by feral cats, pigs, rats, and introduced Barn Owls, and collisions with power lines and structures exacerbated by light attraction.

To create a protected colony of these species, we built a 2400 foot-long predator-proof fence enclosing approximately eight acres at Nihoku in late 2014, and we eradicated all mammalian predators shortly afterwards. Since 2015, we have cleared non-native vegetation from 75% of the fenced area (~4 acres) and planted more than 16,000 native plants representing 30 species to begin restoring the habitat.

From 2012-2020, potential source colonies of Newell's Shearwaters and Hawaiian Petrels were located by the Kauai Endangered Seabird Recovery Project at locations around Kaua`i. In 2020, 20 Newell's Shearwaters and 20 Hawaiian Petrels were translocated into the site and all but one of the Hawaiian Petrels fledged. Since translocation began in 2015, 194 listed seabirds have fledged from this site for a success rate of over 98% for the project. With 2020 being the final year of translocations for this project, we have now moved onto the post-translocation monitoring phase.

In anticipation of adult birds starting to return to the site, intensive monitoring was undertaken with both visual, auditory and report camera surveys every two weeks for the duration of the breeding season. Seven translocated Hawaiian petrels and one Newell's Shearwater adult were found in the burrows. Of the seven Hawaiian Petrels, there were three pairs including one that hatched the first chick ever in a predator free colony. This marks the final and most important milestone of this project, to create the first predator-free breeding colonies of these two species in the Hawaiian Islands.

TRANSLOCATION PRIORITIZATION ACTIVITIES

Pacific Rim Conservation undertook two comprehensive seabird conservation planning exercises in 2021, one for all seabirds species found in the U.S. Tropical Pacific, and one for Establishment of albatross breeding colonies in the Channel Islands of California. The results of these efforts are expected to be available in the peer reviewed literature in 2022.

US Tropical Pacific

The U.S. Tropical Pacific (USTP) is a globally important area for seabirds, with tens of millions of individuals of 32 species breeding in the region. The two greatest threats to breeding seabirds in the USTP are inundation of colonies caused by global climate change and non-native predators. We assessed the status of seabird species breeding in the USTP and which species would benefit most from restoration activities. We scored each species for 10 criteria that reflected their extinction risk and vulnerability to climate change and invasive predators, then summed the scores of all criteria to obtain an overall score and ranked the species in terms of overall conservation need. The top five species at risk (in order) were Newell's Shearwater, Hawaiian Petrel, Polynesian Storm-Petrel, Phoenix Petrel, and Black-footed Albatross. We also assessed 86 locations in the UTSP as potential source and restoration sites for seabirds. Social attraction and translocation are the two primary active restoration techniques that can be used to restore and create seabird populations in suitable areas, and they are being used increasingly to mitigate the impacts of sea level rise and invasive predators. Some restoration actions are underway for three of the top five species in the USTP, but more actions are needed. Two of the top species (Polynesian Storm-petrel and Phoenix Petrel) occur primarily outside the USTP. Actions within the USTP are needed to complement existing conservation measures underway elsewhere in the Pacific and should be prioritized for future management actions.

Channel Islands

PARTNERS: The Nature Conservancy, National Park Service, U.S. Navy, US Fish and Wildlife Service

Albatross species that nest in the north Pacific are at significant risk from global climate change. More than 95% of the global populations of the Laysan Albatross (Phoebastria immutabilis) and the Black-footed Albatross (P. nigripes) nest on low-lying atolls in the Northwestern Hawaiian Islands (NWHI) that are threatened by inundation from sea level rise and increasing storm surge associated with global climate change. Protection of suitable breeding habitat and restoration or creation of breeding colonies on higher islands are among the highest priority conservation actions for these species. The U.S. Fish and Wildlife Service recommended in 2011 that Black-footed Albatross colonies be created on three Mexican islands, three main Hawaiian Island sites, and two California islands. Efforts are underway in Hawaii and Mexico, but none have been undertaken yet in California. In 2020, The Nature Conservancy engaged Pacific Rim Conservation to evaluate the potential role the California Channel Islands could play in conservation of Laysan and Black-footed Albatrosses, and to evaluate the need, feasibility, and risks of attempting to establish albatross breeding colonies on the Channel Islands. Site visits and meetings were held in 2021 and a finalized joint report is expected in 2022.

