



2018



ANNUAL REPORT

‘A‘ohe hana nui ke alu ‘ia.



No task is too big when done together by all.

If there is a phrase that sums up 2018 for our organization, it is this one.

2018 was a year of firsts for our organization, and a year of firsts for the conservation projects we work on. In terms of species, it was the first time that Bonin Petrels and Tristram's Storm-Petrels have been translocated, and the first time worldwide that a storm-petrel translocation was undertaken for conservation purposes. On top of adding two new species, it was the first time that any seabird species has been translocated over a long distance by ship for conservation purposes. We moved Black-footed Albatrosses, Bonin Petrels, and Tristram's Storm-Petrels by ship from Midway Atoll and Tern Island, with some birds at sea for 10 days. 2018 also marked the first year we had a dedicated public outreach program and we have been thrilled to directly involve the children and public of Hawaii in our work. In addition to our flagship project at James Campbell National Wildlife Refuge, we were also fortunate to work on several other impactful conservation projects across Hawaii. In the following pages we summarize our project results for 2018. We could not achieve these goals without our fantastic partners, generous funders, and dedicated staff and volunteers. 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

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PACIFIC RIM CONSERVATION 2018 YEAR IN REVIEW

BIRDS

15 bird species we worked with or protected in 2018, of which 8 are endangered locally, nationally, or globally.

1,394 nests of native Hawaiian birds monitored in 2018

187 wild birds banded as part of our research in 2018

We translocated **5 species** of Hawaiian seabirds this year whose breeding populations that are safe from climate change and non-native predators: **Black-footed Albatross, Hawaiian Petrel, Bonin Petrel, Tristram's Storm-Petrel, and Newell's Shearwater.**

Our work is science based.

In 2018 we wrote:

5 scientific journal publications
Many project reports

4 management and monitoring plans

ECOSYSTEMS

3,215 feet

of predator-exclusion fencing built in 2018

27 Acres

of wetland bird nesting habitat protected by predator-exclusion fencing in 2018

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

6 Full-time & **3** seasonal staff

18 Partners and funders

500 K-12 students visited our project sites, and we visited the classes of 17 more.

28 school and community groups visited our project sites

10 public and professional presentations

10+ number of media articles



FUN FACTS:



5 # forms of transportation used to get seabirds from the Northwestern Hawaiian Islands to Honolulu:

(ATV and golf cart on Midway, zodiac at Tern Island, 1300 miles by ship from Midway, 45 miles by car from Honolulu to JCNWR).



151

lbs of fish and squid per albatross per season



22

lbs of fish and squid used per day during translocation season

1972

lbs of seafood total used in 2018



328

visits by wild Laysan Albatrosses to our social attraction site



700+

miles hiked for conservation work



1,074

non-native predators trapped in bird nesting areas



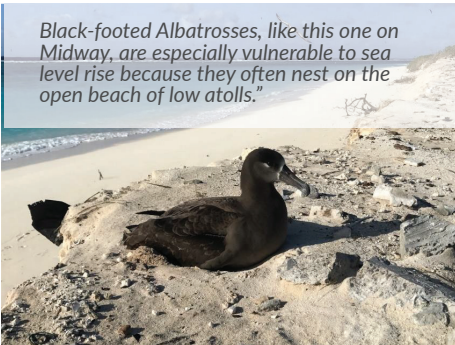
NO NET LOSS: JAMES CAMPBELL NATIONAL WILDLIFE REFUGE SEABIRD TRANSLOCATION

Project website: www.islandarks.org

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 Hawaii Department of Land and Natural Resources.

Black-footed Albatrosses, like this one on Midway, are especially vulnerable to sea level rise because they often nest on the open beach of low atolls.



Feeding and caring for seabirds inside a container on a moving ship was challenging.



13 socially attracted Laysan Albatross with decoys, inside the predator exclusion fence at JCNWR.



