State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
Division of Forestry and Wildlife (DOFAW)
Honolulu, Hawai‘i 96813

January 26, 2022

Endangered Species Recovery Committee
State of Hawaii
Honolulu, Hawai‘i

Committee Members:

SUBJECT: Request for recommendations from the Endangered Species Recovery Committee on all current Habitat Conservation Plans (HCPs), Safe Harbor Agreements (SHAs), and Incidental Take Licenses (ITLs). Status of HCPs to be presented by license-holders for the period July 1, 2020 – June 30, 2021 with updates to December 31, 2021.

CHAPTER 195D
Under Hawai‘i Revised Statute (HRS) §195D, Conservation of Aquatic Life, Wildlife, and Land Plants, an Endangered Species Recovery Committee (ESRC) was authorized and §195D-25 requires that the ESRC “Review all habitat conservation plans, safe harbor agreements, and incidental take licenses on an annual basis to ensure compliance with agreed to activities and, on the basis of any available monitoring reports, and scientific and other reliable data, make recommendations for any necessary changes.”

Contents

SUMMARY OF INCIDENTAL TAKE STATUS FOR ENDANGERED WILDLIFE SPECIES COVERED BY HABITAT CONSERVATION PLANS 2

SUMMARY OF HABITAT CONSERVATION PLANS AND ASSOCIATED INCIDENTAL TAKE LICENSES BY PROJECT TYPE 7

Wind Energy Facilities and Structures 7

Kaheawa Pastures Wind Energy Generation Facility (KWP I) Habitat Conservation Plan, Maui, Hawai‘i. Approved 2006. 7

Kaheawa Wind Power II Wind Energy Generation Facility (KWP II) Habitat Conservation Plan, Maui, Hawai‘i. Approved 2012. 11

Auwahi Wind Energy Habitat Conservation Plan, Maui, Hawai‘i. Approved 2012. 15

Kahuku Wind Power Habitat Conservation Plan, O‘ahu, Hawai‘i. Approved 2010. 19

Kawailoa Wind Power Habitat Conservation Plan, O‘ahu, Hawai‘i. Approved 2012. 22

Nā Pua Makani Wind Energy Project Habitat Conservation Plan, O‘ahu, Hawai‘i. Approved 2019. 27

Transportation Projects 30

Relocation of Abutilon menziesii Habitat Conservation Plan, Kapolei, O‘ahu. Approved 2004. 30

Other Development Projects 33

Cyanotech Aquaculture Facility Habitat Conservation Plan, Keahole Point, Hawai‘i. Approved 2003. 33

Kaua‘i Lagoons Habitat Conservation Plan, Kaua‘i, Hawai‘i. Approved 2012. 35

Relocation of Round-leaved Chaff Flower (Achyranthes splendens var. rotundata) Habitat Conservation Plan, Kenai Industrial Park, Kapolei, O‘ahu, Hawai‘i. Approved 2014 39

SUMMARY OF SAFE HARBOR AGREEMENTS AND ASSOCIATED INCIDENTAL TAKE LICENSES 41

Safe Harbor Agreement for Pu‘u o Hōkū Ranch, Moloka‘i. 42

Programmatic Safe Harbor Agreement for Nēnē, Moloka‘i. 44

Safe Harbor Agreement for the Introduction of Nēnē to Pi‘iholo Ranch, Maui. 45

Safe Harbor Agreement for the Reintroduction of Nēnē to Haleakalā Ranch, Maui. 47

Safe Harbor Agreement for Kamehameha Schools, Keauhou and Kīlauea Forest Lands, Hawai‘i Island 49

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

General locations for the HCPs are shown in Figure 1.

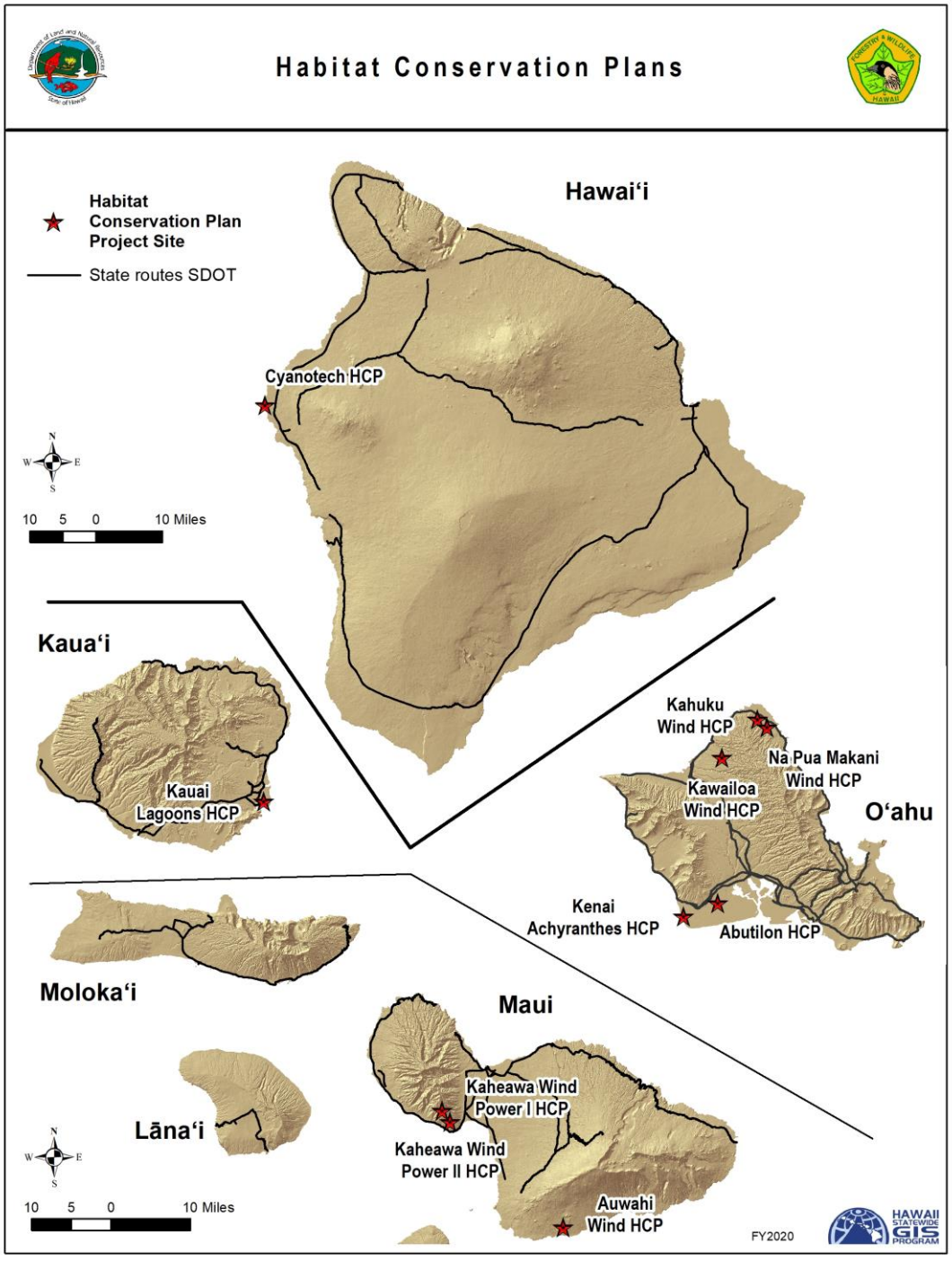


Figure 1. Habitat Conservation Plan Locations

This document summarizes information from requisite fiscal year annual reports submitted by ITL holders for 11 HCPs. No new HCPs were approved and permitted in FY 2021.

Twenty-one (21) incidental take fatalities were documented for seven species covered under HCPs in FY 2021 (Table 1). From the beginning of FY 2022 (July 1, 2021) through December 31, 2021, an additional 25 fatalities were recorded for four covered species (Table 1). An additional 11 Newell's Shearwaters (*Puffinus newelli*) and one Hawaiian Petrel (*Pterodroma sandwichensis*) were reported and found as post-fledging fallout but were released alive and in apparent good health. One Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) fatality and two Nene (*Branta sandvicensis*) fatalities were found outside official search areas at two wind projects (Auwahi Wind and KWP I, respectively) (Table 1). The one Hawaiian Petrel fatality in FY 2021 (Table 1) occurred at Nā Pua Makani. Although this species is not covered under the Nā Pua Makani's current HCP the ITL holder has begun the process of amendment. Lastly, a Band-rumped Storm Petrel (*Hydrobates castro*) fatality was documented at the Auwahi Wind Project in FY 2021, an endangered species that is currently not covered under the current HCP. Mitigation for take of covered species is ongoing and involves projects throughout the state of Hawai‘i.

Table 1. Incidental take fatalities reported for permitted HCPs in FY 2021 and FY 2022.

Common Name	Scientific Name	Take	
		FY 2021	FY 2022[a]
Hawaiian Hoary Bat	*Lasiurus cinereus semotus*	5	10[b]
Newell's Shearwater	*Puffinus newelli*	2	0
Hawaiian Petrel	*Pterodroma sandwichensis*	1	0
Nene	*Branta sandvicensis*	4[c]	2
Hawaiian Duck	*Anas wyvilliana*	2	0
Hawaiian Coot	*Fulica alai*	2	9
Hawaiian Moorhen	*Gallinula galeata sandvicensis*	5	4

[a] = covers take that occurred from July 1 to December 31, 2021
[b] = one Hawaiian Hoary Bat fatality found outside the official search area at Auwahi Wind
[c] = two Nene fatalities found outside the official search area at KWP I

Figure 2 summarizes permit status of species covered under eight active HCPs since ITLs were first issued. Figure 3 presents a breakdown of take of Hawaiian Hoary Bats at six windfarms with HCPs; three on O‘ahu and three on Maui. Take by the Kauai Seabird HCP (KSHCP) is not included in Figure 2 diagrammatic purposes because the relatively high Total Permitted Take for Newell's Shearwater (n = 1,846) heavily skews the graph. The Total Permitted, Estimated and Observed take for the three species covered under this HCP are instead presented in the caption for Figure 2. Incidental take included in Figures 2 and 3 combines observed, modeled, and indirect take to estimate the total take as of the end of FY 2021. This summary shows that for all HCPs combined the total estimated take of each species in FY 2021 is substantially below the total permitted take level. There was no take of plant species in FY 2021 by the one active HCP (Kenai Industrial Park, round-leaved chaff) that cover plant species. This HCP permitted take of plants that occurred during a limited timeframe and does not have ongoing take.