O'AHU ENDANGERED SEABIRD SURVEYS

PARTNERS: Hawai'i Division of Forestry and Wildlife, O'ahu Army Natural Resources Program, Conservation Metrics, National Fish and Wildlife Foundation

Hawai'i's only two endemic seabirds, the Newell's Shearwater and Hawai'ian Petrel, are listed as threatened and endangered, respectively, under the Endangered Species Act. Threats to both species include light attraction and fallout, collisions with power lines and other structures, predation by non-native animals, and habitat degradation. Both species were assumed to be locally extinct on the island of O'ahu, despite limited survey effort and fossil evidence indicating that extensive colonies existed post-human contact. Since 2016, we have deployed up to 15 song meters annually in locations where modelling predicted the habitat would be suitable and obtained 21,348 recording hours. Additionally, since 2018, we have conducted 436 hours of auditory ground surveys.

We have detected Newell's Shearwaters regularly at five sites; two on the leeward slopes of Mount Ka'ala, and 5 in the Ko'olau Range at Kaluanui, Poamoho, 'Opae'ula, Central Ewa Forest Reserve, and South Ewa Forest Reserve. We detected Hawai'ian Petrels at two sites on Mount Ka'ala and at Kaluanui, Poamoho, and O'ahu Forest NWR in the Ko'olau Range. All sites where we detected birds were in nearly intact native forest with very steep slopes, like areas where these species nest on Kauai. Birds were detected on multiple nights during the breeding season, sometimes calling up to 25 times in a single night. In 2021, 13 HAPE detections were observed during auditory ground surveys at Mount Ka'ala. On November 13, a downed hatching-year HAPE chick was found at Waialua High School, just downslope of where HAPE were observed ground calling at Mount Ka'ala. The downed chick was brought to the Hawai'i Wildlife Center for rehabilitation and release. Evidence suggests that, at a minimum, both species are regularly prospecting on O'ahu, and could potentially be breeding on the island. If they are breeding, these individuals could represent a missing link in the population connectivity of both species across the island chain. Protecting any remnant populations would be of high conservation value given their recent catastrophic population declines.

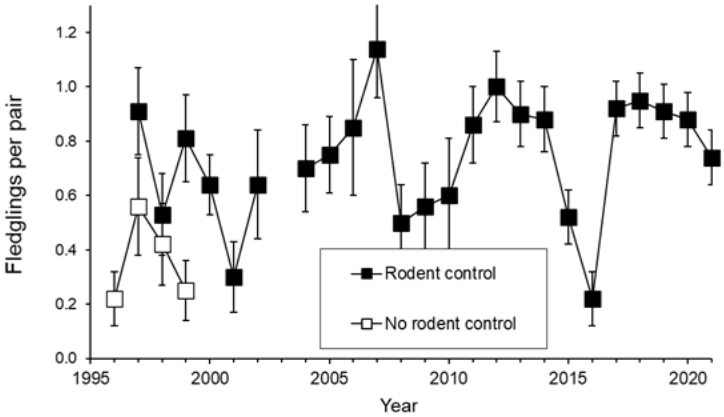
Mount Ka'ala (left) and Poamoho (right) where NESH were detected in 2021 during ground surveys.

O'AHU 'ELEPAIO MONITORING AND RAT CONTROL

PARTNERS: Hawai'i Division of Forestry and Wildlife, Hawaii Natural Area Reserves System, Protect and Preserve Hawai'i.

www.elepaio.org

Two 'elepaio fledglings with their father in Wailupe Valley.



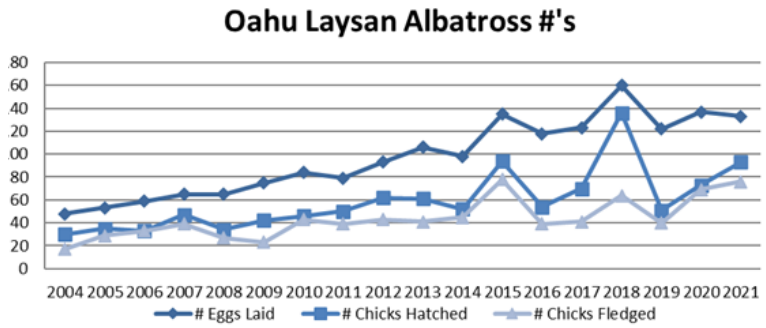
Rat control has been an effective method of increasing reproduction of O'ahu 'Elepaio.