Artificial burrows for Bonin petrels and Tristram's storm petrels



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 Hawaiian Islands because of the effects of climate change; and 2) to establish new breeding colonies of 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 Oahu, and have begun working on four priority species that are most vulnerable to sea level rise: Black-footed and Laysan Albatrosses, Bonin Petrel, and Tristram's Storm Petrel, all of which have a high proportion of their global population nesting in a few locations that are less than 2 meters above sea level. In 2016, we completed a 1,150-meter-long predator exclusion fence enclosing 16 acres at JCNWR. While 16 acres may seem small, it represents 75% of the nesting area of Tern Island in the Northwestern Hawaiian Islands, which is home to more than 240,000 breeding pairs of seabirds.

From 2015- 2017, we translocated 50 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 46 Laysan Albatross chicks successfully fledged as a result of this program, and the first chick from the 2015 cohort returned in 2018. We expect more birds to return soon and to begin nesting at JCNWR in a few years. In 2017-2018, we moved 40 Black-footed Albatross chicks from Midway and Tern Island to JCNWR, of which 36 fledged. In 2018, we moved 53 Bonin Petrel chicks and 28 Tristram's Storm-Petrel chicks from Midway and Tern Island, with 100% survival in both species. We plan to translocate these three species for at least two more years.

To help establish albatross breeding colonies, we used a social attraction program involving 20 decoys of each species and solar-powered sound systems broadcasting albatross courtship calls. While no wild Black-footed Albatrosses visited the site, there were more than 300 visits by Laysan Albatrosses in 2017 and 2018. The first wild Laysan Albatross pair nested on the refuge in December 2017, and they were joined by a second pair in 2018.

NIHOKU ECOSYSTEM RESTORATION PROJECT

Project website: www.nihoku.org

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.

2018 Nihoku restoration area



Translocated Newell's Shearwater chick



Bulwer's Petrel entering a burrow 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 2012-2018, 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 2018, 21 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, 112 listed seabirds have fledged from this site for a success rate of over 97% for the project.

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. Visual surveys found Hawaiian Petrels transiting the site on four occasions and Newell's Shearwaters at least once; none of these birds were observed on the ground. Camera monitoring revealed that Bulwer's Petrels have been using the site and were observed entering and exiting burrows on multiple occasions.

OAHU ENDANGERED SEABIRD SURVEYS

PARTNERS:

Hawaii Division of Forestry and Wildlife, Oahu Army Natural Resources Program, Conservation Metrics, National Fish and Wildlife Foundation



Mt. Kaala, Oahu where we detected Newell's Shearwaters and Hawaiian Petrels using automated acoustic recording units.

Hawaii's only two endemic seabirds, the Newell's Shearwater and Hawaiian 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 Oahu despite limited survey effort, and fossil evidence indicating that extensive colonies existed post-human contact. Since 2016, we have deployed up to 15 automated acoustic recording units (song meters) annually island-wide in locations where modelling predicted the habitat would be suitable. We have obtained 6,924 recording hours since 2016. We have detected Newell's Shearwaters

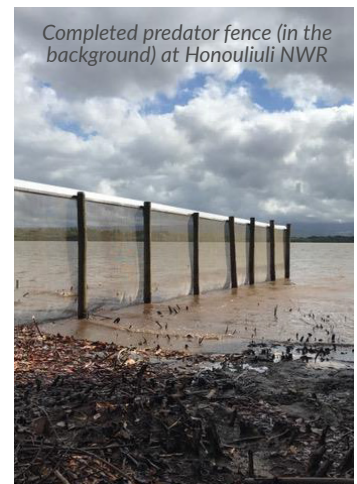
regularly at four sites; 2 on the leeward slopes of Mount Kaala, and two in the Koolau Range at Poamoho and Opaepa. We also detected Hawaiian Petrels at 2 sites on Mount Kaala. All sites where we detected birds were in nearly intact native forest with very steep slopes, similar to areas where these species nest on Kauai. Birds were detected on multiple nights in several months of the breeding season, sometimes calling up to 18 times in a single night. In 2018, ground calls of Hawaiian Petrels were heard on Mt. Kaala by a trained observer, and were recorded on a nearby song meter, indicating birds are landing in the area. Evidence suggests that, at a minimum, both species are regularly prospecting on Oahu, 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.

