Kaheawa Wind Project II

Habitat Conservation Plan

FY 2025 Annual Report

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Incidental Take License ITL-15 / Incidental Take Permit TE27260A-1

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Executive Summary

This report summarizes work performed by Kaheawa Wind Power II, LLC (KWP II), owner of the Kaheawa Wind Project II (Project), during the State of Hawai‘i fiscal year 2025 (FY 2025; July 1, 2024– June 30, 2025) under the terms of the approved Habitat Conservation Plan (HCP). The original HCP was dated December 2011 and described KWP II's compliance obligations under the Project's state Incidental Take License ITL-15 and federal Incidental Take Permit ITP-TE27260A-1. In 2019, the HCP was amended to address higher than expected take of two species (‘ōpe‘ape‘a [Hawaiian hoary bat] and nēnē [Hawaiian goose]) at the Project; the Project operates under the resulting and updated versions of the ITL and ITP, as amended. Species covered under the amended HCP (hereafter HCP; Covered Species) include four federally and state-listed threatened and endangered species. The 14-turbine Project was constructed in 2011–2012 and has been operating since July 2, 2012.

Fatality monitoring at the Project in FY 2025 continued within search plots limited to areas cleared of vegetation (roads and turbine pads) within 70 meters of each Wind Turbine Generator. Canine teams searched each of the fatality monitoring plots once per week year-round. Bias correction trials were conducted quarterly to measure the probability that a carcass would persist until the next search and the probability that an available carcass would be found. In FY 2025, probabilities of a carcass persisting until the next search were 0.73 (‘ōpe‘ape‘a surrogates), 0.99 (nēnē surrogates), and 0.75 (seabird surrogates). Searcher efficiency was 0.95 for ‘ōpe‘ape‘a, 1.00 for nēnē, and 0.93 for seabirds.

No fatalities of Covered Species were found at KWP II during FY 2025. Through FY 2025 and excluding incidental detections, the Project's total observed direct take of Covered Species has been three ‘ōpe‘ape‘a and nine nēnē. No Covered Seabird Species (‘ua‘u [Hawaiian petrel] and ‘a‘o [Newell's shearwater]) have been detected as fatalities at the Project to date. The fatality estimates using the Evidence of Absence estimator at the upper 80 percent credibility level is 11 for ‘ōpe‘ape‘a and 26 for nēnē (plus one gosling fatality attributable to Project infrastructure but not related to the effects of wind turbine operation analyzed using the Evidence of Absence estimator). Indirect take estimates for the Covered Species are one adult equivalent for the ‘ōpe‘ape‘a and one adult equivalent for the nēnē. Combining direct and indirect take estimate values, there is an approximately 80 percent chance that cumulative take of Covered Species at the Project from the start of operations through FY 2025 was less than or equal to 12 ‘ōpe‘ape‘a and 28 nēnē (this value includes one gosling attributable to non-turbine collision in FY 2018).

The bat acoustic monitoring program data captured ‘ōpe‘ape‘a activity across the Project at five detector locations throughout FY 2025. ‘Ōpe‘ape‘a were detected on 96 of 1,494 detector-nights (6.4 percent of detector-nights). The annual detection rate in FY 2025 (6.4 percent) was marginally lower than the annual detection rate in FY 2024 (9.0 percent). The seasonal pattern of detection rates was similar to previous years, and similar to the detection rate observed at the adjacent Kaheawa I Wind Project (KWP I) in FY 2025.

Mitigation commitments to offset the take of Covered Species are ongoing. Current estimated take for the ʻōpeʻapeʻa is within the Tier 3 limit of the HCP. Tier 3 mitigation was fully funded and completed with the publication of research contracted with the U.S. Geological Survey's Hawaiian Hoary Bat Research Group to conduct bat ecological research on Hawaiʻi Island. Current estimated take for the nēnē is at the Tier 2 limit of the HCP. KWP I and KWP II jointly manage the mitigation program at the Haleakalā Ranch release pen. In FY 2025, a total of eight nēnē offspring fledged from the Haleakalā Ranch release pen (this mitigation was fully funded by and assigned to KWP I in FY 2025 to address that Project's lagging nēnē mitigation). Mitigation for nēnē is ongoing at the Haleakalā Ranch nēnē release pen, with additional mitigation efforts at the Puʻu O Hōkū Ranch nēnē release pen commencing in FY 2026 in an effort to adaptively manage the mitigation program.

