

# conservation and restoration program



PACIFIC ISLANDS FISH & WILDLIFE OFFICE  
ANNUAL REPORT FY2016

## *Conservation and Restoration Program*

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

- *Candidate Conservation Program*
- *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.

# candidate conservation

To prevent  
the need to  
list species as  
threatened or  
endangered  
under the  
Endangered  
Species Act





<b>Project Expenditures</b>	<b>Projected End Date</b>	<b>Expended in FY2016</b>
West Maui Irrigation fence and ungulate removal	09/30/2019	\$ 24,063.12
Determine the current status of two candidate Mariana Islands butterflies	09/30/2015	\$ 2,720.06
Develop candidate species listing packages and conservation strategies for Hawaii's endemic terrestrial snails	09/30/2019	\$ 81,120.88
<b>TOTAL</b>		<b>\$ 107,904.06</b>

<b>Project Obligations - FY2017</b>	<b>Status</b>	<b>Awarded Amount</b>
Snail Extinction Prevention Program field activities	Continuing	\$62,202.00
Tissue culture of Hawaiian plants	Continuing	\$65,798.00
<b>TOTAL</b>		<b>\$ 128,000.00</b>



## *Micropropagation of Non-listed, At-risk Hawaiian Plant Species*

The Lyon Arboretum Hawaiian Rare Plant Program (HRPP) utilizes micropropagation, seed banking, and greenhouse propagation as horticultural tools for plant germplasm conservation.

Lyon Arboretum's HRPP micropropagation lab works to initiate and maintain a lifeline for many at-risk and critically endangered Hawaiian plant species. They also work with native species important for ecosystem health, such as *Metrosideros polymorpha* ('Ōhi'a lehua). Micropropagation becomes especially important for plants classified as exceptional species, which are those that cannot be conserved by conventional seed banking methods. Currently, the lab houses more than 25,000 plants, representing nearly 200 native Hawaiian plant taxa. Half of these taxa are listed under the ESA, and close to 40 are not listed but considered at-risk species or highly important for restoration work.

Biologists use several micropropagation techniques – from liquid culture for ferns, to test tubes with semi-solid media for most flowering plant taxa. The primary purpose is to continue the survival of the species through continuous cycles of micropropagation, or grow the species for outplanting and restoration efforts. The next step, cryopreservation, will increase the likelihood of long-term preservation.

The lab relies heavily on volunteers to maintain their current collection and works cooperatively in joint conservation efforts with other botanical gardens, environmental conservation organizations, land managers, and various state and federal agencies, including the Plant Extinction Prevention Program, Hawai'i Department of Land and Natural Resources, and U.S. Fish and Wildlife Service (Service). Funding from the Service allows for increased focus on micropropagation for at-risk Hawaiian plant species, which will make them more readily available for outplanting efforts while ensuring their survival *ex situ*.

*The three primary goals of the HRPP are: 1) Preventing further extinction of native Hawaiian plant species and Polynesian introduced crop plants; 2) Propagating plants for approved restoration projects and garden use; and 3) Initiating and maintaining an in vitro germplasm collection of declining, threatened, and critically endangered plants.*



## *Snail Extinction Prevention Program*

An estimated 60 to 90 percent of Hawaii's terrestrial snail species have gone extinct due to habitat loss and degradation, introduced predators, and overcollection. It is believed that these snails once occupied coastal and lowland forests, up to the high mountain ridges. Currently, most native snails are restricted to a narrow band between 2,000-4,000 feet in elevation. Many remaining species are struggling, surviving in small, isolated patches of their former ranges.

The mission of the Snail Extinction Prevention Program (SEPP), administered through the Hawai'i Department of Land and Natural Resources, is to prevent the extinction of rare land snail species and preserve the ecosystems upon which these species and their local assemblages depend throughout the Hawaiian Islands.



SEPP currently has 19 priority species and is incorporating more as they expand to Maui Nui (Maui, Moloka'i, Lāna'i and Kaho'olawe). Its efforts include building and maintaining predator-free exclosures, monitoring, and implementing *ex situ* captive rearing. In addition, SEPP is working to coordinate rare snail conservation objectives and management techniques across islands and entities.

Funding through the Candidate Conservation Program will assist in conserving many species, including six nonlisted at-risk terrestrial snails on O'ahu that previously received little to no management efforts. These snails include *Laminella sanguinea*, *Amastra cylindrica*, *A. spirizona*, *A. micans*, *A. rubens*, and *Cookeconcha hystricella*. Activities will include constructing and maintaining predator-proof exclosures on O'ahu, Maui, Moloka'i, and Lāna'i. This funding will also allow for the construction of "mini-exclosures" to protect small, isolated populations that do not have traditional predator-proof exclosures. Mini-exclosures are small cages that prevent predator incursion and can be rapidly deployed to provide immediate stopgap protection.