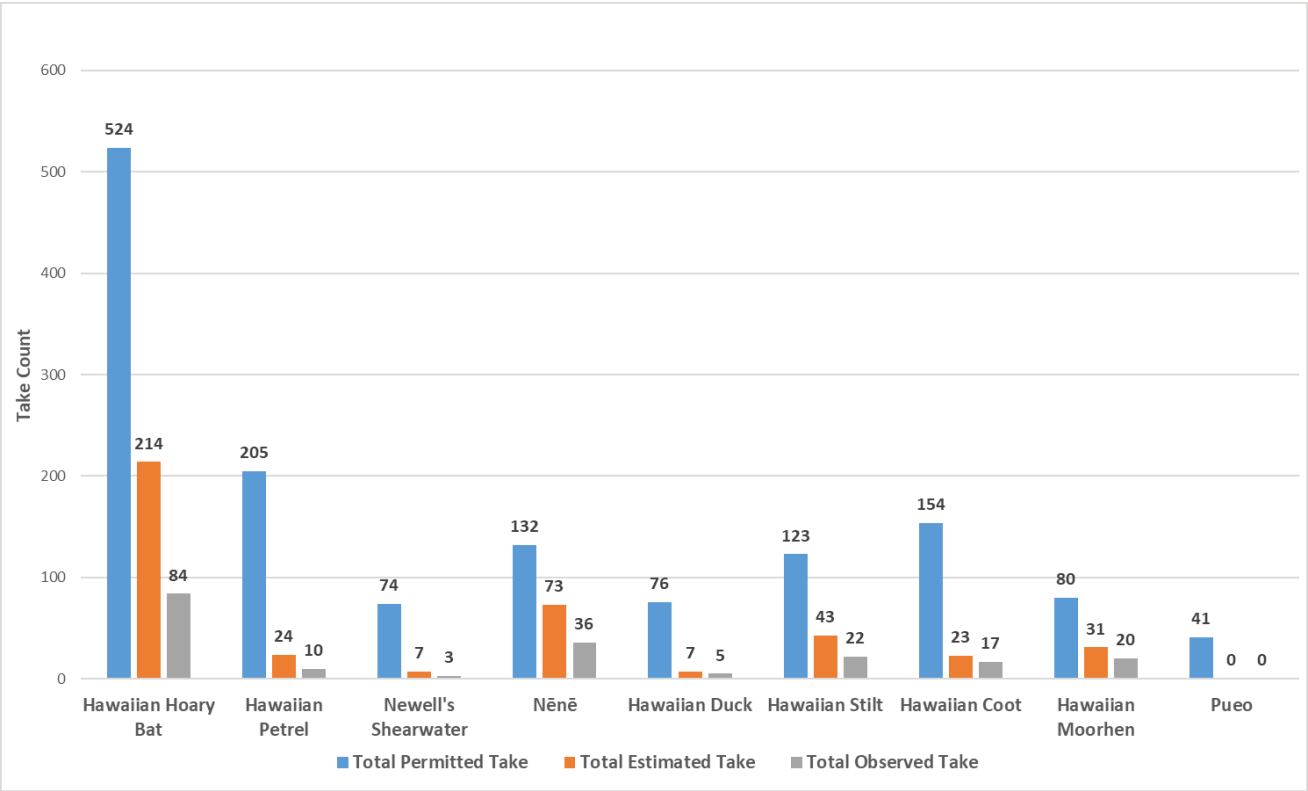


Figure 2. Total permitted take, observed take, and estimated take (includes indirect take and, for wind energy sites, modeled unobserved take at the 80% upper confidence level) of HCP-covered wildlife species for eight approved HCPs as of the end of FY 2021 (June 30, 2021). Take for the KSHCP is not included for diagrammatic purposes. Take values by covered species for KSHCP in FY 2021 are: Newell's Shearwater Total Permitted Take = 1,846, Total Estimated Take = 7, Total Observed Take = 4; Hawaiian Petrel Total Permitted Take = 72, Total Estimated Take = 0, Total Observed Take = 0; Band-rumped Storm Petrel Total Permitted Take = 31, Total Estimated Take = 0, Total Observed Take = 0. Take of the latter species is not yet permitted for any other HCP.

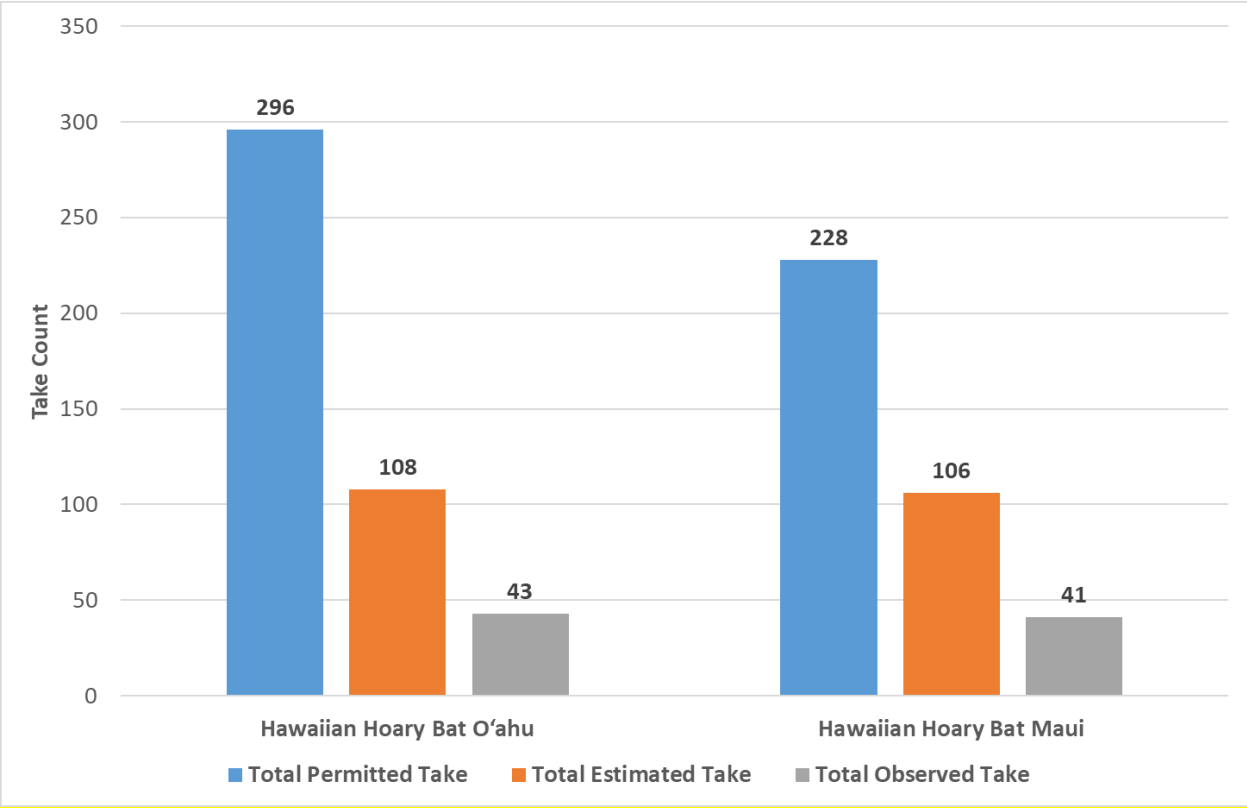


Figure 3. Total permitted take, observed take, and estimated take (includes indirect take and, for wind energy sites, modeled unobserved take at the 80% upper confidence level) for the Hawaiian Hoary Bat for approved HCPs on O'ahu and Maui as of the end of FY 2021 (June 30, 2021).

Table 2. Hawaiian Hoary Bat HCP Summary as of FY 2021.

Permit Level	Permitted or Requested Take	Rate of Bat Take	Mitigation $	Mitigation
Kawailoa (Jan 2012-2032)				
Tier 1	**20**		Mitigation-dependent	Ukoa Wetland mitigation, vegetation removal, predator control, fence monitoring, bat lane construction and insect assessment (IN PROGRESS)
Tier 2	**20**		$1,000,000	USGS studies on a) modeling foraging habitat suitability $143,542 (COMPLETED), b) USGS conservation genetics $377,675 (IN PROGRESS), c) WEST Oahu island-wide acoustic studies $1,105,081 (IN PROGRESS)+$20,000 for Statistical Power Study; *Research Total=$1,646,298*
Tier 3	**20**		$1,000,000	
Tier 4	**55**		$2,750,000	Helemano Wilderness Area - payment to Trust for Public Lands in 2018, preliminary draft management plan completed in FY 21 (COMPLETED)
Tier 5	**85**		Mitigation-dependent	(MITIGATION NOT YET IDENTIFIED)
Tier 6	**20**		Mitigation-dependent	(MITIGATION NOT YET IDENTIFIED)
Total Currently Permitted	**220**	11/year		
Calculated Take as of FY 21	**97**			
Auwahi (Feb 2012-2037)				
Tier 1	**6**		Mitigation-dependent	Restoration of 130 acres in Waihou Mitigation Area to create roosting and foraging habitat (IN PROGRESS)
Tier 2	**5**		Mitigation-dependent	USGS project on radio telemetry and acoustic monitoring project to track success of mitigation efforts at Waihou (COMPLETED)
Tier 3	**10**		Mitigation-dependent	Building off of Tier 2 mitigation, USGS bat study. Adaptive management to focus on insect prey base and food habitat assessment and additional acoustic monitoring (COMPLETED)
Tier 4	**60**		Mitigation-dependent	Restoration on Ulupalakua Ranch to support bats (IN PROGRESS)
Tier 5	**34**		Mitigation-dependent	Restoration and enhancement of Kamehamenui Forest Reserve (690 acres) to support bats (PENDING)
Tier 6	**25**		Mitigation-dependent	Restoration and enhancement of Kamehamenui Forest Reserve (508 acres) to support bats (PENDING)
Total Currently Permitted	**140**	7/year		
Calculated Take as of FY 21	**64**			
KWP II (Jan 2012-2032)				
Tier 1	**6**		$250,000	Baseline mitigation complete. Bat habitat improvement measures in Kahikinui Forest Reserve; 2.8 miles of fence apron to protect Nakula NAR and Kihikinui from ungulates. (COMPLETED)
Tier 2	**5**		$125,000	Continuation of Tier 1 project (IN PROGRESS)
Tier 3	**19**		#REF!	USGS Big Island Studies contracted for bat ecological research (see KWP I for additional funding of this research) (IN PROGRESS)
Tier 4	**8**		Mitigation-dependent	Future Tier with specific mitigation not yet determined but would be to protect or enhance bat habitat. [NOT YET TRIGGERED OR IDENTIFIED]
Total Currently Permitted	**38**	1.9/year		
Calculated Take as of FY 21	**12**			
KWP I (Jan 2006-2026)				
Tier 1	**20**		$40,000	LACI baseline mitigation and monitoring is completed in 2006. Hoary bat research fund and hoary bat contingency fund (COMPLETED)
Tier 2	**30**		$1,500,000	USGS Big Island Studies contracted for bat ecological research $750,000 (see KWP II for additional funding for this research) (IN PROGRESS); H.T. Harvey acoustic and telemetry research on Maui $750,000 (COMPLETED)
Total Currently Permitted	**50**	2.5/year		
Calculated Take to Date	**30**			
Kahuku (June 2010-2030)				
Tier 1	**16**		$150,000	Contributed for Kahikinui-Nakula fence construction (COMPLETED)
Tier 2	**9**		$450,000	Planning initiated via discussions with DOFAW And USFWS (PENDING)
Total Currently Permitted	**25**	1.3/year		
Calculated Take as of FY 21	**13**			
Na Pua Makani (21 year term)				
Tier 1	**34**		$1,700,000	Oahu bat habitat restoration measures and associated monitoring at the Poamoho Ridge mitigation area. (PENDING)
Tier 2	**17**		$850,000	Oahu bat habitat restoration measures and associated monitoring at the Poamoho Ridge mitigation area. (PENDING)
Total Currently Permitted	**51**	2.4/year		
Calculatedd Take as of FY 21				
DRAFT (not yet approved) Lalamilo (20 year term)				
Tier 1	**3**		$150,000	HAVO NP Restoration (PROPOSED)
Tier 2	**3**		$150,000	(MITIGATION NOT YET IDENTIFIED)
Total Requested Take	**6**	0.3/year		
DRAFT (not yet approved) Pakini Nui (10 year term)				
Tier 1	**26**		$1,463,728	HAVO NP Restoration (PROPOSED)
Total Requested Take	**26**	2.6/year		
Total Permitted Take	**473**			
Total Permitted + Requested Take	**556**			