No observed take has occurred for Covered Seabird Species; therefore, both species are within the Tier 1 limit of the HCP. Tier 1 mitigation for both species was completed prior to FY 2025 through the implementation of a comprehensive plan for seabird colony management at the Makamakaʻole Seabird Mitigation Site as well as implementation of predator control and burrow monitoring at a ʻuaʻu breeding colony on Lānaʻi.

KWP II communicated actively with USFWS and DOFAW throughout FY 2025. Communications included conference calls, an in-person meetings, quarterly reports, and emails related to the Project's HCP.

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1.0 Introduction

The Hawai‘i Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) and U.S. Fish and Wildlife Service (USFWS) approved the Kaheawa Wind Project II (Project) Habitat Conservation Plan (HCP) in 2012. In January 2012, the Project received a federal incidental take permit (ITP; ITP-TE27260A-0) from the USFWS and a state incidental take license (ITL; ITL-15) from DOFAW. In 2019, DOFAW and USFWS approved an HCP Amendment to (hereafter HCP; SWCA 2019) to address the higher-than-expected take of two species, and the ITP and ITL were reissued (ITP-TE27260A-1; September 2019 and amended ITL-15; November 2019). The ITP and ITL cover the incidental take of four federally and state-listed, threatened and endangered species (the Covered Species) over a 20-year permit term.

The Covered Species include:

- ‘Ōpe‘ape‘a (Hawaiian hoary bat, *Lasiurus cinereus semotus*)[1];
- Nēnē (Hawaiian goose, *Branta sandvicensis*)[1];
- ‘Ua‘u (Hawaiian petrel, *Pterodroma sandwichensis*); and
- ‘A‘o (Newell’s shearwater, *Puffinus newelli*).

The Project was constructed in 2011 and 2012 and was commissioned on July 2, 2012. The Project continues to be operated by Kaheawa Wind Power II, LLC (KWP II).

KWP II and Tetra Tech have collaborated to prepare this progress report to describe the work performed for the Project during the State of Hawai‘i 2025 fiscal year (FY 2025; July 1, 2024–June 30, 2025) pursuant to the terms and obligations of the approved HCP, ITL, and ITP. The Project has previously submitted annual HCP progress reports to DOFAW and USFWS for FY 2013 through FY 2024 (KWP II 2013, KWP II 2014, KWP II 2015, KWP II 2016, KWP II 2017, KWP II 2018, Tetra Tech 2019, Tetra Tech 2020, Tetra Tech 2022a, Tetra Tech 2022b, Tetra Tech 2023, KWP II 2024).

2.0 Fatality Monitoring

Since operations began in July 2012, the Project has implemented a year-round intensive monitoring program to document downed (i.e., injured or dead) wildlife incidents involving Covered Species and other species. In consultation with USFWS, DOFAW, and the Endangered Species Recovery Committee (ESRC), fatality search areas have evolved over time from the start of operations through the initiation of the current approach in 2015. The last modifications were in response to the March 31, 2015, ESRC meeting wherein members agreed to “encourage the applicant to work with the statistical experts and researchers to develop an alternative more

[1] Among other modifications, increased take and mitigation for impacts to the nēnē and ‘ōpe‘ape‘a were addressed in the 2019 approved HCP Amendment.

efficient and focused monitoring strategy which still meets the committee's expressed preference for continuation of annual monitoring." Initially, monitoring occurred within the entirety of 70-meter radius circular plots centered on each wind turbine generator (WTG). Since April 2015, search plots were reduced to the graded and maintained WTG pads and access roads that fall within a 70-meter radius circle centered on each of the Project's 14 WTGs (Figure 1). This search area continues to be used for monitoring in FY 2025; density weighted proportions of the carcass distribution searched are presented in Appendix 1 (analysis and development presented in the FY 2018 annual report).

In FY 2025, all 14 WTGs were searched for fatalities once per week. The FY 2025 mean search interval for all WTGs was 7 days (Standard Deviation = 0.4 days); no search dates were missed. All search plots were inspected by a canine search team which included a trained detector dog accompanied by a handler; should search conditions prevent the use of dogs (e.g., weather, injury, availability of canine search team, etc.), search plots would be visually surveyed by Project staff. No visual-only searches occurred in FY 2025.