# 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





<b>Project Expenditures</b>	<b>Projected End Date</b>	<b>Expended in FY2016</b>
Restoration for the 'alalā, or Hawaiian crow	09/30/2015	\$ 1,324.07
Hawaiian Duck implementation plan coordinator	09/30/2015	\$ 1,521.99
Support the Hawaiian Tree Snail Program	09/30/2016	\$ 318.60
Protect <i>Newcombia cumingi</i> with fencing	09/01/2017	\$ 1,360.63
'Alalā captive propagation	09/30/2018	\$ 586,940.95
Conduct feral cat management on Rota to protect Mariana Crow	09/30/2017	\$ 280,824.72
'Akikiki and 'akeke'e captive propagation	12/31/2018	\$ 122,871.61
Baseline inventory of arthropods associated with endangered plants	09/30/2016	\$ 10,444.77
Predator-proof enclosure structure for the in situ management of rare snail species, specifically <i>Achatinella fulgens</i> and <i>A. fuscobasis</i>	09/30/2019	\$ 394.33
Support local wildlife law enforcement on Rota	09/30/2017	\$ 819.00
Radio-tag wild Mariana crows (āga) ( <i>Corvus kubaryi</i> )	09/30/2016	\$ 16,426.00
Oahu Snail Extinction Prevention Program	06/30/2020	\$ 106,843.61
Mariana Crow captive care	12/01/2015	\$ 12,722.00
Mariana crow rear and release	09/30/2020	\$ 190,290.40
Hawai'i suitability assessment for Hawaiian seabirds	05/31/2017	\$ 52,000.00
<b>TOTAL</b>		<b>\$ 1,385,102.68</b>

<b>Project Obligations - FY2017</b>	<b>Status</b>	<b>Awarded Amount</b>
Captive Breeding program for 'akikiki and 'akeke'e	Continuing	\$ 148,161.00
Guam Kingfisher capacity expansion	Continuing	\$ 26,000.00
Comprehensive inventory of anchialine habitats: Phase II - Maui and O'ahu	Continuing	\$ 21,000.00
Guam recovery actions for the Mariana eight-spot butterfly, tree snails, and a rare vine	New	\$ 20,814.00
UAV-FLIR for ungulate detection	New	\$ 5,851.00
Rota feral cat control	Continuing	\$ 193,075.00
Rodenticide toxicity trials	New	\$ 126,000.00
Snail Extinction Prevention Program	Continuing	\$ 181,000.00
Hawai'i and Marianas forest bird captive breeding, and 'alalā reintroduction	Continuing	\$ 1,229,856.00
<b>TOTAL</b>		<b>\$ 1,951,757.00</b>

## *Hawai'i Endangered Bird Conservation Program*

The Hawai'i Endangered Bird Conservation Program (HEBCP) is a unique partnership composed of the U.S. Fish and Wildlife Service, State of Hawai'i Department of Land and Natural Resources Division of Forestry and Wildlife and the Zoological Society of San Diego (SDZG). The HEBCP also collaborates with other government agencies, as well as private landowners. The overall mission of this partnership is to aid in the recovery of endangered birds, as part of a multi-faceted approach to ecosystem protection and restoration. Since 1993, the HEBCP has worked with 16 different endemic Hawaiian bird species and has hatched 1,270 birds and released 781 birds into the wild.

To achieve the goal of saving species from extinction and restoring wild populations, activities conducted by SDZG include captive propagation of 5 species at two facilities in Hawai'i; the Keauhou Bird Conservation Center on Hawai'i Island and the Maui Bird Conservation Center. A new facility was started on Rota in the Mariana Islands for a rear and release program for the Mariana Crow, in an effort to increase the wild population (see [Conservation and Recovery Program 2015 Annual Report](#) for more information on this program).

In 2016, two projects at the opposite ends of recovery were the main focus for SDZG; collecting eggs from 'akikiki and 'akeke'e to start a captive population to protect them from extinction, and release planning for the 'alalā, which has reached the target population size for reintroduction to the wild, and will be released in the fall of 2016. SDZG also released the last 18 captive puaiohi in March 2016, ending the captive propagation program for that species, whose status in the wild has improved.



## *‘Akikiki and ‘Akeke‘e Egg Collection*

‘Akikiki populations have declined by more than 80 percent in the last two to three decades and the species’ range has contracted from 21,745 ac (88 km<sup>2</sup>) in 1973 to less than 6,178 ac (25 km<sup>2</sup>) today. ‘Akikiki now number an estimated 470 individuals, down from an estimated 6,800 individuals in 1973 and an estimated 1,400 individuals in 2000. ‘Akeke‘e populations have also undergone a dramatic decline over the past two decades; currently the species’ population is estimated at 950 birds, with its range contracting from 31,382 ac (127 km<sup>2</sup>) to less than 12,355 ac (50 km<sup>2</sup>) over the past decade.