2021 was the 26th year of 'elepaio monitoring in southeastern O'ahu. In order to maximize the conservation benefit of the project, in 2020 the goal was changed to place more emphasis on controlling rats in a larger number of 'elepaio territories, with a lower level of monitoring in each territory. In 2021, we managed rats and monitored 'elepaio in Wailupe Valley and obtained additional funding to expand the work to Pia Valley and Kuliouou Valley in collaboration with the Hawaii Natural Area Reserve System and Protect and Preserve Hawaii.

We controlled rats in 62 'elepaio territories in 2021, including 42 in Wailupe, 12 in Pia, and 8 in Kuli'ou'ou. The overall reproductive rate of 'elepaio was 0.73 young per pair, which is similar to the long-term average of 0.71 and is sufficient to allow about 7% annual population growth. Average nest success was 50% (9 of 18), which was below the long-term average of 61%. A total of 232 traps were deployed in the three locations combined, including 66 automated pneumatic traps (Goodnature) and 166 snap traps. A total of at least 834 rodents was removed over an area of 110 hectares (272 acres). A total of at least 834 rodents was removed over an area of 110 hectares (272 acres). In 2022, we plan to continue controlling rodents at the expanded scale of 2021, and to further increase the number of territories if possible.

LAYSAN AND BLACK-FOOTED ALBATROSS MONITORING AT KAENA POINT

PARTNERS: Hawaii Natural Area Reserve System



2021 marked the 18th year in which we have monitored Laysan Albatrosses on Oahu. In the 2020-2021 season there were 81 albatross nests at Kaena Point Natural Area Reserve and 52 nests at Kuaokala Game Management Area, which is comparable to 2020. In terms of reproductive success, both hatching rates (0.63) and fledging rates (0.82) were high. A total of 55 chicks fledged from Kaena and 38 from Kuaokala. This was a particularly large jump for Kuaokala since this was the first full season after the predator exclusion fence was completed, which eliminated mongoose predation.

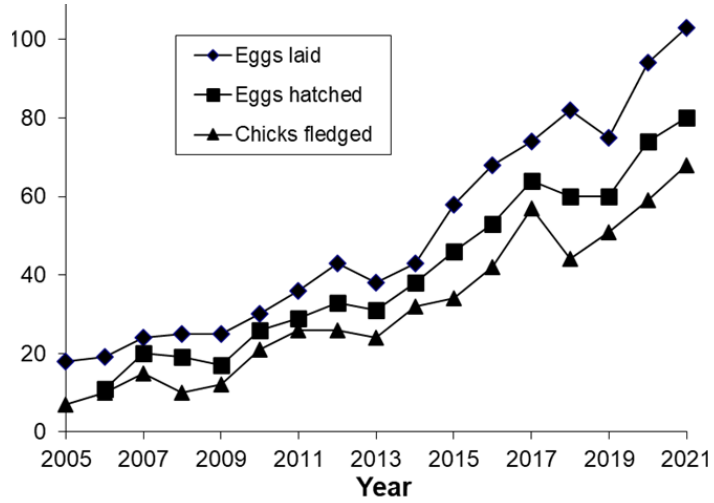
2021 was another record year for Black-footed Albatross visits at Kaena Point, with more than 93 sightings of up to four individuals compared to 35 sightings in 2020. Notably, two individuals were banded by PRC and were seen for several months on the trail cameras including sleeping overnight in the colony and actively courting. We placed two decoys in the center of the colony to aid in attracting them further. A third adult was banded on 02/03/2021. The visits started earlier in the season (November) and continued through May which was an increase in duration from both 2020 and 2019. Finally, in November 2021, the two pair laid the first egg of this species ever recorded in the main Hawaiian Islands. Although the egg didn't hatch, which is not uncommon for first-time breeders, it is still a huge step forward for the conservation of this species.