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 2021, 15.5 years (77.5%) through the permit term)

Take Authorization Over 20-year Term:

Table 4. 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 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 two Nēnē but no other HCP covered species during the reporting period (Table 5).

Table 5. Documented fatalities of HCP covered species at KWP I in FY 2021 and the first half of FY 2022 (July 1 – December 31, 2021).

Common Name	Scientific Name	FY 2021 Fatalities	FY 2022 Fatalities
Nēnē	*Branta sandvicensis*	2	-

Beginning in April 2015, the downed wildlife search area was reduced relative to the previous ten 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. In FY 2021, all searches were performed by a canine-assisted team.

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.

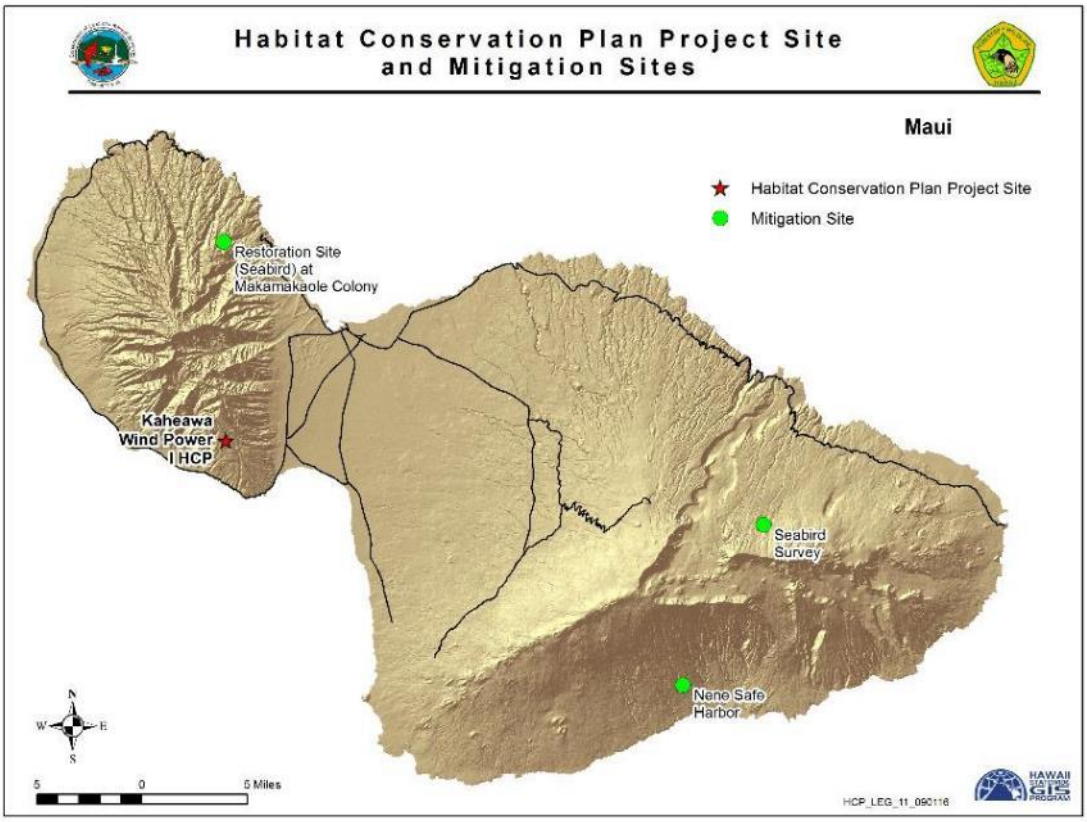


Figure 4. Location of Kaheawa Wind Power I HCP and Mitigation Sites

Table 6 provides an estimate of the overall total adjusted take that has occurred since KWP I ITL issuance. The take rate through FY 2021 for all covered species would keep the project under the permitted take.

Table 6. Total observed fatalities and estimated total take since ITL issuance under the KWP I ITL as of June 30, 2021.

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	25	18	2	45
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 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 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 (Pueo) have been reported in the KWP I

project vicinity since the ITL was issued, all prior to FY 2020. Reports indicate that the majority 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 in conjunction 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 or 'Ou (*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 has been observed in FY 2021.

Work in FY 2021 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 22 mongooses, 19 rats, and eight mice were captured. All of the mongooses were captured outside the enclosures while ten of the rats and all three mice were captured inside the enclosures. Barn Owls were observed during night surveys on five occasions in in FY 2020 and Barn Owl control was conducted on three occasions, but no owls were shot or removed.

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 funding to Pūlama Lāna'i in the amount of $104,657 for the 2021 breeding season. The funded effort included predator control and burrow monitoring and evaluation in the Hawaiian petrel nesting area. Results from the 2021 breeding season will be reported in the FY 2022 annual report.

Nene. Nēnē baseline mitigation continued through funding operation of the Haleakalā Ranch pen in FY 2021. Management at the pen included: monitoring; vegetation management; fence, pond, and infrastructure maintenance; road improvements; and predator control. Seventy traps were deployed in FY 2021 which captured three mongooses and one mouse. Nēnē fledgling production in FY 2021 credited to KWP I was one gosling.

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. This mitigation project is studying movements, roosting behavior, and diet of the Hawaiian Hoary Bat, and is expected to be completed in FY 2022.

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

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

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 2021, 9.5 years (47.5 %) through the permit term)

Take Authorization Over 20-year Term:

Table 7. 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.

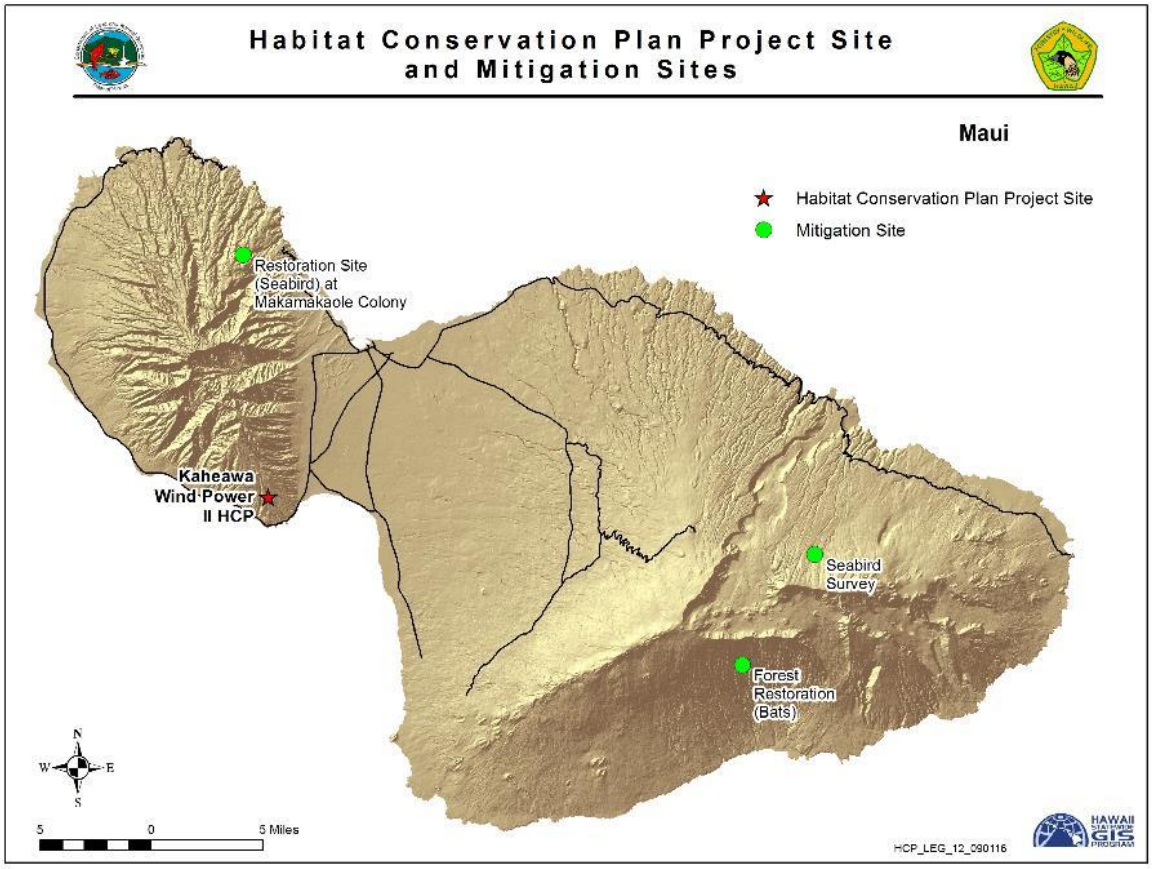


Figure 5. Location of Kaheawa Wind Power II HCP and Mitigation Sites

Status of ITL: There no documented fatalities of HCP covered species at KWP II in FY 2021 but one Nēnē fatality was reported in the first half of FY 2022 (July 1 – December 31, 2021) (Table 8).

Table 8. Documented fatalities of HCP covered species at KWP II in FY 2021 and the first half of FY 2022 (July 1 – December 31, 2021).

