conservation and restoration program

PACIFIC ISLANDS FISH & WILDLIFE OFFICE

ANNUAL REPORT FY2017

Conservation and Restoration Program

The Conservation and Restoration Program of the Pacific Islands Fish and Wildlife Office (PIFWO) is composed of the following:

- *Recovery Programs (Plants and Animals)*
- *Partners for Fish and Wildlife Program*
- *Coastal Program*
- *Fish Habitat Program*
- *Recovery Permits Program*
- *ESA Section 6 Program*

We work closely with the island teams to achieve the office goals to recover our nearly 600 species of listed plants and animals; prevent the extinction or extirpation of the rarest of the rare; enlist the assistance of partners around the Pacific Islands (from private landowners, not-for-profit organizations, state, territorial and local governments and their agencies); and ensure the needed research and recovery actions are permitted and follow the guidelines of the Endangered Species Act (ESA).

This report shares our on-the-ground recovery and partnering efforts during the 2016 fiscal year and offers a small window into all that is being done for the flora and fauna of the Pacific Islands. We include feature stories to illustrate our accomplishments as well as summaries of the expenditures and obligations for ongoing or new projects. But our success is defined by more than just money – it is the dedicated efforts of our staff, our partners and the people of the Pacific Islands.

Every year PIFWO prepares a report of endangered species expenditures for Congress. Data are broken into two categories, project funding and staff time. Project funding is determined through a competitive process in our office. Staff time is the number of hours personnel work on a particular species converted to dollars. The total dollar amount spent per species is what is reported to Congress. We thought it would be interesting to analyze and summarize those data to evaluate which species had the greatest expenditures in 2016.

We used the excel spreadsheet generated for the Congressional report and organized it so that we could look at the project funding, staff time, and total funding categories individually. To identify the species with the greatest expenditures overall we sorted by the total expenditure category. We then wanted to see what proportion of the total expenditure was project money compared to staff time. The results are displayed in Figure 1.

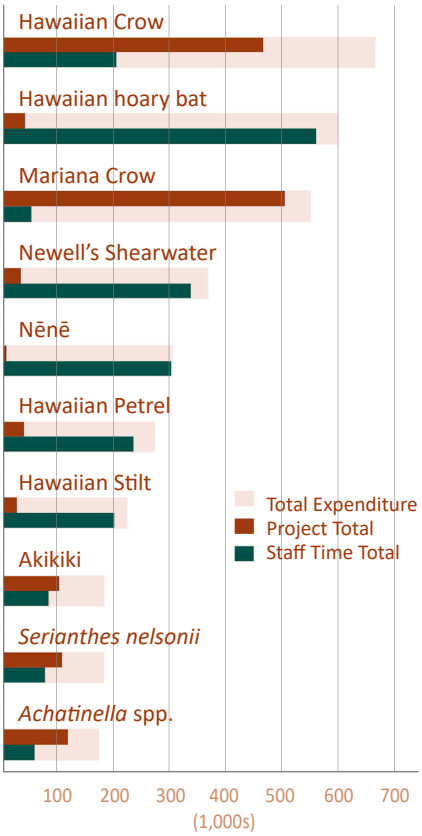


Figure 1. The ten species with the greatest overall expenditure, showing the breakdown by project expense and staff time.

In addition to the greatest expenditures overall, we also decided to look at the species with the greatest project expenditure in the Conservation and Restoration Team–the projects managed by staff on that team. To identify the greatest project expenditures on the team, we sorted the data by the total project expenditure for the program, and displayed it by the total project funding for that species. The results are shown in Figure 2.

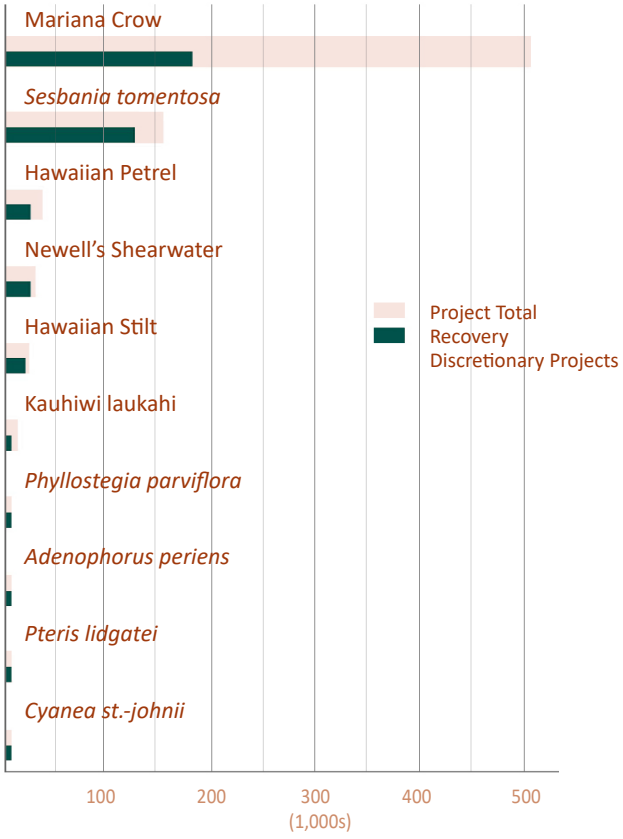


Figure 2. The ten species ranked by discretionary funding expended by the Conservation and Restoration Program, compared with the total project money spent on those species.

animal recovery

Working collaboratively to prevent the extinction and recovery of Pacific Island animals with the ultimate goal of removing them from the list of federally protected species

