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LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 1, 2022

The Honorable Ronald D. Kouchi,
President
and Members of the Senate
Thirty-Second State Legislature
State Capitol, Room 409
Honolulu, Hawaii 96813

The Honorable Scott K. Saiki, Speaker
and Members of the House of
Representatives
Thirty-Second State Legislature
State Capitol, Room 431
Honolulu, Hawaii 96813

Dear President Kouchi, Speaker Saiki, and Members of the Legislature:

For your information and consideration, I am transmitting a copy of Status of the Issuance of Incidental Take Licenses for Endangered, Threatened, Proposed, and Candidate Species and The Condition of the Endangered Species Trust Fund for the period July 1, 2021-June 30, 2022 and Safe Harbor Agreements Summary report as required by Section 195D-26, Hawaii Revised Statutes (HRS) and Act 37, Session Laws of Hawaii 2016.In accordance with Section 93-16, HRS, a copy of this report has been transmitted to the Legislative Reference Bureau and the report may be viewed electronically at https://files.hawaii.gov/dlnr/reports-to-the-legislature/2023/FW23-Endangered-Species-Rpt-FY22.pdf.

Sincerely,

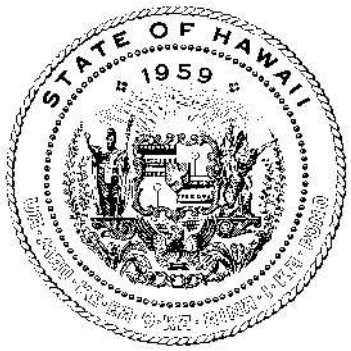
/s/ Suzanne D. Case

SUZANNE D. CASE
Chairperson

Enclosure

REPORT TO THE THIRTY-SECOND LEGISLATURE
STATE OF HAWAII
2023 REGULAR SESSION

STATUS OF THE ISSUANCE OF INCIDENTAL TAKE LICENSES FOR ENDANGERED, THREATENED, PROPOSED, AND CANDIDATE SPECIES AND THE CONDITION OF THE ENDANGERED SPECIES TRUST FUND FOR THE PERIOD JULY 1, 2021 – JUNE 30, 2022 AND SAFE HARBOR AGREEMENTS SUMMARY



Prepared by

THE STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE

In response to Section 195D-26, Hawaii Revised Statutes
and
Act 37, Session Laws of Hawaii 2016

Honolulu, Hawaii
September 2022

STATUS OF THE ISSUANCE OF INCIDENTAL TAKE LICENSES FOR ENDANGERED, THREATENED, PROPOSED, AND CANDIDATE SPECIES AND THE CONDITION OF THE ENDANGERED SPECIES TRUST FUND FOR THE PERIOD JULY 1, 2021 – JUNE 30, 2022 AND SAFE HARBOR AGREEMENTS SUMMARY

PURPOSE

Act 380, Session Laws of Hawai‘i (SLH) 1997, amended the State Endangered Species Law, Chapter 195D, Hawai‘i Revised Statutes (HRS), to provide for the preparation and implementation of Habitat Conservation Plans (HCPs) and Safe Harbor Agreements (SHAs) and to provide additional incentives for private landowners to recover and protect threatened and endangered species on their lands. Specifically, Section 195D-26, HRS, requires that an annual report be prepared by the Department of Land and Natural Resources (DLNR) on:

- The effectiveness of HCPs and SHAs issued under Chapter 195D, HRS, and the status of all species for which incidental take licenses have been issued;
- A description of the condition of the Endangered Species Trust Fund (ESTF) established under Section 195D-31, HRS; and
- Recommendations to further the purposes of Chapter 195D, HRS.

Incidental Take Licenses (ITLs) are issued in conjunction with an approved HCP or SHA for the legal take[1] of threatened or endangered species, if such take is incidental to an otherwise lawful activity. Habitat Conservation Plans and Safe Harbor Agreements are important management tools in the State of Hawai‘i and accomplish the following:

- Resolve conflicts between endangered species protection and legitimate use of natural resources;
- Contribute to endangered species recovery efforts through partnerships and proactive planning; and
- Provide essential ecological information for Hawai‘i’s resource managers by requiring a strong monitoring component in all HCPs.

This annual report is submitted to fulfill the reporting requirement for Fiscal Year (FY) 2022 and provides detailed information for 11 HCPs and six SHAs for which ITLs have been issued. The report is organized by HCP project type, provides an overview of SHAs, describes the condition of the ESTF, and concludes with recommendations to further the purposes of Chapter 195D, HRS.

[1] “Take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect endangered or threatened species of aquatic life or wildlife, or to cut, collect, uproot, destroy, injure, or possess endangered or threatened species of aquatic life or land plants, or to attempt to engage in any such conduct (§195D-2, HRS).

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SUMMARY OF INCIDENTAL TAKE STATUS FOR ENDANGERED WILDLIFE SPECIES COVERED BY HABITAT CONSERVATION PLANS

General locations for the HCPs are shown in Figure 1.

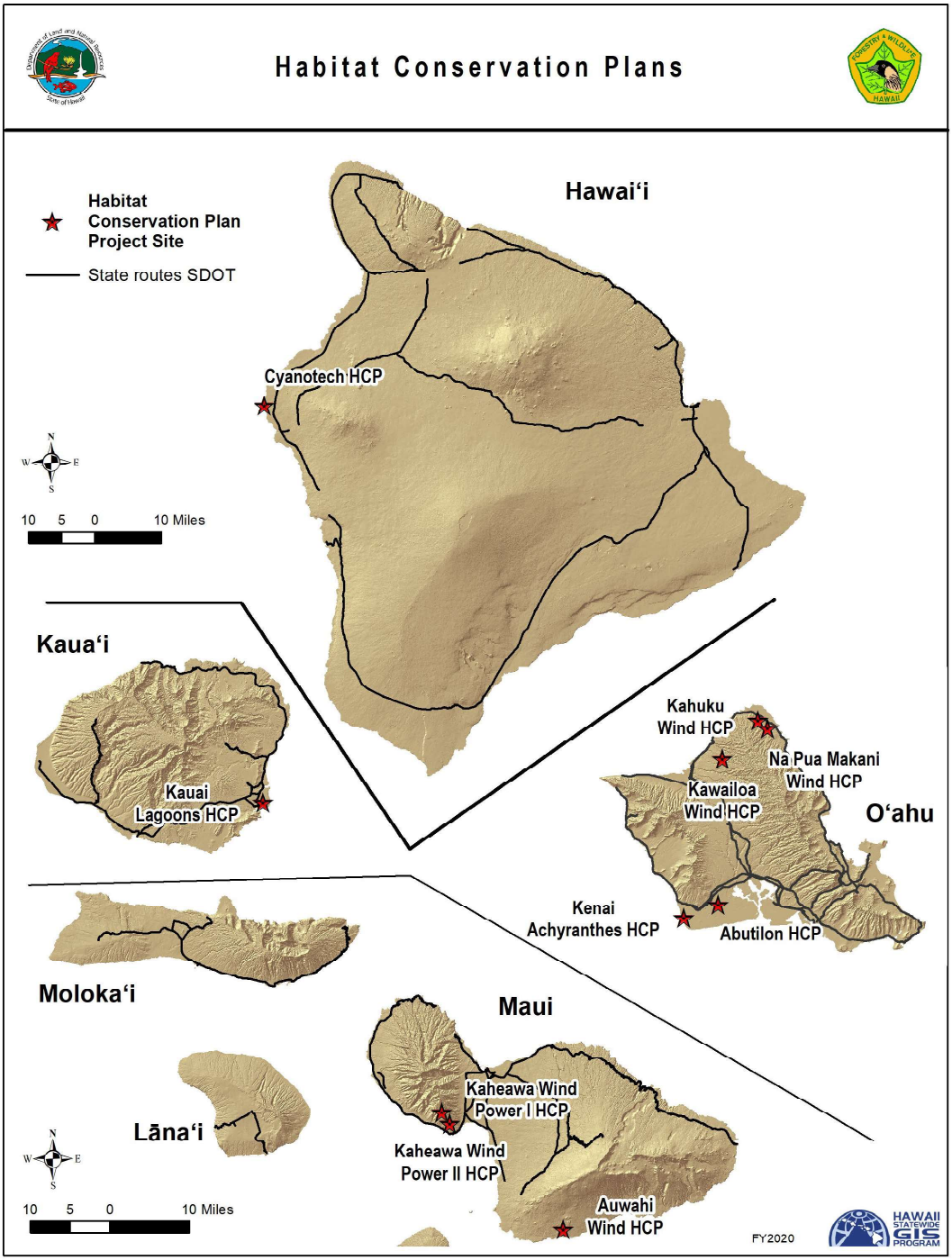


Figure 1. Habitat Conservation Plan project locations

A summary of permit status combining take of all Covered Species of wildlife since ITLs were issued is depicted in Figure 2a. The incidental take shown combines observed, modeled, and indirect take to estimate a total take as of the end of FY 2022. This summary shows that for all species the estimated take is substantially below the total permitted take level. There was no take of plant species in FY 2022 for the two HCPs that cover plant species. Those two HCPs permitted take of plants that occurred during a limited timeframe and do not have ongoing take.

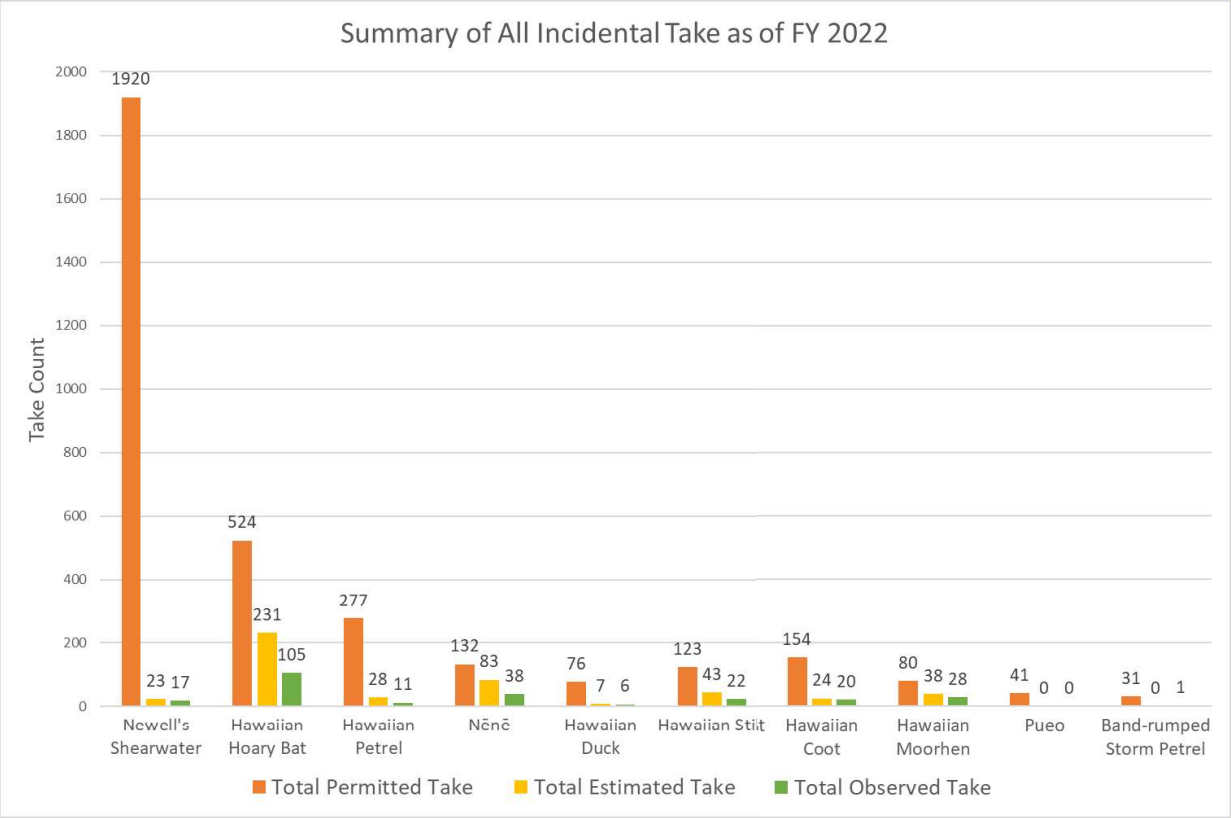


Figure 2a. Total permitted take, observed take, and estimated take (includes indirect take and, for wind energy sites, modeled unobserved take at the 80% upper confidence level) of HCP-covered wildlife species for all approved HCPs as of June 30, 2022.

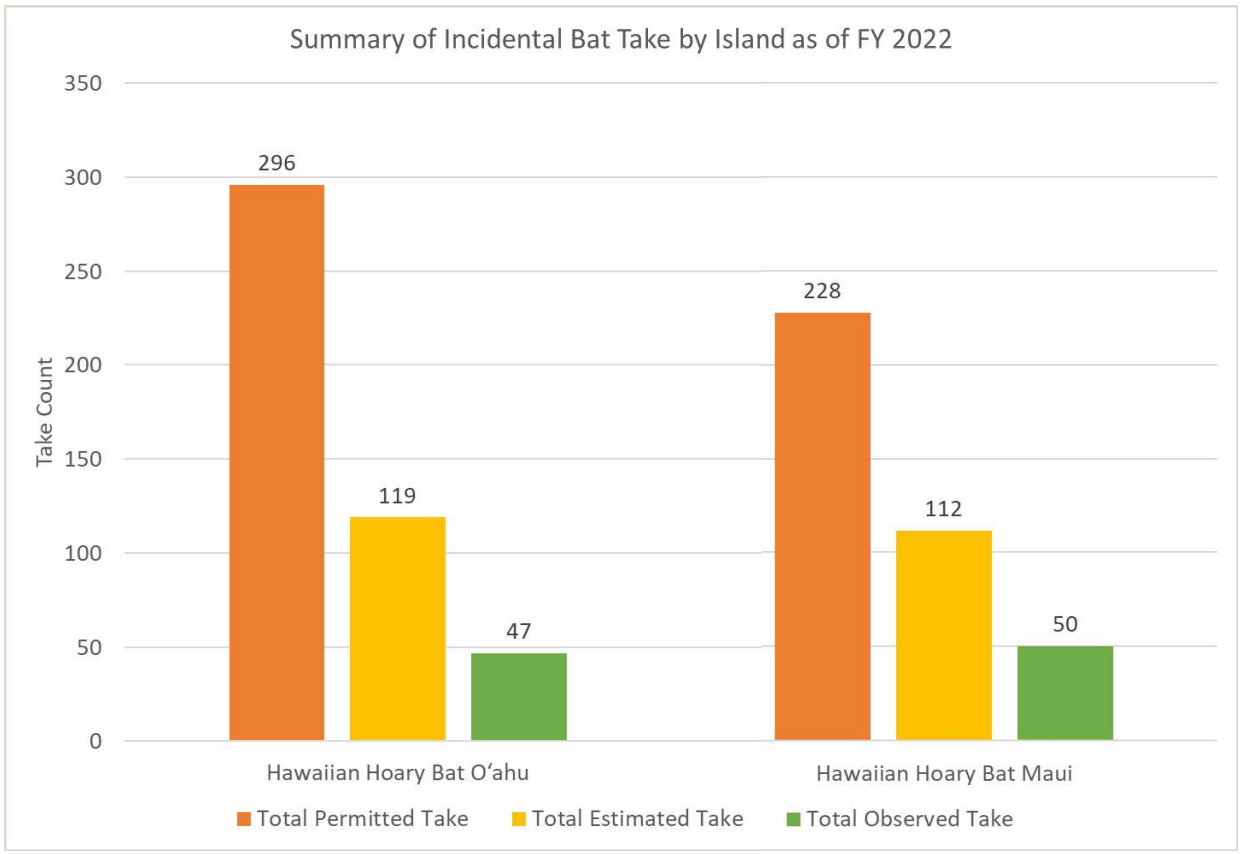


Figure 2b. Total permitted take, observed take, and estimated take (includes indirect take and, for wind energy sites, modeled unobserved take at the 80% upper confidence level) for the Hawaiian Hoary Bat for approved HCPs on O'ahu and Maui as of June 30, 2022.

SUMMARY OF HABITAT CONSERVATION PLANS AND ASSOCIATED INCIDENTAL TAKE LICENSES BY PROJECT TYPE

Wind Energy Facilities and Structures

Kaheawa Pastures Wind Energy Generation Facility (KWP I) Habitat Conservation Plan, Maui, Hawai'i. Approved 2006.

Kaheawa Wind Power project in West Maui above Ma'alaea.

ITL Licensee: Kaheawa Wind Power, LLC
(Terraform Power owns KWP, LLC)

Project: Twenty wind turbine generators (WTGs) with a total 30-megawatt (MW) energy generating capacity

ITL Duration: January 30, 2006 – January 30, 2026 (as of end of FY 2022, 16.5 years [82.5%] through the permit term)

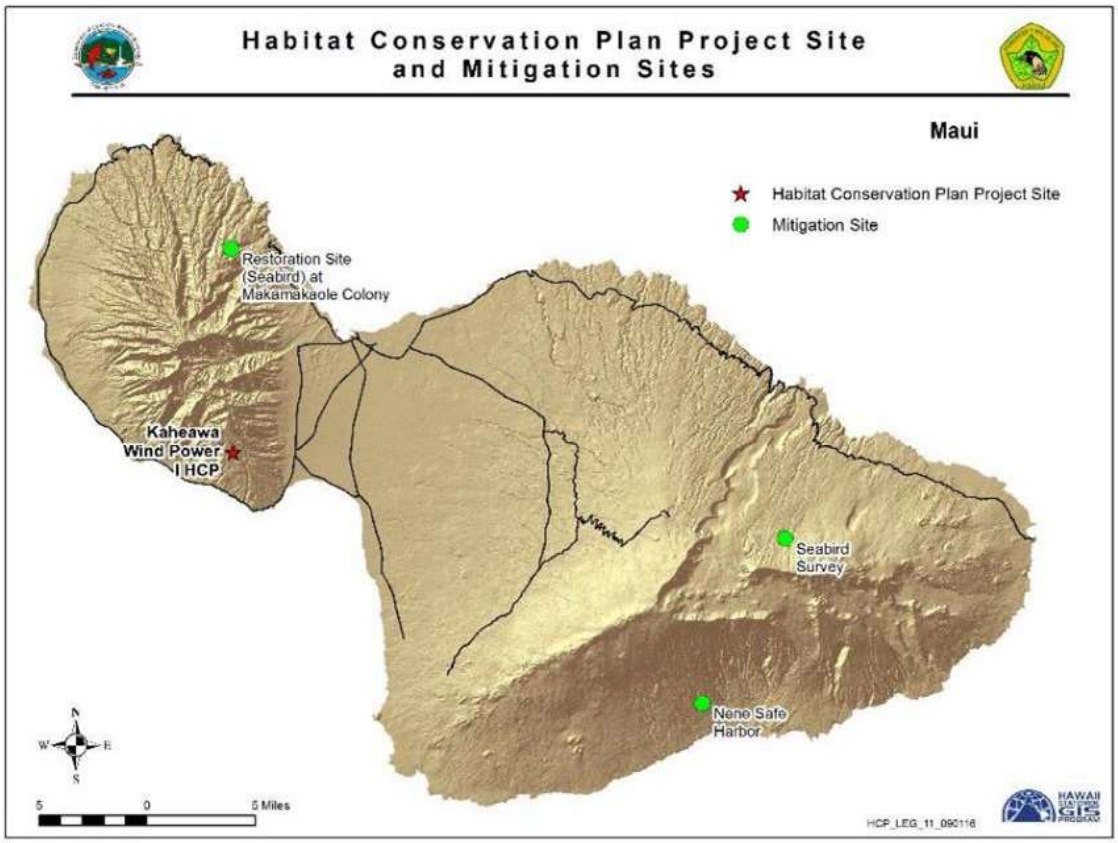


Figure 3. Location of Kaheawa Wind Power I HCP and Mitigation Sites

Take Authorization Over 20-year Term:

Table 1. Take Authorization for KWP I.

Common Name	Scientific Name	Baseline Limit (Tier 1)[1]	Higher Limit (Tier 2)[1]
ʻUaʻu or Hawaiian Petrel	*Pterodroma sandwichensis*	25	38
ʻAʻo or Newell's Shearwater	*Puffinus auricularis newelli*	4	8
Nēnē or Hawaiian Goose	*Branta sandvicensis*	60	n/a
ʻŌpeʻapeʻa or Hawaiian Hoary Bat	*Lasiurus cinereus semotus*	20	50[a]

[1] Take authorization is delineated by Baseline and Higher Limits (Tiers). Upon reaching Higher Limits additional mitigation measures or funding are triggered to ensure that mitigation keeps pace with take.
[a] This higher limit for the Hawaiian Hoary Bat was approved by minor amendment in 2016.

Status of ITL: There was take of one Nēnē but no other HCP covered species during the reporting period (Table 2).

Table 2. Documented fatalities of HCP covered species during the reporting period.

Common Name	FY2022 Fatalities
Nēnē	1

Beginning in April 2015, the downed wildlife search area was reduced relative to the previous 10 years and now consists of graded roads and WTG pads found within a 70-meter radius circle centered on each turbine. Beginning in October 2015, canine-assisted searching was implemented, with visual searching as a secondary method; all searches were performed by a canine-assisted team in FY 2022. In October 2019, wildfires destroyed bat monitoring equipment at the wind turbines and as a result the number of ground-based acoustic detectors was reduced from nine to five thereafter.

Table 3 provides an estimate of the overall total adjusted take that has occurred since KWP I ITL issuance. The take rate through FY 2022 for all covered species would keep the project under the permitted take.

Table 3. Total observed fatalities and estimated total take since ITL issuance under the KWP I ITL as of June 30, 2022.