Common Name	Scientific Name	FY 2021 Fatalities	FY 2022 Fatalities
Nēnē	*Branta sandvicensis*	-	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 9 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 circle of radius 70 meters centered on each WTG. Canine-assisted searching accounted for 100% of the downed wildlife monitoring searches in FY 2021.

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.

Table 9. Total observed fatalities and estimated total take since ITL issuance covered under the KWP II ITL as of June 30, 2021.

Common Name	Total Observed Take[1]	Estimated Unobserved Take[2]	Indirect Take using HCP multipliers	Total Estimated Take
Nēnē	8	13	2	23
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

As the total estimated take of 12 bats (with 80% statistical certainty) exceeds 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 7.

Mitigation Status:

Hawaiian Petrel and Newell's Shearwater. Mitigation for the two seabird species (Hawaiian Petrel and Newell's Shearwater) is being implemented in conjunction with Kaheawa Wind Power I. Tier 1 mitigation for estimated seabird take at the project continues at the Makamaka'ole seabird enclosures. 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. Only Newell's Shearwater nesting activity has been observed in FY 2021. Site surveys of an alternative seabird mitigation site, as required by the HCP, were completed in East Maui in FY 2016.

Nēnē. Nēnē mitigation has 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; however, in Fiscal Year 2020 no funding was provided for either pen by KWP II. Although KWP II intended to resume funding Pi'iholo Ranch Nēnē pen in FY 2021, the future status of the ranch was uncertain in FY 2021 because of anticipated owner transfer of the property that calendar year. No funding credit was therefore available in FY 2021 (DOFAW provided these details to KWP II on June 16, 2021).

Hawaiian Hoary Bat. In accordance with the KWP II HCP, baseline mitigation for the Hawaiian Hoary Bat was 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 outplanting 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 $2058,500 in FY 2021. This mitigation project is studying movements, roosting behavior, and diet of the Hawaiian Hoary Bat, and is expected to be completed in FY 2022.

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 2021, 9.5 years (38%) through the permit term)

Auwahi Wind Power, Maui

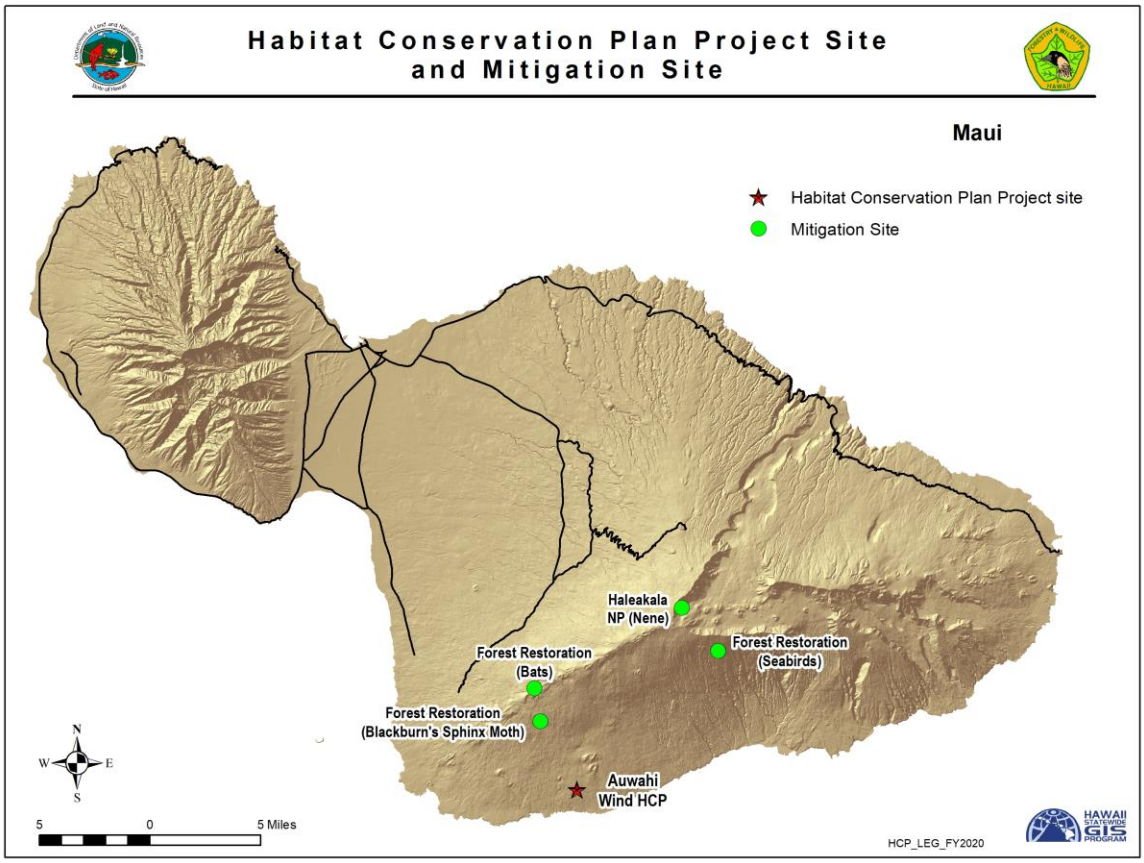


Figure 6. Location of Auwahi HCP and Mitigation Sites

Take Authorization Over 25-year Term:

Table 10. 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: Table 11 provides a listing of HCP covered species fatalities at the Auwahi Wind Energy facility during FY 2021. Four Hawaiian Hoary Bat fatalities were observed in FY 2021, all of which were found within designated search areas.

Table 11. Documented fatalities of HCP covered species at Auwahi Wind in FY2021 and the first half of FY2022 (July 1 – December 31, 2021).

Common Name	Scientific Name	FY 2021 Fatalities	FY 2022 Fatalities
Hawaiian Hoary Bat	*Lasiurus cinereus semotus*	4	6

In FY 2021, 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 12 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 10. 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. 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 12. Total observed fatalities since ITL issuance and estimated total adjusted take covered under the Auwahi Wind Energy ITL as of June 30, 2021.

Common Name	Total Observed Take[1,3]	Estimated Unobserved Take[2]	Indirect Take	Total Adjusted Take
Hawaiian Hoary Bat	29	29	6	64
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.

Mitigation Status:

Hawaiian Petrel. Mitigation for take of Hawaiian Petrels in FY 2021 (2020 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. Four new burrows located were marked, mapped, and added to the monitoring dataset. In the most recent breeding season, 77 petrel burrows were being monitored, 37 of which showed signs of consistent activity. Fourteen burrows successfully fledged a chick.

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 2021. Traps were checked and baited every two weeks and were operational year-round; a break was taken in March 2021, however, because of COVID-19 related restrictions. Trapping effort in FY 2021 resulted in the removal of 54 mice, 12 rats, three mongooses and two cats.

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 Pu‘u 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 2021 and was found to be in good condition. Invasive plant species control is continuing to meet success criteria targets and supplemental outplanting of native Hawaiian plants continued in the reporting period. FY 2020 (Year 5) monitoring of percent vegetative cover along all transects 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.

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 Pu‘u 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 ‘Ulupalakua 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.

Insect and acoustic bat monitoring. Initiated by the Project throughout the mitigation site in FY 2020, was continued in FY 2021. Three malaise traps were set (one at a pond, one at a pasture and one at a hedgerow) and checked quarterly; large moths were found to peak between June and August 2020, with the pond location reporting the highest detection rates. In terms of acoustic monitoring, the average detections throughout the study area was 11.85 ± 0.68 calls per detector night. 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.

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 Forest Reserve.

Blackburn’s Sphinx Moth. Baseline mitigation for Blackburn’s Sphinx Moth 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 Blackburn’s Sphinx Moth. 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. Auwahi continued monthly field surveys for the moth in FY 2021 but their presence was not detected.

Kahuku Wind Power Habitat Conservation Plan, Oʻahu, Hawaiʻi. 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 2021, 11 years (55%) through the permit term)

Kahuku facility on the North Shore of O'ahu.

Take Authorization Over 20-year Term:

Table 13. 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.

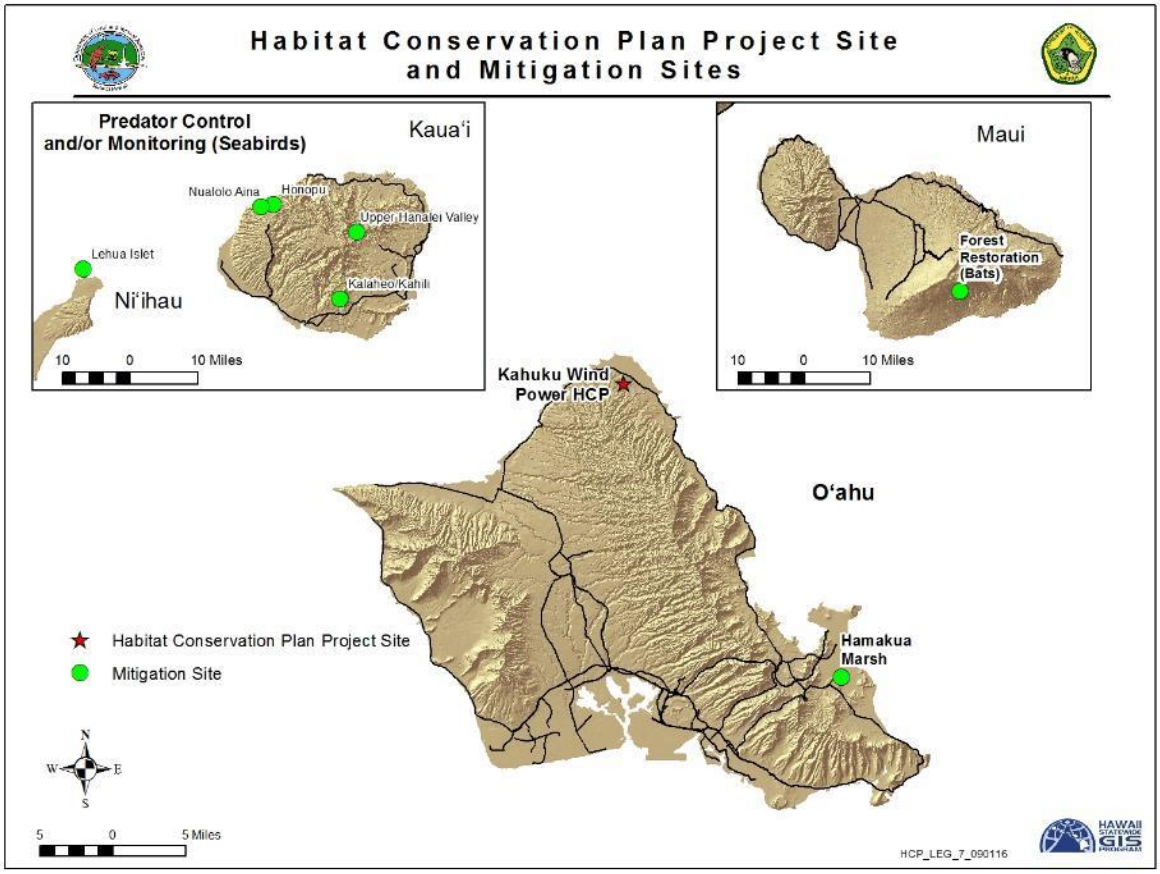


Figure 7. Location of Kahuku HCP and Mitigation Sites

Status of ITL: There was documented take of one Hawaiian Hoary Bat but no other HCP covered species at Kahuku Wind Power during FY 2021 reporting period (Table 14).