LAYSAN ALBATROSS EGG SWAP ON KAUAI AND EGG FOSTERING AT KAENA POINT

PARTNERS: Hawaii Natural Area Reserve System, U.S. Navy.

The U.S. Navy has a requirement to discourage albatrosses from nesting around the airfield at the Pacific Missile Range Facility (PMRF) to reduce the bird air strike hazard (BASH) to aircraft. Pacific Rim Conservation (PRC) has been contracted by the U.S. Navy since 2008 to assess the viability of Laysan albatross eggs from PMRF and to place fertile eggs in foster nests on private properties on the north shore of Kauai in which the natural egg was not fertile. Of 45 eggs laid at PMRF and candled by PRC staff in 2021, 33 were viable (73%), 10 were infertile, and 2 were fertile but died during development. Three more viable eggs from the Sandia area of PMRF were candled by USDA. Of the 36 viable PMRF eggs, 13 were placed in foster nests on Kauai and the remaining 23 viable eggs were transported to Oahu on a Navy flight for placement in foster nests at Kaena Point in which the natural egg was infertile or had died.

EFFECTS OF PREDATOR CONTROL ON REPRODUCTIVE SUCCESS OF RED-TAILED TROPICBIRDS



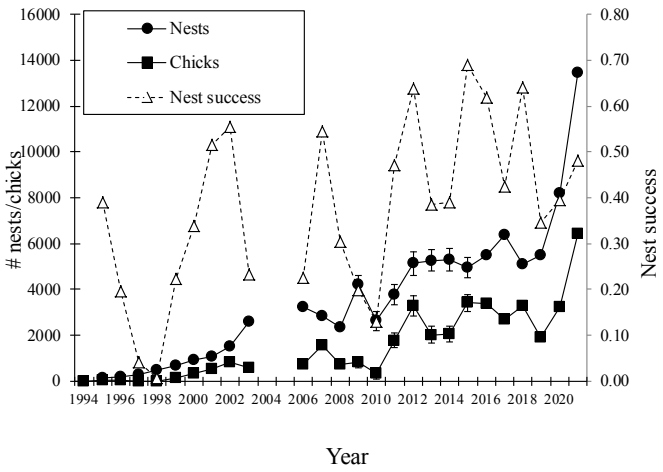
Predator control has allowed a struggling colony of Red-tailed Tropicbirds in southeaster Oahu to flourish and increase over the past 16 years.

For the 16th year in a row, we controlled predators to protect a nesting colony of Red-tailed Tropicbirds in southeastern Oahu. We used a variety of traps to remove mongooses and rats and we monitored nesting success of tropicbirds. This management has been highly effective and has allowed this small, struggling colony to flourish and grow. It is now the third largest Red-tailed Tropicbird colony in the main Hawaiian Islands and may serve as a source of birds to recolonize other sites on Oahu. It also has become valuable as a study site for this species because it is so easily accessible. We have worked with partners from the U.S. Geological Survey Southwest Fisheries Science Center and San Jose State University to track Red-tailed Tropicbirds at sea to better understand their foraging behavior, marine habitat use, and potential risk from offshore wind energy projects. There were 103 Red-tailed Tropicbird nests in the colony in 2021, which is the most yet in any year (Figure 1), indicating the colony is continuing to grow. Eighty of the eggs hatched (78%) and 68 of the chicks fledged (85%), for an overall nest success rate of 66%, which is typical of colonies where predators are absent or controlled. A large mahalo to a generous donor from the local community who supported this project in 2021.