Common Name	Total Observed Take[1]	Estimated Unobserved Take[2]	Indirect Take using HCP multipliers	Total Estimated Take
Hawaiian Petrel	7	8	4	19
Nēnē	26	23	2	51
Hawaiian Hoary Bat	9	17	4	30

[1] Excludes takes that were incidental and not observed during systematic monitoring (incidental takes are evaluated as part of the EoA modeling software and therefore accounted for in the unobserved take).
[2] Based on the 80% credible maximum using the following model: Dalthorp, D., M. M. P. Huso, and D. Dail. 2017. Evidence of absence (v 2.0) software user guide: U.S. Geological Survey Data Series 1055.

In addition to the total estimated take, accrued lost productivity from the mortality of individuals due to the lag in mitigation are also evaluated and mitigated, but are not counted against permitted take levels. Accrued lost productivity calculations for Hawaiian Petrel and Nēnē are pending at the time of this report. Although not listed as endangered on Maui it is noteworthy

that 16 fatalities of the Hawaiian Short-eared owl or Pueo, (*Asio flammeus sandwichensis*) have been reported in the KWP I project vicinity since the ITL was issued, all prior to FY 2020. Reports indicate that most of the fatalities, not necessarily all, are due to project operations.

Mitigation Status:

Hawaiian Petrel & Newell's Shearwater. Mitigation for the two seabird species (Hawaiian Petrel and Newell's Shearwater) is being implemented concurrently with Kaheawa Wind Power II. The primary mitigation entails management of two constructed (approximately four acres) predator-free fenced enclosures (one for each species), provisioned with artificial burrows and social attraction, at the Makamaka'ole site in West Maui. Three species of seabirds, Hawaiian Petrel, Newell's Shearwater, and Bulwer's Petrel (*Bulweria bulwerii*), have frequented burrows within both enclosures between the months of March and October since June 22, 2015. Only Newell's Shearwater nesting activity was observed in FY 2022. A total of 22 burrows were consistently active during the breeding season, 11 of which were reproductively active with 17 eggs and one chick produced.

Work in FY 2022 at Makamaka'ole included predator trapping and tracking, ongoing maintenance of both enclosures, seabird social attraction, artificial burrow checks, and game camera operation. Traps and bait stations were deployed and a total of 39 mongooses, 45 rats, and eight mice were captured. All mongooses were captured outside the enclosures while 14 of the rats and five mice were captured inside the enclosures. A single Barn Owl (*Tyto alba*) was observed during a one-night survey in FY 2022, but no signs of predation were found, and no Barn Owl control was conducted.

To mitigate for the loss of productivity accrued from Hawaiian Petrel estimated take not yet mitigated for at Makamaka'ole, Hawaiian Petrel nesting colony management and predator control by Pūlama Lāna'i on Lāna'i Island was conducted during FY 2020, from which 36 fledglings were produced.

In FY 2021, the two KWP projects adaptively managed their seabird mitigation programs by providing funds to Pūlama Lāna'i. A total of 21 cats and a minimum of 354 rodents (understood to be an extreme underestimate) from the 150-acre petrel nesting area in FY 2021. During the 2021 breeding season 196 known burrows were estimated to have produced 70 Hawaiian petrel chicks above baseline. Results from the 2022 breeding season will be reported in the FY 2023 annual report.

At the close of this reporting period, KWP I was in discussion with the agencies on the assessment of mitigation credit for the Hawaiian petrel. In FY 2022, the two KWP projects again adaptively managed their seabird mitigation programs by providing $118,300 in funding to Pūlama Lāna'i for the 2022 breeding season. The funded effort included predator control and burrow monitoring and evaluation in the Hawaiian petrel nesting area.

Nēnē. Nēnē baseline mitigation continued through funding operation of the Haleakalā Ranch pen in FY 2022. Management at the pen included: monitoring; vegetation management; fence, pond, and infrastructure maintenance; road improvements; and predator control. Seventy traps were deployed in FY 2022 that captured eight mongooses. Nēnē fledgling production credited to

KWP I in FY 2022 was 10 goslings. In FY 2023, KWP I will assume co-management of the Haleakalā Ranch release pen concurrently with the KWP II Wind Project.

Hawaiian Hoary Bat. Baseline mitigation for 20 bats was funded in 2006 and is complete. A mitigation project accounting for take of an additional 15 bats was completed in FY 2020 for a total contract cost of $750,000. This mitigation project consisted of Hawaiian Hoary Bat ecological research in East Maui, contracted to H.T. Harvey Ecological Consultants, and evaluated the species' habitat preferences, prey availability, foraging ranges, core use areas, and diet over 34,226 hectares on Haleakalā. Bat detectors were installed at 45 sites in nine habitat types for a total of 315 deployments. To radio tag bats, mist netting occurred from June 2017 through September 2018 in three general areas: Haleakalā National Park, Olinda Road, and Lower Kula. H.T. Harvey researchers radio-tracked 16 bats on 109 nights during the mist netting period, and sampled insects in the nine habitat types for seven sampling periods from August 2017 through August 2018. From the acoustic data it was determined bats spent more time foraging in gulch, low-density developed, and grassland habitats, although differences existed between months.

The study showed bats were much less likely to call on nights with rainfall. The mean core use area used by the bats for foraging was 3,700 hectares, but there was a wide range of values among individual bats. The majority of guano samples were collected from adult males, adult females, and subadult females, and showed bats ate primarily moths (68%), as well as flies (12%), termites (9%), crickets and katydids (5%), beetles (4%), and true bugs (2%). Insects eaten were both native and non-native, and the dietary data suggested the bats were somewhat selective in their prey choices when compared to the abundance of insect species available in the insect samples. Finally, the results demonstrated the Hawaiian Hoary Bats on Maui were able to forage in different habitats during different seasons.

KWP I is also partially funding another Hawaiian Hoary Bat ecological research project on Hawai‘i Island contracted to the U.S. Geological Survey Hawaiian Hoary Bat Research Group that began in FY 2018. This project is intended to better inform future bat habitat restoration and conservation and provides mitigation benefits to account for the remaining 15 bats of Tier 2. The project contribution to this contract was $378,553 in FY 2021 and $167,500 in FY 2022. This mitigation project is studying movements, roosting behavior, and diet of the Hawaiian Hoary Bat, and is expected to be completed in FY 2023 with completion of the final publications, technical results and data releases.

Kaheawa Wind Power II Wind Energy Generation Facility (KWP II) Habitat Conservation Plan, Maui, Hawai'i. Approved 2012.

ITL Licensee: Kaheawa Wind Power II, LLC
(Note that Terraform Power owns KWP II, LLC)

Project: Fourteen WTGs with a total 21-MW energy generating capacity. Project is adjacent and downslope of KWP I

ITL Duration: January 5, 2012 – January 30, 2032 (as of end of FY 2022, 10.5 years [52.5 %] through the permit term)

Kaheawa Wind Power II project in West Maui above Ma'alaea.

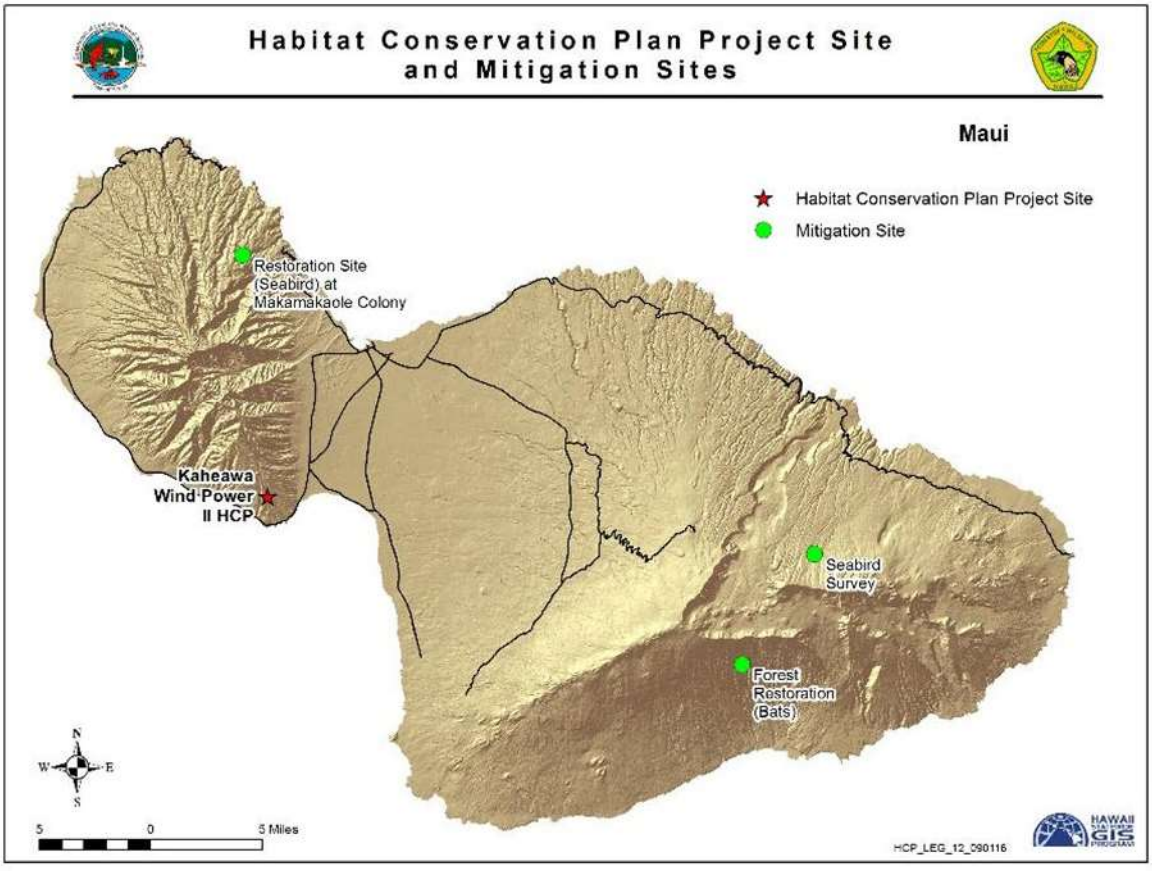


Figure 4. Location of Kaheawa Wind Power II HCP and Mitigation Sites

Take Authorization Over 20-year Term:

Table 4. Take Authorization for KWP II.

Common Name	Scientific Name	Level of Take[1]	5-year Limit	20-year Limit
ʻUaʻu or Hawaiian Petrel	*Pterodroma sandwichensis*	Tier 1	8 adults/ juveniles & 4 chicks/eggs	19 adults/ juveniles & 9 chicks/eggs
		Tier 2	16 adults/ juveniles & 8 chicks/eggs	29 adults/ juveniles & 14 chicks/eggs
ʻAʻo or Newell's Shearwater	*Puffinus auricularis newelli*	Tier 1	2 adults/ juveniles & 2 chicks/eggs	2 adults/ juveniles & 2 chicks/eggs
		Tier 2	5 adults/ juveniles & 3 chicks/eggs	5 adults/ juveniles & 3 chicks/eggs
Nēnē or Hawaiian Goose	*Branta sandvicensis*	Tier 1	8 adults/ juveniles & 1 fledgling	18 adults/ juveniles & 3 fledglings
		Tier 2	12 adults/ juveniles & 3 fledgling	27 adults/ juveniles & 3 fledgling
		Tier 3[3]	Not applicable	44 adults
ʻŌpeʻapeʻa or Hawaiian Hoary Bat[2]	*Lasiurus cinereus semotus*	Tier 1	7 individuals	7 bats
		Tier 2	11 individuals	11 bats
		Tier 3[3]	Not applicable	30 bats
		Tier 4[3]	Not applicable	38 bats

[1] Take authorization is delineated by Tiers. Upon reaching higher Tiers additional mitigation measures or funding are triggered to ensure that mitigation keeps pace with take.
[2] Minor amendment to clarify permitted bat take processed on November 26, 2014.
[3] New tier approved in a major amendment on November 8, 2019.

Status of ITL: There was take of one Nēnē but no other HCP covered species at KWP II in FY2022 (Table 5).

Table 5. Documented fatalities of HCP covered species during the reporting period.

Common Name	FY2022 Fatalities
Nēnē	1

The incidental take authorized includes both observed and unobserved take, including indirect take that occurs when an adult individual is taken during its respective breeding season. Table 6 provides an estimate of the overall total adjusted take that has occurred since KWP II ITL issuance. In addition to the total estimated take, accrued lost productivity from mortality of individuals due to the lag in mitigation are also evaluated and mitigated for, but are not counted against permitted take levels. Accrued lost productivity calculations for Nēnē are pending at the time of this report.

Beginning in July 2015 the search plot areas were reduced in size relative to the size of plots searched prior to July 2015. The reduced search area includes only roads and graded WTG pads found within a 70-meter circle of radius centered on each WTG. Canine-assisted searching accounted for 100% of the downed wildlife monitoring searches in FY 2022.

Table 6. Total observed fatalities and estimated total take since ITL issuance covered under the KWP II ITL as of June 30, 2022.

Common Name	Total Observed Take[1]	Estimated Unobserved Take[2]	Indirect Take using HCP multipliers	Total Estimated Take
Nēnē	9	16	2	27
Hawaiian Hoary Bat	3	8	1	12

[1] Excludes takes that were incidental and not observed during systematic monitoring (incidental takes are evaluated as part of the EoA modeling software and therefore accounted for in the unobserved take).
[2] Based on the 80% credible maximum using the following model: Dalthorp, D., M. M. P. Huso, and D. Dail. 2017. Evidence of absence (v 2.0) software user guide: U.S. Geological Survey Data Series 1055

In October 2019 wildfires destroyed bat monitoring equipment at the wind turbines and as a result the number of ground-based acoustic detectors was reduced from eight to five thereafter.

As the total estimated take of 12 bats (with 80% statistical certainty) exceeded both the Tier 1 and Tier 2 permitted take levels for bats and take of Nēnē (with 80% statistical certainty and indirect take) has been occurring at a rate that could exceed both Tier 1 and Tier 2 permitted take levels for Nēnē, KWP II submitted an amended HCP and associated ITL to the agencies for review in FY 2020. The amendment added an additional tier of Nēnē take and an additional two tiers of bat take. The amended HCP was approved on November 8, 2019, and the adjusted take authorization can be found in Table 4.

Mitigation Status:

Hawaiian Petrel and Newell's Shearwater. Mitigation for the two seabird species (Hawaiian Petrel and Newell's Shearwater) is being implemented concurrently with Kaheawa Wind Power I. Tier 1 mitigation for estimated seabird take at the project continues at the Makamaka'ole seabird enclosures (detailed in the section pertaining to KWP I, above). These efforts include trapping and monitoring for potential predators, maintenance of enclosure fences, erosion control, seabird social attraction and monitoring seabird activity within the Makamaka'ole Stream drainage area and near artificial burrows within the enclosures. Site surveys of an alternative seabird mitigation site, as required by the HCP, were completed in East Maui in FY 2016. Only Newell's Shearwater nesting activity was observed at Makamaka'ole in FY 2022. A total of 22 burrows were consistently active during the breeding season, 11 of which were reproductively active with 17 eggs and one chick produced.

As part of predator control in FY 2022, traps and bait stations captured 39 mongooses, 45 rats, and eight mice. All mongooses were captured outside the enclosures while 14 of the rats and five mice were captured inside the enclosures. A single Barn Owl was observed during a one-night survey during the fiscal year, but no signs of predation by owls were found and no Barn Owl control was conducted.

To mitigate for the loss of productivity accrued from Hawaiian Petrel estimated take not yet mitigated for at Makamaka'ole, Hawaiian Petrel nesting colony management and predator control by Pūlama Lāna'i on Lāna'i Island was conducted during FY 2020, from which 36 fledglings were produced.

In FY 2021, the two KWP projects adaptively managed their seabird mitigation programs by providing funds to Pūlama Lāna‘i. A total of 21 cats and a minimum of 354 rodents (understood to be an extreme underestimate) from the 150-acre petrel nesting area in FY 2021. During the 2021 breeding season 196 known burrows were estimated to have produced 70 Hawaiian petrel chicks above baseline. Results from the 2022 breeding season will be reported in the FY 2023 annual report.

At the close of the reporting period, KWP II was in discussion with the agencies on the assessment of mitigation credit for the Hawaiian petrel. In FY 2022, the two KWP projects again adaptively managed their seabird mitigation programs by providing $118,300 in funding to Pūlama Lāna‘i for the 2022 breeding season. The funded effort included predator control and burrow monitoring and evaluation in the Hawaiian petrel nesting area.

Nēnē. Nēnē mitigation had been contracted to DOFAW for Tier 1 estimated take in prior fiscal years for the Pi‘iholo Ranch Nēnē pen, and in conjunction with KWP I at the Haleakalā Ranch Nēnē pen. In Fiscal Year 2020, however, no funding was provided for either pen by KWP II. Although KWP II intended to resume funding the Pi‘iholo Ranch Nēnē pen in FY 2021, the future ownership status of the ranch was uncertain that fiscal year. In June 2021, DOFAW received notification that the ranch had been sold and, after written inquiry by the agency, that the new owner (La Maddalena, LLC) conveyed no interest in continuing its association with either State or Federal wildlife agencies. No funding credit was therefore available to KWP II in FY 2021, and no mitigation benefits were accrued in FY 2022.

In FY 2022, KWP II initiated planning efforts in coordination with DOFAW to move the wind farm’s Nēnē mitigation to Haleakalā Ranch. KWP II intends to assume co-management of the ranch’s release pen in FY 2023 concurrently with the KWP I Wind Project.

Hawaiian Hoary Bat. In accordance with the KWP II HCP, baseline mitigation for the Hawaiian Hoary Bat was the implementation of bat habitat improvement measures on at least 338 acres. Mitigation for Tier 1 and Tier 2 estimated bat take has been completely funded and continues as vegetation out-planting at Kahikinui State Forest Reserve. Mitigation for Tier 3 estimated take in the form of bat ecological research on Hawai‘i Island has been contracted. This work is intended to better inform future bat habitat restoration and conservation and began in FY 2018 by the U.S. Geological Survey Hawaiian Hoary Bat research group. The project (KWP II) contribution to this contract was $205,500 in FY 2021, which fulfilled its obligation to the contract. This mitigation project is studying movements, roosting behavior, and diet of the Hawaiian Hoary Bat, and is expected to be completed in FY 2023 with the submission of final publications, technical results, and data releases

Pueo. Although the Pueo is not a listed species on Maui, KWP II included Pueo in their HCP and provided mitigation compensation in the form of $25,000 paid to DOFAW in FY 2013 to be directed toward Pueo research efforts on O‘ahu. With these and other funds DOFAW funded a Pueo research project in 2017 on O‘ahu which was completed in FY 2018 and can be viewed at https://www.pueoproject.com.

Auwahi Wind Energy Habitat Conservation Plan, Maui, Hawai'i. Approved 2012.

ITL Licensee: Auwahi Wind Energy, LLC (owned by American Electric Power Company, Inc.)

Project: Eight WTGs with a total 21-MW energy generating capacity

ITL Duration: February 9, 2012 – February 9, 2037 (as of end of FY 2022, 10 years [42%] through the permit term)

Auwahi Wind Power, Maui

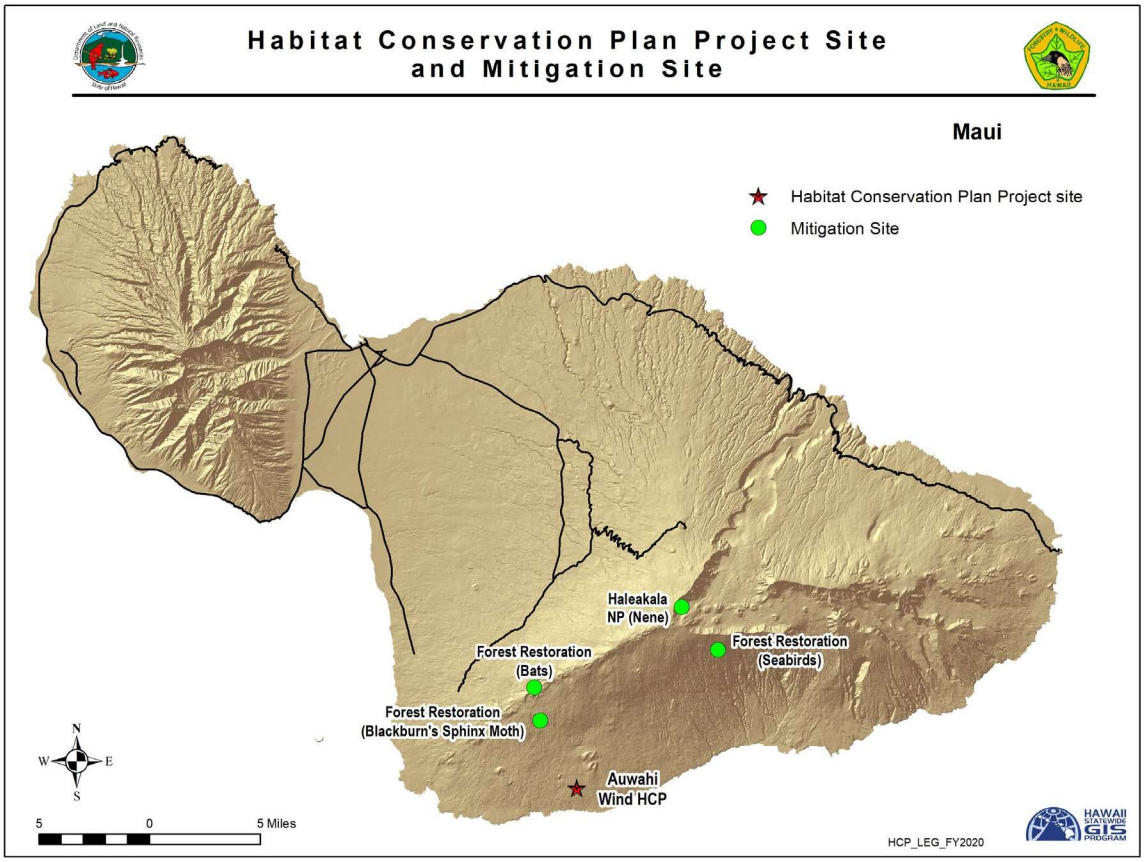


Figure 5. Location of Auwahi HCP and Mitigation Sites

Take Authorization Over 25-year Term:

Table 7. Take Authorization for Auwahi Wind HCP.