Project Expenditures	Projected End Date	Expended in FY2017
Palila on Mauna Kea Volcano	10/31/2017	$1,626,087.32
The Mariana Crow Incentive Plan	09/30/2017	$28,815.00
Puʻu Kukui Newcombia Protection	09/01/2017	$26,775.98
Rota Feral Cat Management, Mariana Crow	09/30/2017	$223,086.78
Captive Breeding ʻAkikiki And ʻAkekeʻe	12/31/2018	$137,011.37
Baseline Inventory of Arthropods	09/30/2015	$17,150.40
Snail Predator Proof Exclosure Structure	09/30/2019	$4,410.80
Rota Law Enforcement Supplemental Support	09/30/2016	$5,656.00
Reintroduce ʻAlalā at Puʻu Makaʻala Natural Area Reserve	09/30/2020	$36,459.79
Guam Kingfisher Capacity Expansion	06/30/2017	$51,400.00
Snail Extinction Prevention Program	09/30/2020	$336,712.75
Seabird Habitat Suitability Assessment	05/31/2017	$46,694.56
UAV-FLIR Ungulate Detection Project	09/30/2017	$5,851.00
San Diego ZG Captive Propagation and Introduction of Forest Birds	09/30/2021	$851,738.32
Student Technicians for Guam Kingfisher	06/30/2019	$5,277.41
TOTAL		**$ 3,403,127.48**

Project Obligations - FY2018	Status	Awarded Amount
San Diego Zoo Forest Birds Captive Propagation	Ongoing	$1,005,000
Snail Extinction Prevention Program	Ongoing	$200,000
Wolbachia Culex	New	$45,000
Hawaiian Coot and Hawaiian Stilt Population Viability Analysis	New	$22,833
Beach park trash cans and bags	Ongoing	$1,470
Mariana Crow genetic database	New	$5,000
Guam King Fisher mice supplement	New	$5,000
Kauaʻi Seabird Recovery Project-DNA sequencing of Band-rumped storm-petrel	Ongoing	$3,500
Albatross Translocation Project	Ongoing	$3,500
Rota Feral Cat Control for Mariana Crow	Ongoing	**$5,000**
ʻAimakapā Wetland Restoraftion supplies	New	**$3,500**
Hawksbill Sea Turtle Outreach	New	**$1,500**
Native Hawaiian Wildlife Educational coloring book	New	**$1,500**
Nēnē public announement	New	**$729**
Goat Control and Removal at Palamanui Dry Forest Preserve	New	**$1,500**
Helicopter Helmets for Maui Nui Forest Bird and Maui Nui Seabird Recovery Projects	New	**$2,922**
TOTAL		**$ 1,307,954.00**

Cat Control for the Mariana Crow

The aga, or Mariana Crow *(Corvus kubaryi),* is endemic to the islands of Rota and Guam in the Mariana Islands. The Guam population was extirpated by the introduced brown treesnake *(Boiga irregularis)* and the decline in the Rota population is attributed to predation by feral cats, nest disturbance by humans, nest loss from typhoons, habitat degradation, inbreeding, and disease. Radio telemetry projects conducted between 2009 and 2017 improved carcass retrieval and aided in the documentation of predation by feral cats as a cause of mortality.

In an effort to improve the status of aga, cat removal has been conducted on Rota since February 2012. From 2014 to late 2017, the Institute for Wildlife Studies (IWS) implemented the cat control program with the objective of suppressing the cat population in specific study zones to determine if reducing cat density would result in an increase in aga nest success or survival. During FY17, IWS used a combination of spotlight hunting and trapping to remove cats in Priority Areas, i.e., those areas with higher densities of crows and nesting crows.

Additional funding was not obtained for this project, and this was the last year of dedicated cat control. Through the length of the program under IWS, more than 170 cats were removed from the island. The number of confirmed breeding pairs of aga increased from 46 in 2014 to 54 in 2016, with an additional eight unconfirmed pairs. Further, first-year survival increased from a low of 40 percent prior to cat control to almost 80 percent after cat control was implemented. Although IWS's project was designed to evaluate the impact of cat control on the crow population, no causal link can be made at this time. However, it is encouraging that we are seeing an increase in both nesting success and juvenile survival in this endangered species. Island-wide surveys are scheduled for this coming year and will provide another measure of population size.

Guam Kingfisher Capacity Expansion

The Guam Kingfisher *(Todiramphus cinnamominus)* is extinct in the wild, and has been sustained as a managed population for more than 30 years by the Guam Kingfisher Species Survival Plan (SSP), operating under the authority of the Association of Zoos and Aquariums (AZA). Currently 25 zoos and the Guam Division of Aquatic and Wildlife Resources maintain the extant kingfisher population. Although the population has increased in recent years to approximately 140 birds, the species still has a high risk of extinction. Most breeding institutions are at capacity and few new institutions are interested in hosting the species until a timetable for reintroducing birds to the wild is developed. A population viability analysis completed in 2015 showed that, under current management (holding capacity and reproductive rate), the population would decline by 57% in the next 25 years and the genetic diversity would decrease by almost 30% (Johnson et al. 2015). However, the model showed that with an increase in holding capacity to just 200 birds, the population would easily increase to fill those spaces, genetic diversity would be maintained, and the population could sustain "exports" for reintroduction to the wild.

In 2016, funding from the Service increased the holding capacity for the population by 30 additional birds. Space was donated by Brookfield Zoo in Chicago, and Recovery funding supported the installation of cages and the cost of caring for the birds for two years. Additional funding from Guam Department of Aquatic and Wildlife Resources and from contributions from zoos in the SSP will provide care of these birds for additional years.

This project is one component of the larger objective of releasing Guam Kingfishers back to the wild. More holding space allows for more flexibility in breeding pairs, which increases the potential to maintain genetic diversity in the population. It also encourages AZA zoos to breed the kingfishers they hold because there is a place to transfer the offspring. Release planning is ongoing; and the hope is that by the time we are ready to put birds back in the wild, the population will be large enough so that we can remove individuals without negatively impacting the captive population.