HONOULIULI PREDATOR EXCLUSION FENCE

PARTNERS:

US Fish and Wildlife Service and Pono Pacific Land Management

In June 2018, Pono Pacific completed construction of a 1-km long predator exclusion fence at the Honouliuli Unit of the Pearl Harbor National Wildlife Refuge. This fence will protect endangered waterbirds, including Hawaiian Stilts, Hawaiian Coots, and Hawaiian Gallinules, from predation by non-native predators. The fence follows the design used at James Campbell NWR, with stainless steel mesh and hood and treated wooden posts for support. This is the first predator exclusion fence to protect waterbirds in the state of Hawaii, and the first to extend into the water.



Completed predator fence (in the background) at Honouliuli NWR

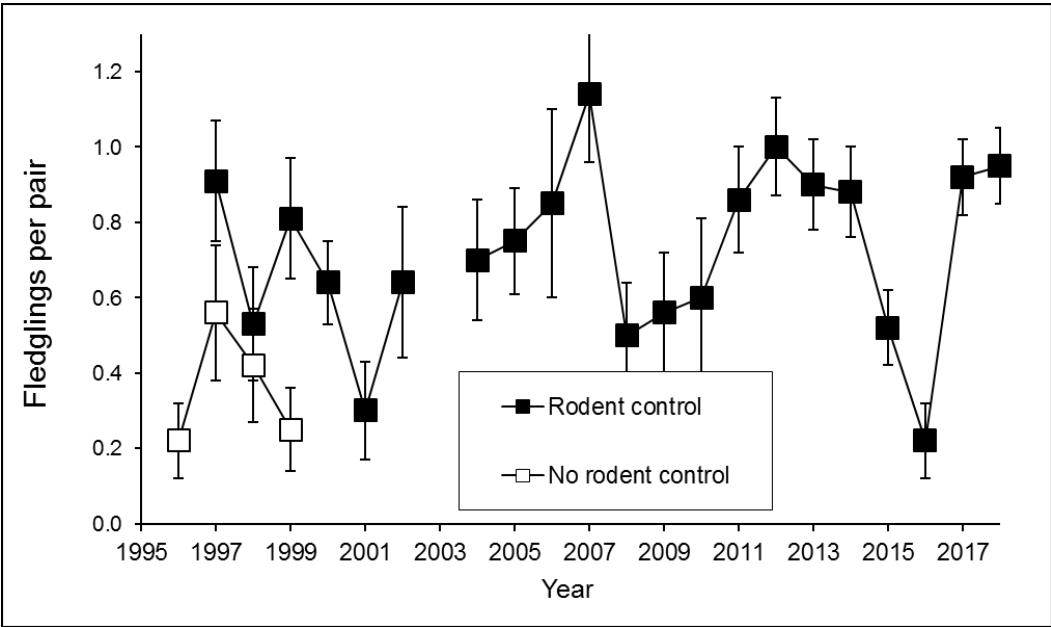
OAHU ELEPAIO MONITORING AND RAT CONTROL

PARTNERS:

Hawaii Division of Forestry and Wildlife



For the 23rd year in a row, in 2018 we controlled rats in southeastern Oahu and monitored nesting success of the endangered Oahu Elepaio. Predation by invasive black rats is the primary threat to this endemic bird, and rat control is an effective method for increasing nest success and survival of female Oahu Elepaio. We controlled rats in 24 elepaio territories in Wailupe Valley using snap traps and automated pneumatic traps made by the Goodnature company. The rat control program again was effective at reducing rat abundance, and elepaio pairs raised an average of 0.95 fledglings per pair, above the long-term average of 0.71. The nest success rate was below average this year because severe weather caused some nests to fail, but most pairs renested and eventually were successful at raising at least one chick. For the 2nd year in a row, we also controlled rats and monitored elepaio in Pia Valley, adjacent to Wailupe, using a crowd-funding campaign. The number of elepaio in Pia Valley has begun to increase again after a 10-year hiatus in rat control.