Common Name	Scientific Name	Level of Take	25-year Limit
ʻUaʻu or Hawaiian Petrel	*Pterodroma sandwichensis*	Tier 1	19 adults/ immatures & 7 chicks/eggs
		Tier 2	32 adults/ immatures & 12 chicks/eggs
		Tier 3	64 adults/ immatures & 23 chicks/eggs
Nēnē or Hawaiian Goose	*Branta sandvicensis*	Length of permit	5 adults/ immatures
ʻŌpeʻapeʻa or Hawaiian Hoary Bat[1]	*Lasiurus cinereus semotus*	Tier 1	5 bats
		Tier 2	11 bats
		Tier 3	21 bats
		Tier 4[2]	81 bats
		Tier 5[2]	115 bats
		Tier 6[2]	140 bats
Blackburn's Sphinx Moth	*Manduca blackburni*	Not applicable	28-acres permanently disturbed habitat is an index of take

[1] Take authorization for bats are converted to adult bats based on HCP and clarified by email from J. Charier of USFWS to Marie VanZandt of Auwahi on March 2, 2015.

[2] New tier approved in a major amendment on August 23, 2019.

Status of ITL: Take of 10 Hawaiian Hoary Bats was reported at the Auwahi Wind Energy facility in FY 2022 (Table 8). No take was reported for other HCP covered species at the facility.

Table 8. Documented fatalities of HCP covered species and species of concern at Auwahi during the reporting period.

Common Name	FY2022 Fatalities
Hawaiian Hoary Bat	10

In FY 2022, all weekly fatality monitoring searches were conducted by a canine-assisted search team along turbine pads and roads within a 100-meter radius of turbines and a 10-meter radius of the meteorological tower.

Table 9 provides an estimate of the overall total adjusted take that has occurred since Auwahi Wind ITL issuance.

The total estimated take of bats exceeded the total permitted take for bats on the original ITL by June 2016 and Auwahi Wind submitted an amended HCP and associated ITL to the agencies for review in FY 2019, which added an additional three tiers of bat take and implemented low wind speed curtailment at 6.9 m/s. The amended HCP was approved in FY 2020 and the adjusted take authorization can be found in Table 7. During FY 2020 the rate of bat take exceeded the projected threshold required to be met in order to remain within the amended take limit over the remainder of the 25-year permit term. Auwahi Wind implemented its adaptive management plan and installed acoustic deterrents on all eight turbines in June and July 2020 and continued their use through FY 2022. In FY 2021, Auwahi Wind initiated coordination with the DOFAW Forestry Program to the use of portions of the Kamehamenui Forest Reserve to offset Hawaiian hoary bat take as mitigation in advance of exceeding Tier 5 level of take.

Table 9. Total observed fatalities since ITL issuance and estimated total adjusted take covered under the Auwahi Wind Energy ITL as of June 30, 2022.

Common Name	Total Observed Take[1,3]	Estimated Unobserved Take[2]	Indirect Take	Total Estimated Take
Hawaiian Hoary Bat	38	24	8	70
Hawaiian Petrel	2	2	1	5
Band-rumped Storm Petrel	1	ND	ND	ND

[1] Excludes takes that were incidental and not observed during systematic monitoring (incidental takes are evaluated as part of the EoA modeling software and therefore accounted for in the unobserved take).
[2] Based on the 80% credible maximum using the following model: Dalthorp, D., M. M. P. Huso, and D. Dail. 2017. Evidence of absence (v 2.0) software user guide: U.S. Geological Survey Data Series 1055.
[3] Includes observed take of one injured bat rehabilitated in FY 2020.
ND - Not determined.

In FY 2022, Auwahi Wind updated and submitted additional minimization measures as part of their Adaptive Management Plan that included removal of the meteorological tower, which was approved by the agencies. Auwahi Wind also supplied acoustic detectors for a test of acoustic bat deterrent function at a wind farm in Minnesota after results of monitoring on Maui showed no difference between deterrent and non-deterrent turbines. Auwahi Wind also investigated bat fatality events at the project turbines via thermal imagery in an attempt to elucidate any patterns of behavior that might indicate bat deterrents are working. Wildlife Imaging Systems subsequently analyzed data collected in FY 2022 and detected no fatality events. Bats continued to utilize the rotor swept zone, however, despite deterrents being active.

Mitigation Status:

Hawaiian Petrel. Mitigation for take of Hawaiian Petrels in FY 2022 (2021 breeding season) consisted of continued petrel burrow monitoring at Kahikinui Forest Reserve to obtain an estimate of the number of active petrel burrows and reproductive (fledging) success. One new burrow located was marked, mapped, and added to the monitoring dataset. In the most recent breeding season, 78 petrel burrows were being monitored, 27 of which were consistently active throughout the breeding season. Ten burrows successfully fledged a chick and the remaining 17 either failed or showed signs of occupation by a non-breeding Hawaiian Petrel. One possible cat predation was documented at one of the burrows in 2021 and one chick was found dead in a burrow due to unknown causes.

The predator control strategy continued to assess rat and mongoose activity across the entire management area. One hundred thirty-five traps were deployed in FY 2022. Traps were checked and baited every two weeks and were operational year-round Trapping effort in FY 2022 resulted in the removal of 30 mice and 10 rats; no mongooses or cats were captured.

Nēnē. Auwahi Wind provided a one-time payment of $25,000 to the Haleakalā National Park on April 17, 2012, to cover mitigation expenses for the Hawaiian Goose.

Hawaiian Hoary Bat. Tier 1 mitigation for the Hawaiian Hoary Bat consists of the restoration of approximately 132 acres of pastureland in the Waihou Mitigation Area (the Puʻu Makua parcel) to create roosting and foraging habitat for the Hawaiian Hoary Bat. Restoration of this area included a perimeter fence and the removal of ungulates. The fence was inspected quarterly in FY 2022 and was repaired after storm damage (a fallen tree) had been identified; the parcel remained ungulate free at the close of the fiscal year. Invasive plant species control continued to

meet success criteria targets and supplemental out-planting of native Hawaiian plants continued in FY 2022.

Year five monitoring of percent vegetative cover along all transects in FY 2020 showed an overall percent cover of native woody vegetation of 27.7 percent, and non-native vegetation of 23.9 percent. Additional vegetation monitoring in FY 2021 included collection of information on tree height and leaf area index. Results showed that plots planted with koa (*Acacia koa*) 20 years ago at 3 x 3-meter densities were found to have an average leaf area index (LAI) of 0.69 and average height of 7.7 meters. Additional Hawaiian native plants, including ʻōhiʻa (*Metrosideros polymorpha*) and aʻaliʻi (*Dodonaea viscosa*), were out-planted in the existing koa plots in FY 2022.

As part of Tier 1 mitigation, habitat restoration efforts were expanded to the surrounding Tier 4 mitigation lands in FY 2022, which has added additional ungulate barriers to this parcel. Cattle grazing continues by the landowner on the surrounding ranch lands including the Tier 4 mitigation lands.

Tier 2 mitigation is completed. Auwahi worked with Frank Bonaccorso of the U.S. Geological Survey (USGS) to develop a research project combining radio telemetry and acoustic monitoring to track the success of mitigation efforts at Waihou, as well as to provide more information on the ecology of the Hawaiian Hoary Bat. Implementation of the plan began in March 2015 with the deployment of six acoustic detectors. Monitoring occurred under Tier 2 for one year and results have been reported previously.

The Tier 3 bat mitigation study conducted by the U.S. Geological Survey in the Puʻu Makua Restoration Area within the Waihou mitigation area is completed, and results were reported in FY 2019.

Tier 4 mitigation for the bat consists of protecting, managing, and enhancing 709 hectares of bat foraging and roosting habitat at ʻUlupalakua Ranch, and planning work began in FY 2020. The 709 hectares of land will be placed in a conservation easement held by the Hawaiian Islands Land Trust and the final conservation easement was fully executed on December 7, 2020. As part of management activities, Auwahi Wind began fence construction in FY 2021, with a total of 44 hectares was fenced off from cattle. A total of 30 hectares was planted with approximately 10,000 koa plantings within the newly constructed hedgerow areas. Quarterly fence inspections also began in FY 2021 and two 50,000-gallon capacity ponds were constructed.

For FY 2022, Auwahi Wind began fence construction of the next 100-acre parcel. A total of 35 acres were planted with approximately 7,000 koa seedlings within this fenced area. Quarterly fence inspections continued during FY 2022 and the area remained cattle-free. The constructed 50,000-gallon capacity ponds were monitored for bat activity in FY 2022. Bat activity was documented at one of the pond locations and both fenced areas have been out-planted with additional native plantings.

Insect and acoustic bat monitoring was initiated by the Project throughout the mitigation site in FY 2020, was continued in FY 2022. Three malaise traps were set (one at a pond, one at a pasture and one at a hedgerow) and checked quarterly. The final monitoring results observed only insects in the order Lepidoptera. A significant median Insect Capture Rate was observed

between the months of July to August while a greater median capture rate was shown for pasture habitat when data were pooled for the entire year. Insect sampling was scheduled to continue twice per year in FY 2022. Results from future sampling years will be compared to baseline values established in FY 2021 to inform adaptive mitigation measures, if required.

In terms of acoustic monitoring for Tier 4 mitigation, the average detections throughout the study area was 11.85 ± 0.68 calls per detector night in FY 2021. The highest detection rate occurred at two upper elevation detector sites located within mesic land cover types, one of which was located next to a pond. The second year of acoustic monitoring was completed in FY 2022 and the average number of Hawaiian hoary bat detections throughout the study area will be reported in FY 2023.

As obligated in the approved HCP amendment, Auwahi Wind began funding a single year occupancy study of the Hawaiian Hoary Bat on Leeward Haleakalā during the reporting period. The study area spans from Ahihi-Kinau Natural Area Reserve to the Kaupō gap, and from the summit of Haleakalā to the coast. The results, made available in FY 2021, show that overall bat detection and occupancy rates were much higher than a similar study performed over a 3-year period on O‘ahu. Bat activity rates were 80 percent at the Leeward Haleakalā study site over a 1-year period compared to 3 percent over a 3-year period on O‘ahu.

In preparation for the anticipated Tier 5 / 6 mitigation needs, Auwahi Wind deployed acoustic detectors in May 2021 to gather baseline information on bat acoustic activity at the proposed mitigation area at Kamehamenui; these detectors were checked regularly in FY 2022. The first year of monitoring for bat detections during acoustic surveys from May 11 – September 17, 2021, resulted in a total call abundance (bat calls / detector-nights) of 39.04 ± 3.81 and a nightly detection (nights bats detected / total detector-nights) of 0.98.

In FY 2022, Auwahi Wind submitted multiple drafts of the Tier 5 Site Specific Management Plan for the Hawaiian hoary bat. Auwahi Wind will continue to coordinate closely with DOFAW and USFWS in the development of Auwahi Wind’s site-specific mitigation implementation plan.

Blackburn’s Sphinx Moth. Baseline mitigation for Blackburn’s Sphinx Moth (BSM) consisted of a contribution of $144,000 to the Leeward Haleakalā Watershed Restoration Partnership in 2012, to restore dryland forest by planting the equivalent of six acres of native endangered ‘Aiea (*Nothocestrum latifolium*) throughout the Auwahi Forest Restoration Project. ‘Aiea is known to serve as a host plant for the endangered BSM. In FY 2019 the goal of planting 1,500 ‘Aiea plants on 11 acres was reached and Auwahi Forest Restoration Project fulfilled the MOU requirements. During FY 2021 47 tree tobacco (*Nicotiana glauca*) plants, a non-native invasive host plant for the moth, were removed from the wind farm site. In FY 2022, all tree tobacco plants found were removed from the Project with most plants observed to be in the immature vegetative state. Auwahi continued monthly field surveys for BSM in FY 2022, but none were detected.

Kahuku Wind Power Habitat Conservation Plan, O'ahu, Hawai'i. Approved 2010.

ITL Licensee: Kahuku Wind Power, LLC
(Note that Terraform Power owns Kahuku, LLC)

Project: Twelve WTGs with a total 30-MW energy generating capacity

ITL Duration: June 7, 2010 – June 7, 2030 (as of end of FY 2022, 12 years [60%] through the permit term)

Kahuku facility on the North Shore of O'ahu.

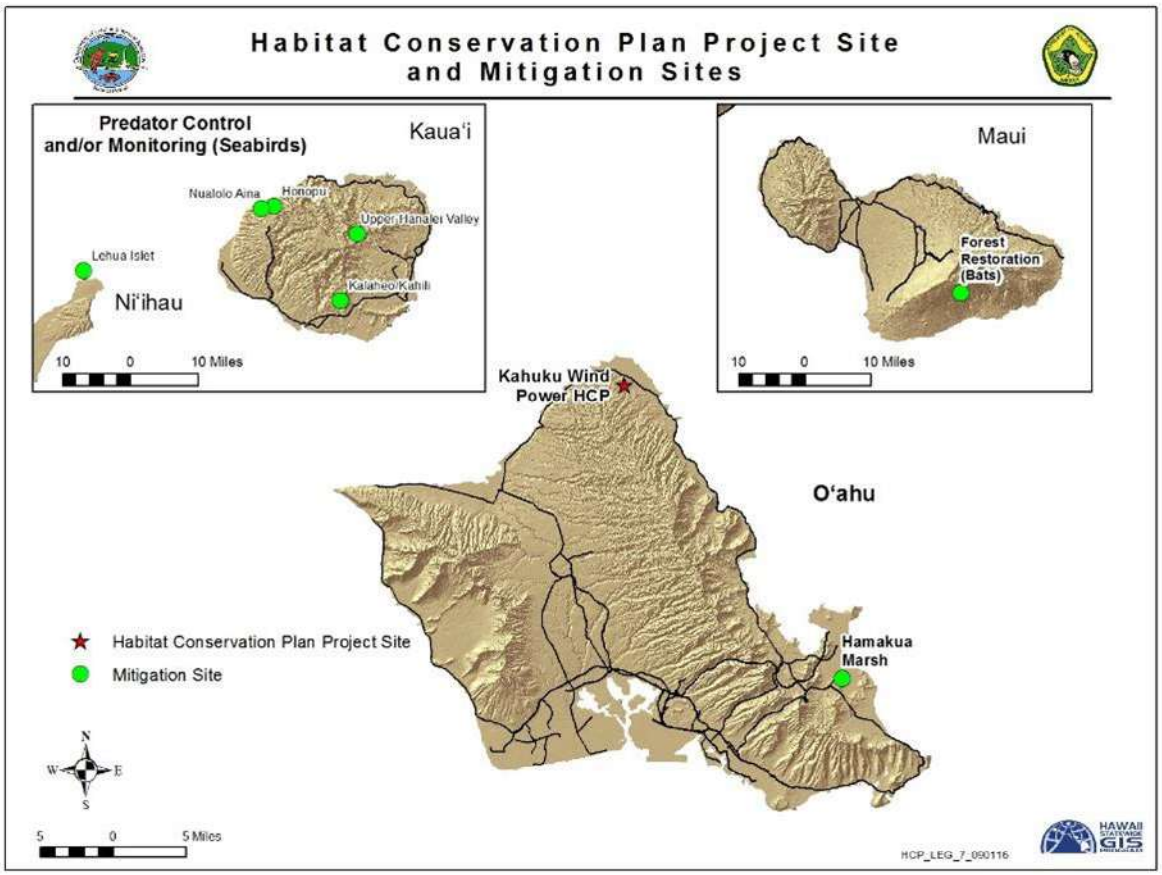


Figure 6. Location of Kahuku HCP and Mitigation Sites

Take Authorization Over 20-year Term:

Table 10. Take Authorization for Kahuku Wind HCP.

Common Name	Scientific Name	Level of Take[1]	Annual Take Limit[2]	5-year Take Limit[3]	20-year Take Limit[3]
ʻUaʻu or Hawaiian Petrel	*Pterodroma sandwichensis*	Baseline	4	8 adults/ juveniles	8 adults/ juveniles
		Higher	8	12 adults/ juveniles	12 adults/ juveniles
ʻAʻo or Newell's Shearwater	*Puffinus auricularis newelli*	Baseline	3	9 adults/ juveniles	12 adults/ juveniles
		Higher	6	12 adults/ juveniles	18 adults/ juveniles
Koloa Maoli or Hawaiian Duck	*Anas wyvilliana*	Baseline	4	12 adults/ juveniles	16 adults/ juveniles
		Higher	8	16 adults/ juveniles	24 adults/ juveniles
Aeʻo or Hawaiian Stilt	*Himantopus mexicanus knudseni*	Baseline	3	9 adults/ juveniles	12 adults/ juveniles
		Higher	6	12 adults/ juveniles	18 adults/ juveniles
ʻAlae Keʻokeʻo or Hawaiian Coot	*Fulica alai*	Baseline	3	9 adults/ juveniles	12 adults/ juveniles
		Higher	6	12 adults/ juveniles	18 adults/ juveniles
ʻAlae ʻUla or Hawaiian Moorhen	*Gallinula chloropus sandvicensis*	Baseline	4	10 adults/ juveniles	14 adults/ juveniles
		Higher	7	14 adults/ juveniles	20 adults/ juveniles
ʻŌpeʻapeʻa or Hawaiian Hoary Bat[4]	*Lasiurus cinereus semotus*	Baseline	7	14 individuals	16 individuals
		Higher	14	16 individuals	25 individuals
Pueo or Hawaiian Owl	*Asio flammeus sandwichensis*	Baseline	4	12 adults	16 adults
		Higher	8	16 adults	24 adults

[1] Take authorization is delineated by Baseline and Higher Limits (Tiers). Upon reaching Higher Limits additional mitigation measures or funding are triggered to ensure that mitigation keeps pace with take.
[2] Exceeding the Annual Take Limit (including observed and unobserved take) will require one or more of the following: adaptive management, increased mitigation, or a major ITL amendment.
[3] "5-Year" and "20-year" take limits are cumulative for the respective period of years.
[4] Minor amendment to clarify permitted bat take processed on November 26, 2014.

Status of ITL: There was documented take of one female Hawaiian Hoary Bat, but no other HCP covered species at Kahuku Wind Power during FY 2022 reporting period (Table 11).

Table 11. Documented fatalities of HCP covered species during the reporting period.

Common Name	FY2022 Fatalities
Hawaiian Hoary Bat	1

Table 12 provides an estimate of the overall total adjusted take that has occurred since Kahuku Wind ITL issuance.

Table 12. Total observed fatalities and estimated total take since ITL issuance under the Kahuku Wind Power ITL as of June 30, 2020.

Common Name	Total Observed Take	Estimated Unobserved Take[1]	Indirect Take using HCP multipliers	Total Estimated Take
Hawaiian Hoary Bat	6	7	3	16

[1] Based on the 80% credible maximum using the following model: Dalthorp, D., M. M. P. Huso, and D. Dail. 2017. Evidence of absence (v 2.0) software user guide: U.S. Geological Survey Data Series 1055.

In December 2014 the downed wildlife search area was reduced relative to previous years to a 35-meter radius plot centered on each turbine, and in April 2015 search frequency was increased from monthly to weekly. For FY 2022, starting in January 2021 weekly searches primarily occurred over two consecutive days with searches conducted at six of the 12 WTGs on each day; searches, however, were occasionally completed at all turbines on a single day. All searches were conducted by canine teams in FY 2022.

Kahuku additionally monitored bat activity at the project site with four ground-based acoustic detectors located at each WTG. Between June 1, 2021, and May 31, 2022, Hawaiian hoary bats were detected on 23 nights out of 1,076 detector-nights (2.1 percent of detector-nights). Seasonal patterns of detection rates were comparable with previous years.

Kahuku continues to implement adaptive management measures including adjustments in vegetation management and scavenger control efforts at the project site t and the Low Wind Speed Curtailment (LWSC) regime initiated in April 2012. As the result of a bat fatality at WTG two on August 19, 2021, Kahuku discovered the 2021 LWSC program had not been triggered in April of that year. This issue was immediately corrected and investigated thoroughly to verify that each of the 12 turbines was properly set to operate under the prescribed LWSC regime. Kahuku has implemented checks to ensure the LWSC programming is operating as intended.

Mitigation Status:

Hawaiian Petrel & Newell's Shearwater. In accordance with the Kahuku Wind HCP, the seabird mitigation plan for Newell's Shearwater and Hawaiian Petrel requires the ITL holder to fund seabird colony-based protection and management measures on the island of Kaua'i. Kahuku Wind also funded the Kaua'i Endangered Seabird Recovery Project to deploy and then analyze data from Wildlife Acoustics SM2TM Song-meters at multiple locations in Kaua'i's remote mountains to survey for Newell's Shearwater and Hawaiian Petrel nesting colonies. All seabird mitigation work was completed prior to FY 2021.

Hawaiian Stilt, Hawaiian Coot, Hawaiian Moorhen, and Hawaiian Duck. Baseline mitigation for the four waterbird species covered under the ITL consisted of payments to DOFAW to conduct predator control and wetland restoration at Hamakua Marsh, part of the State's Kawainui-Hamakua Marsh Complex, for four years from FY 2012-2015. All waterbird mitigation work was completed prior to FY 2021.