In light of the steep population declines and range contraction for these species, we supported the Hawai‘i Division of Forestry and Wildlife’s Kauai Endangered Forest Bird Recovery Program (KEFBRP) and the Zoological Society of San Diego (SDZG) in their efforts to bring both species into captivity to prevent their extinction.

KEFBRP located pairs, territories, and nests for both species. They monitored nests to determine what phase of incubation it was in so that the eggs were old enough to be harvested and transferred to SDZG’s temporary captive care facility on Kaua‘i. Collecting eggs from the nest was an arduous task, as the birds nest in small branches very high in the canopy. The KEFBRP team carried a tall ladder through wet, mountainous terrain so they could reach the nests. In 2016, they found 24 active ‘akikiki nests and three active ‘akeke‘e nests, and were able to harvest six of the ‘akikiki nests and two of the ‘akeke‘e nests. Ten ‘akikiki chicks and two ‘akeke‘e chicks hatched at the SDZG’s facility. In total, 12 male and seven female ‘akikiki, and one male and two female ‘akeke‘e are cared for in SDZG’s Keouhou and Maui facilities.



### **2017 efforts**

*Because ‘akeke‘e have proven difficult to monitor and collect, efforts in 2017 may focus on finding ‘akikiki nests in order to build that population to a desirable size. After the conclusion of the breeding season, efforts would focus on collecting young of the year and adult ‘akeke‘e to help bolster the size of the captive population.*

# 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





<b>Project Expenditures</b>	<b>Projected End Date</b>	<b>Expended in FY2016</b>
<b>Hawai'i Plant Extinction Prevention Program</b>	<b>12/31/2016</b>	<b>\$ 28,082.62</b>
Sub-unit of the larger Laupāhoehoe watershed	08/31/2017	\$ 6,286.86
Protect lowland wet and wet cliff ecosystems in the windward Ko'olau Mountains on O'ahu by building a fence	09/01/2017	\$ 113,596.07
Remove ungulates and invasive weeds within Alaka'i Wilderness Preserve	08/31/2018	\$ 6,674.67
Seed lab staff position	09/30/2018	\$ 495.63
The staff position funded by this grant will develop species guidelines for viability testing, re-collection intervals for native plants across Hawai'i	09/30/2018	\$ 35,495.92
Ka'ū Forest Reserve removal of invasive ungulates (feral cattle, pigs and sheep) from inside a 2000-acre fenced management unit	09/30/2018	\$ 41,171.63
Construct a fenced management unit to protect 950 acres of Pu'uwa'awa'a Forest Reserve	09/30/2018	\$ 82,259.77
<b>Hawai'i Plant Extinction Prevention Program</b>	<b>09/30/2019</b>	<b>\$ 895,890.47</b>
Coordinate large-scale reintroduction efforts for three critically imperiled lobeliads ( <i>Clermontia peleana</i> , <i>Cyanea shipmanii</i> , and <i>Cyanea stictophylla</i> )	09/30/2019	\$ 8,859.77
Plant Extinction Prevention work on <i>Serianthes nelsonii</i>	09/30/2016	\$ 90,930.22
<b>TOTAL</b>		<b>\$ 1,309,743.63</b>

<b>Project Obligations - FY2017</b>	<b>Status</b>	<b>Awarded Amount</b>
Southeast Alaka'i conservation project	Continuing	\$100,000.00
Phylogenetic study of the <i>Serianthes nelsonii</i>	New	\$40,000.00
Guam Plant Extinction Prevention Program	Continuing	\$88,731.00
Kānepu'u fence retrofit	New	\$5,000.00
Assistant plant propagator at Volcano Rare Plant Facility	Continuing	\$64,455.00
Mehame restoration ( <i>Flueggea neowawraea</i> exclosure and invasive plant control), Auwahi forest	New	\$36,000.00
Rapid 'Ōhi'a Death survey	New	\$50,000.00
Mo'omomi fence	Continuing	\$5,000.00
<b>Hawai'i Plant Extinction Prevention Program</b>	<b>Continuing</b>	<b>\$500,000.00</b>
<b>TOTAL</b>		<b>\$ 889,186.00</b>

## *Plant Extinction Prevention Program*

The Plant Extinction Prevention Program (PEPP) of Hawai'i conducts conservation actions to aid in the recovery of the rarest plants, focusing on those which have only 50 individuals, or fewer, remaining in the wild. PEPP surveys for new plant populations, monitors and collects propagules from existing populations, conducts threat control to prevent further decline of wild populations, and outplants propagated plants back into suitable habitat.