Rat control has been an effective method of increasing reproduction of Oahu Elepaio. 2018 was an above average year for elepaio reproduction; the nest success rate was low because of severe weather, but the number of nesting attempts was exceptionally high and most pairs eventually raised at least one chick.

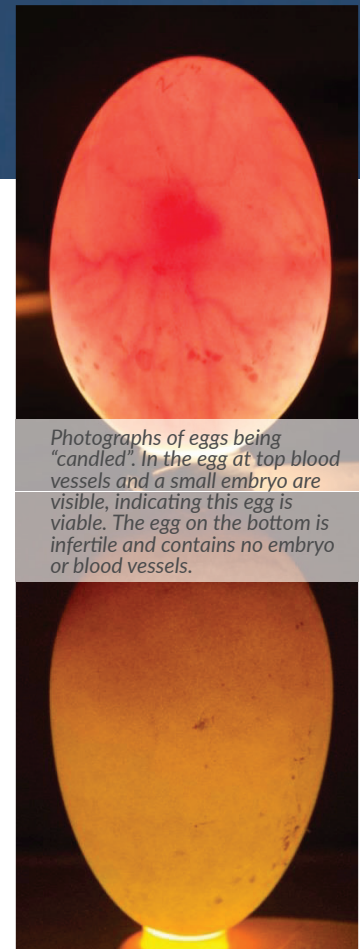
LAYSAN ALBATROSS MONITORING AND EGG FOSTERING

PARTNERS:

Hawaii Natural Area Reserve System, US Navy



2018 marked the 15th year in which we have monitored Laysan Albatrosses on Oahu, and it was by far a record year, with 106 nests at Kaena Point Natural Area Reserve and 54 nests at Kuaokala. The large increase in the number of breeding pairs probably is related to favorable oceanographic conditions that encouraged many young birds to breed for the first time, and caused few older birds to skip breeding this year. Additional efforts were made in 2018 to bolster the breeding population at Kaena Point by bringing 35 eggs from a colony at the Pacific Missile Range Facility (PMRF) on Kauai, where Laysan Albatrosses nest next to an airport runway. In order to reduce the bird strike hazard to aircraft, the US Navy removes the eggs, and since 2008 we have helped to help find foster homes for these eggs, on Kauai and Oahu. We do this by shining a bright light through the shell of an egg to illuminate the interior and determine if the embryo is alive. If the egg is infertile or the embryo has died, we replace it with a live foster egg from PMRF. In 2018, we placed 22 eggs in foster nests on Kauai and 35 eggs in foster nests at Kaena Point. The number of albatross chicks fledged at Kaena Point was a record high (60), but at Kuaokala mongooses killed 43 of 47 chicks in the colony despite intensive trapping efforts. Even the bones were gnawed until they were gone, leaving no trace of the predation.