Species Status Assessments for Two Endangered Hawaiian Waterbirds

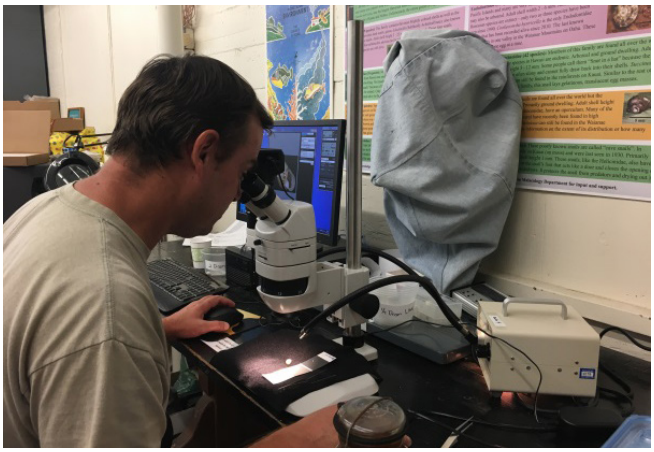
This year, we completed draft Species Status Assessments (SSAs) for the Hawaiian Stilt (ʻaeo or *Himantopus mexicanus knudseni)* and the Hawaiian Coot (alae keʻokeʻo or *Fulica alai)*. Each SSA report is the result of a comprehensive status review, using the best scientific and commercial data, including peer-reviewed literature, grey literature (government, academic, business, and industry reports), and technical and scientific expertise. SSAs are intended to provide biological support for decision-makers; they do not contain any guidance, regulatory, or policy components nor do they make any decisions.

There are currently 1,500-2,000 Hawaiian Stilts and 2,000-2,500 Hawaiian Coots distributed across the main Hawaiian Islands. The largest number of individuals for both species occur on Kauaʻi, Oʻahu, and Maui. Waterbird and wetland ecologists consider Hawaiian Stilts and Hawaiian Coots to be conservation-reliant species. Almost all successful breeding sites for these waterbirds occur on managed wetlands (e.g., Hanalei National Wildlife Refuge (NWR), Kawainui Marsh, James Campbell NWR, Kealia NWR, and Kanaha Pond State Wildlife Sanctuary). Both waterbird species travel intra- and interisland, stopping at wetlands along the way like stepping stones. Although these species are benefiting greatly from management actions, they still experience myriad stressors including predation by nonnative animals (e.g., cats, mongoose, rats, barn owls, and cattle egrets), habitat degradation from overgrowth of vegetation, and by water levels that are too high or too low. Habitat fragmentation and disease further burden these waterbirds. Additionally, sea-level rise is anticipated to flood and inundate many wetlands by the end of the century. Further, due to urban development and Hawaiʻi's geography, there may not be many places for new or shifting wetlands to emerge.

Although these highly adaptable species have maintained steady or slightly increasing populations over the last several decades, their viability is largely dependent on the amount of management actions implemented on their behalf. Population viability analyses are currently underway for both species with all new data incorporated into the SSA reports.

Collaboration with Bishop Museum Malacology Laboratory

The Charles Montague Cooke, Jr. Malacology Center at the Bishop Museum dates back to the late 19th century and houses the largest Pacific Islands snail collection in the world. At more than 6 million specimens, 4 million of which are terrestrial snails, this collection provides invaluable data on species distribution, abundance, and diversity. Norine Yeung, the lead malacology researcher and laboratory manager, was awarded three years of funding from the National Science Foundation Collections in Support of Biological Research to protect and modernize the malacology collection, starting with the land snail collection.



In Hawaiian, land snails are generally referred to as kāhuli and are the subject of select oli (chant), mele (songs), and moʻolelo (stories).

This past year, the Candidate Conservation Program hired a volunteer from PIFWO to assist with the rehousing of specimens in environmentally stable and protective containers, imaging all type material, and digitalizing all collection data and making information readily available to the community both in-house and online.

This effort will greatly improve physical and virtual access to the collection, and protect this critical data resource for researchers, natural resource managers, students, and the public.

plant recovery

Working with partners to protect and restore native habitats on which threatened and endangered Pacific Islands plant species depend, with the ultimate goal of removing them from the list of federally protected species

Project Expenditures	Projected End Date	Expended in FY2017
Plant Extinction Prevention Program (PEPP)	09/30/2019	$426,377.62
Kaluanui Fencing	09/20/2018	$117,270.97
Alakaʻi Preserve	08/31/2016	$96,105.05
Puʻu Waʻawaʻa Forest Reserve Fence	09/30/2018	$4,501.06
Reintroduction of Endangered Lobeliads	09/30/2019	$3,148.17
Guam Plant Extinction Prevention Program	09/30/2016	$154,974.10
Aupaka Recovery and Habitat Restoration	09/30/2018	$16,509.42
Mehame Restoration Auwahi Forest	09/01/2021	$35,509.27
Serianthes nelsonii Phylogenetic Study	07/31/2018	$10,658.27
Volcano Rare Plant Facility	09/30/2020	$59,887.75
TOTAL		**$ 924,941.68**

Project Obligations - FY2018	Status	Awarded Amount
Plant Extinction Prevention Program	Ongoing	$400,000
Kalaeloa Plants, Leeward Community College outreach	New	$2,000
Rare Plant Management of Upper Monoa Valley, two helicopter loads	New	$2,750
Lyon Arboretum, Hawaiian Rare Plant Program	Ongoing	$2,285
Volcano Rare Plant Facility	Ongoing	$1,551
Big Island Invasive Species Committee chainsaw replacement	New	$1,000
TOTAL		**$ 409,587.00**

Plant Extinction Prevention Program

The Hawai‘i Plant Extinction Prevention Program (PEPP), with support from and in collaboration with 20 partner programs, agencies and landowners, is currently managing 238 listed species, totaling 1,328 wild populations and an additional 455 outplantings, across the islands of Kaua‘i, O‘ahu, Maui, Moloka‘i, Lāna‘i, and Hawai‘i. In FY17, PEPP implemented recovery actions for a total of 134 listed species.