This year, PEPP outplanted two species for the first time ever. Both species, *Cyanea obtusa* and *Pritchardia munroi*, were outplanted on Maui. *Cyanea obtusa* is known from only two individuals in one population on Maui. *Pritchardia munroi* is known from one population on Maui, and another population on Moloka'i. Several other species had a substantial number of individuals planted, and contributed to the recovery goals by increasing the number of population sites for these rare plants. More than 200 *Lobelia oahuensis* were planted into a newly fenced management unit on O'ahu. This species is monocarpic (flowers once and then dies), and at most, there are only a couple known to mature in a given year. Rodents eat the developing fruit and greatly hinder production of mature seeds. PEPP utilizes rodent control methods to collect the seeds to propagate these outplants. On Moloka'i, almost 600 plants

of *Cyanea procera* were planted. This was a collaborative effort with propagation facilities on O'ahu, Maui, and Moloka'i. All plants were grown from seeds collected from the last remaining wild plant. Lastly, the genus *Asplenium* received much attention through a partnership with the Hawai'i Department of Forestry and Wildlife and the Tallin Botanical Garden in Estonia. Approximately 2,000 ferns of three species were transported from Estonia to Kaua'i in 2015. More than 200 were planted this year, and more will continue to be planted throughout the coming years.

### **2016 efforts**

*This year, PEPP outplanted a total of 2,453 plants on Kaua'i, O'ahu, Maui, Moloka'i, and Hawai'i Island. This included 48 taxa, 80% of which fall into the criteria of having 50 or fewer individuals remaining in the wild. Along with collaboration with partnering propagation facilities, this outplanting effort is almost three times greater than last fiscal year.*



## *Hand-pollination and Seed Collection of the Mauna Kea Silversword*

This year the Hawai'i Island PEPP program, in collaboration with the Hawai'i Silversword Foundation, Hawai'i Department of Forestry and Wildlife (DOFAW), the Volcano Rare Plant Facility and the University of Arizona, conducted a hand-pollination effort for the two wild populations of *Argyroxiphium sandwicense* subsp. *sandwicense* (Mauna Kea Silversword) to facilitate seed production of this endangered, and self-incompatible species. This year, three plants flowered at both populations, although only five total flowered during similar times to allow for cross pollination. Only 15 total wild plants remain in these two populations.

Pollen was collected and then applied to stigmas with blush brushes. Pollen was moved between the Pōhakuloa Gulch and Waipāhoehoe populations, which are eight kilometers apart. Paternal lines were tracked by wrapping colored yarn around clusters of inflorescences, one color for each pollen donor. With these five plants, there was an estimated 50,000 flowers, each capable of producing a single seed. The PEPP staff are still collecting the mature seeds, and estimate 8,000 viable seeds will be collected and stored. Batches of these seeds will incrementally be propagated over the next several years. The first batch will go to DOFAW, and subsequent cohorts will be planted at existing outplantings established with all of the partners. Thanks to this partnership, and the numerous generous volunteers it attracts, there are thousands of outplanted Mauna Kea Silverswords thriving in protected lands on Hawai'i Island.



# partners program

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





<b>Project Expenditures</b>	<b>Projected End Date</b>	<b>Expended in FY2016</b>
Sub-unit of the larger Laupāhoehoe watershed	08/31/2017	\$ 6,286.86
Remove ungulates from Lānaʻihale	09/30/2017	\$ 987.67
West Maui Mountains Watershed Partnership ungulate removal on private lands	09/30/2017	\$ 21,938.44
Protect and restore 59 acres of lowland wet forest in the Lower Limahuli Preserve (LLP) and to conduct rare plant restoration in the 400-acre fenced, ungulate-free Upper Limahuli Preserve (ULP) on the island of Kauaʻi to benefit native plants, birds, and forest invertebrate resources.	09/30/2018	\$ 3,302.45
Kaʻū Preserve's Makaʻālia fence project	09/30/2019	\$ 143,090.74
Collect seeds of <i>Serianthes nelsonii</i> and <i>Osmoxylon mariannense</i> from the wild, propagate seedlings of these species at Rota Forestry, build ungulate exclosures, and outplant two species of endangered plants on the properties of the landowners.	09/30/2016	\$ 19,875.10
Kaupō Ranch - 1 mile deer-proof fence with Leeward Haleakalā Watershed Partnership	09/30/2019	\$ 4,605.30
West Maui Irrigation fence and ungulate removal	09/30/2019	\$ 24,063.12
<b>TOTAL</b>		<b>\$ 224,149.68</b>

<b>Project Obligations - FY2017</b>	<b>Status</b>	<b>Awarded Amount</b>
Native forest restoration at 'Ukulele, Haleakalā Ranch, Maui	New	\$50,000.00
Auwahi Forest, 6 endangered species	New	\$50,000.00
Kapunakea fence retrofit	New	\$100,000.00
Control of priority weeds at Pu'u Pahu	New	\$25,000.00
Mo'omomi Fence	Continuing	\$23,500.00
Mo'omomi Fence	Continuing	\$47,000.00
<b>TOTAL</b>		<b>\$ 295,500.00</b>