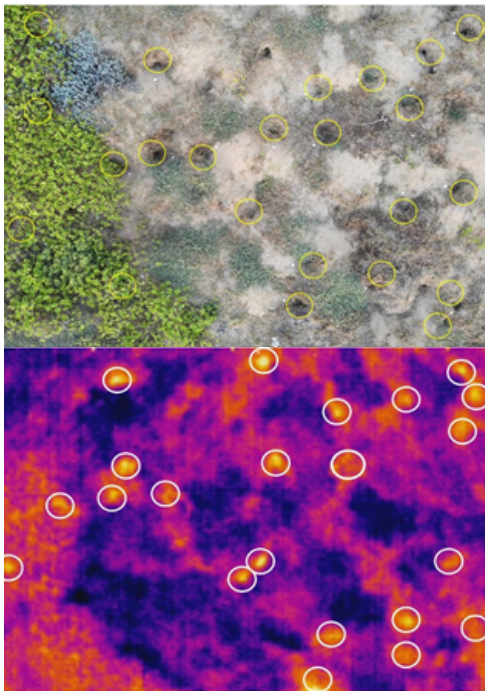
WEDGE-TAILED SHEARWATER MONITORING AT KA'ENA POINT, O'AHU

PARTNERS: Hawai'i Natural Area Reserve System

We have been monitoring Wedge-tailed Shearwaters at Ka'ena Point Natural Area Reserve, in collaboration with the Hawai'i Natural Area Reserve System, since 2006. Protection of Ka'ena Point from off-road vehicles allowed shearwaters to begin recolonizing the site beginning in the early 1990s. Predator control helped improve nesting success and allowed the colony to grow more rapidly starting in 2000. Construction of a predator-exclusion fence in 2011, the first one in Hawaii, allowed the population to increase dramatically, and it has remained high ever since. In 2021, we estimated that 6,414 chicks were raised from 13,478 nests, which is a dramatic increase and record high for the reserve.



THERMAL IMAGING DRONE PROGRAM



In 2021 we continued using the Kaena Point Wedge-tailed Shearwater colony as a test case for new techniques for expanding our capability to detect and monitor seabird colonies. Burrow-nesting petrels and shearwaters include some of the seabird species most vulnerable to extinction and species with some of the largest knowledge gaps. Much of this is due to their cryptic, nocturnal habits and their tendency to nest in underground burrows that are often in inaccessible locations. Locating nests, or in some cases even entire colonies, can be difficult. The use of unoccupied aerial vehicles (drones) in conservation biology has accelerated in recent years, but few studies have examined the potential to combine traditional visible spectrum photography with infrared thermal imaging to survey wildlife. We tested the use of thermal imaging cameras mounted alongside traditional RGB cameras to detect the heat signatures of cryptic burrow-nesting seabirds. We conducted six test flights of a quad copter drone with a dual sensor RGB/infrared camera over survey plots in a Wedge-tailed Shearwater colony prior to sunrise at Kaena Point, Oahu, Hawaii. Within one hour of the flights, we then manually counted the burrows in each plot and confirmed their contents to verify the drone results. Initial results indicate the thermal images taken by the drone were able to detect the presence of birds in burrows by the signature of heat venting from the burrow entrance. In 2022, we plan to ramp up this study across multiple habitats and develop an open-source AI model to be able to detect thermal images adequately.

KAUAI SEABIRD PREDATOR EXCLUSION FENCES

Pacific Rim Conservation has been leading the construction of four separate predator exclusion fences across the island of Kauai. Three of the four fences were completed in 2021 (pictured below- Pohakea, Honopu and Kahuamaa) and all will serve as social attraction sites for Newell's Shearwater and Hawaiian Petrels.

PARTNERS: Hawaii Department of Land and Natural Resources, US Fish and Wildlife service, US Navy, National Fish and Wildlife Foundation, Pono Pacific, Hallux Ecosystem Restoration, Archipelago Research and Conservation, Participant Group under the KSHCP

Pohakea

Location	Length (ft)	Area (acres)	Funder	Purpose
Pohakea	1000	3	NFWF	Social attraction
Honopu	1896	3	NFWF	Social attraction
Kahuamaa	2842	9	KSHCP	Social attraction
KPNWR	10,500	163	USFWS	In-situ

Honopu

We also have partnered with Pono Pacific and Pacific Islands: U.S. Fish and Wildlife Service to build a predator exclusion fence that protects the native ecosystems Kilauea Point National Wildlife Refuge from invasive mammalian predators. Kilauea Point is home to tens of thousands of native birds ranging from the endangered Nene goose, `Ua`u (Hawaiian Petrel), and A`o (Newell's Shearwater) to the Moli (Laysan Albatross) and `Ua`u Kani (Wedge-tailed Shearwater), and all of whom are vulnerable to predation. Once complete, this will be the largest full predator exclusion fence in the Hawaiian Islands.