Table 14. Documented fatalities of HCP covered species at Kahuku Wind in FY 2021 and the first half of FY 2022 (July 1 – December 31, 2021).

Common Name	Scientific Name	FY 2021 Fatalities	FY 2022 Fatalities
Hawaiian Hoary Bat	*Lasiurus cinereus semotus*	1	1

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

Table 15. 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	5	6	2	13

[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. In FY 2021 all searches were performed by a canine-assisted team.

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.

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 2021 9.5 years (47.5 %) through the permit term)

Kawailoa Wind Power, Oʻahu

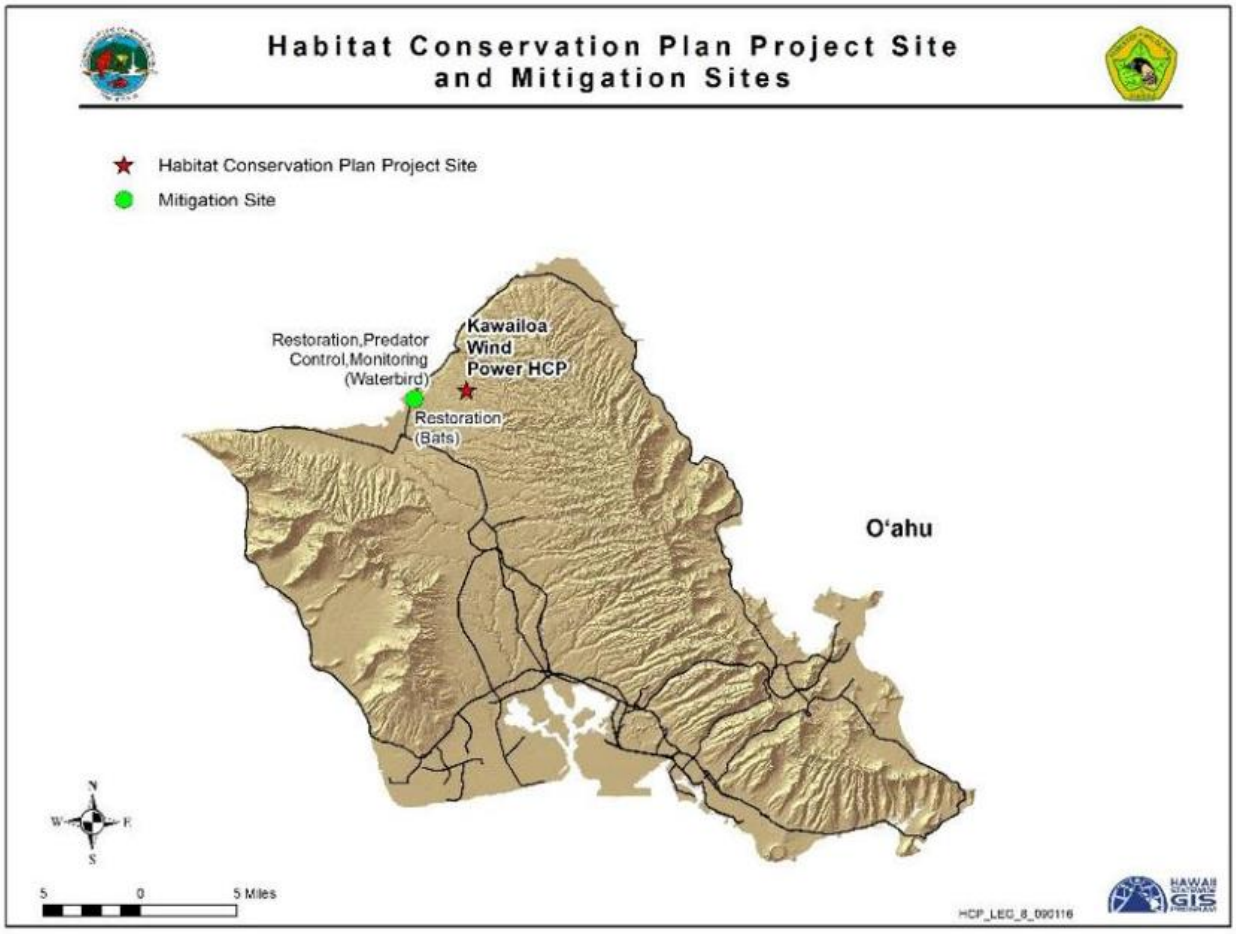


Figure 8. Location of Kawailoa HCP and Mitigation Sites

Take Authorization Over 20-year Term:

Table 16. 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 no take of covered species at the Kawailoa Wind Power facility during FY 2021. Table 17 provides an estimate of the overall total adjusted take that has occurred since Kawailoa Wind ITL issuance. 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 2021 100% of fatality searches were performed by a canine-assisted team.

The total estimated take of 97 bats (with 80% statistical certainty and indirect take) falls within the Tier 4 bat take request detailed in the HCP amendment. Kawailoa submitted an application and 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

Table 17. Total observed fatalities and estimated total take since ITL issuance under the Kawailoa Wind Power ITL as of June 30, 2021.

Common Name	Total Observed Take[1]	Estimated Unobserved Take[2]	Indirect Take using HCP multipliers	Total Estimated Take
Hawaiian Hoary Bat	38	50	9	97
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.

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 20-minute averaging in January 2021. Following agency review of Tetra Tech's analysis, however, Kawailoa returned to 10-minute averaging in April of 2021 where it remained till the end of FY 2021. Additionally, the project 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 Duck, Hawaiian Stilt, Hawaiian Moorhen, & Hawaiian Coot. The ‘Uko‘a Wetland mitigation program for Tier 1 mitigation continued for waterbirds. In FY 2021, activities associated with Tier 1 included invasive vegetation removal, predator control, monitoring predator presence, and fence monitoring and maintenance. In FY 2021, a total of 219 predators were removed from ‘Uko‘a Wetland including 9 pigs, 173 mongooses, two cats, and 35 rats. A total of 40 weekly waterbird surveys were completed in FY 2021 at ‘Uko‘a Wetland. The Hawaiian Moorhen was the listed waterbird species most frequently detected during surveys. In FY 2021, Hawaiian Moorhens were recorded at five out of nine PC stations, and either adults or chicks were observed or heard on 39 out of 40 survey dates. Hawaiian Moorhen breeding activity was observed on two occasions, but no chicks are believed to have successfully fledged. No Hawaiian Coots or Hawaiian Stilts were seen in FY 2021. Kawailoa has begun discussion with the agencies regarding adaptive management of waterbird mitigation due to minimal observed breeding events at the site.

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

Hawaiian Hoary Bat. In FY 2021, activities associated with Tier 1 mitigation included invasive vegetation removal, bat lane maintenance, and bat acoustic monitoring. A total of 16 bat lanes within ten 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 613 of 3,182 detector-nights (19.3% of detector nights) at ‘Uko‘a in FY 2021. This represents a slight decrease from FY 2020, which documented detections on 20.3% of detector-nights. However, bat activity appears to have increased at ‘Uko‘a Wetland since sampling began in 2012. Detection of feeding buzzes also increased after the mitigation.

Female Hawaiian Hoary Bat caught at ´U´koa Wetland, Oahu.

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. 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. The third

study, conducted by Western EcoSystems Technology Inc., is a multi-year Hawaiian Hoary Bat acoustic surveys study to examine the distribution and seasonal occupancy of the Hawaiian Hoary Bat on O‘ahu. The Year 3 Status Report for the study (covering results from June 2017 to August 2020) indicated highest detection frequencies in the northern Ko‘olau Mountains and the highest elevation areas of the Wai‘anae Mountains.

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 FY21.

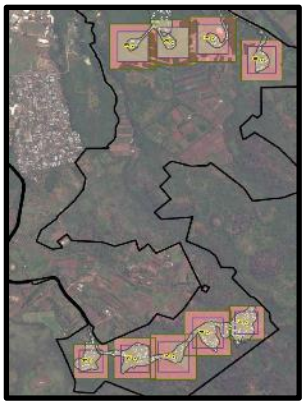
Pueo. A contribution of $12,500 was made to the Hawai‘i Wildlife Center for Pueo rehabilitation in FY 2012. An additional $12,500 was provided to DOFAW to complete the mitigation obligation in the second quarter of FY 2017. With these and other funds DOFAW funded a Pueo research project in 2017 on O‘ahu 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 2021, 2 year (10%) through the permit term)



Na Pua Makani Wind Energy Project, Oʻahu

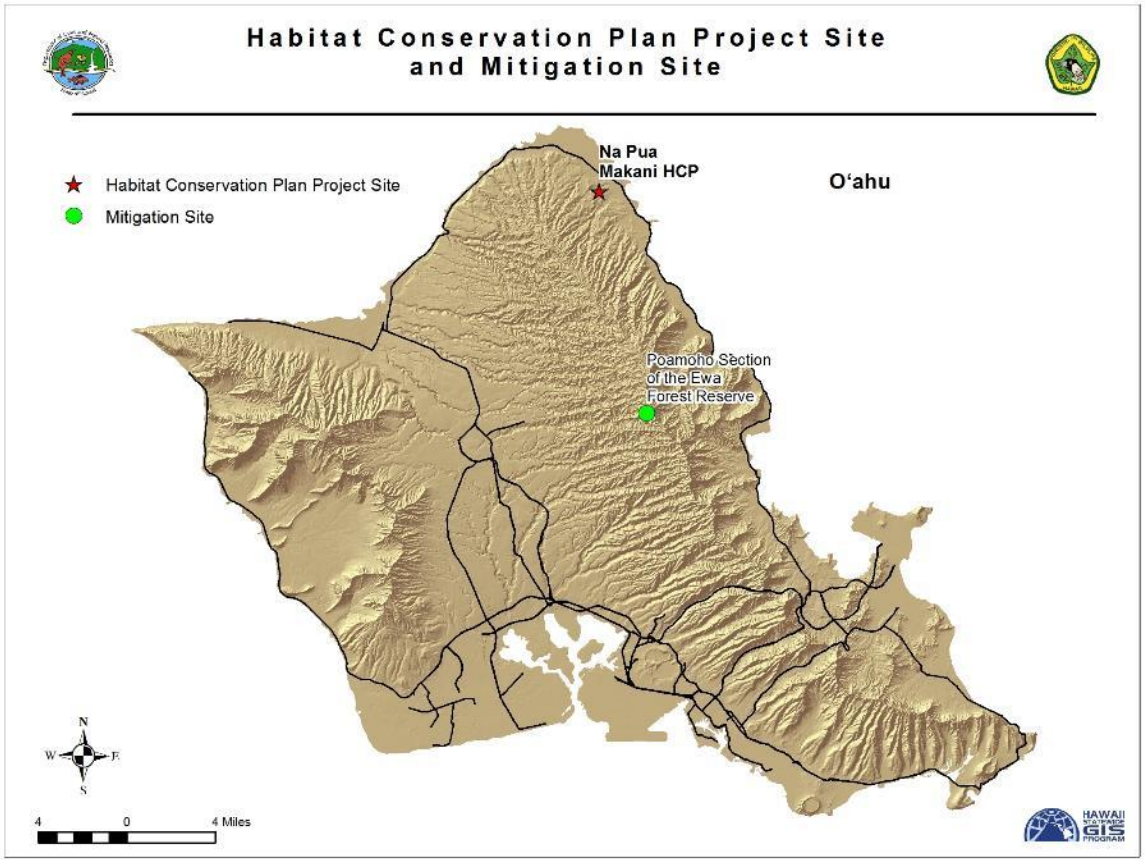


Figure 9. Location of Nā Pua Makani HCP and Mitigation Site

Take Authorization Over 21-year Term:

Table 18. 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: In FY 2019 the Project began construction, which continued throughout FY 2020. The project began commercial operations in December of 2020. There was take of an endangered Hawaiian Petrel near a turbine prior to operation. This take was likely attributed to light attraction by security lights. Nā Pua Makani is working with the agencies to amend its HCP and ITL to add the Hawaiian Petrel as a covered species. Although there was no take of covered species at the Nā Pua Makani Wind Energy facility during FY 2021, one Hawaiian hoary bat was taken in the first half of FY 2022 (Table 19).

Table 19. Documented fatalities of HCP covered species at Kahuku Wind in FY 2021 and the first half of FY 2022 (July 1 – December 31, 2021).

Common Name	Scientific Name	FY 2021 Fatalities	FY 2022 Fatalities
Hawaiian Hoary Bat	*Lasiurus cinereus semotus*	-	1

Mitigation Status:

Newell's Shearwater. In FY 2021, Nā Pua Makani provided the required mitigation funds to the National Fish and Wildlfe Foundation (NFWF). The mitigation report for Newell's Shearwater will be reported when NFWF identifies an appropriate mitigation project.

Hawaiian Hoary Bat. Nā Pua Makani is working with the Koʻolau Mountain Watershed to prepare management and research plans that will 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 will be reviewed and approved by the agencies 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. The mitigation report for the Hawaiian Short-earted Owl will be reported when DOFAW identifies an appropriate mitigation project.
Hawaiian Goose. Nā Pua Makani is currently working with the agencies to identify appropriate updates to the mitigation framework through adaptive management.

Hawaiian Waterbirds. Nā Pua Makani is currently working with the agencies to identify appropriate updates to the mitigation framework through adaptive management.

Transportation Projects

Relocation of *Abutilon menziesii* Habitat Conservation Plan, Kapolei, Oʻahu. Approved 2004.

ITL Licensee: Hawaiʻi 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)

Koʻoloaʻula (Abutilon menziesii), Island of Oʻahu.

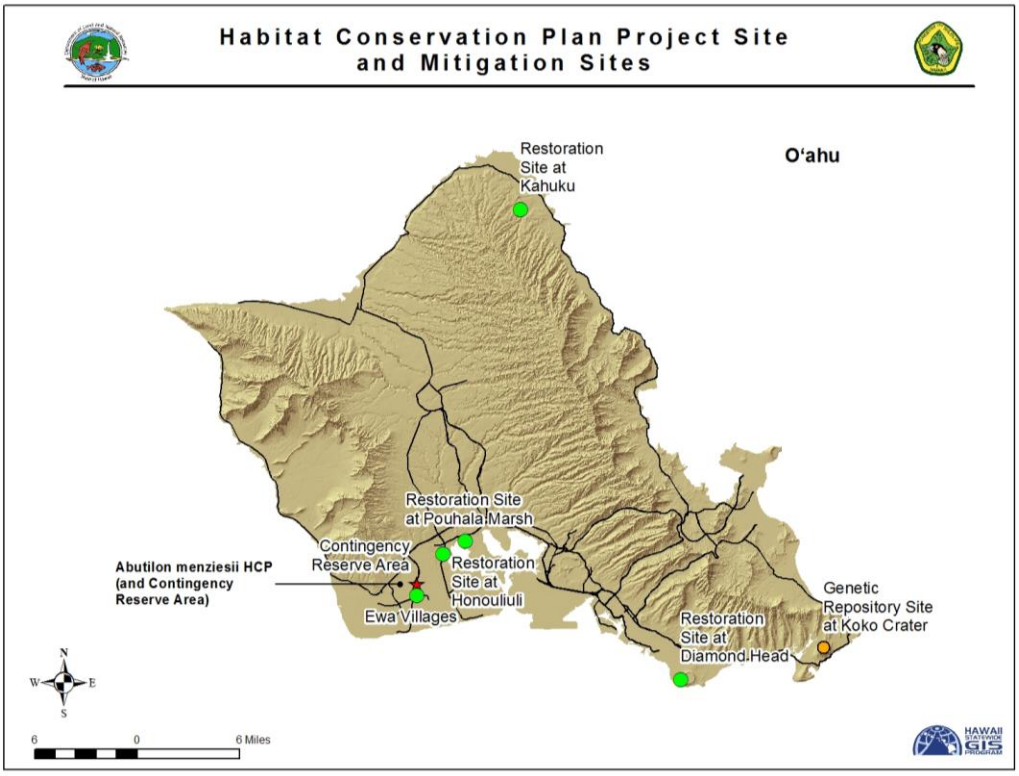


Figure 10. Location of Abutilon HCP and Mitigation Sites

Take Authorization:

Table 20. 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 and a genetic repository location contains plants with genetic representation of the translocated plants. A

Contingency Reserve Area was established where additional plantings were to remain until success criteria was met at the three mitigation sites. The HCP officially concluded a month after the end of the FY 2021 fiscal year without success criteria being met. Sub-permittees under this HCP, which includes the Department of Hawaiian Homelands, HART, UH West Oʻahu, and the City and County of Honolulu, are in consultation and interested in obtaining continued take coverage of *Abutilon* on their properties. However, they will not be able to get coverage under this HCP due to HDOT's unwillingness to extend the HCP and ITL term.

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. Additionally, some outplanting 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).

By the end of FY2021, the success criteria has not been therefore, the Contingency Reserve Area (1,381 acre project area) cannot 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. Due 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, outplanting efforts have resulted in 107 founders genetically represented at all the sites. When the last surveys were done in FY2020, 628 mature *A. menziesii* plants were present across all of the HCP populations at the targeted wild sites, the genetic reserve sites, and the Contingency Reserve Area. No new plants were outplanted during the FY2021 reporting period.

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

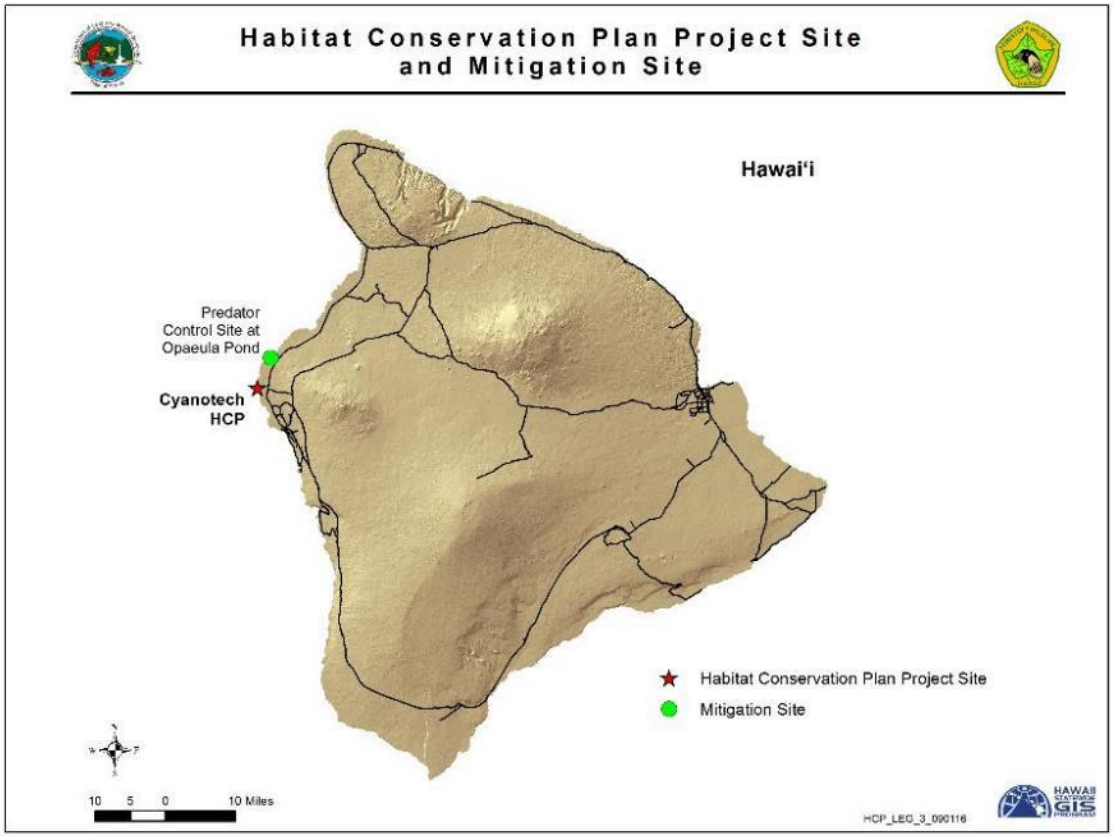


Figure 11. Location of Cyanotech HCP

Take Authorization Over 13-year Term:

Table 21. 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 2021 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 2021 documented five Hawaiian Stilt nests that produce seven hatchlings, of which three fledged.

Table 22 provides an estimate of the overall total adjusted take that has occurred since Cyanotech ITL issuance.

Table 22. Total observed fatalities since ITL issuance and estimated total adjusted take covered under the Cyanotech ITL as of June 30, 2016.

Common Name	Scientific Name	Total Observed Take	Total Adjusted Take[1]
Hawaiian Stilt	H. m. knudseni	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 those 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 for the ITL and HCP, with a requested take of 38 Hawaiian Stilts for the next 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.