## *Maka‘ālia Fence Project, Ka‘ū Preserve*

In 2002, the Nature Conservancy (TNC) established the 3,511 acre Ka‘ū Preserve on Hawai‘i Island to protect biologically rich and intact native forest on Mauna Loa’s southeast flank. The forest provides sanctuary to 153 endemic plant species (including 32 known rare and endangered) and supports one of Hawai‘i’s richest remaining assemblages of endangered forest birds. Four species have been reported in the vicinity of Kaiholena: the ‘io or Hawaiian Hawk, the Hawai‘i ‘ākepa, the Hawai‘i Creeper, the Hawaiian Crow or ‘alalā, along with a species which is considered for listing, the ‘I‘iwi. The endangered Hawaiian hoary bat, ‘ōpe‘ape‘a, has also been observed on the preserve, inhabiting the wet montane forests of Ka‘ū. The preserve also contains critical habitat for a species of picture wing fly (*Drosophila heteroneura*). Seven rare plant species; the endangered, *Cyanea tritomantha*, *Nothocestrum breviflorum*, and *Pritchardia lanigera*; and the rare *Phyllostegia vestita*, *Trematolobelia grandifolia*, *Lobelia hypoleuca* and *Strongylodon ruber* are also known to occur in the preserve.

In January 2016, TNC completed a 2.85-mile ungulate fence, protecting 800 acres of biologically rich native forest at Pu‘u Maka‘ālia, in the Kaiholena unit of the preserve. This new fence connects to an existing 1,200-acre pig-free fenced management unit, and creates a 1x3-mile core of protected native forest on the

southeast flank of Mauna Loa volcano. Funding from the Partners for Fish and Wildlife program was leveraged with the Natural Area Partnership Program to complete fence construction and remove the pig population within the newly-constructed management unit. Funds were also used to monitor habitat, including: understory monitoring plots to measure vegetation condition and composition, monitoring ungulate transects with motion-activated game cameras, and documenting any changes in total vegetation cover before and after ungulate removal through the use of ultra-high resolution aerial images.

### **Rapid ‘Ōhi‘a Death**

*In an effort to prevent the spread of Ceratocystis fimbriata, a fungus linked to the rapidly expanding footprint of Rapid ‘Ōhi‘a Death on Hawai‘i Island, the fence contractors utilized new tools, chainsaws, machetes, boots and other equipment. Equipment was stored on site and vehicles were washed before entering the preserve.*



## *East Alaka'i Fence Project*

The Alaka'i plateau, in the remote wilderness of Kaua'i, is home to a broad array of native birds, plants and invertebrates, which are found nowhere else. Known as *wao akua* or "realm of the gods," the Alaka'i plateau is a sacred place for the people of Kaua'i. It is also the primary source of the island's freshwater. Feral ungulates (pigs, goats, and deer) and invasive weeds threaten this montane wet forest and the integrity of the watershed. The area is also important habitat for endemic forest bird species, including the endangered puaiohi, 'akikiki and 'akeke'e; all three species have fewer than 1,000 individuals. The East Alaka'i Fence Project protects the highest elevation montane wet forest on Kaua'i and provides a refugia for species impacted by climate change. The Nature Conservancy (TNC) installed 1.8 miles of fence to protect 1,405 acres of private lands that abuts the state-owned Alaka'i Wilderness Preserve. From the start of ungulate control activities in 2010, TNC has removed 88 pigs, 47 goats, and 1 deer from the unit. The fencing project was the first in a series of fences planned to protect this important watershed and will eventually protect more than 11,000 acres of native habitat and priority watersheds on state and private lands.

*"I've been working with the USFWS Partners for Conservation Program for 16 years on numerous projects on five Hawaiian islands. In all cases, I've found the Service's staff to possess very high level of commitment and dedication to conservation, a deep understanding of the constraints and issues, and valuable experience needed to help with project planning and implementation. I believe the Partners program is the most effective way for the service to build bridges with the landowners and communities critical for recovering endangered species in Hawai'i."*

*-Trae Menard, Director of Forest Conservation, TNC*



# 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





<b>Project Expenditures</b>	<b>Projected End Date</b>	<b>Expended in FY2016</b>
Behavior study on choice/preference of pellets in triggerfish; Diphacinone toxicity in trigger fish	06/07/2016	\$ 3,099.00
Improve natural resources management in the Hanalei watershed through direct community action	12/31/2015	\$ 14,674.78
Organize and strengthen the Pohnpei Watershed Alliance	03/10/2016	\$ 1,187.99
Mo'omomi Preserve fencing	08/31/2018	\$ 36,325.36
O'ahu yellow-faced bee project	08/31/2018	\$ 18,990.72
James Campbell predator proof fencing	09/30/2019	\$ 145,000.00
Sea turtle outreach	09/30/2016	\$ 3,000.00
<b>TOTAL</b>		<b>\$ 222,277.85</b>