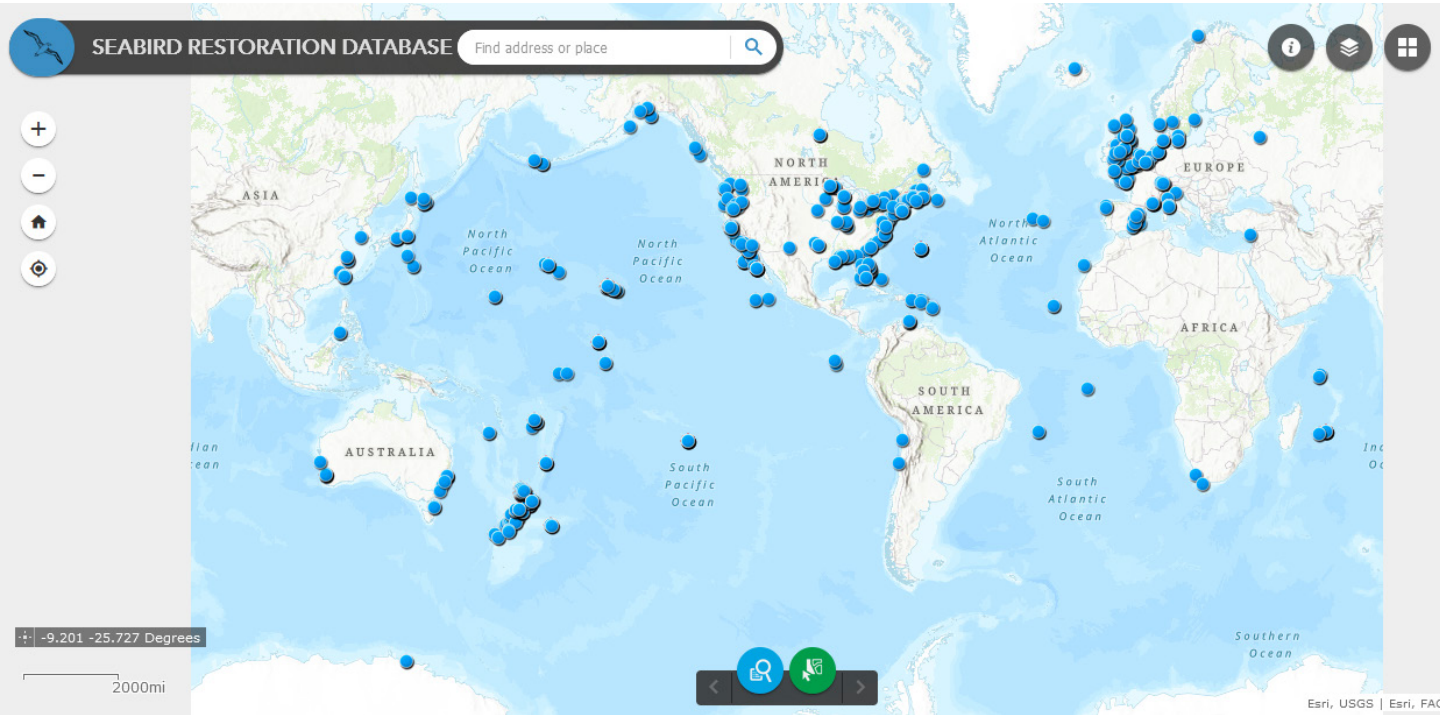
For more information go to: ***https://www.fws.gov/refuge/kilauea_point/***

SEABIRD RESTORATION DATABASE

PARTNERS: The Nature Conservancy, National Audubon Society, Northern Illinois University, the New Zealand Department of Conservation, Museum of New Zealand Te Papa Tongarewa

www.seabirddatabase.org

The Seabird Restoration Database seeks to improve knowledge transfer of active restoration techniques among practitioners and enhance seabird conservation by documenting the methods and outcomes from social attraction and translocation activities applied to restore and recover seabird populations around the world. In 2021 we finished collecting and entering data into the database, which now contains approximately 850 records of active seabird restoration efforts targeting nearly 140 seabird species across 48 countries. These results are the product of extensive systematic reviews of approximately 1,400 resources – including published and unpublished documents, blogs and media, databases, and other websites - and communication with over 600 experts, and could not have been achieved without the contribution of PRC staff, Database Partners, and our research interns. The data is now available as a searchable web map at seabirddatabase.org. Users can freely visit the website and filter data by location, species, and method to learn about when, where, and how active restoration has been used to restore seabird colonies. Finally, this project was presented on the global stage at the 3rd World Seabird Conference (October 2021) and at the International Congress for Conservation Biology (December 2021). In 2022, we will continue to communicate the results of the Seabird Restoration Database with various audiences and in various formats, including via scientific publications.