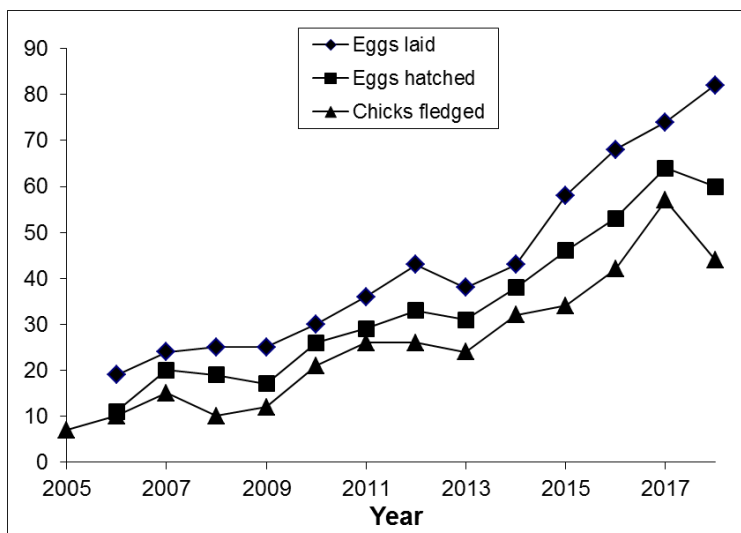


Photographs of eggs being "candled". In the egg at top blood vessels and a small embryo are visible, indicating this egg is viable. The egg on the bottom is infertile and contains no embryo or blood vessels.

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



For the 13th 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 US Geological Survey Southwest Fisheries Science Center and San Jose State University to track Red-tailed Tropicbirds at sea to better understand their foraging behavior and marine habitat use. Although the number of nests in 2018 was the highest yet (82), the hatching rate and fledging rate were lower this year, because of an exceptionally high abundance of mongoose, deaths of two chicks from mosquito-borne disease, which we have never before seen in this dry location, and perhaps because unfavorable oceanographic conditions made it more difficult for tropicbirds to find sufficient food.



Predator control has allowed a struggling colony of Red-tailed Tropicbirds in southeast Oahu to flourish and increase over the past 13 years.

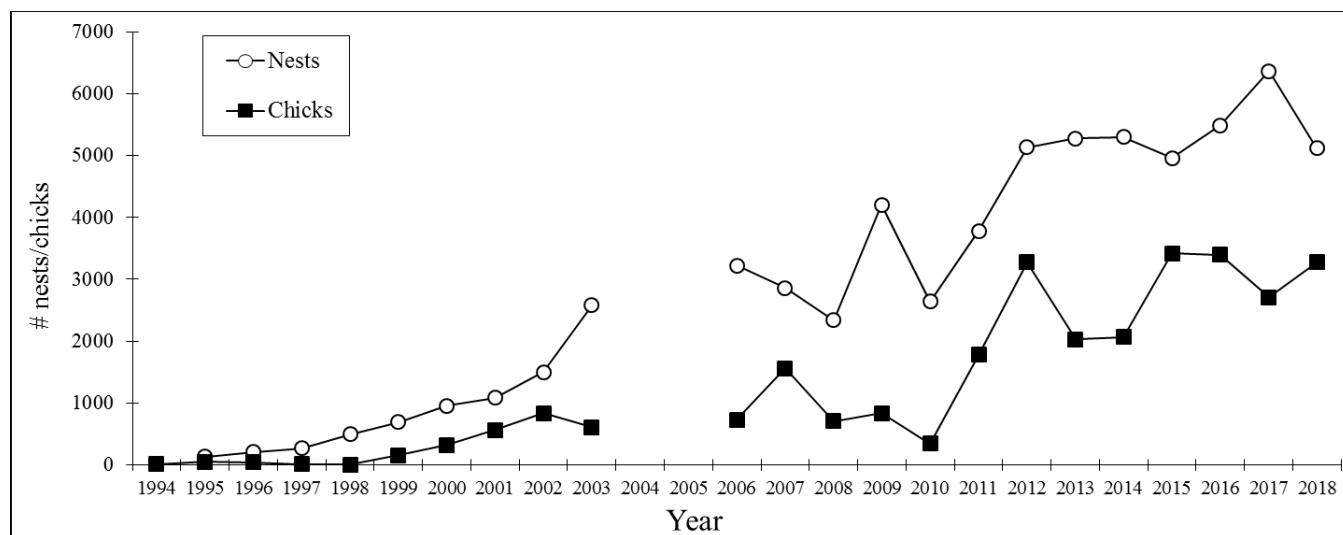
WEDGE-TAILED SHEARWATER MONITORING AT KAENA POINT, OAHU

PARTNERS:

Hawaii Natural Area Reserve System



We have been monitoring Wedge-tailed Shearwaters at Kaena Point Natural Area Reserve, in collaboration with the Hawaii Natural Area Reserve System, since 2006. Protection of Kaena 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 2018, we estimate that 3,274 chicks were raised from 5,116 nests.