<b>Project Obligations - FY2017</b>	<b>Status</b>	<b>Awarded Amount</b>
Anapuka dunes restoration	New	\$30,000.00
Band-rumped Storm Petrel phylogeny and adaptive variation project	New	\$48,000.00
Creating nest habitat to recover populations of Hawaiian yellow-faced bees	Continuing	\$95,992.00
Blackburn's sphinx moth genetics, and habitat assessment in West Hawai'i and Maui	New	\$53,009.00
<b>TOTAL</b>		<b>\$ 227,001.00</b>

## *James Campbell Predator-proof Fence*

The Coastal Program collaborated with Pacific Rim Conservation, James Campbell National Wildlife Refuge, National Fish and Wildlife Foundation, David and Lucile Packard Foundation and American Bird Conservancy to construct a predator-proof fence that encloses 16 acres of high-quality coastal strand habitat on the north coast of O‘ahu. The fence construction was part of an effort that included the translocation and fostering of Laysan Albatross eggs from a colony near an active runway at the US Navy’s Pacific Missile Range Facility on Kaua‘i. This translocation was implemented as part of bird air strike hazard abatement program. The predator-proof fence was constructed to give these and other individual Laysan Albatross a safe, predator-free place to nest along the north shore of O‘ahu. In 2016, ten Laysan Albatross chicks successfully fledged at James Campbell and we expect to see those individuals return to the site within the next three to five years.



## Hylaeus anthracinus

### *Nest Site Enhancement*

*Hylaeus anthracinus* is one of seven species of yellow-faced bees recently protected under the Endangered Species Act of 1973. Once abundant across the Hawaiian Islands, many species of Hawaiian yellow-faced bees are now extinct, while others occupy just a tiny fraction of their historical ranges. A combination of habitat loss and modification, as well as the introduction of invasive plants, competitors and predators, has significantly impacted the ability of yellow-faced bees to survive. The Pacific Islands Coastal Program is collaborating with Hawai'i Division of Land and Natural Resources to utilize newly-developed applied management tools to increase populations of yellow-faced bee species by providing artificial nest substrate in locations where they persist, as well as relocate occupied artificial nest substrate to appropriate habitat where the species no longer occurs. The work will provide stability and possibly recovery for *H. anthracinus*, and the management techniques may be applied to other rare yellow-faced bee species.



# 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





<b>Project Expenditures</b>	<b>Projected End Date</b>	<b>Expended in FY2016</b>
Kahana Stream invasive species control	09/30/2017	\$ 725.71
Kīholo Bay estuary and fishpond invasive species control	09/30/2017	\$ 18,267.18
Waipā Stream invasive species control	09/30/2017	\$ 318.00
<b>Kāwā estuary riparian restoration, Ka'ū</b>	<b>09/30/2017</b>	<b>\$ 4,568.99</b>
Halulu estuary fishpond restoration	09/30/2016	\$ 7,227.68
Lokoea fishpond/estuary restoration	09/30/2016	\$ 9,199.01
He'eia Stream restoration	09/30/2017	\$ 18,741.59
Fish passage engineering services	09/30/2017	\$ 46,689.25
<b>TOTAL</b>		<b>\$ 105,737.41</b>

<b>Project Obligations - FY2017</b>	<b>Status</b>	<b>Awarded Amount</b>
Mālama I na Loko I'a o Moloka'i: fish pond habitat restoration	New	\$30,000.00
Lokoea Tributary aquatic habitat	Continuing	\$19,500.00
<b>TOTAL</b>		<b>\$ 49,500.00</b>

## *Kāwā Estuary Restoration Ka‘ū District, Hawai‘i Island*

In 2014, The Hawai‘i Wildlife Fund, a local non-profit organization, initiated a project to restore habitat conditions and estuarine biodiversity in the Kāwā Estuary/Ka‘alāiki Fishpond complex located in the Ka‘ū District of the Big Island. The primary project goal was the removal of invasive vegetation along the estuary banks, primarily the highly-invasive grass seashore paspalum. Fish observations and improvements to habitat conditions were recorded by participating biologists throughout the project period.

Over the course of two years, 25 volunteer workdays were coordinated with local and visiting participants including youth groups, outdoor education programs, school and community groups, and Hawaiian family members with ancestral ties to the region. Agency cooperators included the Three Mountain Alliance, the Department of Land and Natural Resources, and Hawai‘i County.

In fiscal year 2016 the project was nearly complete after hosting approximately 445 volunteers (52.4% youth volunteers) who contributed more than 2,670 hours of enthusiastic labor to remove 112 truckloads (3,844 cu. ft.) of invasive vegetation for off-site disposal.