Establishing germplasm collections is the first step in preventing extinctions. PEPP has lived up to its name, preventing 240 plant species from going extinct by securing them in ex situ storage. By 2017, 64% of populations of PEPP species had been collected from. In FY17, surveys were conducted for 51 species, and population monitoring was implemented for 125 listed species, placing 105 of these species into ex situ storage and propagation.

- Survey Highlights
  Flueggea neowawraea: On Hawai‘i Island, 17 new individuals were discovered, including a very large female in North Kona and three immature trees in Manukā. Thousands of seeds were collected from a couple of these new trees this year. This discovery raises the total number of individuals on the island to 26 (and worldwide total to over 80). Until this discovery, this species recently consisted of only old mature trees in very poor health, due largely to invasive boring beetles *(Xylosandrus compactus).*
- Collection Highlight
  Tetramolopium remyi: On Lāna‘i, the last individual of the *T. remyi* is in decline, but soil collected beneath this plant contained viable seeds. Reintroduction of plants back into suitable habitat to establish new populations is an integral part of the recovery of listed species. By 2017, 147 listed species, totaling 55,787 plants, had been outplanted. PEPP has outplanted over five times the number of wild PEPP plants. Statewide in FY17, 5,397 plants of 59 listed species were outplanted into protected habitats.
- Reintroduction Highlight
  Cyanea stictophylla: The Hawai‘i Island PEPP team and its partners outplanted a total of 690 *C. stictophylla* plants within a 10-acre fence at Kukuiopa‘e that PEPP retrofitted with deer fencing to prevent the ongoing ingress of sheep.

Silene Perlmanii

More than 420 native Hawaiian plant taxa are threatened or endangered, and 238 taxa have less than 50 individuals remaining in the wild. *Silene perlmanii,* is just one example. Named after one of Hawai'i's most renowned botanists, Steve Perlman, it was discovered in 1987 in Honouliuli in the Southern Wai'anae Mountains of O'ahu. It is extinct in the wild, last observed in 1997, and was known only from two small populations totaling less than 20 plants on one cliff face on the windward side of the Wai'anae Mountains and another on the leeward side. Like most Hawaiian ecosystems, *S. perlmanii* habitat experiences ongoing threats due to impacts of invasive species and climate change.

Luckily, fruits and cuttings were collected from the populations before the species went extinct, and these were propagated by the Nature Conservancy of Hawai'i and the Pahole Rare Plant Facility (State of Hawai'i Division of Forestry and Wildlife (DOFAW)). One plant remained at the Pahole Rare Plant Facility, and in 2008 flowers were pollinated and seeds were produced. The seeds were propagated and stored at Lyon Arboretum.

Sixty-three accessions of *S. perlmanii* seeds were stored from 2008-2016, for a total of more than 44,000 seeds. More than 2,300 seeds have been sown for viability testing and propagation for restoration. Despite the limited genetic diversity of these collections, seed viability and seedling survival have generally been quite high. The Plant Extinction Prevention Program and DOFAW have outplanted hundreds of plants back into the southern Wai'anae Mountains at three protected reintroduction sites on O'ahu. These sites are regularly managed for threats and all three have had some degree of success. Most notable is the smallest site, which is closest to where the wild plants existed, where some regeneration is being observed. Regeneration is rarely observed in outplantings of listed plants, so there is genuine excitement over the seedlings that have been observed, where some have grown and matured. While the restoration efforts have been successful so far, there are still less than 200 plants in the ground for this extremely rare species.

Prelisting Poject Expenditures	Projected End Date	Expended in FY2017
Ka'ū Forest Reserve Invasive Control	09/30/2018	$46.50
Waikamoi Fence	09/30/2019	$7,780.81
In Vitro Germplasm Collection	09/30/2018	$3,707.52
TOTAL		**$ 11,534.83**

Waikamoi Preserve Fence Project

The Nature Conservancy's Waikamoi Preserve is located on the slopes of Mt. Haleakalā on East Maui. This preserve provides an important sanctuary for hundreds of native Hawaiian plants and animals. Waikamoi Preserve is an important component of the East Maui watershed-which spans more than 100,000 acres across the windward slopes of Haleakalā. At least 63 rare plant species and 13 rare bird species call this preserve home. Many of these endemic species are Endangered or Threatened species and others are considered at risk of becoming Endangered or Threatened species due to stressors such as climate change, disease, and nonnative invasive species.

Combined with other funding sources, USFWS Prelisting funds were used to help build three miles of fence along the new Waikamoi East Maui Irrigation (EMI) addition to the Waikamoi Preserve. This fencing completes the western boundary of the new EMI conservation easement and the 12,000-acre East Maui Watershed Partnership core managed area. These funds were also allocated toward ungulate removal and weed control in the area. Additionally, the new fencing completes a 13,000-acre managed and fully-fenced area. Ungulate removal and weed control have been initiated in the new EMI addition. Waikamoi Preserve is managed in partnership with the Hawai'i State Department of Land and Natural Resources through the Natural Area Partnership Program.

partners program

To efficiently achieve voluntary habitat restoration on private lands, through financial and technical assistance for the benefit of Federal Trust Species

Project Expenditures	Projected End Date	Expended in FY2017
Lāna'ihale Ungulate Removal	09/30/2017	$79,012.33
'Īao Protective Fence	09/30/2017	$6,131.00
Kaluanui Fencing	09/20/2018	$40,238.78
Protect Koa Forests and Buffer Hakalau Forest NWR	09/30/2018	$49,469.00
TNC Maka'alia Fence Unit	09/30/2019	$1,586.33
Rota Rare Plant Recovery	09/30/2016	$8,685.65
Waipāhoehoe Management Unit	09/30/2020	$110,000.00
Kaupō Ranch Forest Restoration	09/30/2019	$52,807.24
Kapunakea and Kanepuu Fence Replacement	09/30/2020	$25,810.66
Control of Priority Weeds Pu'u Pahu Maui	09/30/2019	$5,200.00
Auwahi Forest, Six Endangered Plants	09/01/2019	$48,500.00
TOTAL		**$ 427,440.99**