'Alae 'Ula or Hawaiian Moorhen swimming at Hamakua Marsh

Hawaiian Hoary Bat. In accordance with the Kahuku Wind Power HCP, baseline bat mitigation consisted of a $150,000 payment to DOFAW (procured on May 31, 2012) for preserving or enhancing foraging and/or roosting habitat by constructing an ungulate-proof fence around a roughly 280-acre section of the State Kahikinui Forest Reserve and State Nakula Natural Area Reserve. In FY 2015, approximately 2,500 meters of fence were installed to enclose the unit. In FY 2020, Kahuku Wind Power, LLC began mitigation planning for the higher level of take and contributed funding to the U.S. Geological Survey for future Hawaiian Hoary Bat ecological research. Mitigation planning for higher level of bat take continued in FY 2021.

During FY 2022, Kahuku submitted a draft of Tier 2 Mitigation Plan, which identifies habitat modification actions that are additive and complementary to the broad management goals and forest management activities identified and previously executed by DOFAW O'ahu Branch at the Helemano Section of the 'Ewa Forest Reserve. Discussions with DOFAW and USFWS regarding Tier 2 bat mitigation are currently underway to include the scale of the project and specific habitat modification actions necessary to meet mitigation obligations.

Pueo. Obligations for Pueo mitigation were complete prior to FY 2016. These included payments of $50,000 for Pueo research on O'ahu aimed at determining population status and management priorities. With these and other funds DOFAW funded a Pueo research project in 2017 on O'ahu, which was completed in FY 2018 and can be viewed at https://www.pueoproject.com. Funding of $25,000 was also provided to the Hawaii Wildlife Center prior to FY 2021.

Kawailoa Wind Power Habitat Conservation Plan, Oʻahu, Hawaiʻi. Approved 2012.

ITL Licensee: Kawailoa Wind Power, LLC
(Note that DESRI IV, LLC now owns Kawailoa Wind Power, LLC; it is an investment fund managed by D.E. Shaw Renewable Investments, LLC)

Project: Thirty WTGs with a total 69-MW energy generating capacity

ITL Duration: January 6, 2012 – January 6, 2032 (as of end of FY 2022 10.5 years [52.5 %] through the permit term)

Kawailoa Wind Power, Oʻahu

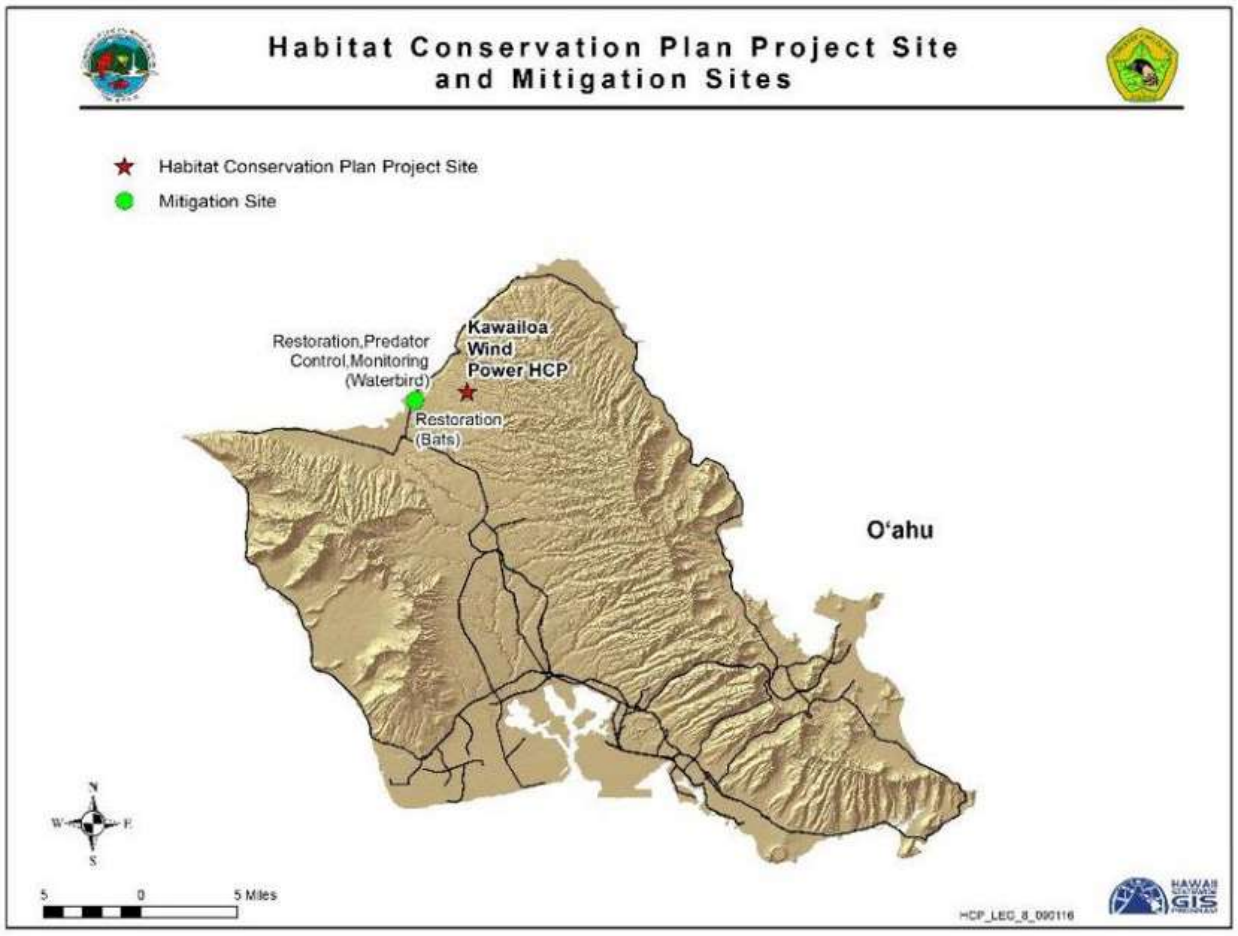


Figure 7. Location of Kawailoa HCP and Mitigation Sites

Take Authorization Over 20-year Term:

Table 13. Take Authorization for Kawailoa Wind HCP.

Common Name	Scientific Name	Level of Take[1]	5-year Take Limit[2]	20-year Take Limit
ʻAʻo or Newell's Shearwater	*Puffinus auricularis newelli*	Tier 1	3 adults/ juveniles & 2 chicks/eggs	3 adults/ juveniles & 2 chicks/eggs
		Tier 2	6 adults/ juveniles & 3 chicks/eggs	6 adults/ juveniles & 3 chicks/eggs
Koloa Maoli or Hawaiian Duck	*Anas wyvilliana*	Tier 1	4 adults/ juveniles & 4 ducklings	4 adults/ juveniles & 4 ducklings
		Tier 2	6 adults/ juveniles & 6 ducklings	6 adults/ juveniles & 6 ducklings
Aeʻo or Hawaiian Stilt	*Himantopus mexicanus knudseni*	Tier 1	6 adults/ juveniles & 3 fledglings	8 adults/ juveniles & 4 fledglings
		Tier 2	8 adults/ juveniles & 4 fledglings	12 adults/ juveniles & 6 fledglings
ʻAlae Keʻokeʻo or Hawaiian Coot	*Fulica alai*	Tier 1	6 adults/ juveniles & 3 fledglings	8 adults/ juveniles & 4 fledglings
		Tier 2	8 adults/ juveniles & 4 fledglings	12 adults/ juveniles & 6 fledglings
ʻAlae ʻUla or Hawaiian Moorhen	*Gallinula chloropus sandvicensis*	Tier 1	6 adults/ juveniles & 3 fledglings	8 adults/ juveniles & 4 fledglings
		Tier 2	8 adults/ juveniles & 4 fledglings	8 adults/ juveniles & 4 fledglings
Pueo or Hawaiian Owl	*Asio flammeus sandwichensis*	Tier 1	4 adults & 4 owlets	4 adults & 4 owlets
		Tier 2	6 adults & 6 owlets	6 adults & 6 owlets
ʻŌpeʻapeʻa or Hawaiian Hoary Bat[3]	*Lasiurus cinereus semotus*	Tier 1	20 individuals	20 individuals
		Tier 2	40 individuals	40 individuals
		Tier 3	60 individuals	60 individuals
		Tier 4	Not applicable	55 individuals
		Tier 5	Not applicable	85 individuals
		Tier 6	Not applicable	20 individuals
ʻUaʻu or Hawaiian Petrel	*Pterodroma sandwichensis*	Not Applicable	Not Applicable	19 adults/fledglings and 5 chicks/eggs

[1] Take authorization is delineated by Baseline and Higher Limits (Tiers). Upon reaching Higher Limits additional mitigation measures or funding are triggered to ensure that mitigation keeps pace with take.
[2] Exceeding the 5-year Take Limit (including observed and unobserved take) will require one or more of the following: adaptive management, increased mitigation, or a major ITL amendment.
[3] Minor amendment to clarify permitted bat take processed on November 26, 2014.

Status of ITL: There was documented fatal take of two Hawaiian Hoary Bat during the reporting period, but no other HCP covered species at the Kawailoa Wind Power facility in FY 2022 (Table 14).

Table 14. Documented fatalities of HCP covered species during the reporting period.

Common Name	FY2022 Fatalities
Hawaiian Hoary Bat	2

Table 15 provides an estimate of the overall total adjusted take that has occurred since Kawailoa Wind ITL issuance.

Table 15. Total observed fatalities and estimated total take since ITL issuance under the Kawailoa Wind Power ITL as of June 30, 2022.

Common Name	Total Observed Take[1]	Estimated Unobserved Take[2]	Indirect Take using HCP multipliers	Total Estimated Take
Hawaiian Hoary Bat	40	50	9	99
Hawaiian Petrel	2	ND	ND	ND

[1] Excludes hoary bat takes that were incidental and not observed during systematic monitoring (incidental takes are evaluated as part of the EoA modeling software and therefore accounted for in the unobserved take).
[2] Based on the 80% credible maximum using the following model: Dalthorp, D., M. M. P. Huso, and D. Dail. 2017. Evidence of absence (v 2.0) software user guide: U.S. Geological Survey Data Series 1055.
ND - Not determined.

With completion of three years of intensive monitoring in November 2015 and concurrence from the USFWS and DOFAW, fatality-monitoring plots were reduced in size on November 1, 2015, to 35-meter radius circular plots. These plots are centered on the wind turbine generators (WTGs) and searched twice per week.

In FY 2022, a revised fatality monitoring protocol to be implemented for two years was approved by USFWS and DOFAW in September 2021 and November 2021, respectively. Starting on January 3, 2022, WTG search areas were expanded to 55-meter radius circular search areas centered on each WTG, with less than 4% of the expanded search radius designated as unsearchable due to safety concerns. Starting on January 24, 2022, roads out to 75 meters surrounding each WTG were also included in the new search areas. All fatality monitoring was conducted 100% by canine teams once per week.

The total estimated take of 99 Hawaiian Hoary Bats (with 80% statistical certainty and indirect take) falls within the Tier 4 bat take request for the species detailed in the amended HCP. Kawailoa submitted an application and an amended HCP to the agencies for review and approval in FY 2019 to increase the amount of Hawaiian Hoary Bat take and add the Hawaiian Petrel to their ITL. After the contested case hearing for this amendment was dismissed in January of 2021, the BLNR unanimously voted to approve the HCP amendment in February of 2021. The amended ITL was issued by DOFAW on February 26, 2021 and signed by Kawailoa Wind on March 30, 2021.

To minimize Hawaiian Hoary bat take, in FY 2019 Kawailoa Wind reduced the number of turbine stop/start events per night by extending the rolling average time used from 10 to 20 minutes. However, the 20-minute rolling average resulted in unanticipated wind turbine behavior and the project returned to a 10-minute rolling average in FY 2020. In FY 2021, the rolling average was again reverted to a 20-minute average in January 2021. Following an agency review of Tetra Tech's analysis, however, Kawailoa returned to 10-minute average in April of 2021 where it remained till the end of FY 2022. The project additionally installed acoustic deterrents at all 30 project turbines in May and June 2019.

Mitigation Status:

Newell's Shearwater. Tier 1 mitigation for Newell's Shearwater as described in the HCP consisted of (1) providing funding for adapting a resetting trap for use in Hawai'i, (2) field testing traps at a suitable location where predators are known to occur, and (3) supporting a one-year pilot study to provide localized predator control in an area where Newell's Shearwater are known to be breeding. Item number three was completed for a project on Kaua'i. Projects that fulfilled these obligations were completed by end of FY 2015.

Hawaiian Petrel. To mitigate for impacts to this species, Kawailoa funded one year of monitoring and predator control at the Hanakāpī'ai and Hanakoa seabird colonies within the Hono O Nā Pali Natural Area Reserve on Kaua'i in 2020. Final reports from Kaua'i Endangered Seabird Recovery Project and Hallux Ecosystem Restoration LLC for this mitigation project were included in the FY 2021 Annual Report, which confirmed completion of Kawailoa Wind's mitigation obligations for the Hawaiian Petrel.

In response to a contested case settlement, Kawailoa Wind provided $250,000 to Pacific Rim Conservation in October 2021 (FY 2022) to carry out research related to Hawaiian Petrels on O'ahu. The goal of this project is to determine whether Hawaiian Petrels detected in previous surveys were prospecting or breeding on O'ahu. In April 2022, Pacific Rim deployed 12 automated acoustic recording units (song meters) in suitable locations on the island (six units in the 'Ewa Forest Reserve and two at Mt Ka'ala). In May and June 2022, 70 auditory ground surveys were conducted at the 'Ewa Forest Reserve and at Mt Ka'ala for listed seabirds, during which two Hawaiian Petrels and eight unknown seabirds were detected at Mt Ka'ala. The funds from Kawailoa will be used to survey for the remainder of the 2022 breeding season and the 2023-2026 Hawaiian Petrel breeding seasons.

Hawaiian Duck, Hawaiian Stilt, Hawaiian Moorhen, & Hawaiian Coot. The 'Uko'a Wetland mitigation program for Tier 1 mitigation continued for waterbirds. In FY 2022, activities associated with Tier 1 included invasive vegetation removal, predator control, monitoring predator presence, and fence monitoring and maintenance. In FY 2022, 176 predators were removed from 'Uko'a Wetland including 48 pigs, 105 mongooses, and 23 rats. A total of 38 weekly waterbird surveys were completed in FY 2022 at 'Uko'a Wetland. The Hawaiian Moorhen was the listed waterbird species most frequently detected during surveys, recorded at six out of nine PC stations, and either adults or chicks were observed or heard on 36 out of 38 survey dates. Hawaiian Moorhen breeding activity was observed on two occasions. Breeding observed in December 2021 resulted in the successful fledgling of two moorhens and the second event observed in June 2022 had determined outcome during the fiscal year; as of June 30, 2022, two moorhen chicks were still present at the site.

Water hyacinth within removal area before removal work was initiated (Top), and after removal was complete (Bottom).

Two Hawaiian stilts were observed on a single survey date in June 2022 flying over areas of 'Uko'a Wetland, the first stilts observed since March 2020. Hawaiian stilt detections have decreased since comprehensive

surveys began in January 2017 and no nests, chicks, or evidence of reproductive activity have yet been observed. No Hawaiian Coots were seen in FY 2022.

Kawailoa has continued ongoing discussions with the agencies regarding adaptive management of waterbird mitigation due to minimal observed breeding events at the site, which includes potentially shifting waterbird mitigation activities to Kawainui Marsh.

Hawaiian Hoary Bat. In FY 2022, activities associated with Tier 1 mitigation included invasive vegetation removal, predator monitoring and control, fence monitoring and maintenance, bat acoustic monitoring, and insect sampling and analysis. No bat lane maintenance was necessary during the reporting period.

Female Hawaiian Hoary Bat caught at ʻUʻkoa Wetland, Oahu.

A total of 16 bat lanes within 10 zones were cleared in previous years throughout ‘Uko‘a Wetland. Bat lane maintenance occurred in Q3 of FY 2021 and consisted of cutting branches and trees that regrow within the 5-meter-wide bat lanes. Hawaiian Hoary Bats were detected on 559 of 2.430 detector nights (1923.0 of detector nights) at ‘Uko‘a in FY 2022. This represents a slight increase from FY 2021, which documented detections on 19.3% of detector nights. Bat activity appears to have increased at ‘Uko‘a Wetland since sampling began in 2012. Detection of feeding buzzes also increased after the mitigation.

In FY 2022, 25 tracking tunnels detected rat activity that varied between 0 % and 11.1 %, mongoose activity that varied between 0 % and 7.4 %, mice activity that varied between 0 % and 11.1 %; no cat activity was detected during the fiscal year.

A follow-up insect assessment was approved by both agencies in April and May 2021 to compare bat prey availability prior to and after management activities at ‘Uko‘a Wetland. Insect sampling was conducted from June to September 2021 and nearly 17,700 insect taxa were collected. A report will be submitted to the agencies in FY 2023 that will include: 1) a list of insect taxa collected in 2014, 2015, and 2021; 2) a comparison on the species and relative abundance of insects sampled in previous years compared to 2021; and 3) a discussion of how the samples relate to Hawaiian hoary bat prey.

Kawailoa Wind has contracted three studies as Tier 2 / 3 bat mitigation. The results of one USGS research project were published in an article titled “*Multi-state occupancy models of foraging habitat use by the Hawaiian hoary bat (Lasiurus cinereus semotus)*” in the Journal PLoS ONE in October 2018. The primary findings reported by Gorresen et al. (2018) include: 1) elevated levels of acoustic activity by Hawaiian Hoary Bats were found to be related primarily to beetle biomass, and 2) video-derived observations demonstrated higher and more accurate estimates of the prevalence of high bat flight activity and feeding events than acoustic sampling methods.

During FY 2022, Kawailoa Wind continued to fund the second USGS genetics study and a third study conducted by Western EcoSystems Technology Inc (WEST). Final invoices for both studies were paid in FY 2022 for a total expenditure of $88,600.

The objectives of the USGS Hawaiian Hoary Bat Conservation Genetics study are to improve the understanding of the genetic diversity of the Hawaiian Hoary Bat, identify bat prey items, and identify the sex of bat carcasses and any sex-specific food habits. A technical report was published for this study in November 2018. During FY 2019, this research determined the sex of 88 Hawaiian Hoary Bat tissue samples using genotyping, which allows for more reliable evaluation of the ratio of males to females affected by collisions with wind turbines. The results indicate that 65% of observed fatalities at the sampled wind farms have been male. In FY 2022, all lab work and data analysis for this study was completed, for which Kawailoa Wind provided all funds, and two journal manuscripts were drafted in FY 2022 and submitted for publication.

The third study, conducted by WEST is a multi-year Hawaiian Hoary Bat acoustic survey study to examine the distribution and seasonal occupancy of the Hawaiian Hoary Bat on O‘ahu. Field data collection for the study spanned roughly four years and concluded in early fall of 2021. In FY 2022, a final report was drafted and concluded that Hawaiian Hoary Bat occupancy rate for O‘ahu was stable to slightly increasing over the study period. Bat distribution was found to be most contracted during the wet period, when dry or mesic habitats appear to be preferred over wet habitats. No habitat covariates were additionally identified as significant predictors of site occupancy during the post-lactation season, a period when the Hawaiian Hoary bat population appears most dispersed across O‘ahu and occupancy rates are highest.

WEST received additional funds from various sources to continue monitoring a subset of the deployed detectors after the completion of the project’s 4th year. Kawailoa has committed to providing up to $10,000 to support continued monitoring during a 5th year (ending August 2022). This funding is outside the Tier 2 / 3 mitigation obligations, which are now complete. Funding the above-listed Tier 2 / 3 studies left an outstanding obligation of $353,702 for Tier 3 bat mitigation. To fulfill the remaining uncommitted funding obligation, Kawailoa Wind contributed the remaining funds towards the purchase of the 3,716-acre Waimea Native Forest, an acquisition through a partnership that includes The Trust for Public Land and others. The acquisition was completed in December 2019. This contribution completes the Tier 3 mitigation obligation for Hawaiian Hoary Bats.

Tier 4 Hawaiian Hoary Bat Mitigation included contributing $2,750,000 to the Trust for Public Land (TPL) toward the purchase and long-term protection of the 2,900-acre Helemano Wilderness Area (HWA). Kawailoa proactively provided funds to TPL in October 2018 and the ownership of the HWA was transferred from TPL to DOFAW in 2018. In March of 2021, the HWA was designated as part of the State of Hawaii’s Forest Reserve System and a preliminary Draft Management Plan for HWA was completed in FY 2021.

Tier 5 bat mitigation will consist of the implementation of one or a combination of the following: 1) funding contributions to acquire property that will protect bat roosting and foraging habitat in perpetuity, and/or 2) bat habitat management/restoration to improve bat foraging and/or roosting habitat at the Central Ko‘olau area, Helemano Wilderness Area, Waimea Native Forest, or similar sites . In accordance with the mitigation planning requirements under the HCP Amendment, a Site-Specific Mitigation Implementation Plan for Tier 5 mitigation was submitted

to USFWS and DOFAW on May 1, 2020. Kawailoa Wind, however, has continued planning for Tier 5 mitigation and is exploring new options as potential sites for this mitigation utilizing information from recent research and other management/restoration projects.