Kaua‘i Lagoons, Kaua‘i.

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 2021, 9 years (30%) through the permit term)

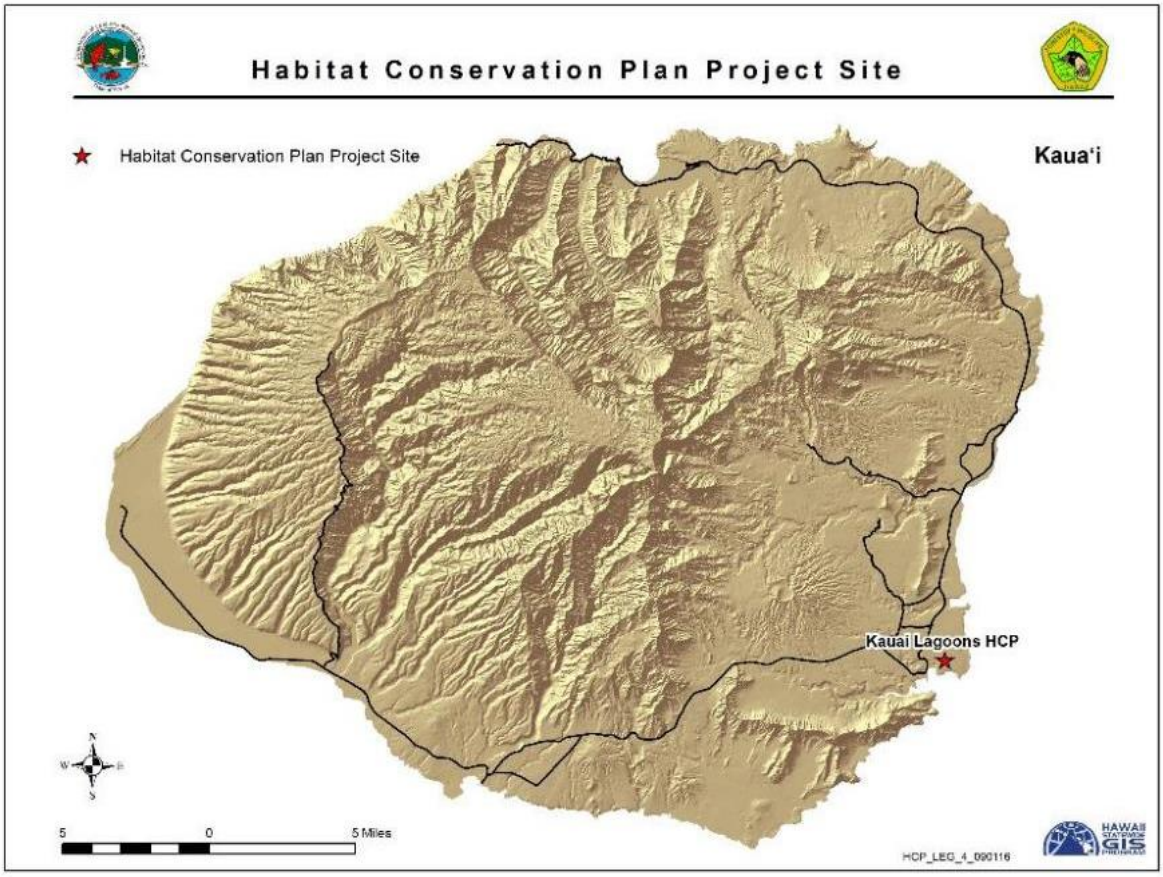


Figure 12. Location of Kaua‘i Lagoons HCP

Take Authorization Over 30-year Term:

Table 23. 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 24 provides a listing of all documented incidental take during the reporting period.

Table 24. Documented fatalities of HCP covered species at Kauai Lagoons in FY 2021 and the first half of FY 2022 (July 1 – December 31, 2021).

Common Name	Scientific Name	FY 2021 Fatalities	FY 2022 Fatalities
Hawaiian Moorhen	*G. c. sandvicensis*	2	4
Hawaiian Coot	*F. alai*	3	9
Hawaiian Duck	*A. wyvilliana*	1	-
Nēnē	*B. sandvicensis*	2	1

Table 25 provides the observed mortalities that have occurred since Kauaʻi Lagoons ITL issuance. Of concern is the rate of Hawaiian Moorhen take. Although only 30% of the license term is complete, over 75% of the permitted Hawaiian Moorhen lethal take has been reached as of the end of FY 2021.

Table 25. Total observed incidental take since ITL issuance under the Kauaʻi Lagoons ITL as of June 30, 2021.

Common Name	Total Observed Take	Total Including Indirect Take
Newell's Shearwater	7	7
Nēnē	3	5
Hawaiian Moorhen	22	31
Hawaiian Duck	6	7
Hawaiian Stilt	0	0
Hawaiian Coot	20	23

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 2021 was 18, from 18 different pairs and which produced 21 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 2021 including four Hawaiian Coot nests producing 10 chicks, 12 Hawaiian Duck nests producing 62 chicks, and 30 Hawaiian Moorhen nests producing 113 chicks (not all chicks will fledge).

The average number of individuals of each species observed during 91 waterbird counts was as follows: Nēnē, 23; Hawaiian Duck, 9; Hawaiian Moorhen, 60; Hawaiian Coot, 56; and Hawaiian Stilt, four.

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 2021, this request is 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 this reporting period included deploying up to 63 live traps on the property. Live traps were deployed throughout the year and were placed in areas in response to sightings of mammalian predators, and checked daily.

Trapping resulted in the removal of 18 cats, 27 pigs, and one dog. Additionally, 996 chickens were removed using 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 June 23, 2021, $10,000 was provided to NFWF to cover the upcoming 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 2021, 7.3 years (73%) through the permit term)

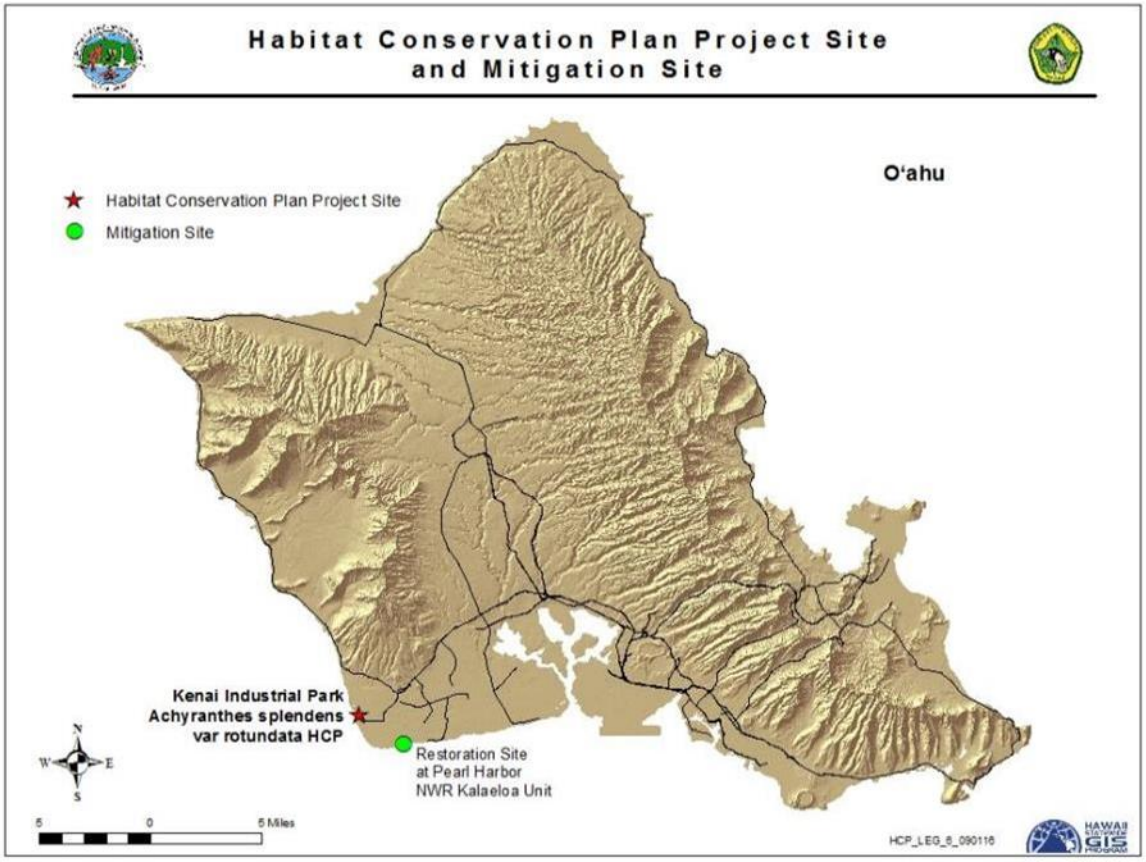


Figure 13. Location of Kenai Industrial Park HCP

Take Authorization Over 10-year Term:

Table 26. 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 outplanted 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 will take place to ensure all plots meet other success criteria.

Reports on the life expectancy of Round-leaved Chaff Flower vary and range from two to ten 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.

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, AKC Leasing Corporation used their own procurement processes to fulfill HCP obligations.