Project Obligations - FY2018	Status	Awarded Amount
Auwahi Māhoe Restoration, Maui	New	$47,095.00
Three Mountain Alliance Rare Plant and Bird Protection Project, Hawaii	New	$24,430.00
Auwahi Rodent Control Project	New	$48,732.00
Kapunakea, TNC Maui	New	$45,000.00
WMMWP Fence Repair, Maui	New	$34,709.00
The Nature Conservancy Rare Species Enhancement Project, Hawaii	New	$42,034.00
Laupāhoehoe Nui Watershed Enhancement	New	$30,000.00
TOTAL		**$ 272,000.00**

Habitat Improvements at Waipāhoehoe

Mauna Kea provides habitat for unique assemblages of Hawaiian flora and fauna. Because of its range of elevations, Mauna Kea has a variety of diverse biotic ecosystems. The Waipāhoehoe region of the Piʻihonua ahupuaʻa (land division) on the eastern slope of Mauna Kea is an important area for the protection of high elevation ʻōhiʻa-koa forest and is among the headwaters for the Wailuku River, the longest river in Hawaiʻi.

The Partners for Fish and Wildlife Program working with the Mauna Kea Watershed Alliance and the Department of Hawaiian Homelands, enclosed the Waipāhoehoe Management Unit–about 1,100 acres of mesic ʻōhiʻa and koa forest located on the eastern slopes of Mauna Kea between 5,400 and 6,000-ft elevation.

This management unit was identified for its conservation value in the ʻĀina Mauna Legacy Program Management Plan and Environmental Assessment produced by the Department of Hawaiian Homelands. This plan outlines protection measures for the area and is designed to restore upper elevation native forests and provide habitat connectivity for native Hawaiian forest birds. The 2.75-mile section of fence includes the existing perimeter fence of the Hakalau Forest National Wildlife Refuge

The staff from the Mauna Kea Watershed Alliance have established transects in the management unit and monitoring protocols have been established for weeds and ungulates. Ungulates will be removed upon the completion of the fence.

Laupāhoehoe Nui Watershed Reserve

The Laupāhoehoe Nui Watershed Reserve represents one of the most unique assemblages of native habitats in the Hawaiian islands, including montane bogs, cloud forest, perennial streams, steep cliffs, and montane wet shrublands. The Reserve, located on windward Kohala Mountain is home to an assemblage of endangered forest birds, seabirds, and waterfowl; rare and endangered Hawaiian plants and their associated fauna; and some of the last remaining perennial streams in the State that flow unhindered by human impacts from source to the ocean.

In 2012, the Partners for Fish and Wildlife Program provided funds to the Kohala Watershed Partnership to begin construction of a 5-mile perimeter ungulate-proof fence around the 710-acre management area. The project, which occurs on lands owned by Laupāhoehoe Nui LLC, includes the eradication of feral pigs once the unit is completely fenced, the control of target invasive plants like kāhili ginger, and mule's foot fern, and the monitoring of rare and endangered species. The fences crossing Kaimū and Waikoloa streams were difficult to complete and required at least seven stream crossings along rugged terrain and dealing with inclement weather. The fence crews rappelled with gas powered rock drills in order to install certain sections of the fence. However, additional funding was needed to complete the fence, and an additional award of $30,000 was made in 2017 to the Kohala Center.

Prior to fence construction, the Kohala Watershed Partnership conducted stream and biological surveys. A new species of hō‘awa (*Pittosporum* sp.) was found along with nā‘ū (*Gardenia remyi*). Stream surveys found the native goby, ‘o‘opu alamo‘o (*Lentipes concolor*), and the freshwater shrimp, ‘ōpae kuahiwi (*Atyoida bisculata*). Game cameras were set up near the streams, but have been unsuccessful in capturing the foraging habits of the elusive kōloa (Hawaiian Duck).

The Kohala Center and the Kohala Watershed Partnership are pursuing other sources of funding to complete the Laupāhoehoe Nui Watershed Reserve fence and begin restoration activities within the unit. Funding for ongoing monitoring and invasive species control will be sought from the Department of Land and Natural Resources' Watershed Partnership Program Grant.

coastal program

To work with partners to achieve voluntary habitat restoration in coastal ecosystems, marine habitats, and watersheds, through financial and technical assistance for the benefit of federal and trust species

Project Expenditures	Projected End Date	Expended in FY2017
Mo‘omomi Fence	08/31/2018	$28,715.32
James Campbell Predator Proof Fence	09/30/2019	$15,580.00
Sea Turtle Outreach	09/30/2016	$17,000.00
Kahuku Point Predator Proof Fence	09/30/2017	$40,000.00
Micronesia Mangrove Resilience Project	03/01/2020	$41,524.40
Phylogeny of Band-Rumped Storm Petrel	09/30/2019	$21,840.40
Anapuka Dune Restoration	09/30/2019	$30,000.00
Blackburn's Sphinx Moth Genetics and Habitat	09/30/2019	$6,342.11
TOTAL		**$ 201,002.23**

Project Obligations - FY2018	Status	Awarded Amount
Inventory of Anchialine Pools, Maui and O‘ahu	New	$8,000.00
Coastal Plant Extinction Prevention	New	$57,539.00
Ngerkeklau Island Protection	New	$81,586.00
Ka Iwi Coastal Restoration	New	$20,000.00
Kayangel Rat Eradication	New	$92,000.00
Anchialine Pool Rotenone Trials	New	$7,875.00
TOTAL		**$ 267,000.00**

Kahuku Point Coastal Restoration

The Coastal Program is collaborating with North Shore Community Land Trust, Hawai‘i Department of Land and Natural Resources, Turtle Bay Resort and the local community to restore and conserve 12.1 hectares (30 acres) of coastal strand habitat on and around Kahuku Point, the northernmost point on the island of O‘ahu. The area was protected under a conservation easement in 2014. The partnership envisions that the site will be treated as a culturally sacred and ecologically important area with a healthy, functioning and resilient native coastal ecosystem. This vision is being realized through community-based stewardship that includes invasive species removal, native plant out-planting and planning for the construction of a predator-proof fence that will allow nesting birds to return to the area.