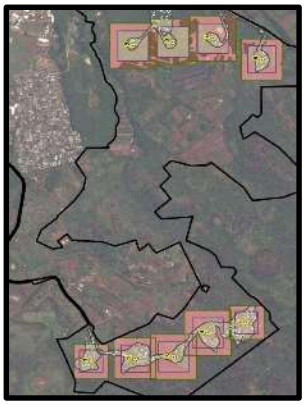
Pueo. A contribution of $12,500 was made to the Hawai‘i Wildlife Center for Pueo rehabilitation in FY 2012. An additional $12,500 was provided to DOFAW to complete the mitigation obligation in the second quarter of FY 2017. With these and other funds DOFAW funded a Pueo research project in 2017 on O‘ahu which was completed in FY 2018 and can be viewed at https://www.pueoproject.com.

Nā Pua Makani Wind Energy Project Habitat Conservation Plan, Oʻahu, Hawaiʻi. Approved 2019.

ITL Licensee: Nā Pua Makani Power Partners, LLC
(Note that AES Corporation owns Na Pua Makani Power Partners, LLC)

Project: Eight WTGs with a total 24-MW energy generating capacity

ITL Duration: April 30, 2019 – April 30, 2040 (as of end of FY 2022, 3 years [14%] through the permit term)



Na Pua Makani Wind Energy Project, Oʻahu

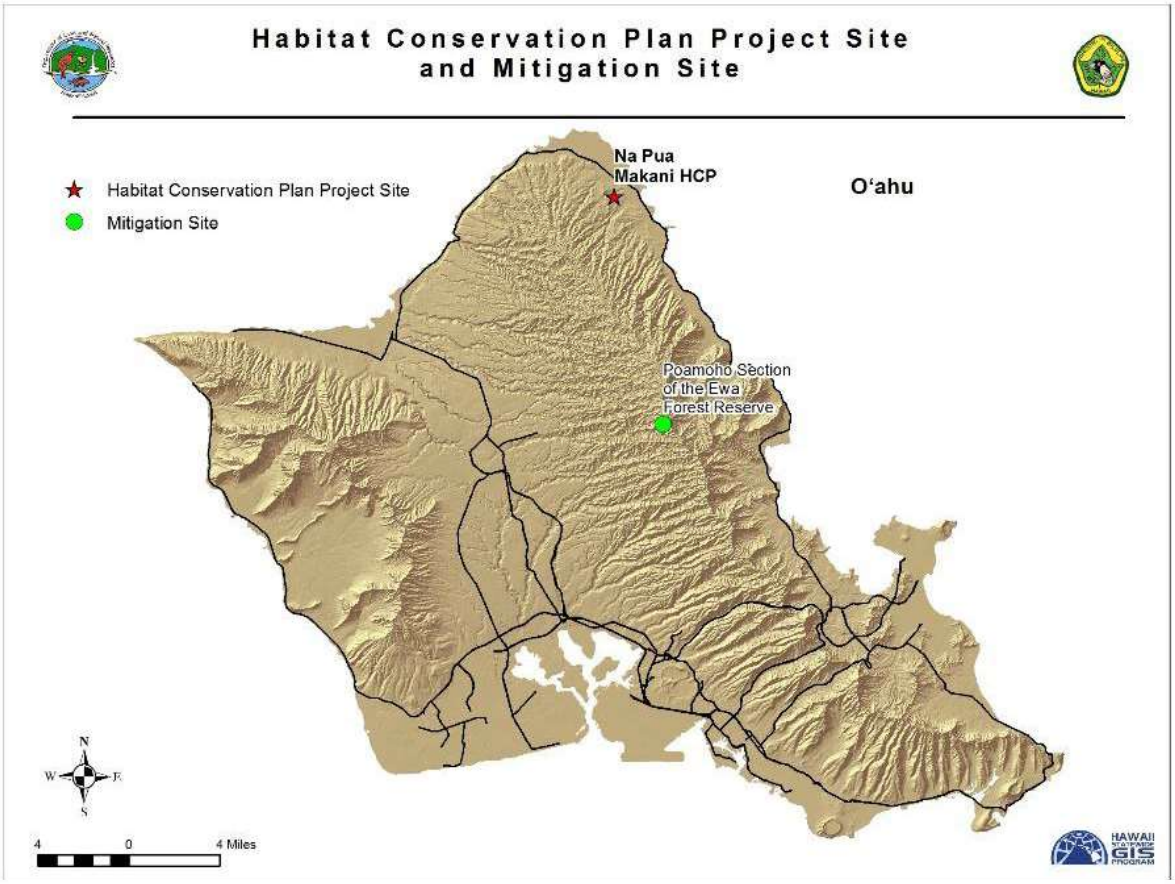


Figure 8. Location of Nā Pua Makani HCP and Mitigation Site

Take Authorization Over 21-year Term:

Table 16. Take Authorization for Nā Pua Makani Wind Energy Project HCP.

Common Name	Scientific Name	Level of Take	21-year Take Limit
ʻŌpeʻapeʻa or Hawaiian Hoary Bat	*Lasiurus cinereus semotus*	Tier 1	34 bats
		Tier 2	51 bats
ʻAʻo or Newell's Shearwater	*Puffinus newelli*	Length of permit	4 adults/immatures and fledglings & 2 chicks/eggs
Nēnē or Hawaiian Goose	*Branta sandvicensis*	Length of permit	6 birds
Koloa Maoli or Hawaiian Duck	*Anas wyvilliana*	Length of permit	4 birds
Aeʻo or Hawaiian Stilt	*Himantopus mexicanus knudseni*	Length of permit	4 birds
ʻAlaekeʻokeʻo or Hawaiian Coot	*Fulica alai*	Length of permit	8 birds
ʻAlae ʻula or Hawaiian Moorhen	*Gallinula chloropus sandvicensis*	Length of permit	8 birds
Pueo or Hawaiian Short-eared Owl	*Asio flammeus sandwichensis*	Length of permit	4 adults/fledged young & 4 chicks/eggs

Status of ITL: There was a take of one Hawaiian Hoary Bat but no other HCP covered species at Nā Pua Makani in FY2022 (Table 17).

Table 17. Documented fatalities of HCP covered species during the reporting period.

Common Name	FY2022 Fatalities
Hawaiian Hoary Bat	1

In FY 2019 the Project began construction, which continued throughout FY 2020; the project began commercial operations in December of 2020. Although there was no take of covered species at the Nā Pua Makani Wind Energy facility in FY 2021, one endangered Hawaiian Petrel was found near a wind turbine prior to faciltiy operation. This take was attributed to likely attraction by security lights. Nā Pua Makani is working with the agencies to amend its HCP and ITL to include the Hawaiian Petrel as a covered species. As of FY 2022, the project has a total estimated take of 4 Hawaiian Hoary Bats (with 80% statistical certainty and indirect take) (Table 18).

Table 18. Total observed fatalities and estimated total take since ITL issuance under the Na Pua Makani Winde Energy ITL as of June 30, 2022.

Common Name	Total Observed Take[1]	Estimated Unobserved Take[2]	Indirect Take using HCP multipliers	Total Estimated Take
Hawaiian Hoary Bat	1	2	1	4

[1] Excludes hoary bat takes that were incidental and not observed during systematic monitoring (incidental takes are evaluated as part of the EoA modeling software and therefore accounted for in the unobserved take).
[2] Based on the 80% credible maximum using the following model: Dalthorp, D., M. M. P. Huso, and D. Dail. 2017. Evidence of absence (v 2.0) software user guide: U.S. Geological Survey Data Series 1055.

Mitigation Status:

Newell's Shearwater. In FY 2021, Nā Pua Makani provided the required mitigation funds to the National Fish and Wildlfe Foundation (NFWF). Although no programs have yet been funded with these funes, mitigation status and results for Newell's Shearwater will be reported when NFWF identifies an appropriate mitigation project.

Hawaiian Hoary Bat. Nā Pua Makani, in cooperation with the Koʻolau Mountain Watershed, submitted management and research plans to DOFAW in FY 2022. These proposed plans are intended to improve and protect bat habitat in the Poamoho Management Area and study the effectiveness of habitat restoration activities on improving the availability of bat food resources and increasing bat activity. These plans were reviewed by DOFAW and Nā Pua Makani was in negotiations at close of the fiscal year to secure approved by the agency and the ESRC. In compliance with their ITL, Nā Pua Makani is perparing another mitigation research plan that focuses on bat deterrence measures with the goal of reducing the bat take at wind turbines. This plan will be reviewed by DOFAW for approval by the agency and the ESRC.

Hawaiian Short-eared Owl. Nā Pua Makani provided the required mitigation funds to DOFAW's Endangered Species Trust Fund in September of 2020. An MOU was finalized between Nā Pua Makani and DOFAW in February of 2021 to cover use of funds and reporting requirements. DOFAW used these funds to support a University of Hawaiʻi graduate research project on Hawaiian short-eared owl breeding ecology including nest site selection and nesting success, and the timing of courtship and nesting. A preliminary report for the first year of study was submitted to DOFAW in July of FY 2022.

Hawaiian Goose. The Hawaiian Goose was extirpated from O'ahu prior to the construction and operation of the Project and DOFAW and Nā Pua Makani have agreed that the Project currently poses no risk to the species. The wind farm will therefore modify the mitigation framework for the Hawaiian Goose via an HCP major amendment to clarify that if the Hawaiian goose is not at risk from the Project during the permit term, no mitigation will be required.

Hawaiian Waterbirds. DOFAW and Nā Pua Makani agreed that a modified program implemented at Hāmākua Marsh, which reduces fatalities and/or increases productivity of the resident waterbird species, is appropriate mitigation for take at the facility (the fencing, public outreach, and staffing program identified in the HCP was determined to be no longer viable). In FY 2022, Nā Pua Makani submitted a draft waterbird mitigation adaptive management plan to DOFAW and was in negotiations for agency approval as the fiscal year ended.

Transportation Projects

Relocation of *Abutilon menziesii* Habitat Conservation Plan, Kapolei, O'ahu. Approved 2004.

ITL Licensee: Hawai'i Department of Transportation (HDOT)

Project: Development of 1,381-acre East Kapolei Master Plan project and construction of the North-South Road arterial highway bisecting the property

ITL Duration: March 18, 2005 – July 31, 2021 [100%] through the permit term)

Ko'oloa'ula (Abutilon menziesii), Island of O'ahu.

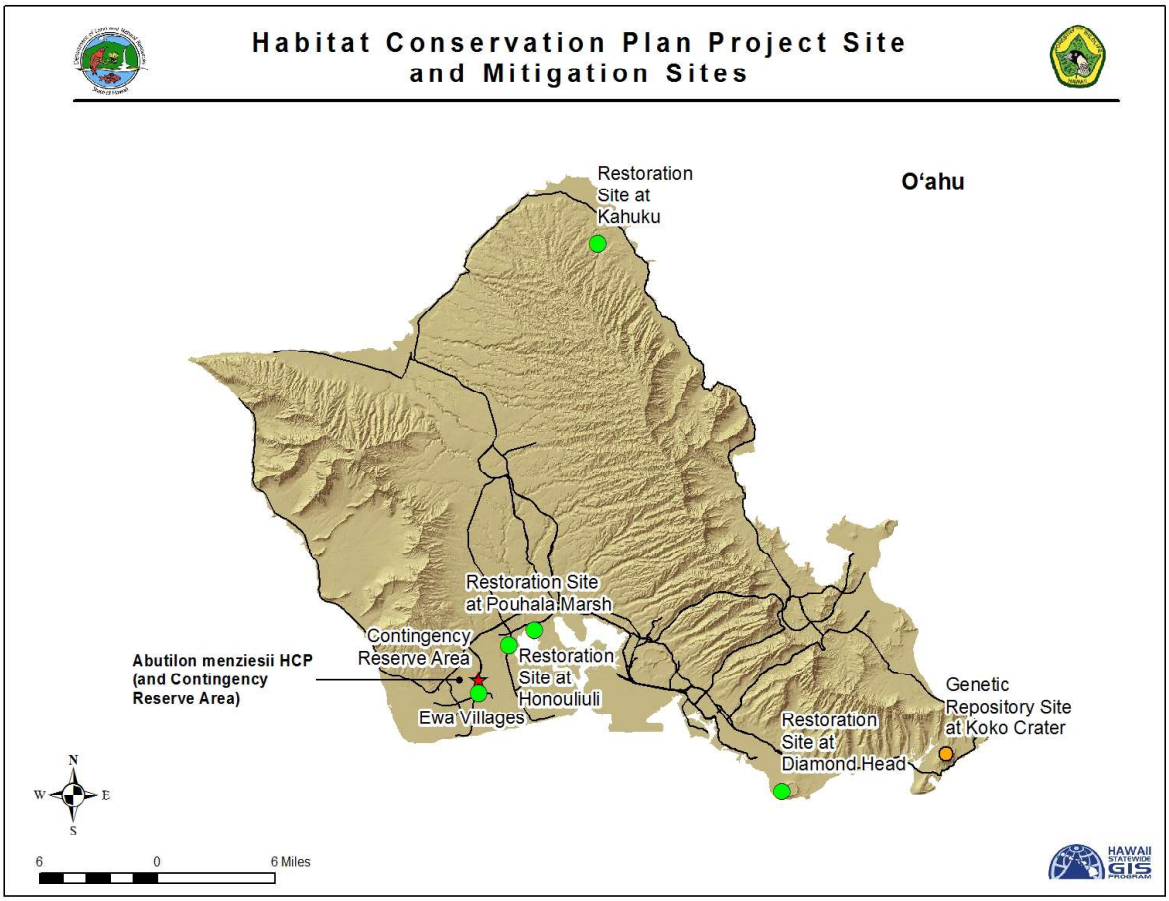


Figure 9. Location of Abutilon HCP and Mitigation Sites

Take Authorization:

Table 19. Take Authorization for Abutilon HCP.

Common Name	Scientific Name	Total Authorized Over ITL Duration
Koʻoloaʻula	*Abutilon menziesii*	All individual plants within the 1,381-acre project area

Status of ITL: All plants have been moved. Five mitigation sites were established, with a genetic repository location containing plants with a genetic representation of the translocated plants. A Contingency Reserve Area was established where additional plantings were to remain until success criteria were met at the three mitigation sites. The HCP officially concluded a month after the end of the FY 2021 fiscal year (July 31, 2021) without success criteria being met.

Sub-permittees under this HCP, which include the Department of Hawaiian Homelands (DHHL), HART, UH West Oʻahu, and the City and County of Honolulu, were interested in obtaining continued take coverage of *Abutilon* on their properties. They were not be able to obtain coverage under the now expired HCP because HDOT was unwilling to extend the HCP and ITL term. In February of FY 2022, DHHL initiated discussions with DOFAW to plan the development of a new HCP for *Abutilon menziesii*. Discussion and planning will be ongoing in FY 2023.

Mitigation Status:

The goal of the HCP was to initiate and sustain a program that will result in an overall net gain in the number of endangered *Abutilon menziesii* plants on Oʻahu. The end goal was the establishment of three wild sites that are protected self-sustaining populations of *A. menziesii* from the single degraded Kapolei population. Wild populations of *A. menziesii* have been successfully established at the following sites: 1) Diamond Head State Park; 2) Honouliuli Refuge, part of the U.S. Fish and Wildlife Service's Oʻahu National Wildlife Refuge Complex; and 3) Pouhala Marsh on City and County property in Waipahu. Three new sites were established in FY 2018 in the attempt to bring this species' conservation efforts into current DOFAW projects with long-term project investment by the DOFAW Oʻahu Branch. They are Hāmakua Marsh in Kailua, Makua Keaʻau Forest Reserve in western Oʻahu, and a Waiʻanae Mountains Watershed Partnership restoration site in Waiʻanae Kai. The species was being incorporated within these already established efforts to help ensure long-term progress at little to no added cost of expansion and maintenance efforts. Some out-planting additionally occurred at the ʻEwa Villages Golf Course, which has successfully maintained 39 individuals, although due to irrigation it is not considered a wild site. The main genetic reserve site established at Koko Crater Botanical Garden currently has 139 mature (reproductive) plants (63% genetic representation).

The success criteria were not met by the end of the first month of FY 2022, when the ITL expired. The Contingency Reserve Area (1,381-acre project area) can therefore not be developed. As of early 2021, the Contingency Reserve Area population had 22 individual plants, a decline from 29 mature *A. menziesii* plants present in FY 2020, and 35 mature plants in FY 2019. Owing to the lack of funding provided by the HDOT to do mitigation work, the last time Oʻahu Branch surveyed the Contingency Reserve Area for remaining plants was on July 28, 2020. From an original founder population of 133 plants on the project site in 2002, out-planting efforts have resulted in 107 founders genetically represented at all the sites. When the last

surveys were completed in FY2020, 628 mature *A. menziesii* plants were present across all the HCP populations at the targeted wild sites, the genetic reserve sites, and the Contingency Reserve Area. No new plants were out-planted during the FY2021 reporting period nor by the expiration of the ITL.

In FY 2020, DOFAW completed a full monitoring survey of all the management sites. This monitoring data showed that the long-term criteria has not been met and additional management is required. The main reason for the lack of seedling recruitment and survivorship may be a lack of sufficient moisture on a regular basis, which may be due to a variety of factors. However, the expansion of populations via clonal growth (such as rooting of the overhanging branches) has been observed and could have warranted a revision to the measures of success in the HCP.

Funding Source and Status: Funding to implement mitigation activities was provided to DOFAW from HDOT and were exhausted in January 2020. DOFAW was committed to managing the project through the remaining ITL term, and during FY 2021 continued to seek discussions with HDOT on achieving the HCP's success criteria. By the end of FY 2021, however, HDOT did not respond to requests to continue funding the project in order to meet success criteria.

Other Development Projects

Cyanotech Aquaculture Facility Habitat Conservation Plan, Keahole Point, Hawai'i. Approved 2003.

ITL Licensee: Cyanotech Corporation

Project: Commercial microalgae farming operation

ITL Duration: Original Endangered Species Permit: April 2002 (short term); Subsequent ITL December 24, 2003 – March 17, 2016; Renewal application for 2016-2035 in process

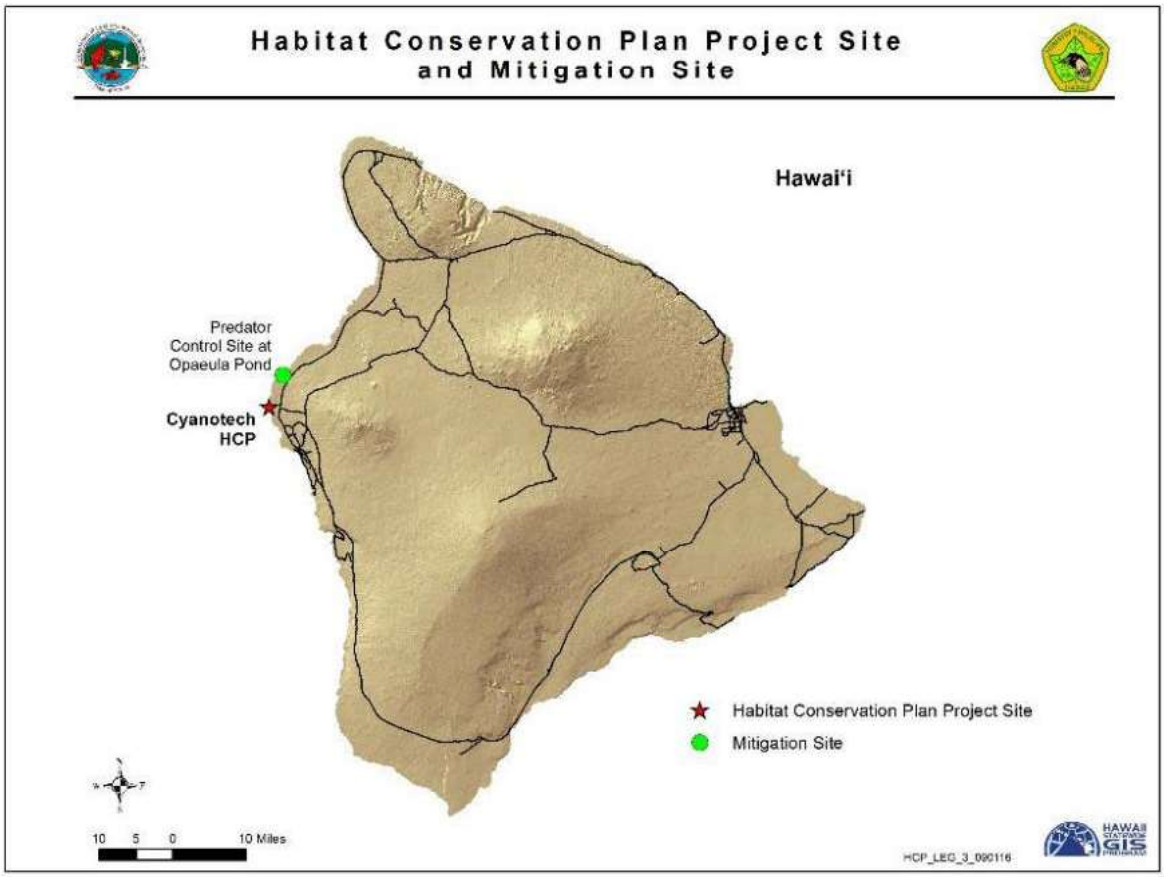


Figure 10. Location of Cyanotech HCP

Take Authorization Over 13-year Term:

Table 20. Take Authorization for Cyanotech HCP.

Permit Period	Common Name	Scientific Name	Total Authorized Over ITL Duration
2002-2016	Ae'o or Hawaiian Stilt	*Himantopus mexicanus knudseni*	The greater of, 45, or the number of chicks produced to offset losses
2016-2035* (requested renewal)	Ae'o or Hawaiian Stilt	*Himantopus mexicanus knudseni*	38 (requested)

*not yet approved

Status of ITL: There were no documented fatalities of HCP covered species of any other species listed as threatened or endangered in Hawai‘i at the Cyanotech facilities during the FY 2022 reporting period.