SUMMARY OF SAFE HARBOR AGREEMENTS AND ASSOCIATED INCIDENTAL TAKE LICENSES

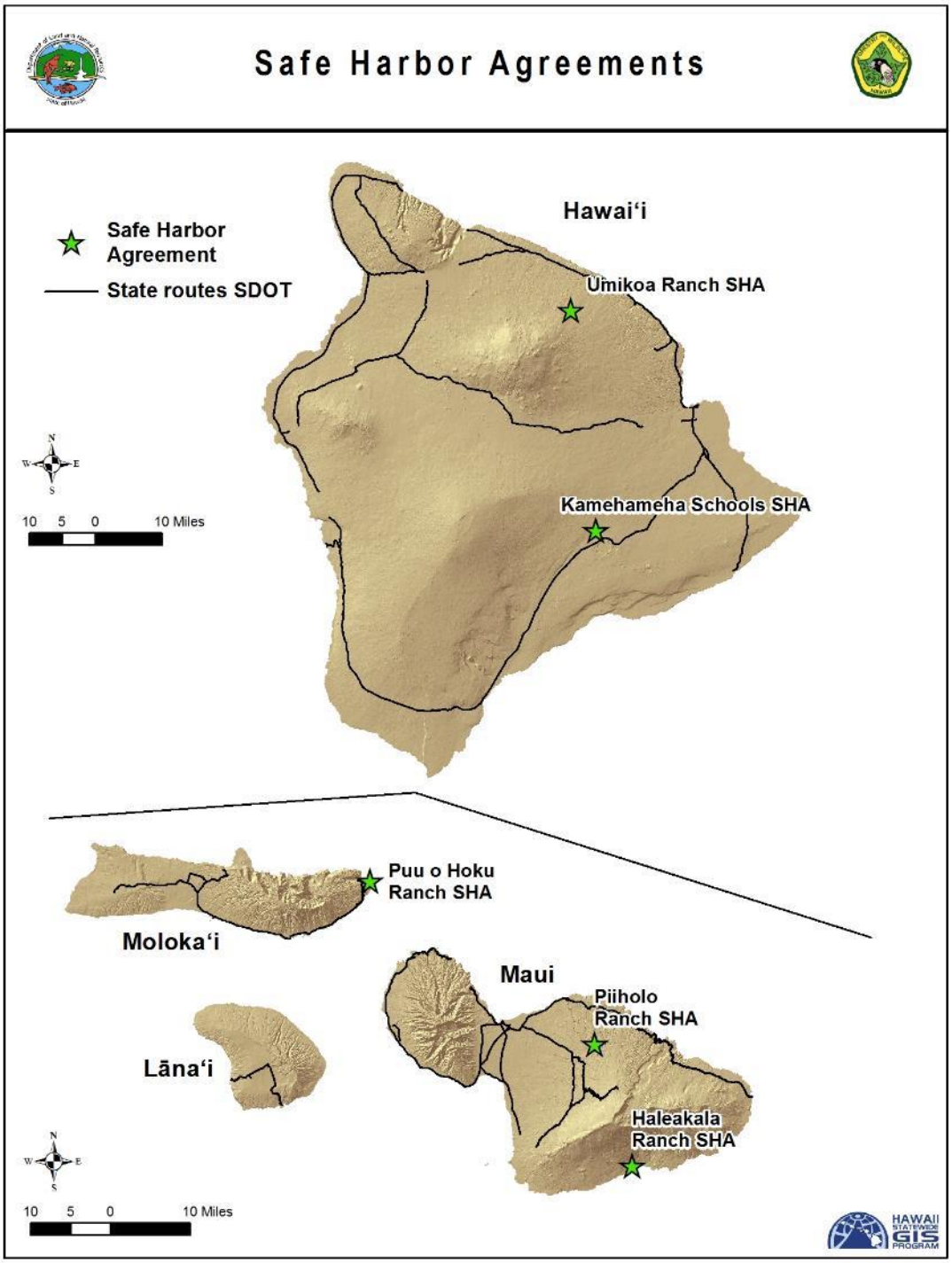


Figure 15. Location of Safe Harbor Agreements

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 were 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 2021 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 11 birds, which was the estimated population size. No island-wide Nēnē survey was conducted this year on Molokai due to travel restrictions because of COVID-19.

During the August – April nesting season two 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. Three young hatched and two young, both of which were banded, were successfully fledged between the two nests. As mentioned above, the remaining gosling died after being trapped behind the feeder and the mesh wiring of the pen.

Maintenance at the three-acre open-top release pen in FY 2021 included monthly checks and repairs of fences, weekly checks of waterlines and water troughs, and mowing the half-acre around the pen. Forty feet of fence line was repaired after damage from high winds, 15 feet of electric fence line was replaced, and 100 feet of iron roof paneling was added to the fence. Alien vegetation (Lantana and Haole Koa) was removed from the pen. Mowing by DOFAW staff totaled 36 acres. Ranch personnel mowed an additional 900 acres within the ranch.

Sixteen live traps were checked regularly at the pen and a total of 39 mongooses were removed around the open-top release pen at Puʻu o Hōkū Ranch in FY 2021.

A total of 74 birds were translocated to the Puʻu o Hōkū Ranch from 2002-2005. Table 27 provides survey data for the original 74 birds translocated to the Puʻu 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 27. 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)
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.

Pi'iholo Ranch on Maui.

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

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. Therefore the baseline condition 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 eight Nēnē (2 adults and 6 goslings) 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 10 nests in FY 2021, eight of which were inside the open-top release pen and two outside; seven of these nests fledged 14 young. Six (6) goslings died before fledging because of inclement weather, the outcome was unknown for four goslings, and four fledged from open-top release pen.

Nēnē monitoring recorded 36 banded birds on the Ranch in FY 2021, of which three were from the original released birds. An island wide annual Nēnē survey was conducted on August 2, 2020; no birds were observed during this survey. The population on the ranch was estimated as 47 individuals. However, these birds only frequent the pen during certain times of the year and are also seen throughout the entire island of Maui.

The open-top pen's fence line was continuously checked and maintained throughout the year. Three holes along a 5-foot section of fence were repaired, 20 feet of metal skirt was reattached where it had disconnected from the main fence due to cattle damage, and two iron pins were added to the fence line to reinforce a rotten fence post. Repairs and replacement were completed for two broken water lines in the pen and the pond and automatic waterers were cleaned and

maintained weekly. A two-foot perimeter along the fence line was weed wacked, for a total of six (6) acres around the pen. A total of 38.25 acres was mowed this year to maintain Nēnē short grass habitat and 2.25 acres of invasive fireweed and guava were removed from the pen.

Predator control efforts from 70 traps resulted in a total of 13 mongooses, trapped and removed around the open-top release pen at Piʻiholo Ranch.

Table 28 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 28. 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)
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 six Nēnē at Haleakalā Ranch (2 adults and 4 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 38 banded birds were recorded this season at the pen, of which 28 were wild Maui birds, two were original Olinda released birds, and eight were Kaua‘i translocated birds. Seven Nēnē were observed during the August 2020 survey and the population for the Ranch is estimated at 50 birds. However, these birds only frequent the pen during certain times of the year and are also seen throughout the entire island of Maui.

Six nests were found in the open-top release pen this season. Three nests were successful produced five young, four of which died before fledgling; the remainding gosling fledged successfully. Two adults died of unknown causes. Three (3) adult nene were relocated to Haleakala Ranch open-top release pen after being captured due to injuries.

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, and the water catchment was repaired after damage from high winds. Four holes were patched along a 10-foot section of fence and the entire fence line was weedwacked each month for a total of 6 acres for FY 2021, and 0.5 acres of fence line was additionally treated with herbicide. In total 26.25 acres were mowed in and around the pen to maintain short grass habitat and alien vegetation including lantana, guava, tomato, fireweed, and glycine, was removed. The road to the pen was maintained as needed by moving rocks and backfilling holes with dirt and rocks and approximately 525 feet was repaired.

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

A total of 53 birds were translocated to Haleakalā Ranch between 2011 – 2016. Table 29 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 29. 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)
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 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 30. 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 2021, a total of 17,844 native plants of 32 species were planted. Of these 7,707 were koa seedlings. All of the outplanting 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 restrictions, outplanting was conducted primarily by collaborators and vendors with limited small group volunteer and ʻohana events starting early in the 2021 calendar year (educational planting events consisted of 13 small groups of 76 volunteers). Silviculture activities included 70 acres of new koa planted in the August 2018 wildfire burn area in Kīpuka

Ke'āmoku, for a total of 267 acres of koa planted over the first three years of the Agreement. Other stand improvement activities included singling of 62 acres within stands planted in 2020 to remove competitive branches at the top of koa seedlings and pruning of lower branches from 165 acres within stands planted in 2019 to improve stem form.

All fence lines were regularly inspected at least semi-annually in FY 2021 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 retrofitting of the Palakea fence: sections along the Puʻu Kipu and Kūlani Cone units were raised in height from 3 feet to a minimum of 4 feet, similar to heights along other portions of this fence. Just over a mile of the upper Keauhou boundary fence was also replaced. No signs of ungulates were observed for the sixth consecutive year in upper Keauhou. Pig signs were observed in the lower Keauhou and Puʻu 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 2021, Kamehameha Schools inspected and maintained all water sources, access routes, the recently installed firebreak, and tertiary roadways.

Weed surveys by Kamehameha Schools and Three Mountain Alliance (TMA) in FY 2021 were conducted on 3,460 acres and suppression occurred across 2,435 acres and targeted priority weed species Faya (*Morella faya)*, Ginger (*Hedychium gardnerianum*), Strawberry Guava (*Psidium cattleianum*), and Himalayan Raspberry (*Rubus ellipticus*), as well as Blackberry (*Rubus argutus*). Existing populations of priority weed species was below 10% within conservation fences that is a criterion specified in the SHA.

In FY 2021, die-off from Rapid ʻŌhiʻa Death (ROD) was observed in portions of lower Keauhou in areas outside of conservation fences. The ongoing removal of pigs from the newly completed fence unit is expected to mitigate further spread of ROD in this area. No areas of extensive dieback have been observed in Upper Keauhou and Kamehameha Schools provided access of the enrolled lands to the U.S. Forest Service for researchers monitoring the presence, patterns, and impacts of ROD.

Monitoring in FY 2021 included a bird survey in February for the covered species at 335 stations along 19 transects across the SHA Enrolled Property. Survey results are in Table 31.

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 31. Bird survey results for the Kamehameha SHA in FY 2021

Common Name	Scientific Name	# Detected	Stations Occupied
ʻIʻiwi	*Drepanis coccinea*	274	134
ʻAkiapōlāʻau	*Hemiganthus wilsoni*	34	23
ʻĀkepa	*Loxops coccineus*	5	3
ʻAlawī	*Loxops mana*	26	19
ʻIo	*Buteo solitarius*	10	9

Up to 17 Nēnē were observed during monthly surveys in in FY 2021 in the western portion of the enrolled property and up to six at the ʻŌhiʻa Ranch portion: surveys were not conducted in February because of COVID-19 related scheduling conflicts. No active nests or juvenile were observed at any site, but the carcass of an adult Nēnē was found at the Power Road Resevoir in March 2021. The cause of the fatality was not known, and the carcass was too decomposed to warrant a necropsy.

Plant monitoring of covered species was conducted in FY 2021 through a contract with the Hawaiʻi Plant Extinction Prevention Program (PEPP). Six of eight covered plant species show declining population numbers, due to poor survival of outplants and possible lifespan considerations. New populations for three of the covered species, *Asplenium peruvianum* var. *insulare*, *Clermontia lindseyana*, and *Vicia menziesii*, were discovered. Neither *P. racemosa* nor *Plantago hawaiensis* were identified, suggesting that both are currently extirpated from the enrolled property. Reintroduced populations of *Clermontia lindseyana*, *Cyanea shipmaii*, and *C. stictophylla* were not monitored. Although new populations were discovered for both *A. peruvianum* var. *insulare* and *V. menziesii*, both exhibited a net decrease in the number of individuals since 2019. *A. peruvianum* var. *insulare* appears to be the most stable of the covered species. Two previously known populations of *V. menziesii* are no longer extant but a newly located population of the species is the most robust with a total of 13 individuals, three of which are mature. Kamehameha Schools is also working with DOFAW to develop a collaborative recovery program for *Vicia menziesii*, which is currently known only from the property, and started discussions with the agency to expand collaboration to include recovery actions for all covered plant species.