Ngerkeklau Island Protection

Ebiil Foundation in partnership with the Palauan Government, local community and Pacific Islands Coastal Program are working to officially designate Ngerkeklau Island and the surrounding marine environment as a protected area and to develop a management plan that includes a focus on biosecurity and protecting and increasing populations of rare and endangered species.

Ngerkeklau Island, located just north of Babledaob Island in the Republic of Palau, is 8.7 hectares (21.6 acres) with extended and diverse reef habitat surroundings providing important nesting grounds for the Micronsian Megapode, Hawksbill and Green Sea Turtles, feeding grounds for the Endangered Palauan Dugong and high quality habitat for a variety of endemic and native taxa. Thirty-eight sea turtle nests were identified between April and October 2016. Human poaching of sea turtle eggs and adults and poaching of Micronesian Megapode nests have been observed. Introduced rats, forest burning and clearing, marine debris, and introduction of other invasive species are also threats. Official designation of the site as a protected area will reduce human impacts. Since the official start date of this project, October 1, 2017, efforts have been made to engage community leaders, state resource managers, government officials, and community volunteers. In addition to legal designation of the island as a protected area, the partnership plans to engage the local community and to educate via training programs, educational campaigns, social marketing materials, radio/TV programs for children, youth summer camps, and "Outdoor Classroom" programs. There will be a focus on capacity building, monitoring biological outcomes, and enforcement via surveillance and physical presence.

fisheries program

To cooperatively develop and implement aquatic conservation projects in Hawaiian streams and estuaries through the support and participation of government agencies, non-governmental organizations, and the private sector

Project Expenditures	Projected End Date	Expended in FY2016
Kahana Stream Restoration Project, O'ahu	09/30/2017	$37,814.96
Kīlolo Estuary/Fishpond Restoration Project, Hawai'i Island	09/30/2017	$26,047.12
Waipā Stream Restoration Project, Phase II, Kaua'i	09/30/2017	$2,278.62
Kāwā Estuary Restoration Project, Ka'ū Hi	09/30/2017	$13,651.07
Halulu Fishpond Restoration, Kaua'i	09/30/2016	$6,320.54
Loko Ea Estuary/Fishpond Restoration, O'ahu	09/30/2016	$6,543.71
Lower He'eia Stream Restoration Project, O'ahu	09/30/2017	$26,758.41
Fish Passage Engineering Support	09/30/2017	$59,118.99
Moloka'i Fishpond Habitat Restoration	09/30/2019	$30,000.00
Restoration of Anchialine Pools in Kona, Hawai'i Island	09/30/2018	$13,700.62
TOTAL		**$ 222,234.04**

Project Obligations - FY2017	Status	Awarded Amount
He'eia Wetland Tributaries Restoration, O'ahu	New	$60,549
North Fork Wailua River and Waikoko Stream Fish Passage Project, Kaua'i	New	$78,000
Moloka'i Fishpond Restoration Project, Phase II	New	**$69,460**
TOTAL		**$ 208,009.00**

Kahana Stream Fish Passage Project
Ahupuaa O Kahana State Park , Island of O'ahu

The Hawai'i Department of Land and Natural Resources (DLNR), Commission on Water Resources (CWRM) recently completed the Kahana Stream Restoration Project. This long-running project removed nearly an acre of densely overgrown hau bush along the lower Kahana stream and "daylighted" more than 100 meters of stream that was previously completely obscured by a tunnel of dense foliage.

The Hawai'i Fish Habitat Partnership funded the development of a preliminary project plan that was created with input from residents of Kahana Valley and on-site State Parks managers. Federal funding from the National Fish Passage Program were used for the difficult task of tree removal, and matching State funds from DLNR were used for staff time and the procurement of plants to establish a replacement stand of native riparian vegetation. The newly-restored channel now exhibits channel characteristics more suitable for upstream and downstream fish passage, and restored habitat consisting of clean, silt-free gravel and cobble substrate, partial canopy cover, and a mosaic of riffle-run-pool habitat conditions. Native fish regularly observed in the restoration area include o'opu nakea *(Awaos staminaeus)* and aholehole *(Kuhlia sandwichensis)*.

Workdays coordinated by CWRM staff enlisted the participation of the DLNR Divisions of Forestry, Aquatic Resources, Engineering, and State Parks. In addition, state workers were regularly joined in the field by volunteers from Brigham Young University, Hawai'i; University of Hawai'i School of Natural Resources and Environmental Management; and interns participating in Hawai'i Youth Conservation Corps programs.

E ke ahupua`a aloha o Kahana!
Kou makani ahiu ke hea nei ia`u.

Oh, beloved lands of Kahana!
Your untamed winds call to me.

Malama Kahana
Sonny Greer

Restoration of Anchialine Pools Along the Kona Coast Island of Hawai'i

This project is restoring habitat and biological communities of anchialine pools at six sites along the Kona Coast, located at three different locations: Pu'uhonua o Hōnaunau National Historical Park, Keahuolū (in collaboration with Queen Lili'uokalani Trust), and Kīholo State Park (with the non-profit Hui Aloha Kiholo).

Anchialine pools are tidally influenced brackish water bodies that provide a unique habitat to rare, endemic species, and are threatened by habitat alteration and invasive species. Many anchialine pools across the Hawaiian island chain are severely degraded and conservation actions to protect and restore these habitats are a growing priority. Restoration efforts of this project include removal of introduced fish and riparian vegetation, as well as sedimentation that has accumulated on anchialine pool substrate and currently covers the naturally rocky bottom. Native riparian plants will also be planted where invasive plants were removed.

This project is field testing a novel fish removal method that employs injection of carbon dioxide gas (CO^2) into the water column to lower the pH of the pool water. This causes temporary disorientation of the fish, which allows easy capture for their removal. The carbon dioxide injection method holds promise for efficient and low-impact removal of invasive fish with negligible effects upon non-target species.