In accordance with the Cyanotech HCP, surveys for incidental take are conducted once per week during the nesting season (March-August) and once per month during the non-nesting season (September-February). Monitoring for injured wildlife is conducted daily as part of normal operations of the production raceways. Monitoring in FY 2022 documented seven Hawaiian Stilt nests that produce five hatchlings, of which three fledged. One of the fledged chicks was later found dead on one of the facilities raceways and the fate of the others was unknown.

Table 21 provides an estimate of the overall total adjusted take that has occurred since Cyanotech ITL issuance.

Table 21. Total observed fatalities since ITL issuance and estimated total adjusted take covered under the Cyanotech ITL as of June 30, 2016.

Common Name	Total Observed Take	Total Adjusted Take[1]
Hawaiian Stilt	18 adults, 4 chicks	43 fledglings

[1] Total adjusted take represented as number of fledglings, based on the survival rate of 2.17 fledglings with respect to incidental take of adult as described in the 2006 Cyanotech Amendment.

Mitigation Status:

Hawaiian Stilt. Prior to the HCP, mitigation occurred onsite at a lake that was managed as nesting and foraging habitat for stilts. Concerns about the proximity to the airport led to the onsite mitigation site being closed in 2002, with hazing implemented to discourage further nesting. Prior to being shut down, the on-site lake resulted in 237 fledglings, 48 of which fledged in 2002 and were “credited” to the HCP for the first year of permit coverage. According to a 2006 minor amendment, Cyanotech mitigation was to be satisfied by funding and implementing predator control at an off-site location. ‘Ōpae‘ula (now Kapo‘ikai) pond is a 3.24-hectare coastal wetland located in the North Kona district of Hawai‘i Island and was identified as a viable location for predator control efforts. Cyanotech worked with the private landowner to fund predator control efforts at ‘Ōpae‘ula pond to meet mitigation obligations to satisfy the HCP.

Renewal: In June 2016, Cyanotech requested a renewal of their ITL and HCP, with a requested take of 38 Hawaiian Stilts for the following 19 years (2016-2035). Cyanotech is required to propose a suitable potential mitigation project within one year of approval. Cyanotech is working on an agreement with the County of Hawaii to provide predator control at the Kealakehe Wastewater Treatment Plant as part of their off-site mitigation.

Kaua‘i Lagoons Habitat Conservation Plan, Kaua‘i, Hawai‘i. Approved 2012.

ITL Licensee: Kaua‘i Lagoons, LLC
(Note that Tower Kaua‘i Lagoons, LLC is the current name of the entity holding the license)

Project: Oceanfront resort encompassing approximately 600 acres

ITL Duration: April 11, 2012 – April 11, 2042 (as of end of FY 2022, 10 years (33%) through the permit term)

Kaua‘i Lagoons, Kaua‘i.

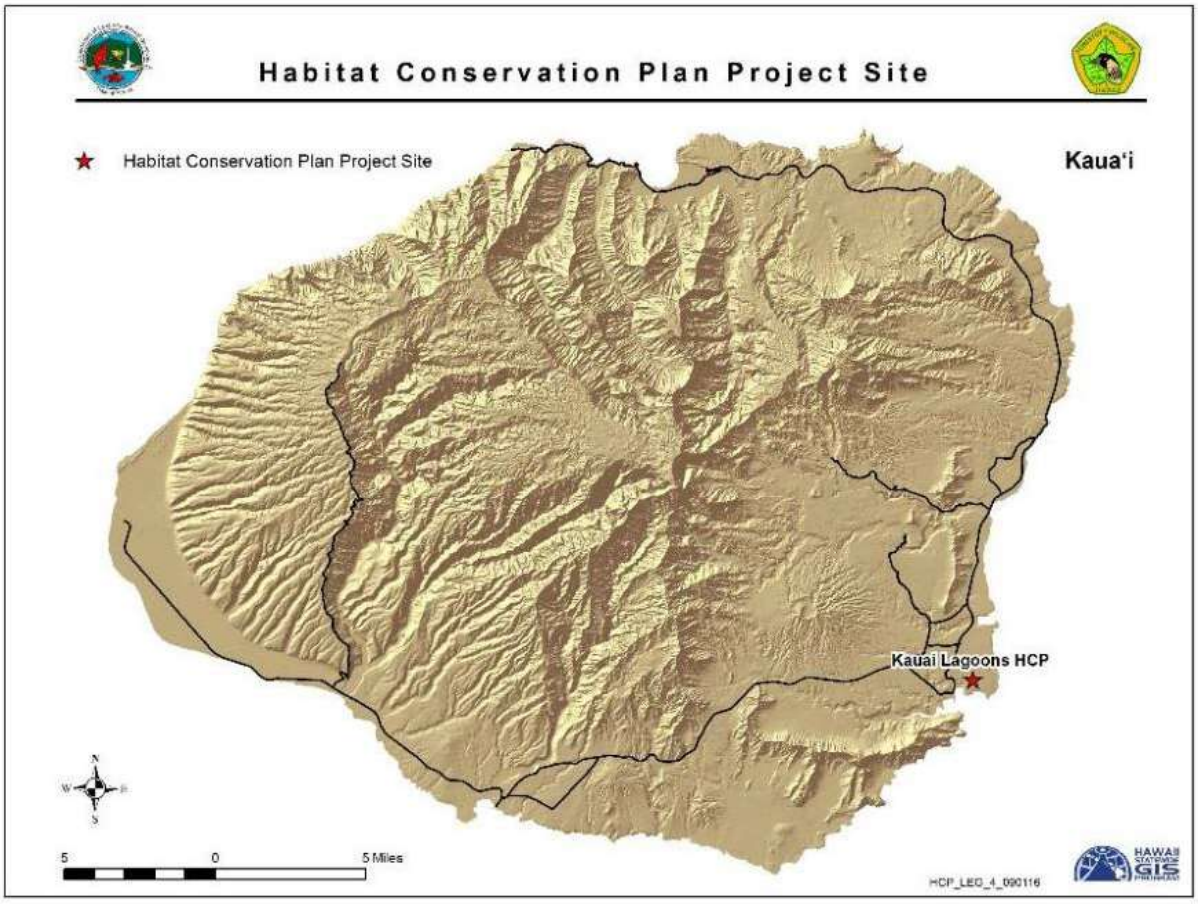


Figure 11. Location of Kaua‘i Lagoons HCP

Take Authorization Over 30-year Term:

Table 22. Take Authorization for Kauaʻi Lagoons HCP.

Common Name	Scientific Name	Type of Take	Total Authorized Over ITL Duration
ʻAʻo or Newell's Shearwater	*Puffinus auricularis newelli*	Life of permit	29[a]
Koloa Maoli or Hawaiian Duck	*Anas wyvilliana*	Mortality or Non-Lethal	36
Aeʻo or Hawaiian Stilt	*Himantopus mexicanus knudseni*	Mortality or Non-Lethal	38
ʻAlae Keʻokeʻo or Hawaiian Coot	*Fulica alai*	Mortality	110
		Non-Lethal	180
ʻAlae ʻUla or Hawaiian Moorhen	*Gallinula chloropus sandvicensis*	Mortality	40
		Non-Lethal	30
Nēnē or Hawaiian Goose	*Branta sandvicensis*	Mortality or Non-Lethal	17
ʻUaʻu or Hawaiian Petrel	*Pterodroma sandwichensis*	Life of Permit	1
ʻAkēʻakē or Band-rumped Storm Petrel	*Oceanodroma castro*	Life of Permit	1

[a] Authorized level of take changed from 27 to 29 as processed under the September 2013 minor amendment.

Status of ITL: Table 23 provides a listing of all documented incidental take during the reporting period.

Table 23. Documented incidental take of Covered Species at the Kauaʻi Lagoons site during the reporting period.

Common Name	FY 2022 Fatalities
Hawaiian Moorhen	5
Hawaiian Coot	11

Table 24 provides tentative observed mortalities that have occurred since Kauaʻi Lagoons ITL issuance. At the close of FY 2022, DOFAW found disparities in the licensee reported observed take for Hawaiian Moorhen and Hawaiian Coot, which had not been rectified prior to this reporting. This will be addressed, and accurate Observed and Total of these species will be reported in FY 2023. Of concern in Table 24 is the rate of Hawaiian Moorhen take. Although only 33% of the license term is complete, well over 75% of the permitted Hawaiian Moorhen lethal take has been reached as of the end of FY 2022 (a value that will likely be greater still after the above-mentioned reporting disparity for the species is rectified).

Table 24. Total observed incidental take since ITL issuance under the Kauaʻi Lagoons ITL as of June 30, 2022.

Common Name	Total Observed Take	Total Including Indirect Take
Newell's Shearwater	8	7
Nēnē	3	5
Hawaiian Moorhen [a]	28	39
Hawaiian Duck	7	7
Hawaiian Stilt	0	0
Hawaiian Coot [a]	31	23

[a] Observed and Total take reported here are likely inaccurate. This will be corrected for FY 2023

One non-lethal take of a Newell's Shearwater also occurred, which was found alive at the resort and released unharmed the following day by the Save Our Shearwaters (SOS) program.

In accordance with the Kaua'i Lagoons HCP, the Kaua'i Lagoons Resort (Resort) continued to implement the following minimization measures during this reporting period:

- On-site predator control;
- Comprehensive endangered species awareness training to all Resort employees, with updated modules, and retraining for all staff and contractors after the new owners took over;
- Deployment of construction monitors and biological monitors during construction operations to prevent harm to ITL covered species;
- Education program to inform golfers of the presence of endangered species and implement measures to avoid harm to such species while golfing;
- Program to minimize light-induced attraction of seabirds to Resort facilities by installing appropriate lighting fixtures, and implementing appropriate seasonal restrictions and practices; and
- Maintenance of on-site nesting areas.

The total number of Nēnē nests documented at Kaua'i Lagoons during FY 2022 was 26, from 26 different pairs and which produced 15 fledglings. On June 24, 2019 the U.S. Department of Agriculture Wildlife Services on behalf of Hawai'i Department of Transportation, Airports Division, began a pilot project to haze Nēnē from the property using dogs and other non-lethal methods, which extended throughout the reporting period and greatly reduced the number of Nēnē present on site. Other covered species also nested in FY 2022 including 5 Hawaiian Duck nests producing 29 chicks and 17 Hawaiian Moorhen nests producing 48 chicks (not all chicks will fledge).

The average number of individuals of each species observed during 99 waterbird counts in FY 2022 was 17 Nēnē, 6 Hawaiian Duck, 45 Hawaiian Moorhen, 125 Hawaiian Coot, and seven Hawaiian Stilt.

In FY 2020, the ITL-holder submitted an HCP amendment request to reflect the property's current name, implementing entity, and financial assurances. In FY 2022, this request was still under review by the agencies.

Mitigation Status:

Nēnē, Hawaiian Stilt, Hawaiian Coot, Hawaiian Moorhen, & Hawaiian Duck. Baseline mitigation for waterbirds consists of providing and maintaining approximately 35 acres of lagoons on the property that are an important habitat for endangered waterbird species, including predator control trapping and wildlife monitoring. Predator control efforts during the FY 2022 reporting period included deploying up to 25 live traps on the property. Live traps were deployed throughout the year and were placed in areas in response to sightings of mammalian predators; traps were checked daily.

Trapping resulted in the removal of 42 cats, 7 pigs, and one dog. Additionally, 890 chickens were removed via either live traps or the use of air rifles. Hōkūala also contributed mitigation funding of $85,000 to DOFAW in May 2012 to be used to conduct predator control and/or

manage Nēnē at a translocation site(s) after the completion of the State's five-year translocation project ending in 2016.

Newell's Shearwater, Hawaiian Petrel, & Band-rumped Storm Petrel. The minor amendment in 2013 increasing Newell's Shearwater take specified contribution of mitigation funding for seabird take in the amount of $10,000 annually to the National Fish and Wildlife Foundation (NFWF) account, to be held until such time as a Kaua'i island wide seabird HCP was finalized and approved. On September 15, 2022, $10,000 will be provided to NFWF to cover the FY 2023 season. In FY 2020, the Kaua'i Seabird HCP was approved.

Relocation of Round-leaved Chaff Flower (*Achyranthes splendens* var. *rotundata*) Habitat Conservation Plan, Kenai Industrial Park, Kapolei, Oʻahu, Hawaiʻi. Approved 2014

Achyranthes splendens var. *rotundata.*

ITL Licensee: CIRI Land Development Company (In September 2014 CIRI Land Development Company sold the property under the ITL to AKC Leasing Corporation)

Project: Industrial development on a 0.75-acre parcel

ITL Duration: February 10, 2014 – February 9, 2024 (as of end of FY 2022, 8.3 years [83%] through the permit term)

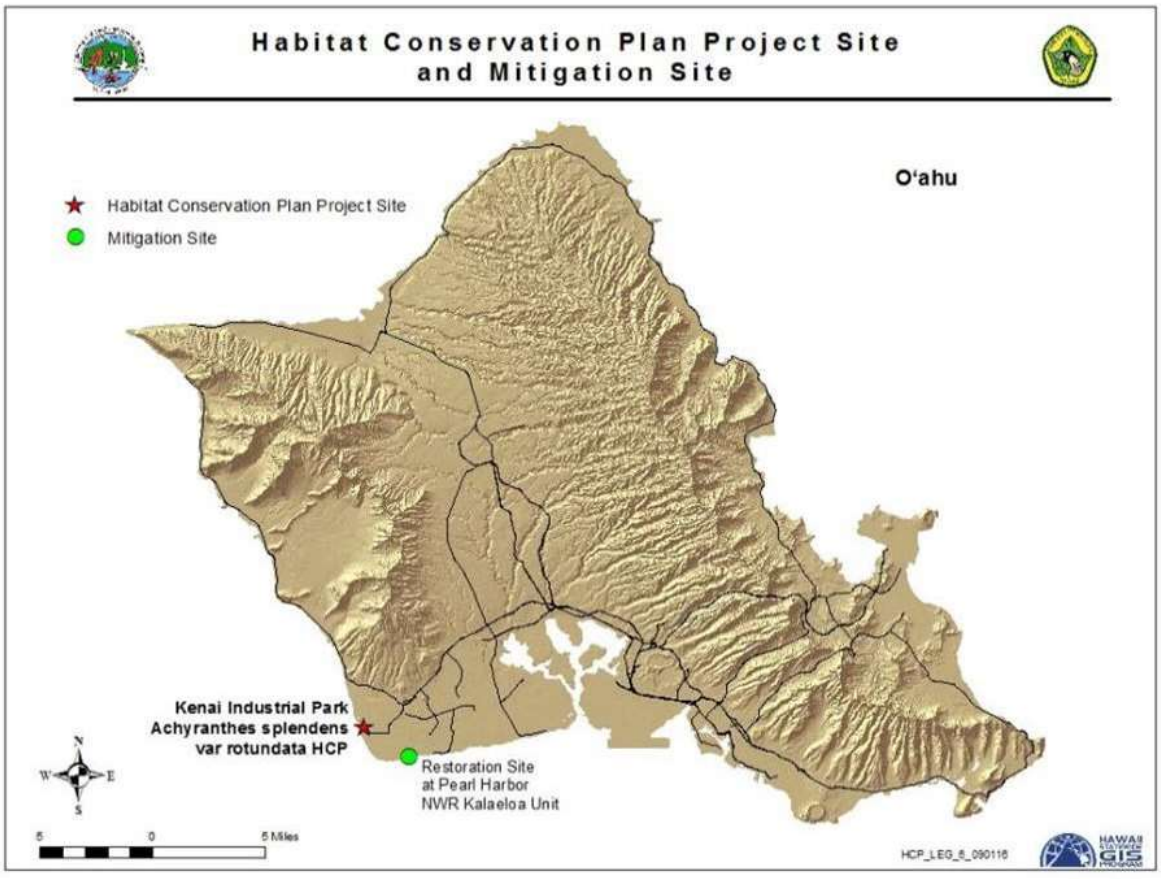


Figure 12. Location of Kenai Industrial Park HCP

Take Authorization Over 10-year Term:

Table 25. Take Authorization for Kenai Industrial Park.

Common Name	Scientific Name	Total Authorized Over ITL Duration
Round-leaved Chaff Flower	*Achyranthes splendens* var. *rotundata*	3 individuals and their seed bank

Status of ITL: All plants at the site have been removed under supervision of the State Botanist. Approximately 23,000 seeds were collected in 2014. Approximately 400 of the seeds collected were used to germinate plants at Hui Kū Maoli Ola native plant nursery, the remainder are in storage at the Lyon Arboretum seed facilities. The seeds at Hui Kū Maoli Ola were propagated and were used for out-planting at the mitigation site.

Mitigation Status:

Round-leaved Chaff Flower. In accordance with the HCP, seeds were collected from the project site and were either stored or propagated for future out-planting at the mitigation site located at the Kalaeloa Unit of the Pearl Harbor National Wildlife Refuge.

Plot 1 outplants on 4/25/17

A total of 159 plants were installed in four plots within the Kalaeloa Unit in November and December 2014. Each planting plot is approximately 12 × 12 meters (39.5 × 39.5 feet). In addition, four individual plants of Round-leaved Chaff Flower were planted outside of the Plots 1–4 in November 2014 and this area was designated Plot 5. As of June 29, 2021, there were 0 outplants (0% of 159 planted) surviving; therefore, the 75% survival by Year 5 outlined in success criteria 1 would not have been met if it were still valid. In all, 2 seedlings reached at least six inches in height in FY 2021. In June 2021, 57 live newly out-planted individuals were included in the count bringing the total number of individual progeny at the project site to 121.

Success criteria that apply to Year 5 of the monitoring include no fewer than 120 mature plants surviving, no mature kiawe present within the plots, less than 25% cover of herbaceous non-native plants, and more than 25% cover of native plants. At the end of FY 2021, there were 121 plants at the site (57 recently planted and not yet considered established), native plant cover ranged from 17-50% in the plots, and non-native plant cover ranged from 8-67% in the plots, and no mature kiawe were present in the plots. Weeding took place to ensure all plots met other success criteria.

Reports on the life expectancy of round-leaved chaff vary and range from two to 10 years; however, restoration managers generally agree that this species has a relatively short lifespan, relying on its high reproductive output to perpetuate its populations in the harsh, dry environments in which it is found. For this reason, in FY 2019 the ITL licensee and DOFAW discussed adjusting the survivorship criterion in the HCP to reflect that the species' lifespan often falls below this time period. In FY 2021, DOFAW finalized the ESRC's approval to omit success criteria 1 as requested by the permittee.

DOFAW paid a site visit to the Kalaeloa Unit on September 27, 2021, and determined that only 64 *Achyranthes* still occurred there in FY 2022. None of these plants were those originally planted in 2014, and not all plants were mature. The mortality rate of adult plants, therefore, had exceeded the recruitment of new individuals, resulting in fewer remaining *Achyranthes* than were in the founding population. Out-plantings and seedlings had been watered throughout the dry season and were observed still being watered during the site visit in early FY 2022. The provenance of the plants grown or out-planted for the project had additionally not been suitably tracked. Recruitment of seedlings that survive through the dry season, therefore (in absence of any supplemental watering) and seed production by at least 25% of the out-planted lineages still could not be determined in FY 2022. Excluding criterion 1, DOFAW concluded that three out of the six remaining success criteria had not yet been met.

In April of FY 2022 DOFAW met with the licensee to discuss the fate of 100 *Achyranthes* cuttings in the licensee's possession that were taken from the mitigation site. While the licensee prefers to hand these cuttings over to DOFAW, the agency feels that they do not have the capacity to tend to them and instead suggested the licensee look for an alternative mitigation site at which to plant them. Although the Kalaeloa Heritage Park in Kapolei was discussed as a suitable site no firm decision was made and no further discussion or follow up occurred between the licensee and DOFAW by the end of the fiscal year.

Funding Status: In September of 2014, CIRI Land Development Company (original owner of the property under the ITL) sold the property to AKC Leasing Corporation. AKC Leasing Corporation has acknowledged and understands that ownership of the property is subject to conditions under the approved Incidental Take License Number ITL-18 and the associated HCP for Kenai Industrial Park. AKC Leasing Corporation is required to provide all funding necessary to fulfill obligations outlined in the approved HCP including funding assurances. In FY 2021 and 2022, AKC Leasing Corporation used their own procurement processes to fulfill HCP obligations.

Kauaʻi Seabird Habitat Conservation Plan, Kauaʻi Island, Hawaiʻi. Approved 2020.

ITL Licensees:

- Alexander & Baldwin, Inc.
- County of Kauaʻi
- Hawaiʻi Department of Transportation
- Royal Sonesta Resort (Essex House Condominium Corporation)
- Kauaʻi Coffee Company, LLC
- NCL (Bahamas) Ltd.
- Princeville Resort Kauaʻi (XI Kauaʻi PV Hotel)
- Sheraton Kauai (Kauai Blue, Inc)

Newell's Shearwater (Puffinus auricularis newelli)

Project: Island wide conservation plan to address the impacts of artificial lights to seabirds on Kauaʻi

ITL Duration: June 12, 2020 – June 12, 2050

Take Authorization Over 30-year Term:

Table 26. Take Authorization for All Participating Entities.

	Authorized Take over Permit Term			
	(lethal/non-lethal) fledglings			
Participant	Newell's Shearwater (ʻAʻo)	Hawaiian Petrel (ʻUaʻu)	Band-rumped Storm Petrel (ʻAkēʻakē)	Green Sea Turtle (Honu)
Kauaʻi Marriott Resort	33 / 22	1 / 1	1 / 1	0
Kauaʻi Coffee	34 / 27	-	-	0
Sheraton Kauaʻi	81 / 64	1 / 1	3 / 3	0
NCL	30 / 30	6 / 6	6 / 6	0
Princeville Resort	125 / 476	6 / 6	1 / 1	0
County of Kauaʻi	276 / 217	17 / 4	4 / 0	0
Hawaiʻi Dept. of Transportation	103 / 144	5 / 12	1 / 2	0
Alexander & Baldwin	104 / 80	3 / 3	1 / 1	0

Status of ITL: The Kauaʻi Seabird Habitat Conservation Plan (KSHCP) was approved in FY 2020 and addresses artificial nighttime lighting threats and light attraction on covered seabirds and the Hawaiian Green Sea Turtle (*Chelonia mydas*).