RESEARCH

We continue to actively collect data on all our projects with the goal of publishing in the peer reviewed literature and 2021 resulted in 10 peer reviewed publications, with several more expected to come out in early 2022. Current research projects not already mentioned above and being written up for publication include:

2021 peer-reviewed publications (all available for download on our website):

Young, L.C., Kohley, C. R., Dalton. M., Knight, M., VanderWerf, E.A., Fowlke, L., Dittmar, E., Raine, A.F., Vynne, M., Nevins, H., Hall, C.S., and Mitchell, M. 2021.Translocation of Newell's Shearwaters and Hawaiian Petrels to create new colonies on Kaua`i, Hawai`i. Case study in: Global Reintroduction Perspectives: 2021; case studies from around the globe. Ed. Pritpal Soorae. 287 pp.

Raine, A.F., Vanderwerf, E., Khalsa, M., Rothe, J. and S. Driskill. 2021. Update on the status of the avifauna of Lehua Islet, Hawai'i, including initial response of seabirds to rat eradication. Pacific Cooperative Studies Unit Technical Report #203. University of Hawai'i at Mānoa, Department of Botany. Honolulu, HI. 68 pages.

VanderWerf, E. A. 2021. Status and monitoring methods of a Red-tailed Tropicbird colony on O ahu, Hawai i. Marine Ornithology 49:215-222.

VanderWerf, E. A., Talyor, P. E., and Dittmar, E. 2021. Breeding season shift by the Oahu Elepaio (Chasiempis ibidis) in response to changing rainfall patterns. Wilson Journal of Ornithology 132:924-933.

VanderWerf, E. A., and Kalodimos, N. P. 2021. Status of naturalized parrots in the Hawaiian Islands. Pp. 211-226 in Naturalized Parrots of the World: Distribution, Ecology, and Impacts of the World's Most Colorful Colonizers (S. Pruett-Jones, Ed.). Princeton University Press, Princeton, New Jersey

Harmon, K.C., Phipps, C., VanderWerf, E., Chagnon, B., and Price M.R. 2021. First observations of Least Tern (Sternula antillarum) eggs and other breeding observations on the island of O'ahu, Hawai'i. Wilson Journal of Ornithology

Nimz, I., Renshaw, M.A, Iacchei, M., Vanderwerf, E., Vanderlip, C., Saunter, M., Worcester, N. & Hyrenbach, K.D. 2021. Underwater behavior of Christmas Shearwaters Puffinus nativitatis from Kure Atoll. Marine Ornithology 49:25-35.

Antaky, C.C., Young, L.C., Ringma, J., Price, M.R. 2021. Dispersal under the seabird paradox: probability, life history, or spatial attributes? Marine Ornithology. 49: 1-8

Orben, R.A., J. Adams, M. Hester, S.A. Shaffer, R. Suryan, T. Deguchi, K. Ozaki, F. Sato, L.C. Young, C. Clatterbuck, M.G. Conners, D.A. Kroodsma, L.G. Torres. 2021. Across borders: External factors and prior behavior influence North Pacific albatross associations with fishing vessels. Journal of Applied Ecology.

FINANCIAL INFORMATION

DIRECT REVENUE
$1,453,590.97

DIRECT EXPENSES
$1,405,227.26

FINANCIAL HEALTH

Assets	Liabilities	Net Assets
$494,604.52	$280,526.39	$214,078.13

FUNDERS

National Fish and Wildlife Foundation

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Department of the Navy United States of America

American Bird Conservancy

Maui Nui Seabird Recovery Project

Conservation Metrics

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Ecosystem Restoration Services

Audubon

The Nature Conservancy

Northern Illinois University

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Hawai'i Wildlife Center