This project is led by researchers working with Hui Aloha Kīholo, and has staff and technical support from The Nature Conservancy Hawai'i Marine Program and the Hawai'i Youth Conservation Corps internship program.

section 6

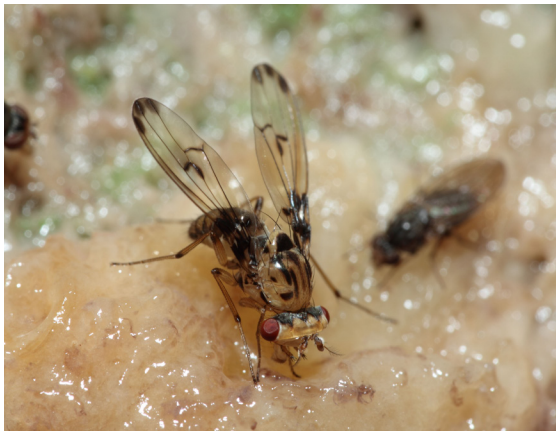
The Cooperative Endangered Species Conservation Fund (section 6 of the Endangered Species Act) provides funding to States, Territories, and Commonwealths for species and habitat conservation actions on non-federal lands

Project	Funds Requested	Funds Awarded
Plant restoration and enhancement, Mid-elevation rare plant facilities statewide	$515,775	$515,775
Snail Extinction Prevention Program (SEPP)	$100,000	$100,000
Captive propagation of endangered birds	$505,328	$505,328
Plant Extinction Prevention Program (PEPP)	$170,000	$170,000
Insectary Facility, captive propagation and entomologist	$80,000	$80,000
ʻAlalā recovery	$137,501	$137,501
Plant restoration and enhancement, T&E, C, and SOC outplanting, Hawaiʻi	$53,000	$53,000
Rare, threatened, and endangered invertebrates on Maui	$75,000	$75,000
Kauaʻi endangered forest bird recovery	$115,945	$115,945
Plant restoration and enhancement, Natural Area Reserves, Hawaiʻi	$20,000	$20,000
Kauaʻi triad (Fabulous Green Sphinx Moth, a noctuid moth, and Kauaʻi Stag beetle)	$40,000	$40,000
Picture-wing fly rearing (at U.H.)	$26,905	$26,905
Kamehamenui Forest	$2,000,000	TBD
Kauaʻi Nēnē Habitat Conservation Plan	$299,330	TBD
Kaluaʻaha Watershed Acquisition	$1,000,000	TBD
Avicultural management of Guam Rail (koʻkoʻ) and Micronesian Kingfisher (sihek)	$339,276	$339,276
Monitoring of Guam Rail on Rota, CNMI	$28,615	$28,615
Mariana Crow (åga) population monitoring	$322,202	$322,202
Endangered species conservation program manager	$45,689	$45,689

Picture-wing Fly Rearing

The Hawaiian Drosophila Research Stock Center (HDRSC) at the University of Hawai'i at Mānoa has been supporting research and captive rearing of native picture-wing flies for over 50 years. The center currently maintains colonies of a number of species, three species of which *(D. differens, D. hemipeza, and D. heteroneura)* are among the 11 Hawaiian picture-wing flies currently listed as endangered.

The HDRSC has historically provided flies for a diversity of research projects however, due to budget cuts, the HDRSC stocks have not been utilized in recent years for active research, or conservation and management. The Division of Forestry and Wildlife (DOFAW) is expanding their Hawai'i Invertebrate Program to include captive propagation and species reintroductions, and seeks to build from existing invertebrate knowledge and resources. The HDRSC is committed to sharing methodologies as well as picture-wing fly stock with DOFAW and HDRSC is also willing to expand the current number of fly species it propagates, and participate in applied conservation and management efforts. Supporting the HDRSC will ensure that these picture-wing fly stocks, many of which are no longer extant in the wild, can be maintained.



Kamehamenui Forest Habitat Conservation Plan Land Acquisition

Three wind energy complexes provide 72 MW of power on Maui resulting in incidental take of federally listed endangered species, including ua'u or Hawaiian Petrel (*Pterodroma sandwichensis*), the nēnē or Hawaiian goose (*Branta sandvicensis*), and 'ope'ape'a or Hawaiian hoary bat (*Lasiurus semotus*). This Habitat Conservation Plan (HCP) Land Acquisition Proposal seeks $2,000,000 in federal funds for Hawai'i's Division of Forestry and Wildlife (DOFAW) to buy Kamehamenui Forest (KF). The proposed project will complement required mitigation done under the respective HCPs and contribute to the long-term recovery of the covered species and for 10 additional endangered species. DOFAW identified the KF property as a priority statewide land acquisition based on the following:

1. Imminent threat of sale, habitat degradation and loss, and development (property is listed for sale);
2. Very high likelihood of suitable habitat and a significant number of breeding pairs of the Hawaiian Petrel;
3. Presence of nēnē and their preferred habitat as well as appropriate areas for the development of predator-proof breeding exclosures;
4. A Blackburn's sphinx moth management unit within two miles of the property and suitable habitat on the property;
5. Likely presence of Hawaiian hoary bat on the property and suitable roosting and feeding habitat, as well as its suitability for applied research and habitat restoration efforts to expand habitat and help ongoing Hawaiian hoary bat mitigation providing net recovery benefits;
6. Sufficient distance from the impact zones of the Auwahi, Kaheawa I, and Kaheawa II wind farms;
7. Protecting and enhancing Critical Habitat and native mesic forest ecosystems for numerous listed species through management and restoration; and
8. A strong coalition of partners interested in and actively working on conservation projects in the immediate area.

permits

Recovery permits are provided to qualified individuals and organizations to achieve recovery goals of listed species, including research, on-the-ground activities, controlled propagation, and establishing and maintaining experimental populations