In total, nine Newell's Shearwaters and one Hawaiian Petrel were found on participants properties during the 2021 seabird fallout season (Table 27). Calculated take is in Table 28. Eight shearwaters and the one petrel were alive and were brought to the Save our Shearwaters facility at the Kauai Humane Society for release after stabilization; six of those birds were

released and one shearwater and the petrel were euthanized. No Band-rumped Storm Petrels were found during the 2021 season.

Table 27. Summary of all downed seabirds in FY 2022 under the KSHCP

Date	Property	Species	Status
10/3/2021	Port Allen Shoreline	Newell's Shearwater	Released
10/6/2021	Nawiliwili Harbor	Newell's Shearwater	Found dead
10/26/2021	Sheraton Bell Desk	Newell's Shearwater	Released
10/27/2021	Sheraton Ocean Pool	Newell's Shearwater	Released
10/29/2021	Lihue Airport	Newell's Shearwater	Released
11/1/2021	Lihue Airport	Newell's Shearwater	Released
11/2/2021	Nawiliwili Harbor	Newell's Shearwater	Euthanized in care
11/3/2021	Nawiliwili Harbor	Newell's Shearwater	Released
11/15/2021	Lihue Airport	Newell's Shearwater	Euthanized in care
11/27/2021	Nawiliwili Harbor	Hawaiian Petrel	Euthanized in care

Table 28. Calculated seabird take for all Participants in FY 2022

	Newell's Shearwater		Hawaiian Petrel		Band-rumped Storm Petrel	
Property or Facility	**Lethal**	**Non-lethal**	**Lethal**	**Non-lethal**	**Lethal**	**Non-lethal**
A&B- Multiple	2	2	0	0	0	0
Kauai County-Multiple	0	0	0	0	0	0
HDOT-Lihue Airport	2	2	0	0	0	0
HDOT-Nawiliwili Harbor	2.2	0	1.1	0	0	0
HDOT-Port Allen	0	0	0	0	0	0
Kauai Coffee	0	0	0	0	0	0
Royal Sonesta	0	0	0	0	0	0
NCL	0	0	0	0	0	0
Princeville Resort Kaua'i	0	0	0	0	0	0
Sheraton Kauai Resort	2	2	0	0	0	0
Total FY 2021 Take	8.2	6	1.1	0	0	0

In August 2021, at the Royal Sonesta, security patrols found twenty-six green sea turtle hatchlings within the grounds of the resort "…spread across a wide swath of the property… in the hallways and in the pool". This take was not correctly reported.

Facility changes: There was one ownership transfer in 2021- A&B sold the Kukuila Development to Brue Baukol Capital Partners during the 2021 seabird season.

Two additional properties were re-named and/or rebranded. The management of the Association of Apartment Owners of the Kaua'i Marriott Resort transitioned in 2021 from Essex House Condominium Corporation (an affiliate of Marriott International, Inc.) to Sonesta International Hotels Corporation. Although management has changed, the property continues to be owned by HPTMI Hawaii, Inc. after this transition. Until the permit is transferred it continues to be held by Essex House Condominium Corporation and implemented by current management.

The name of property owned by SOF-XI Kauai PV Hotel, LP was also changed from Princeville Resort to 1 Hotel Hanalei Bay. The facility owner and permit holder (SOF-XI Kauai PV Hotel, LP) remain unchanged. The property is under renovation with plans to reopen in 2022.

Mitigation Status:

Hawaiian Petrel, Newell's Shearwater & Band-rumped Storm Petrel. Under the KSHCP, the participants will mitigate their take, in part, by enhancing, protecting, and managing suitable seabird breeding habitat on Kaua‘i to facilitate successful production of covered seabirds. This will be accomplished through 1) the construction and maintenance of a predator proof enclosure installation, 2) long-term maintenance of social attraction equipment within the enclosure, and 3) eradication of predators from within the enclosure, and implementation of long-term predator control at the site. The KSHCP identified the Kahuama‘a Flats within the Kōke‘e State Park as a suitable location for the mitigation/social attraction site.

The Kahuama'a seabird preserve site was selected during the HCP process to create a fenced, predator-free seabird preserve in the northwest region of Kaua‘i. Owing to a large landslide that occurred at the originally proposed site, an alternative preserve site was selected 102m away from the original site resulting in changed circumstances being initiated almost immediately upon the adoption of the HCP. The new site selected provides comparable area and habitat to the originally proposed site. In FY 2021, construction of the 9.2-acre seabird reserve was completed. Biological monitoring of forest birds, seabirds and habitat at the preserve site were completed prior to the initiation of construction in FY 2020 and continued into FY 2021; all required surveys were completed during that time to provide an inventory of the flora and fauna present in the area. Intensive burrow searching indicated that seabirds do not appear to be nesting in the immediate project area but based on high rates of detection during auditory surveys they were clearly transiting the area daily during the breeding season. With the deployment of social attraction infrastructure and installation of 100 artificial burrows in 2021, it is expected they will readily find the mitigation site.

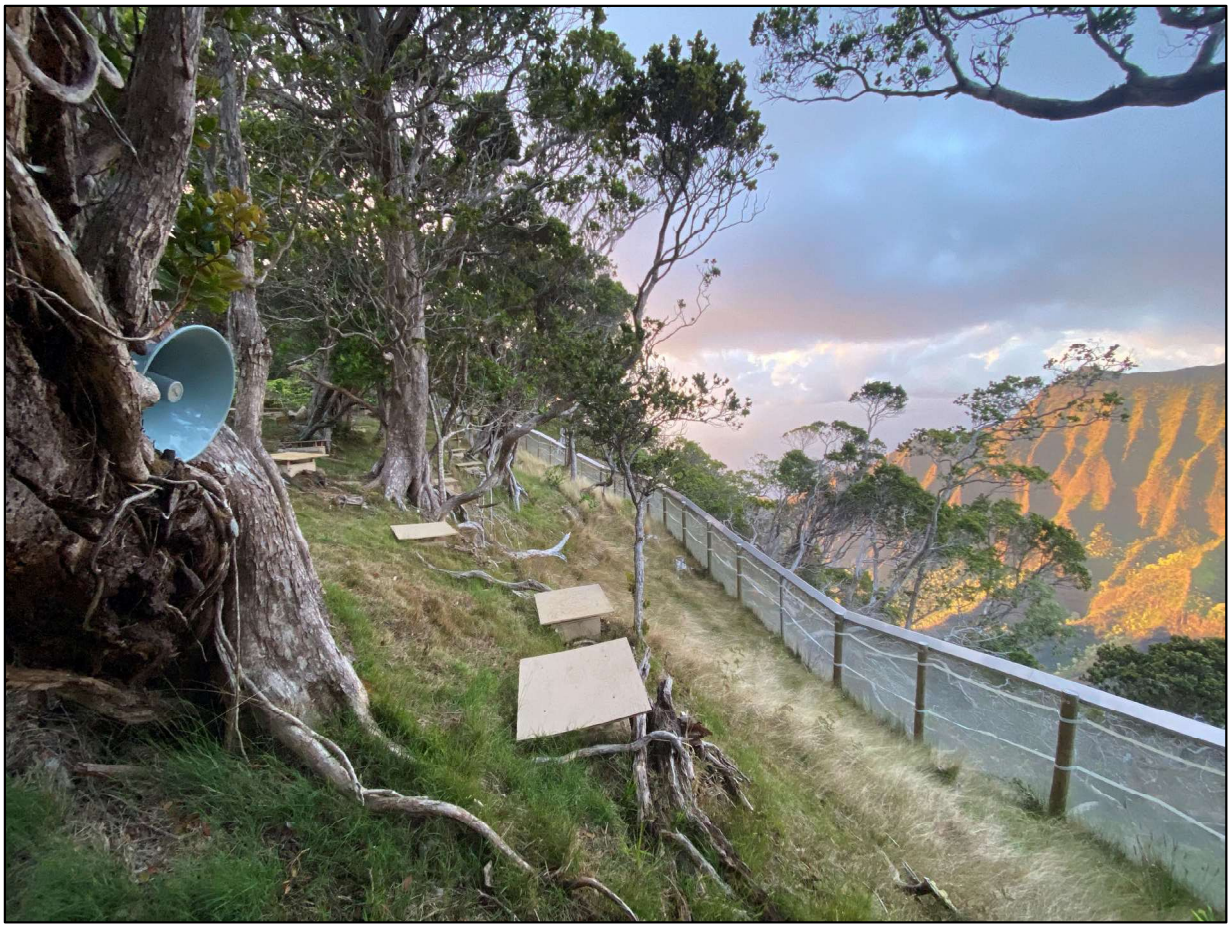


Figure 13. Kahuama'a Seabird Preserve new fence, artificial nesting burrows, and social attraction speakers

SUMMARY OF SAFE HARBOR AGREEMENTS AND ASSOCIATED INCIDENTAL TAKE LICENSES

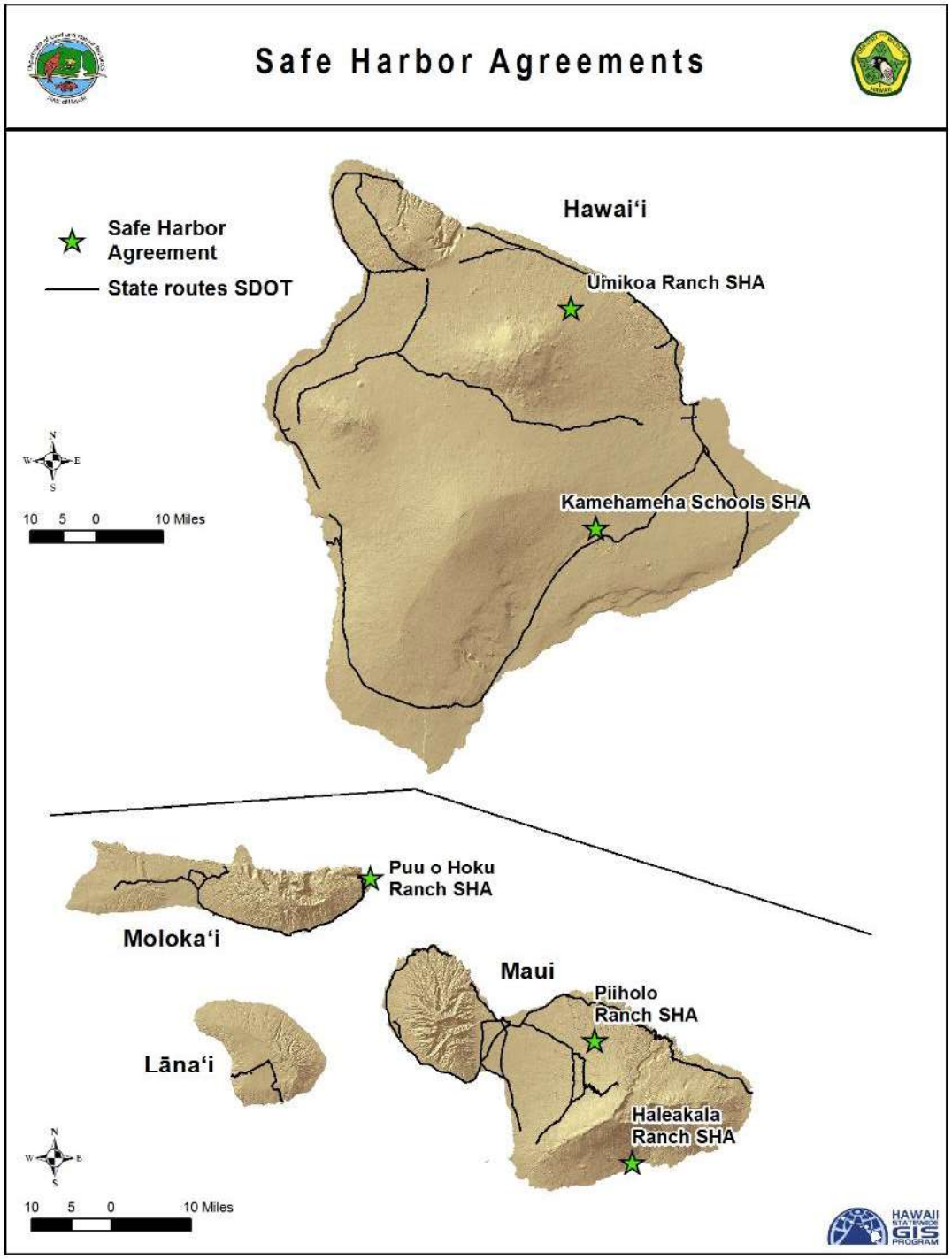


Figure 1. Location of Safe Harbor Agreements

Safe Harbor Agreement for Pu‘u o Hōkū Ranch, Moloka‘i.

ITL Licensee: Pu‘u o Hōkū Ranch, Limited.

Project: Reintroduce Nēnē (*Branta sandvicensis*) to Pu‘u o Hōkū Ranch, Moloka‘i.

ITL and SHA Duration: ITL has no specific expiration and is valid unless rescinded; SHA period was from September 4, 2001, to September 3, 2008 (DOFAW is currently in discussion with Pu‘u o Hōkū Ranch to enter into a new agreement).

Nēnē, official bird of the State of Hawai‘i, resting in the foreground.

Take Authorization: Incidental take of Nēnē on lands owned or otherwise controlled by Pu‘u o Hōkū Ranch, Limited.

Baseline Condition: At the time of agreement execution, there was no wild Nēnē on Moloka‘i. Therefore the baseline condition is zero wild Nēnē on Pu‘u o Hōkū Ranch property. The SHA allowed for reintroduction of Nēnē on Pu‘u o Hōkū Ranch property, construction of a release pen, provision of habitat for Nēnē grazing and breeding, and control of predators in the release pen and breeding areas.

Status of ITL and SHA: There was take of one Nēnē gosling at Pu‘u o Hōkū Ranch this fiscal year. In FY 2022 Nēnē monitoring was performed on a weekly basis by DOFAW personnel throughout the reporting period. Observations from surveys throughout the reporting period resulted in a total of eight birds, which was the estimated population size. Island-wide Nēnē survey was conducted on Molokai on September 7, 2021, during which the same eight individuals were recorded.

During the August through April nesting season no nests were recorded within the open-top release pen at Pu‘u o Hōkū Ranch and no additional nests were located on the ranch or adjacent areas.

Maintenance at the three-acre open-top release pen in FY 2022 included monthly checks and repairs of fences, weekly checks of waterlines and water troughs, and mowing the half-acre around the pen. Twenty-five feet of fence line was repaired this fiscal year, the pen’s front entry gate was replaced, and two water troughs were repaired to prevent leaking. A total of 2.25 acres of alien vegetation (Lantana and Haole Koa) was removed from the pen and mowing by DOFAW staff totaled 30 acres. Ranch personnel mowed an additional 1000 acres within the ranch.

Sixteen live traps were checked regularly at the pen and a total of 30 mongooses and one cat were removed around the open-top release pen at Pu‘u o Hōkū Ranch in FY 2022.

A total of 74 birds were translocated to the Pu‘u o Hōkū Ranch from 2002-2005. Table 1 provides survey data for the original 74 birds translocated to the Pu‘u o Hōkū Ranch. The percentage of the original 74 birds that were re-sighted is a factor of survey effort and does not

account for any unknown mortality or emigration from the ranch and may not necessarily be a measure of translocation success.

Table 1. Observations of Nēnē translocated to Puʻu o Hōkū Ranch

Year	No. of Birds Translocated	Total Birds Translocated	No. of Known Fatalities	No. of Birds Sighted	Percentage (%) of Translocated Birds Sighted (excluding known fatalities)
2022	0	74	0	0	0
2021	0	74	0	0	0
2020	0	74	0	0	0
2019	0	74	0	1	2
2018	0	74	0	1	2
2017	0	74	0	1	2
2016	0	74	0	2	3
2015	0	74	0	4	5
2014	0	74	0	6	9
2013	0	74	0	6	9
2012	0	74	0	6	9
2011	0	74	0	7	11
2010	0	74	0	8	13
2009	0	74	0	18	28
2008	0	74	1	33	52
2007	0	74	0	38	58
2006	0	74	5	29	45
2005	11	74	2	47	67
2004	8	63	1	42	69
2003	41	55	1	54	100
2002	14	11	0	14	100

Programmatic Safe Harbor Agreement for Nēnē, Moloka'i.

ITL Licensee: DOFAW to issue Certificates of Inclusion under authority of §195D-22, HRS, to landowners signing Cooperative Agreements.

Project: Encourage private landowner management activities to benefit Nēnē and provide regulatory assurances if Nēnē occupy or breed on their property.

ITL Duration: April 7, 2003 – April 6, 2053.

Take Authorization: Any Nēnē or Nēnē habitat above Baseline Conditions, as defined in respective landowner Cooperative Agreements.

Baseline Condition: To be set in each landowner Cooperative Agreement.

Status of ITL and SHA: During the reporting period and to date, there are no landowners enrolled under this SHA; discussions with interested landowners are ongoing.

Safe Harbor Agreement for the Introduction of Nēnē to Pi‘iholo Ranch, Maui.

ITL Licensee: Pi‘iholo Ranch, LLC.

Project: Establish a Nēnē population on Pi‘iholo Ranch.

ITL Duration: The ITL is valid for 50 years from September 21, 2004, to September 20, 2054; the SHA is currently expired. The original period was from September 21, 2004, to September 20, 2014.

Take Authorization: Incidental take of Nēnē on lands owned or otherwise controlled by Pi‘iholo Ranch, LLC.

Pi‘iholo Ranch on Maui.

Baseline Condition: Following Nēnē reintroduction efforts on Maui that began at Haleakalā National Park in 1962, DOFAW began establishing a population in west Maui through a reintroduction program at Hana‘ula in 1995. However, prior to the development of the SHA, there had been no known Nēnē sightings at Pi‘iholo Ranch premises by DOFAW staff or Ranch personnel. The baseline condition, therefore, was determined to be zero. Under the SHA Pi‘iholo Ranch was to maintain or improve approximately 600 acres of Nēnē habitat for a period of 10 years.

Status of ITL and SHA: There was take of three Nēnē (one adult, one gosling, and one fledgling) at Pi‘iholo Ranch this fiscal year. The activities under the SHA were construction of a Nēnē release pen, predator control activities around Nēnē nesting and breeding sites, and out-planting native plant species known to be Nēnē food sources. There were 14 nests in FY 2022, all of which were inside the open-top release pen; six of these nests fledged 10 young. Two goslings died of unknown causes before fledging.

Nēnē monitoring recorded 34 banded birds on the Ranch in FY 2022. An island wide annual Nēnē survey was conducted on September 27, 2021; no birds were observed during this survey. The population on the ranch was estimated as 43 individuals. However, these birds only frequent the pen during certain times of the year and are also seen across the entire island of Maui.

The open-top pen’s fence line was continuously checked and maintained throughout the fiscal year. Three holes along a 10-foot section of fence were repaired, and 45 feet of metal skirt was reattached where it had disconnected from the main fence due to cattle damage. Two broken water lines were repaired, a 1-foot water line was replaced, the supply valves were replaced at the pen. and automatic waterers were cleaned and maintained weekly. A 2-foot perimeter along the fence line was weed wacked, for a total of 7.75 acres around the pen. A total of 40.5 acres was mowed this year to maintain Nēnē short grass habitat and 1 acre of invasive fireweed was removed from the pen.

Predator control efforts from 70 traps employed in FY 2022resulted in a total of 15 mongooses and one mouse trapped and removed around the open-top release pen at Pi‘iholo Ranch.

Table 2 provides survey data for the original 48 birds released to the Ranch. The percentage of the original 48 birds that were re-sighted is a factor of survey effort and does not account for any unknown mortality or emigration from the Ranch and may not necessarily be a measure of release success.

Table 2. Observations of Nēnē translocated to Piʻiholo Ranch

Year	No. of Birds Translocated	Total Birds Translocated	No. of Known Fatalities	No. of Birds Sighted	Percentage (%) of Translocated Birds Sighted (excluding known fatalities)
2022	0	48	0	0	0
2021	0	48	0	0	0
2020	0	48	0	1	2
2019	0	48	0	3	6
2018	0	48	0	3	6
2017	0	48	0	4	9
2016	0	48	0	9	20
2015	0	48	0	10	23
2014	0	48	0	10	23
2013	0	48	0	11	25
2012	0	48	0	11	25
2011	0	48	1	16	36
2010	0	48	0	23	51
2009	0	48	1	26	58
2008	10	48	0	30	65
2007	25	38	2	26	72
2006	8	13	0	12	92
2005	5	5	0	5	100

Safe Harbor Agreement for the Reintroduction of Nēnē to Haleakalā Ranch, Maui.

ITL Licensee: Haleakalā Ranch Company.

Project: Establish a Nēnē population on Haleakalā Ranch, Maui.

ITL Duration: The ITL is valid for 50 years from May 22, 2012, to May 21, 2062; the SHA has been finalized as of August 2019.

Take Authorization: Incidental take of Nēnē on lands owned or otherwise controlled by Haleakalā Ranch.

Baseline Condition: There had been no Nēnē sightings at Haleakalā Ranch by DOFAW staff or ranch personnel prior to execution of the SHA, therefore the baseline condition was determined to be zero.

Status of ITL and SHA: There was take of three Nēnē at Haleakalā Ranch (1 adults and 2 goslings) reported this fiscal year. DOFAW in cooperation with Haleakalā Ranch has constructed a two-acre Nēnē release pen, conducts predator control activities around Nēnē nesting and breeding sites, and maintains access roads leading to the Nēnē release pen.