RED-FOOTED BOOBY SOCIAL ATTRACTION PROJECT AT MARINE CORPS BASE HAWAII

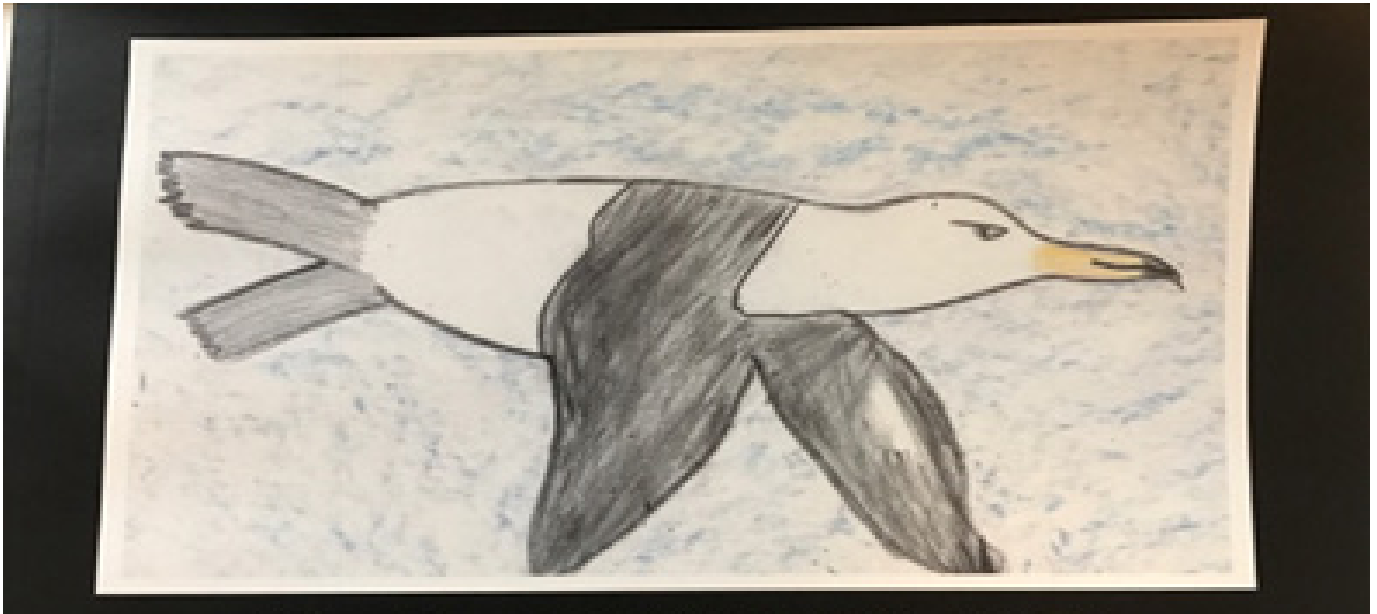
PARTNERS:

Marine Corps Base Hawaii (MCBH), Oikonos Ecosystem Knowledge, US Fish and Wildlife Service, Ducktrap Woodworking