Additionally, KWP II tracks observations of live nēnē on site when they overlap with the timing of fatality searches. Because individual nēnē are not banded, KWP II provides a count of observations and individuals within these observations, however, individuals are likely counted multiple times throughout the year. In FY 2025, a total of 20 observations were made of 39 (non-distinct) individual adult nēnē and 22 (non-distinct) fledglings over 16 days between September 2024 and June 2025, with observations made in every month of this timeframe except October 2024. Three nēnē nest locations were observed on February 12th and 25th, 2025.

Precautions have been taken to eliminate any potential canine interactions with wildlife, with a focus on the nēnē. If nēnē were present nearby, the canine handler immediately retrieved and restrained the dog to avoid disturbing the birds, and either postponed searching in the vicinity of the birds, worked on leash away from any nēnē, or temporarily skipped canine searches in the vicinity. No canine-wildlife interactions occurred in FY 2025. Additionally, predator control efforts were targeted to protect detected nēnē nests in support of successful fledging.

3.0 Carcass Persistence Trials

One 28-day carcass persistence trial was conducted in each quarter, for a total of four trials in FY 2025. Each trial tested a minimum of five black rats (*Rattus rattus*) for ʻōpeʻapeʻa surrogates, two large chickens (*Gallus gallus*) for nēnē surrogates (i.e., large birds) and two wedge-tailed shearwater (*Ardenna pacifica*) carcasses as surrogates for the ʻuaʻu and ʻaʻo (i.e., medium birds; Covered Seabird Species).

In FY 2025, the probability that a carcass persisted until the next search was 0.73 for all ʻōpeʻapeʻa surrogates (95 percent Confidence Interval [CI] = 0.6, 0.84; N=20), 0.99 for large birds (95 percent CI = 0.86, 1.00; N=9), and 0.75 for medium-sized birds (95 percent CI = 0.41, 0.92; N=11).