*Project Volunteers: Kuleana family members, Hawai‘i County, Youth Challenge Academy, Imi Pono No Ka ‘Aina, Three Mountain Alliance, Hawai‘i Prep Academy, Kamehameha Schools, Hawai‘i Wildlife Fund board members, Townscape, Inc., Big Island Substance Abuse Council, Telluride Mountain School, Ka‘ū Learning Academy, Normandale Community College, Kupu, The Nature Conservancy of Hawai‘i, National Geographic Student Collective, Na Mamo O Kāwā, and St. Joseph Elementary School.*



## *Stream Conservation Workshop and Anchialine Pool Workshop – Scientists and Managers Communicate and Interact*

The Fisheries Partnerships Program was a major sponsor of two important technical gatherings in 2016.

**Stream Conservation Workshop:** More than 40 participants including agency administrators and biologists, academic researchers and students were convened to discuss current topics in conservation of Hawaii's stream systems with support from the Fisheries Partnerships Program. Speakers reported on improvements in geospatial analytical methods for Hawaiian stream systems, improved information resources for surface water hydrology, and results of biological monitoring at several locations on the Big Island and Maui Nui.

**Anchialine Pool Workshop:** The Hawai'i Fish Habitat Partnership supported a statewide meeting for conservation professionals to discuss assessment and management of anchialine pool habitats in Hawai'i. Landowners and resource agency personnel contributed talks on protection efforts, invasive species removal, and anchialine pool assessment methods. The workshop concluded with a field trip that allowed participants to observe native anchialine pool species at Manukā Natural Area Reserve.



# 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





<b>Project</b>	<b>Funds Requested</b>	<b>Funds Awarded</b>
Snail extinction prevention program (SEPP)	\$100,000	\$100,000
Captive propagation of endangered birds	\$537,200	\$537,200
Plant restoration and enhancement, mid-elevation rare plant facilities statewide	\$400,000	\$400,000
Insectary Facility – captive propagation and entomologist	\$80,000	\$80,000
ʻAlalā recovery	\$64,464	\$64,464
Plant restoration and enhancement - PEPP	\$ 170,000	\$ 64,464
Picture-wing fly rearing (at U.H.)	\$35,000	\$35,000
Kauaʻi endangered forest bird recovery	\$124,022	\$150,600
Plant restoration/enhancement, T/E/C/SOC outplanting, Hawaiʻi	\$65,000	\$65,000
Plants: Oʻahu and Kauaʻi GoodNature traps	\$7,150	\$7,150
Plants: Endangered plant genetics	\$23,536	\$23,536
Plant restoration and enhancement, Natural Area Reserves, Hawaiʻi	\$60,000	\$60,000
Invertebrates: Kauaʻi triad (fabulous green sphinx moth, a noctuid moth, and Kauaʻi stag beetle)	\$40,000	\$40,000
Invertebrates: Yellow-faced bee habitat	\$10,000	\$10,000
Population genetic analysis to guide emergency management actions for two crashing endangered species: Kauaʻi Island’s ʻakikiki and ʻakekeʻe	\$14,504	\$14,504
Using high-resolution imagery to identify, conserve, and manage habitat for Kauai’s endangered birds	\$85,592	\$85,592
Ground-truthing model predictions to refine distribution maps and population estimates of endangered forest bird species	\$27,209	\$27,209
<b>Helemano Wilderness</b>	<b>\$2,000,000</b>	<b>\$2,000,000</b>
Hawaiian hoary bat habitat conservation plan for biomass and timber harvest in Hawaiian islands	\$395,000	\$395,000
Kauaʻi seabird habitat conservation plan	\$906,150	\$906,150
Kaluaʻaha watershed acquisition	\$500,000	\$500,000
Avicultural management of Guam Rail (koʻkoʻ) and Micronesian Kingfisher (sihek)	\$310,975	\$310,975
Establishment of a population of Guam Rail on Rota, CNMI	\$6,100	\$6,100
Monitoring of Guam Rail on Rota, CNMI	\$ 26,200	\$ 26,200
Mariana Crow (āga) population monitoring	\$294,976	\$272,870
Endangered species conservation program manager, CNMI	\$48,298	\$48,298

## *Helemano Wilderness Habitat Conservation Plan (HCP) Land Acquisition Project*

The Helemano Wilderness Area (HWA) project on O‘ahu, Hawai‘i, will permanently protect more than 3,000 acres of habitat for the federally listed endangered ‘ōpe‘ape‘a or Hawaiian hoary bat (*Lasiurus cinereus semotus*).

This HCP Land Acquisition Proposal for \$2,000,000 in federal funds was the highest priority HCP project for the State of Hawai‘i (DOFAW) in FY 2016. The HWA will complement HCPs for three wind energy complexes on O‘ahu for incidental take of the ‘ōpe‘ape‘a arising from windmill strikes. One-half of the HWA is suitable ‘ōpe‘ape‘a habitat with no need for management or restoration and a substantial portion of the remainder will be reforested, incorporating ongoing research findings on optimal ‘ōpe‘ape‘a habitat such as feeding corridors and roosting preferences into the forest’s design.