Species	Permittee	Location	TAILS Number
Friendly Ground-dove (Tu'aimeo)	Institute for Bird Populations (Peter Pyle)	Islands of Ofu and Olosega, American Samoa	2016-F-0536
Hawaiian Hoary Bat (ʻōpeʻapeʻa)	Tetra Tech	Maui	2017-F-0071
Hawaiian Hoary Bat (ʻōpeʻapeʻa)	H.T. Harvey	Oʻahu and Maui	2017-F-0121
Hawaiian Stilt (aeʻo) and Hawaiian Coot (ʻalae keʻokeʻo)	Arleone Dibben-Young	Molokaʻi and Keālia Pond National Wildlife Refuge, Maui	2017-F-0136
Mariana Eight-spot Butterfly (abbabang)	Guam DAWR	Guam	2017-F-0192
ʻAkikiki or Kauaʻi Creeper	ZSSD – letter of amendment and BO	Kauaʻi	2017-F-0210
12 species of Oʻahu Tree Snails, Newcomb's Snail, and 2 species of Lānaʻi Tree Snails	DOFAW-SEPP	Oʻahu, Maui, and Lānaʻi	2017-F-0215
7 species of Hawaiian Yellow-faced Bees	Environmental Solutions and Innovations, Inc. (ESI)	Oʻahu, Maui, Molokaʻi, Lānaʻi, Hawaiʻi and Kahoʻolawe	2017-F-0238
Hawaiian Common Gallinule (ʻalae ʻula), Nihoa Finch, Anthricinan Yellow-faced Bee, Green Sea Turtle (honu), and Hawksbill Sea Turtle (honu ʻea)	PIFWO	Oʻahu, Hawaiʻi, Maui, Molokaʻi, Lānaʻi, Kauaʻi, and Nihoa Islands	2017-F-0256
Hawaiian Stilt (aeʻo) and Band-rumped Storm-Petrel (ʻakēʻakē)	Melissa Price (UH)	Kawainui Marsh on Oʻahu for aeʻo and Kauaʻi, Maui and Hawaiʻi Islands for ʻakēʻakē	2017-F-0268
8 recently listed plants	HAVO	Hawaiʻi Island	2017-F-0279
5 recently listed plants	Hakalau Forest National Wildlife Refuge (HFNWR)	Hakalau Forest National Wildlife Refuge, Hawaiʻi Island	2017-F-0383
5 recently listed plants	Pōhakuloa Training Area (PTA)	PTA, Hawaiʻi Island	2017-F-0388
Mariana Crow (åga)	Renee Ha (UW)	Rota, CNMI	2017-F-0486

Friendly Ground-dove (tu'aimeo)

The Institute for Bird Populations has an on-going study in American Samoa looking at landbird dynamics and habitat requirements using capture and banding (Monitoring of Avian Productivity and Survivorship (MAPS)) stations and collaborated with the American Samoa Division of Marine and Wildlife Resources to establish the Tropical MAPS (TMAPS) program in American Samoa. There are currently six TMAPS stations on the islands of Ofu and Olosega, in which they have previously captured tu'aimeo or Friendly Ground-doves *(Gallicolumba stairi),* American Samoa Distinct Population Segment (DPS). The project proposes to capture up to 30 tu'aimeo to band, measure, collect bio-samples, collect recordings, track birds and monitor nests. Once complete, this project will accomplish multiple goals including improving our understanding of the status of the tu'aimeo in American Samoa as well as resulting in information on their demography that may be important in helping to recover this species.

Mariana Eight-spot Butterfly (abbabang)

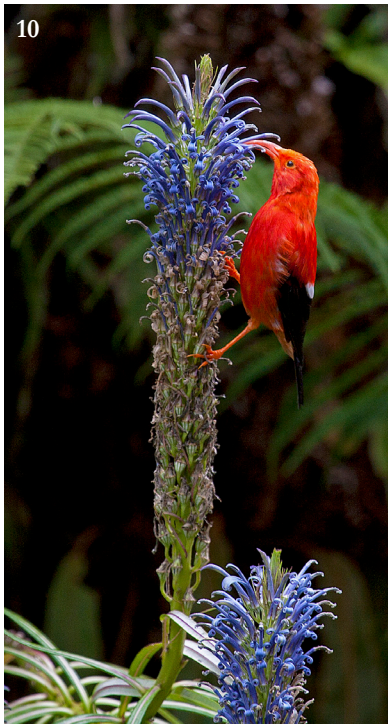
The Guam Division of Aquatic and Wildlife Resources (DAWR), received a recovery permit to collect eggs and larvae of the endangered abbabang or Mariana eight-spot butterfly *(Hypolimnas octocula marianensis)* in order to establish a captive propagation colony for transplantation into protected habitat on Guam. Thirty eggs and/or larvae of the abbabang will be collected from the wild in order to develop captive propagation and release techniques. At least 100 plants of each of the butterfly's known host plants *(Procris pedunculata* and *Elatostema calcareum)* will be propagated and maintained in a plant nursery and the captive-reared butterflies will be released within the two protected areas with the host plants. This species appears to be declining and the range-wide population is comprised of only a few local populations on Guam (DAWR 2016). The information gathered from this project will help the conservation and recovery of the abbabang.

Photographs

1. *Gordon Smith, Fisheries Program*
2. *Megan Laut, Animal Recovery Program*
3. *Sheldon Plentovich, Coastal Program*
4. *Carrie Harrington, Recovery Biologist*

5. Sesbania tomentosa, *G. Koob*
6. *Gregory Koob, Manager*
7. Manduca blackburnii *(Blackburn's sphinx moth), E. VanGelder*

8. *Lehua, S. Plentovich*
9. *Benton Pang, Partners for Fish & Wildlife Program*
10. *'I'iwi and* Lobelia grayana, *D. Clark*
11. *Lauren Weisenberger, Plant Recovery Program*
12. *Annie Marshall, Section 6 and Permits Programs*



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