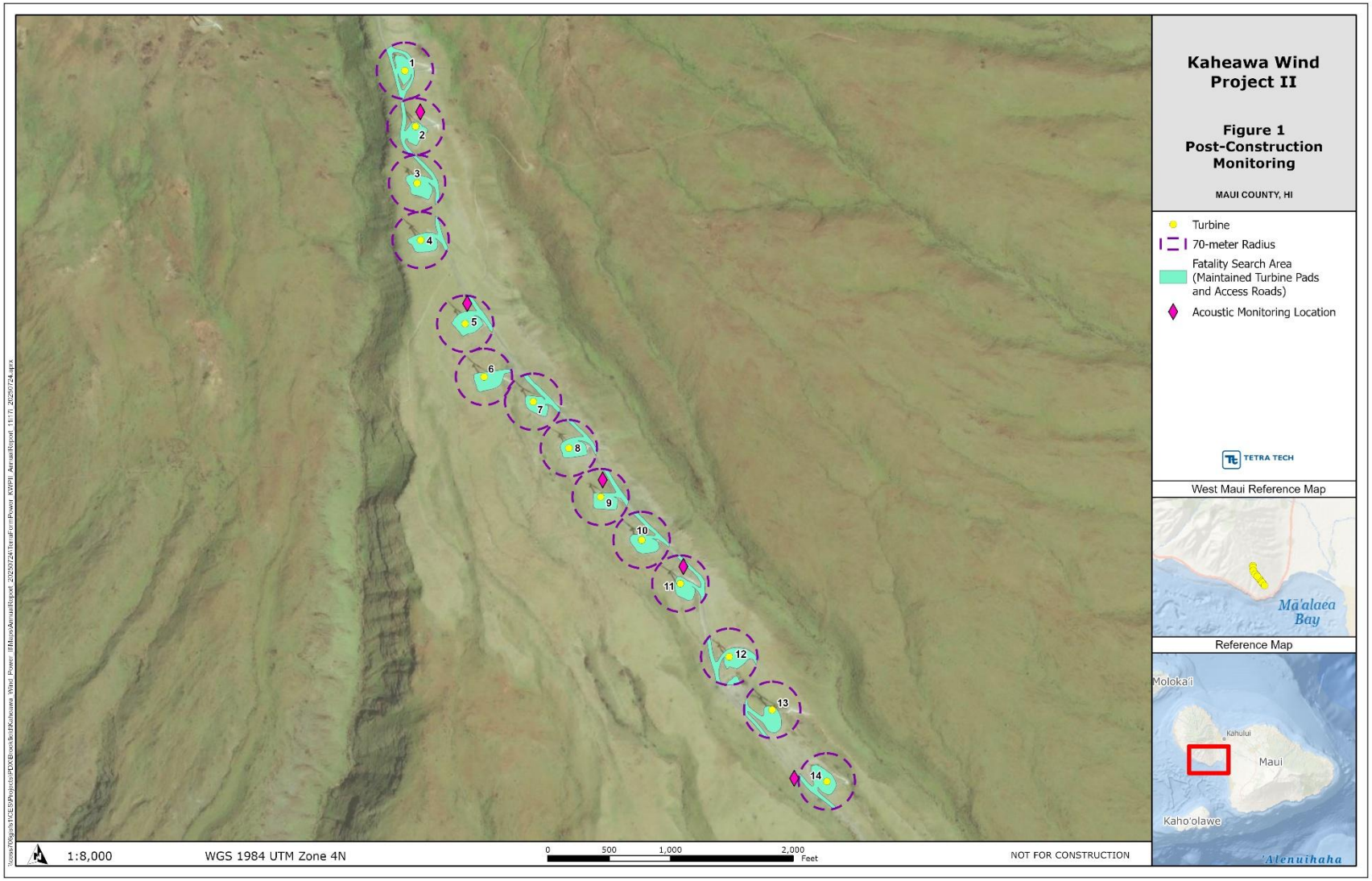

Figure 1. HCP Monitoring Locations

4.0 Searcher Efficiency Trials

A total of 79 individual searcher efficiency carcasses (trial carcasses) over 21 trial dates were administered during FY 2025. Similar to the carcass persistence trials, black rats were used as surrogates for ʻōpeʻapeʻa and large chickens were used as surrogates for nēnē. Trial proctors used wedge-tailed shearwaters and other medium-sized birds collected under the Project's Special Purpose Utility Permit (PER0055564[2]) and Protected Wildlife Permits (231228115819-WILD and 250122122859-WILD) as surrogates for Covered Seabird Species. Searcher efficiency trials occurred approximately twice monthly throughout the year; all trials tested canine search teams in FY 2025 (no visual only searches occurred in FY 2025). Of the 79 trial carcasses placed, eight ʻōpeʻapeʻa surrogates and one seabird surrogate were not available for detection (e.g., scavenged prior to the search).

For FY 2025, the probability that a canine search team would find a carcass was 0.95 for ʻōpeʻapeʻa surrogates (95 percent CI = 0.85, 0.99; N=41), 1.00 for large birds (95 percent CI = 0.85, 1.00; N=15), and 0.93 for medium-sized birds (95 percent CI = 0.71, 0.99; N=14).

5.0 Vegetation Management

In order to maximize fatality monitoring efficiency and minimize impacts to native plants without compromising soil stability, KWP II performs vegetation management at the Project. Vegetation management activities have evolved over time, and account for management activity restrictions during the nēnē nesting season. The evolution of vegetation management includes:

- Initial vegetation management activities within the search plots were limited to between April 1 and October 31 to minimize risk during the nēnē nesting season.
- In November 2016, Stephanie Franklin (DOFAW-Maui) verbally approved using hand management tools (spray packs and weed whackers) during the nēnē nesting season if the activity was within the current search area and did not disturb wildlife.
- In March 2017, Stephanie Franklin verbally approved the removal of Christmas berry (*Schinus terebinthifolius*) within 70 meters of the WTGs to reduce potential nēnē nesting habitat in the vicinity.
- In September 2021, Stephanie Franklin verbally approved the continuation of the quarterly management program and woody vegetation removal using hand and power tools, and manual application of herbicide on cut stumps as necessary, in proximity to select turbines. Verbal approval was also given for additional woody vegetation removal within a 1-meter

[2] This permit expired March 31, 2025. However, a permit renewal application was submitted on February 25, 2025, more than 30 days prior to expiration, and therefore the activities authorized by the permit are allowed to continue per 50 CFR 13.22 until the USFWS acts on the renewal application. As of August 12, 2025, the renewal status remains "Application in Review".

buffer of select turbine access roads noting that all woody vegetation removal work must be completed between April 1 and October 31 and in conjunction with a biological monitor.