2018 marked the first year of a multi-year project aimed at determining the success of social attraction techniques and habitat management to relocate a portion of the Red-footed Booby colony at the Kaneohe Bay Range Training Facility to two areas located outside the firing area. This project was initiated by MCBH to reduce the impact of training activities on the nesting colony, which has shifted as the habitat has changed and now infringes on the firing range. To do this, we had 150 wooden Red-footed Booby decoys custom made by Ducktrap Woodworking. In order to mimic a natural colony, we used decoys of birds in a resting posture and other decoys of boobies in a courtship posture. The decoys and a sound system broadcasting calls of a Red-footed Booby colony were distributed between two social attraction study sites chosen in consultation with MCBH. The first site is located inside Ulupa'u crater in sight of the existing colony in an area with kiawe and koa haole nesting habitat. The second site was located on the outer slope Ulupau Crater facing to the north in ironwood and mixed shrub habitat. After considerable experimentation with how to mount the relatively heavy decoys, we used four methods: 1) flag pole design for mounting a single decoy inside or near a potential nesting tree on a slope; 2) A-frame design for mounting up to 8 decoys on a slope; 3) artificial nest platforms built previously by MCBH in Site 1; and 4) attached directly to trees in Site 2. To attract Red-footed Boobies, we installed a solar powered sound system at each site, which played sound recordings of a Red-footed Booby colony. To document movements of birds roosting in the nesting trees identified for removal, we captured and placed color leg bands on 30 Red-footed Booby adults roosting in the selected trees. We are continuing to monitor the social attraction sites using remote trail cameras to collect data on visitation rates and whether birds move between nesting colonies.

PUBLIC OUTREACH



Cover photo of the Laysan Albatross book Hauula elementary 4th grade created

As part of a grant from the Harold K.L. Castle Foundation, PRC hired its first ever dedicated outreach coordinator, Leilani Fowlke. The purpose was to start bringing children from schools on Oahu to visit conservation sites and learn more about Hawaii's native birds, and in cases where school groups couldn't visit, we went into the classroom with them.

In 2018, 28 school and community groups visited the translocation site at James Campbell National Wildlife Refuge- 16 were student/ scout groups and the other 12 community groups. Another 13 site visits were hosted for state, federal and other non-profit stakeholder organizations. During the translocation site tours, the visitors learned why the chicks were translocated, how they are cared for at the James Campbell Wildlife Refuge by our animal care team and the goal of the project: to create a self-sustaining seabird

colony safe from sea level rise. During many of the visits, groups participated in service activities ranging from helping to care for the translocated chicks, to beach clean ups to weeding and outplanting.

In addition to the groups that visited the site in person, we visited 17 separate classes, presenting to over 500 students primarily in the Laie and Kahuku areas. Prior to visiting the classes, a seabird conservation curriculum was created focusing on educating the students about basic biology of Laysan and Black-footed Albatross along with Bonin Petrels and Tristram's Storm-petrels, the threats these birds face, and the work that is being to save these species. The Hauula 4th grade class prepared for their site visit by researching Laysan Albatross and creating a book about this seabird (see above). Hauula 4th grade is preparing for their 2019 site visit by creating a similar book, this time about Bonin Petrels.



Finally, we also partnered with U.S. Fish and Wildlife to host a refuge Open House day that was announced through social media postings. Within in the first two days of announcing the Open House all 140 slots were reserved and 138 of those came to the event- most of them parents of students who had visited during an educational tour from local schools. Larger media exposure and reach included 9 popular news articles, and visits from both the programs 60 minutes and BBC television for upcoming series on plastic pollution and islands respectively. So in addition to K-12 Windward area school groups, the project was able to reach a larger audience across the state and country.



RESEARCH

We continue to actively collect data on all of our projects with the goal of publishing in the peer reviewed literature. Current research projects not already mentioned above and being written up for publication include:

- *Translocations of Newell's Shearwaters and Hawaiian Petrels to create a new colony*
- *Designing predator proof fences for Hawaii: Results of a survey of sanctuaries in New Zealand and Hawaii and ground testing of new fence designs*
- *Results of mammalian eradications within three predator exclusion fences in Hawaii*
- *Demography, survival, and at-sea habitat use of Laysan Albatross*

2018 peer-reviewed publications (all available for download on our website):