The HWA also includes upland portions of the Paukauila and Ki‘iki‘i Watersheds, which include the Helemano, Poamoho, and Kaukonahua (North Fork) streams. The Paukauila-Ki‘iki‘i stream drainage basin is the largest drainage basin on O‘ahu, supplying drinking water to communities from Pearl Harbor to the North Shore—a third of O‘ahu’s residents. Thus, in addition to aiding the recovery of the ‘ōpe‘ape‘a, acquiring the HWA will protect and secure in perpetuity clean drinking water for Oahu’s present and future.



## *Propagation and Outplanting of Three Endangered Plant Species on Rota, Commonwealth of the Northern Mariana Islands*

The goal of this project is to establish a DLNR program for the recovery of 3 endangered plant species: *Nesogenes rotensis*, *Osmoxylon mariannense*, and *Serianthes nelsonii* (hayun lāgu). Both *Nesogenes rotensis* and *Osmoxylon mariannense* are endemic to Rota. *Serianthes nelsonii* is found on both Rota and Guam, though only one mature individual tree and several young outplants occur on Guam. This project will help recovery efforts by determining the current population status and distribution of each species on Rota, propagating and outplanting individuals within existing conservation areas to counter poor dispersal, seed predation and seedling survival rates, and protecting individuals with fencing to prevent damage by deer. For all three of these endangered species, there is an urgent need to counter the extremely low population sizes and distributions and poor rates of dispersal and reproduction through propagation and outplanting. There is also an urgent need to use fencing to protect the natural and outplanted individuals from deer browsing.



# 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
14 newly listed plants	Guam National Wildlife Refuge	Guam	2016-F-0076
3 damselfly species	M. Butler-Higa	O'ahu, HI	2015-F-0167
3 waterbirds, 2 forest birds	USGS Biological Resources Division	O'ahu and Hawai'i Islands, HI	2015-F-0233
Sea turtles, <i>Serianthes nelsonii</i> , and 12 newly listed plants	Anderson Air Force Base	Guam	2015-F-0390
'A'o – Newell's Shearwater	Pacific Rim Conservation	Kaua'i, HI	2015-F-0425
Åga – Mariana Crow	University of Washington	Rota, CNMI	2015-F-0472
<i>Schiedea hawaiiensis</i>	Steve Weller	Hawai'i Island, HI	2015-F-0498
'Akikiki and 'akeke'e	Zoological Society of San Diego	Kaua'i, HI	2015-F-0518



## *14 Newly-listed Marianas Plant Species*

This permit was issued to add 14 newly listed species of plants to the Guam National Wildlife Refuge (GNWR) permit, including seven endangered and seven threatened species. Among the listed species are a cycad, several orchids, several shrubs, a perennial herb in the coffee family, and a tree in the hibiscus family. The permit allows the collection of seeds and cuttings from individuals in wild populations for propagation in a greenhouse for later outplanting. The addition of these 14 plant species will allow GNWR to conduct habitat restoration work and contribute to the conservation of these species. The information collected from this work is also expected to benefit other resource managers working to conserve listed plants on Guam.



## *Translocation of the Endangered 'A'o or Newell's Shearwater*

This permit was issued to Pacific Rim Conservation to allow the translocation of the endangered 'a'o or Newell's Shearwater (*Puffinus auricularis newelli*) from unprotected colonies on Kaua'i, to an accessible and protected (fenced) site on Kaua'i National Wildlife Refuge.

This is an important project as this species is declining due to persistent threats, including habitat degradation by feral ungulates (pigs and goats) and invasive exotic plants, predation by introduced cats, dogs, pigs, rats, mongoose, and Barn Owls; fallout due to artificial light attraction; and collisions with artificial structures including towers, power lines, fences, and potentially wind mills. The creation and protection of 'a'o colonies in more accessible locations is a high priority recovery action for the species, particularly given the challenges in protecting nesting birds in their rugged montane habitats. Eight chicks were translocated to the new colony and as of October 24, 2016, all eight fledged.



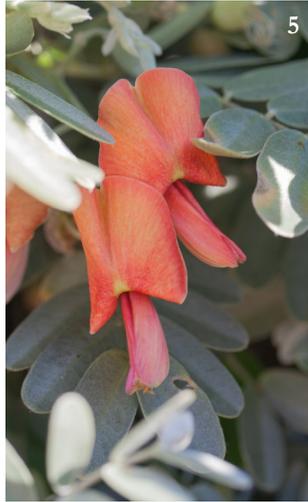
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1. *Gordon Smith, Fisheries Program*
2. *Megan Laut, Animal Recovery Program*
3. *Sheldon Plentovich, Coastal Program*
4. *Carrie Harrington, Candidate Conservation Program*



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



8. *Nihoa, S. Plentovich*
9. *Benton Pang, Partners for Fish & Wildlife Program*
10. *Fiwi and Lobelia grayana, D. Clark*
11. *Lauren Weisenberger, Plant Recovery Program*
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