The vegetation management program implemented at the Project in FY 2025 consisted of one herbicide application in October 2024, and an as-needed weed-whacking program. Herbicide was applied to the cleared areas within each search plot outside of the nēnē breeding season, as wind and weather conditions allowed. The remaining vegetation was trimmed by weed whacking to maintain annual consistency of the graded roads and pads (cleared area) within 70 meters of each turbine.

6.0 Scavenger Trapping

KWP II implements periodic scavenger trapping at the Project to extend carcass persistence times and contribute to a high probability of a carcass persisting until the next search. The program includes a once-quarterly intensive trapping effort followed by ongoing biweekly (every other week) trapping effort. In FY 2025, the number of traps in use for each effort was 17 DOC250 traps and 12 cage traps. Trap distribution has remained consistent since the FY 2022 increase in implementation effort, and provides additional protections to nēnē by increasing effort in safe proximity to detected nests. All traps utilized an additional protective entry guard that excluded nēnē ("gosling gaurd"). This program also benefits the resident wildlife, including the nēnē, by reducing the potential for predation. In FY 2025, there were an average of 32 trap nights per quarter for cage traps, and 92 trap nights per quarter for the DOC250s. This level of effort removed 14 mongooses (*Herpestes auropunctatus*) and nine feral cats (*Felis cattus*). No non-target animals were trapped.

7.0 Documented Fatalities and Take Estimates

No fatalities of a Covered Species were detected in FY 2025. Any observed downed wildlife would be handled and reported in accordance with the Downed Wildlife Protocol provided by USFWS and DOFAW (USFWS and DOFAW 2020). No injured (live) downed wildlife was observed at the Project in FY 2025.

To calculate take estimates, the number of observed fatalities is scaled to account for fatalities that are not detected (unobserved). Unobserved fatalities are the result of three primary factors:

- Carcasses may be scavenged before searchers can find them;
- Carcasses may be present, but not detected by searchers; and
- Carcasses may fall outside of the searched area.

Carcass persistence and searcher efficiency (bias correction; see Sections 3.0 and 4.0) measure the effect of the first two factors. The third factor, the number of carcasses that fall outside of the searched area, is dependent upon the proportion of the carcass distribution that is searched. The

search area for fatalities at the Project has evolved over time (Section 2.0); therefore, the proportion of the carcass distribution searched has varied historically. However, no change to the search plots has been made since FY 2016 (Section 2.0). Thus, the estimate of the proportion of the carcass distribution searched (DWP; Appendix 1) has remained the same as described in the FY 2018 annual report (KWP II 2018).

Cumulative take at an upper credible limit (UCL) of 80 percent was calculated for each Covered Species for which documented fatalities have occurred, per request of USFWS and DOFAW. The UCL is estimated from three components:

1. Observed direct take (ODT) during protocol (standardized) fatality monitoring;
2. Unobserved direct take (UDT); and
3. Indirect take.

The Evidence of Absence software program (EoA; Dalthorp et al. 2017), the agency-approved analysis tool for analyzing direct take, uses results from bias correction trials and ODT to generate a UCL of direct take (i.e., ODT + UDT). Direct take values from this analysis can be interpreted as an 80 percent probability that actual direct take at the Project over the analysis period was less than or equal to the 80 percent UCL. Indirect take calculations are based on the HCP and agency guidance. Indirect take is estimated based on factors such as the breeding season in which fatalities are observed, sex, and age characteristics of Covered Species fatalities found at the Project, their associated life history characteristics as described in the Project's approved HCP, and current agency guidance (e.g., USFWS 2016 for the ʻōpeʻapeʻa).