DOFAW conducted regular monitoring during the reporting period at Haleakalā Ranch. A total of 31 banded birds were recorded this season at the pen, of which 29 were wild Maui birds and two were Kauaʻi translocated birds. Four Nēnē were observed during the September 27, 2021, survey and the population for the Ranch is estimated at 37 birds. However, these birds only frequent the pen during certain times of the year and are also seen throughout the entire island of Maui.

Ten nests were found in FY 2022, nine inside the open-top release pen this season and one outside under the open water unit. Six nests successfully produced 12 goslings, two of which died of impact injuries before fledgling; the remaining 10 fledged successfully. One adult Nēnē was found at the pen with a broken right wing and later euthanized by the vet because of the severity of the injury.

Maintenance activities included checking fences and automatic waterers monthly. The water unit was checked and maintained monthly. The pond was drained and cleaned once a month and refilled with clean water. Two holes were patched along a 5-foot section of fence and the entire fence line was weed wacked each month for a total of 4.5 acres for FY 2022. In total 28.25 acres were mowed in and around the pen to maintain short grass habitat and alien vegetation including lantana, guava, tomato, fireweed, and bur, was removed. The road to the pen was maintained as needed by moving rocks and backfilling holes with dirt and rocks and approximately 20 feet was repaired in FY 2022.

Predator control efforts from 70 traps resulted in a total of eight mongooses removed around the open-top release pen.

A total of 53 birds were translocated to Haleakalā Ranch between 2011 – 2016. Table 3 provides survey data for the original 53 translocated birds. The percentage of the original 53 birds that

were re-sighted is a factor of survey effort and does not account for any unknown mortality or emigration from the Ranch and may not necessarily be a measure of release success.

Table 3. Observations of Nēnē translocated to Haleakala Ranch

Year	No. of Birds Translocated	Total Birds Translocated	No. of Known Fatalities	No. of Birds Sighted	Percentage (%) of Translocated Birds Sighted (excluding known fatalities)
2022	0	53	0	2	4
2021	0	53	1	8	15
2020	0	53	0	10	19
2019	0	53	0	10	19
2018	0	53	0	13	25
2017	0	53	0	19	40
2016	8	53	0	28	60
2015	8	45	1	25	64
2014	0	37	2	23	84
2013	7	37	1	31	91
2012	20	30	2	30	100
2011	10	10	0	10	100

Safe Harbor Agreement for the Koloa Maoli or Hawaiian Duck (Anas wyvilliana) and the Nēnē or Hawaiian Goose (Branta sandvicensis) on ʻUmikoa Ranch, Hawaiʻi Island.

Koloa Maoli or Hawaiian Duck, endemic to the Hawaiian Islands.

ITL Licensee: Umikoa Ranch.

Project: Establish a Koloa and Nēnē population on privately owned lands of ʻUmikoa Ranch in the Hamakua District of Hawaiʻi Island.

ITL Duration: The ITL is valid from December 5, 2001, to December 4, 2100; the SHA period is from December 5, 2001, to December 4, 2021.

Take Authorization: Incidental take of Nēnē and Koloa, including their progeny, on lands owned or otherwise controlled by ʻUmikoa Ranch, provided that such take is above established baseline conditions.

Baseline Condition: The Baseline Conditions for Koloa and Nēnē were determined from monthly biological surveys conducted between January and October 2000. During this time there were five existing ponds ranging from 0.12 to 0.30 acres, providing approximately one acre of open water habitat, in addition to five acres of adjacent upland habitat. Surveys indicated that the ʻUmikoa wetland area was frequented by a single pair of wild Koloa. Therefore, the baseline for Koloa was determined to be two individuals, one acre of open water habitat, and five acres of adjacent upland habitat. The baseline for Nēnē was determined to be zero.

Status of ITL: It is unknown if there was take of covered species at ʻUmikoa Ranch in FY 2021 due to lack of reporting. The Ranch is responsible for maintaining fencing around 10 ponds, consisting primarily of open water, and surrounding riparian and associated upland habitat totaling a minimum of 50 acres. Fences at two of the ponds were in need of repair based on a site visit in December 2018.

Additionally, no waterbird surveys were conducted in FY 2021 due to access issues. In FY 2021, USFWS terminted the Federal ITP for ʻUmikoa Ranch and DOFAW rescinded the ranch's ITL due to lack of reporting and communication.

Safe Harbor Agreement for Kamehameha Schools, Keauhou and Kīlauea Forest Lands, Hawai‘i Island

ITL Licensee: Trustees of the Estate of Bernice P. Bishop, DBA Kamehameha Schools.

Project: Restoration and enhancement of habitat for native plants and animals.

ITL Duration: The ITL is valid from June 22, 2018, to June 21, 2068.

Example species in the Kamehameha Schools SHA.

Take Authorization and Baseline Condition:

Table 4. Take Authorization for Kamehameha Schools SHA

Common Name	**Scientific Name**	**Incidental Take Permitted No. of Individuals or Habitat**	**Baseline Individuals or Habitat**
Forest Birds: ‘Akiapōlā‘au, Hawai‘i Creeper Hawai‘i ‘Ākepa ‘I‘iwi	*Hemignathus wilsoni* *Loxops mana* *Loxops coccineus* *Vestiaria coccinea*	Any habitat for the four forest birds above the baseline identified on the Enrolled Property	Approximately 4,162 acres of habitat in Forest Bird Stratum 1 on the Enrolled Property
Hawaiian Hawk, ‘Io	*Buteo solitarius*	Any habitat for the ‘Io above the baseline identified on the Enrolled Property	Approximately 18,517 acres of habitat on the Enrolled Property
Hawaiian Crow, ‘Alalā	*Corvus hawaiiensis*	Any individual on or at the Enrolled Property	Zero Individuals
Hawaiian Goose, Nēnē	*Branta sandvicensis*	Any individual on or at the Enrolled Property	Zero Individuals
Hawaiian Hoary Bat, ‘Ōpe‘ape‘a	*Lasiurus cinereus semotus*	Any habitat for the ‘Ōpe‘ape‘a above the baseline identified on the Enrolled Property	Approximately 18,517 acres of habitat on the Enrolled Property
None	*Asplenium peruvianum var. insulare*	Any individual on or at the Enrolled Property	128 Individuals
‘Ōhā wai	*Clermontia lindseyana*	Any individual above the baseline on the Enrolled Property	24 Individuals
Hāhā	*Cyanea shipmanii*	Any individual above the baseline on the Enrolled Property	463 Individuals
Hāhā	*Cyanea stictophylla*	Any individual above the baseline on the Enrolled Property	104 Individuals
Kīponapona	*Phyllostegia racemosa*	Any individual above the baseline on the Enrolled Property	4 Individuals
None	*Phyllostegia velutina*	Any individual above the baseline on the Enrolled Property	38 Individuals
None	*Plantago hawaiensis*	Any individual above the baseline on the Enrolled Property	1 Individual
None	*Vicia menziesii*	Any individual above the baseline on the Enrolled Property	27 Individuals

Common Name	**Scientific Name**	**Incidental Take Permitted No. of Individuals or Habitat**	**Baseline Individuals or Habitat**
ʻĀhinahina	*Argyroxiphium kauens*	Any individual above the baseline on the Enrolled Property	Zero Individuals
ʻŌha	*Clermontia peleana*	Any individual above the baseline on the Enrolled Property	Zero Individuals
ʻAkū	*Cyanea tritomantha*	Any individual above the baseline on the Enrolled Property	Zero Individuals
Haʻiwale	*Cyrtandra giffardii*	Any individual above the baseline on the Enrolled Property	Zero Individuals
Haʻiwale	*Cyrtandra tintinnabula*	Any individual above the baseline on the Enrolled Property	Zero Individuals
Hau kuahiwi	*Hibiscadelphus giffardianus*	Any individual above the baseline on the Enrolled Property	Zero Individuals
ʻOhe	*Joinvillea ascendens*	Any individual above the baseline on the Enrolled Property	Zero Individuals
Alani	*Melicope zahlbruckneri*	Any individual above the baseline on the Enrolled Property	Zero Individuals
None	*Neraudia ovata*	Any individual above the baseline on the Enrolled Property	Zero Individuals
ʻAiea	*Nothocestrum breviflorum*	Any individual above the baseline on the Enrolled Property	Zero Individuals
None	*Phyllostegia floribunda*	Any individual above the baseline on the Enrolled Property	Zero Individuals
None	*Phyllostegia parviflora*	Any individual above the baseline on the Enrolled Property	Zero Individuals
Makou	*Ranunculus hawaiiensis*	Any individual above the baseline on the Enrolled Property	Zero Individuals
ʻĀnunu	*Sicyos alba*	Any individual above the baseline on the Enrolled Property	Zero Individuals
ʻĀnunu	*Sicyos macrophyllus*	Any individual above the baseline on the Enrolled Property	Zero Individuals
None	*Silene hawaiiensis*	Any individual above the baseline on the Enrolled Property	Zero Individuals
None	*Stenogyne angustifolia*	Any individual above the baseline on the Enrolled Property	Zero Individuals

Status of ITL: Kamehameha Schools requested to revise the baseline for four species of plants in FY 2021 (ʻŌhā wai *Clermontia lindseyana*, Hāhā *Cyanea shipmanii*, Hāhā *Cyanea stictophylla*, and Kīponapona *Phyllostegia racemose*) due to outplant mortality within the first two years of the agreement, as documented by a comprehensive survey conducted by the Hawaiʻi Plant Extinction and Prevention Program (PEPP). They also requested based baseline revisions for the Hawaiian Hawk and Hawaiian Hoary Bat because of habitat destroyed by the 2018 Keauhou fire, considered a *force majure* event. This is currently under consideration by DOFAW.

In FY 2022, a total of 14,080 native plants of 22 species were planted. Of these 10,251 were koa seedlings. All the out-plantings occurred outside of Forest Bird Stratum 1 during the reporting period. Planting areas were concentrated in the lower portions of the Enrolled Property and, because of COVID-19 related precautions, out-planting was conducted primarily by collaborators and vendors with limited small group volunteer and ʻohana events (educational

planting events consisted of 20 small groups of 169 volunteers). Silviculture activities included 91 acres of new koa planted outside of Forest Bird Stratum 1, for a total of 358 acres of koa planted over the first four years of the Agreement. Other stand improvement activities included singling of 70 acres within stands planted in 2021 to remove competitive branches at the top of koa seedlings and pruning of lower branches from 41 acres within stands planted in 2019 and 62 acres planted in 2020 to improve stem form.

All fence lines were regularly inspected at least semi-annually in FY 2022 with most inspected 3-4 times a year; repairs were completed as needed to maintain ungulate exclusion. Additional fence work to prevent ingress into Keauhou included the replacement of the Puu Lālā‘au makai fence line, which separates the Puu Lālā‘au unit from the area in lower Keauhou. The 9-49” wire was found to be deteriorating and is being replaced with the smaller mesh 13-48” hogwire which is the standard size used to prevent potential ingress of small piglets. About 0.4 miles of fence were replaced in FY 2022 and work is ongoing. Just under a mile of the upper Keauhou boundary fence was also replaced, completing the replacement of this eline that stretched over multiple years.

No signs of ungulates were observed for the seventh consecutive year in upper Keauhou. Pig signs were observed in the lower Keauhou and Pu‘u Kipu units and control work is ongoing.

The wildfire in August 2018 consumed 3,739 acres including 649 acres of the enrolled property in addition to the much larger area in the adjacent Volcanoes National Park. In response to the 2018 wildfire, an 18,000-foot firebreak was installed along the property boundary with National Park in FY 2019. In FY 2022, Kamehameha Schools inspected and maintained all water sources, access routes, the recently installed firebreak, and tertiary roadways.

Kamehameha Schools suppressed weed species across 3,247 acres in FY 2022. Suppression activities occurred on 2,182 acres within Forest Bird Stratum 1 and 1,065 acres on the remainder of the Enrolled Property. Targeted priority weed species were Faya (*Morella faya)*, Ginger (*Hedychium gardnerianum*), Strawberry Guava (*Psidium cattleianum*), Himalayan Raspberry (*Rubus ellipticus*), and Blackberry (*Rubus argutus*). Existing populations of priority weed species was below 10% within conservation fences that is a criterion specified in the SHA.

Kamehameha Schools assessed 4,182 acres for target weed species via ground surveys in FY 2022. Other weed assessments this fiscal year located a large population of Japanese anemone (*Anemone hupehensis)* growing across nearly 1,000 acres of ‘ā‘ā on the dry side of lower Keauhou, as well as the first detection of Mexican elderberry (*Sambucus mexicana*). Both species are highly invasive and will be targets for control in FY 2023.

Die-off from Rapid ‘Ōhi‘a Death (ROD) has been observed in portions of lower Keauhou in areas outside of conservation fences since June 2017. In FY 2022, the number of trees appearing to be symptomatic of ROD increased across this area. In July 2022, however, (just outside of the FY 2022 reporting period), Three Mountain Alliance (TMA) and Big Island Invasive Species Committee (BIISC) crews sampled 10 symptomatic trees in lower Keauhou and none tested positive for ROD. TMA staff noted that there was significant longhorn beetle damage on the sampled trees, and they will be working with researchers to further investigate the dieback. The ongoing removal of pigs from the newly completed fence unit is expected to mitigate the further spread of ROD in this area. No areas of extensive dieback have been observed in Upper

Keauhou and Kamehameha Schools provided access to the enrolled lands to the U.S. Forest Service for researchers monitoring the presence, patterns, and impacts of ROD.

Monitoring in FY 2022 included a bird survey in February for the covered species at 164 stations along seven transects primarily across Forest Bird Stratum 1; 154 stations were located on Kamehameha Schools lands and 10 were located on adjacent State lands. Survey results are in Table 5.

ʻAlalā from the 2017 and 2018 release cohorts continued to frequent Kamehameha Schools lands with activity being focused around the Puʻu Kipu area, and in early 2020 a pair of ʻAlalā demonstrated behavior that could have indicated the establishment of breeding territory, but this did not come to fruition. High mortality of ʻAlalā at Puʻu Makaʻala Natural Area Reserve led the AWG to recapture all remaining birds and return them to captivity in early FY 2021. There are currently no released birds remaining in the wild.

Table 5. Bird survey results for the Kamehameha SHA in FY 2022

Common Name	Scientific Name	# Detected	Stations Occupied
ʻIʻiwi	*Drepanis coccinea*	245	107
ʻAkiapōlāʻau	*Hemiganthus wilsoni*	25	22
ʻĀkepa	*Loxops coccineus*	7	6
ʻAlawī	*Loxops mana*	29	24
ʻIo	*Buteo solitarius*	1	1

A mean of 4.5 Nēnē was observed during monthly surveys (range = 0 – 7) in FY 2022 in the western portion of the enrolled property and a mean of 1.6 (range = 0 – 9) at the ʻŌhiʻa Ranch portion. No active nests were observed at any site, but remote cameras near the Nēnē cabin reservoir captured an image of an un-banded Nēnē in late February that was believed to be a flighted juvenile.

A Nēnē carcass was discovered stuck in the old fence at the Nēnē Cabin Reservoir on December 16, 2021, with a single Nēnē egg discovered approximately 10 meters away under an ʻaʻaliʻi. The bird's head and innards were missing and there was no auxiliary band attached. The federal band, however, was still attached correlates to a Nēnē that was originally banded in 2019 at Waikōloa Paniolo Greens and was last seen using Keauhou Ranch in 2020. While a remote camera was nearby, the camera was not angled in a way to capture what transpired that month. DOFAW, therefore, placed a second camera that provides a direct view of the reservoir.

On January 18, 2022, two Nēnē eggs were discovered in the Nēnē Cabin Reservoir. While there were no signs of a nearby nest from which the eggs could have been removed, it is not uncommon for Nēnē to drop eggs before they are ready to nest.

Plant monitoring of covered species was conducted in FY 2021 through a contract with the Hawaiʻi Plant Extinction Prevention Program (PEPP); monitoring was confined to the Area Requiring Additional Conservation Commitments (ARACC). Kamehameha Schools continued monitoring inside and outside of the ARACC in FY 2022, targeting surveys near historic locations, geological features, and remnant habitat zones. These surveys and incidental

observations collectively resulted in identification of new populations of *A. peruvianum* var. *insulare*, *C. lindseyana*, and *Vicia menziesii,* two new endangered species (*Exocarpus menziesii* and *Sanicula sandwicensis*) that were not previously known from the Enrolled Property, and one rare but unlisted species, *Phyllostegia macrophylla*. The *P. macrophylla* discovery is highly significant as it is currently the only extant wild remnant individual known. This individual plant was vigorous, sprawling across the forest floor and climbing 3 meters into the understory, occupying an area of approximately 75m, with mature fruit on some of the highest terminal ends of the vines.

Analysis of surveys conducted from FY 2019 through FY 2021 show an overall downward trend for most covered plant species. Three of the eight covered plant species show a decline in the number of population units (*C. stictophylla*, *C. lindseyana*, and *C. shipmanii*), one shows a decline in both the number of population units and individuals (*V. menziesii*), and two are no longer present on the property (*P. racemosa* and *P. hawaiiensis*). Only three covered plant species show an overall increase in both population units and individuals (*A. peruvianam* var. *insulare*, *Clermontia peleana*, and *Phyllostegia velutina*). Most mortality appears to be due to poor survival of outplants and possible lifespan considerations. For the two species no longer present on the property, baseline numbers were particularly low. The baseline for *P. racemosa* consisted of 4 out-planted individuals and the baseline for *P. hawaiiensis* consisted of a single founder. Kamehameha Schools intends to target out-plantings for both species and additional survey for *P. hawaiiensis*.

In February 2022, Kamehameha School staff, accompanied by DOFAW and Volcano Rare Plant Facility (VRFP) staff, made collections from a population of *V. menziesii* on the south flank of Pu‘u Kipu in Kīlauea Forest. Eight cuttings were made from five individuals within a single population and were accessioned at VRPF. As of April 2022, multiple cuttings were rooted, with some having new growth. Given the success of these cuttings, Kamehameha Schools will collect cuttings from additional *V. menziesii* populations in FY 2023 and will continue working with DOFAW on planned *V. menziesii* recovery efforts, including increased monitoring of wild plants, securing propagule collections, and establishing reintroduced populations across the species’ historic range. Kamehameha Schools will also continue discussions with DOFAW to expand the planned collaboration to include recovery actions for all covered plant species, with a focus on propagule collections and out-planting.

The Palakea fence and road were rerouted around a population *P. velutina* in FY 2022 that had overgrown the fence. The population will be monitored closely in the future and DOFAW staff will be consulted if the population continues to encroach upon the rerouted fence and road.

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CONDITION OF THE ENDANGERED SPECIES TRUST FUND

Act 144, SLH 2004 established the Endangered Species Trust Fund, with purposes set forth in Section 195D-31, HRS.

Description	Expenditure	Revenue	
Beginning Cash Balance		$1,514,227.05	
Outstanding Encumbrances FY2022			$656,869.74
Expenditures in FY2021	$989,401.81		
Total in Encumbrances from previous years			$384,594
Funds to Implement Obligations of a Habitat Conservation Plan	$261,540	$160,920	
Private Contributions for the Management and Recovery of Hawaii's Native Wildlife	$726,351.54	$690,998	
Subtotal Ending Balance			**$388,850.61**
Total in Encumbrances			$1,041,463.61
Total in ESTF in FY22			$1,430,314.22
Funds rolled over from previous years HCP Technical Assistance Program		$ -	
Funds Received as Payment for the Use of the HCP Technical Assistance Program[1]			
Expenditures in FY22 for personnel		$5,120	
Total in ESTF (including outstanding encumbrances)			**$1,425,194.17**

RECOMMENDATIONS TO FURTHER THE PURPOSES OF CHAPTER 195D, HRS

Habitat Conservation Plans and Safe Harbor Agreements are necessary tools in Hawai‘i to achieve threatened and endangered species protection while balancing growth and addressing the need for energy independence. FY 2022 marks the 24th year since implementation of Chapter 195D, HRS, to include the issuance of Incidental Take Licenses. The program has demonstrated numerous successes since its inception.

The following are recommendations to further improve implementation of Chapter 195D, HRS.

- Increase staff capacity statewide for HCPs by providing for three fully funded State civil service position to effectively track and monitor funds and expenditures related to each Habitat Conservation Planning project. The staff within DLNR-DOFAW are currently three contracted members in administration managing all HCP and SHA projects throughout the islands in addition to reviewing all projects statewide with the potential to impact threatened or endangered species. Supplemental staff are supported by grant to produce standalone HCPs. Additional staff capacity would allow for more time-efficient processing of HCP applications, development of administrative rules for the program (described in the last bullet), development of procedures for promoting consistency in HCPs, conducting follow-up monitoring for development projects, and implementation and management of mitigation and other projects that are extremely beneficial for the recovery of Hawai‘i’s threatened and endangered species.
- Continue fostering partnerships between DLNR/DOFAW, other State and Federal agencies, and private landowners to ensure program success.
- Conduct additional outreach to further educate private landowners and developers on the benefits of HCPs and SHAs.
- Provide resources to establish a habitat/conservation banking system as authorized under Section 195D-21(b)(1), HRS.
- Establish administrative rules under Chapter 195D, HRS, to provide guidelines, limitations, and parameters specific to the authority provided under Chapter 195D, HRS.

For information on DLNR’s Endangered Species Recovery Committee, please see http://dlnr.hawaii.gov/wildlife/esrc/. For a full listing of the State’s Habitat Conservation Plans and license-holder annual reports, please see http://dlnr.hawaii.gov/wildlife/hcp/approved-hcps/.

For further information on the State’s Habitat Conservation Plans contact:

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