Young, L.C., J.H. Behnke, E.A. Vanderwerf, A.F. Raine, C. Mitchell, C.R. Kohley, M. Dalton, M. Mitchell, H. Tonneson, M. DeMotta, G. Wallace, H. Nevins, C.S. Hall and K. Uyehara. 2018. The Nihoku Ecosystem Restoration Project: A case study in predator exclusion fencing, ecosystem restoration, and seabird translocation. Pacific Cooperative Studies Unit Technical Report 198. University of Hawai'i at Mānoa, Department of Botany. Honolulu, HI. 83 pages

VanderWerf, E.A., and L.C. Young. 2018. U.S. Tropical Pacific Seabird Surveying Guide. Report prepared for the U.S. Fish and Wildlife Service, Region 1, Portland OR. Pacific Rim Conservation, Honolulu, HI. 55 pp, 3 tables, 1 figure.

VanderWerf, E.A., Young, L.C., Kohley, C.R. and Dalton, M. 2018. Translocations of Laysan and Black-footed albatrosses in Hawaii, USA, to create new protected breeding colonies safe from climate change. Pp. 100-105 in, Global Reintroduction Perspectives: 2018; case studies from around the globe (Pritpal Soorae, Ed.). 287 pp.

VanderWerf, E. A., and R. E. Downs. 2018. Current distribution, abundance, and breeding biology of White Terns (*Gygis alba*) on Oahu, Hawaii. *Wilson Journal of Ornithology* 130: 297-304.

VanderWerf, E.A., R.E. David, P. Donaldson, R. May, H.D. Pratt, P. Pyle, and L. Tanino. 2018. First report of the Hawaii birds records committee. *Western Birds* 49(1):2-23.

Nishizawa, B, Sugawara, T, Young, L.C., Vanderwerf, E.A., Yoda, K., Watanuki, Y. 2018. Albatross-borne loggers show feeding on deep-sea squids: implications for the study of squid distributions. *Marine Ecology Progress Series* 592: 257-265.

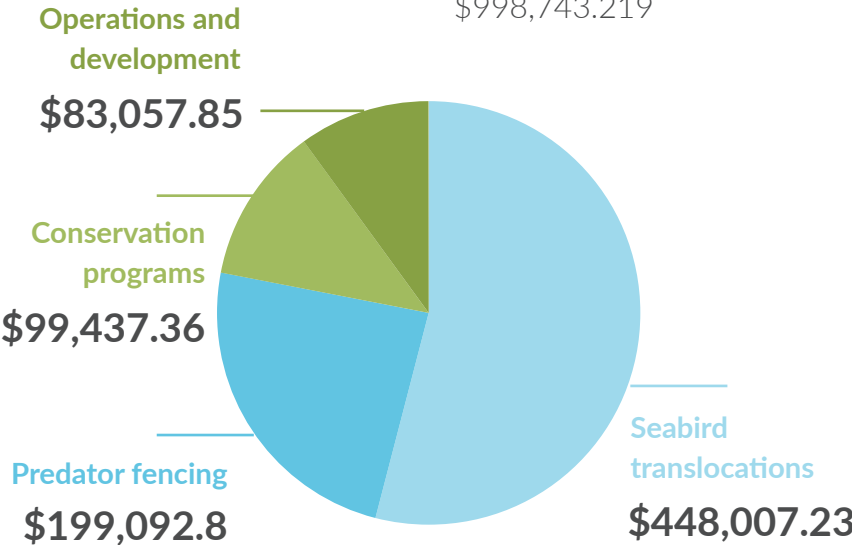
FINANCIAL INFORMATION

DIRECT REVENUE

\$998,743.219

DIRECT EXPENSES

\$829,595.24



FINANCIAL HEALTH

Assets	\$353,342.33
Liabilities	\$10,851.46
Net Assets	\$342,490.87

FUNDERS



the David & Lucile Packard
FOUNDATION



ATHERTON FAMILY
FOUNDATION



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2017 PARTNERSHIPS AND COLLABORATORS



Preventing Extinctions