Additionally, EoA includes a module that allows users to project future estimates of mortality based on results of past fatality monitoring. Due to the inherent uncertainty of these projections (including the potential future contribution of indirect take) and the amplification of this uncertainty resulting from the use of the 80 percent UCL as the estimate of take for regulatory compliance, it is important to note that long-term projections have limited utility. Nevertheless, they do help gauge the likelihood of permitted take exceedance and may help operators in their mitigation planning, assuming future management and monitoring conditions can be reasonably estimated.

7.1 ʻŌpeʻapeʻa

7.1.1 Estimated Take

No take of ʻōpeʻapeʻa was observed in FY 2025. A total of four ʻōpeʻapeʻa fatalities have been observed at the Project since operation began in July 2012. Three observed ʻōpeʻapeʻa fatalities have been found within the search area and are used to estimate direct take. One fatality was classified as an incidental observation. All ʻōpeʻapeʻa carcasses were detected prior to FY 2021 and were transferred to the U.S. Geological Survey for genetic sexing (Pinzari and Bonaccorso 2018). The ʻōpeʻapeʻa fatalities by fiscal year are listed in Table 1.

Table 1. Observed ʻŌpeʻapeʻa Fatalities at KWP II through FY 2025

Fiscal Year	ʻŌpeʻapeʻa Observed Direct Take	ʻŌpeʻapeʻa Incidental Fatality Observations	Total
2013	1	0	1
2014	2	0	2
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	0	0	0
2019	0	1	1
2020	0	0	0
2021	0	0	0
2022	0	0	0
2023	0	0	0
2024	0	0	0
2025	0	0	0
Total	**3**	**1**	**4**

The estimated direct take (ODT + UDT) for the four ʻōpeʻapeʻa fatalities found between the start of operation (July 2012) and end of FY 2025 (June 30, 2025) is less than or equal to 11 ʻōpeʻapeʻa (80 percent UCL; Appendix 1a).

Indirect take is estimated to account for the potential loss of individuals that may occur indirectly as the result of the loss of an adult female through direct take during the period that females may be pregnant or supporting dependent young. The timing and sex of all observed fatalities (those observed in fatality monitoring as well as incidental to fatality monitoring) is used in the calculation of indirect take. Cumulative indirect take through FY 2025 remained the same as in FY 2024 at 0.47 adults (Appendix 2a).

The UCL for Project take of the ʻōpeʻapeʻa at the 80 percent credibility level is 12 adult ʻōpeʻapeʻa (11 estimated direct take + one estimated indirect take, rounded up from 0.47). That is, there is an approximately 80 percent probability that actual take at the Project at the end of FY 2025 is less than or equal to 12 ʻōpeʻapeʻa (Appendix 1a). The estimated take value is the same as reported in FY 2024.

7.1.2 Projected Take

KWP II has projected ʻōpeʻapeʻa take through the end of the permit term using the fatality monitoring data collected through FY 2025 to evaluate the potential for the Project to exceed the permitted take limit at the 80 percent UCL prior to the end of the permit term (Appendix 3a). For this analysis, the detection probability for future years is assumed to match the detection

probability of FY 2025 (0.39; 95 percent CI 0.33, 0.46), and the fatality rate is unaltered for all future years (rho=1). Future indirect take is unknown and will potentially vary based on the timing of any ODT. Therefore, based on historical Project data, Tetra Tech assumed a total indirect take for the Project over the permit term would be a maximum of two adult equivalents (approximately six juveniles based on assumed ʻōpeʻapeʻa survival rates; or 5.3 percent of the permitted take; USFWS 2016). Currently, the proportion of total take that is attributable to indirect take is 4.1 percent (0.47 [adult ʻōpeʻapeʻa equivalents estimated from indirect take] / 11.47 ʻōpeʻapeʻa [ʻōpeʻapeʻa estimated combining the direct and indirect take]), making the assumption of indirect take of two adult ʻōpeʻapeʻa conservative. Assuming two adult ʻōpeʻapeʻa equivalents are attributed to the Project as indirect take, direct take allowable under the HCP would be 36 ʻōpeʻapeʻa (38 ʻōpeʻapeʻa [permitted take, Tier 4] minus 2 ʻōpeʻapeʻa [estimated as attributed to indirect take] = 36 ʻōpeʻapeʻa [estimated direct take maximum]).

Currently the Project is fully permitted for take of 38 ʻōpeʻapeʻa (Tier 4) and take is within the Tier 3 limit. Based on the analysis described above and presented in Appendix 3a, there is a 99.86 percent probability that the 80 percent UCL of cumulative take at the Project *will not* exceed the fully permitted amount during the permit term. The median years of operations without exceeding this direct take threshold is 20, suggesting that even with an indirect take contribution of two adult equivalents, the Project is unlikely to exceed a cumulative take estimate of 38 ʻōpeʻapeʻa.

Additionally, when the same analysis is performed for the Tier 3 level of take (30 ʻōpeʻapeʻa), using a threshold of 28 ʻōpeʻapeʻa (30 ʻōpeʻapeʻa [permitted take, Tier 3] minus 2 ʻōpeʻapeʻa [estimated as attributed to indirect take] = 28 ʻōpeʻapeʻa [estimated direct take maximum]) there is a 98.26 percent probability that the 80 percent UCL of cumulative take at the Project will not exceed the Tier 3 permitted amount of during the permit term.

7.2 Nēnē

7.2.1 Estimated Take

No take of nēnē was observed in FY 2025. A total of 14 adult nēnē fatalities and one gosling fatality have been observed at the Project since the beginning of operation. Nine of the 15 observed adult fatalities have been found within the search area and are used to estimate UDT. Five of the 15 observed fatalities were classified as incidental observations. One gosling was detected in FY 2018; as the gosling was not capable of flight, it is accounted for independently of the analysis of take associated with collision risk. The observed nēnē fatalities by fiscal year are listed in Table 2.

Table 2. Observed Nēnē Fatalities at KWP II through FY 2025

Fiscal Year	Nēnē Observed Direct Take	Nēnē Incidental Fatality Observations	Total
2013	1	0	1
2014	0	0	0
2015	2	0	2

Fiscal Year	Nēnē Observed Direct Take	Nēnē Incidental Fatality Observations	Total
2016	1	0	1
2017	0	0	0
2018	1	3[1]	4[1]
2019	0	1	1
2020	3	0	3
2021	0	0	0
2022	1	1	2
2023	0	0	0
2024	0	0	0
2025	0	0	0
Total	**9**	**5[1]**	**14[1]**

1. Excludes one gosling detected in FY 2018 attributable to wind farm operations other than turbines.

The estimated direct take (ODT + UDT) for the 14 nēnē fatalities found between the start of operation (July 2012) and end of FY 2025 is less than or equal to 26 nēnē (80 percent UCL; Appendix 1b).

Indirect take is estimated to account for the potential loss of individuals that may occur as the result of the loss of their parents. Both parents for the nēnē care for young post-fledging (Banko et al. 2020). The point during the breeding season when an adult is taken determines to what extent offspring may be affected (SWCA 2011). Cumulative indirect take through FY 2025 was 1.65 fledglings (0.85 adult equivalents, assuming a 0.8 annual survival rate and 3 years from fledging to adult; Appendix 2b).

Thus, the UCL for cumulative Project take of the nēnē at the 80 percent credibility level is 28 nēnē (26 [estimated direct take from EoA] + 1 observed gosling fatality*0.512 adults/gosling + 0.85 [estimated adult equivalent indirect take], rounded up). That is, there is an approximately 80 percent probability that actual take at the Project at the end of FY 2025 is less than or equal to 28 adult nēnē.

In FY 2025, KWP II was able to reach consensus with USFWS and DOFAW on mitigation achieved through FY 2024. The total mitigation, achieved annually through 2025, is indicated in rows K and L of Appendix 2b.

Per the HCP, the Project may cause a net loss in productivity if take outpaces the number of individuals produced from mitigation efforts. The lag between production of nēnē through mitigation efforts and the take of nēnē at the Project drive the estimate of lost productivity. Accrued lost productivity at a given point in time is calculated as the cumulative take less the number of individuals generated from mitigation efforts to date, and then adjusted by a factor of 0.1 to account

for the probability that those unmitigated birds would have produced young (SWCA 2011). Accrued lost productivity is currently estimated at 10.6 adult equivalents (Appendix 2b).

7.2.2 Projected Take

KWP II has projected nēnē take through the end of the permit term using the fatality monitoring data collected through FY 2025 to evaluate the potential for the Project to exceed the permitted take limit at the 80 percent UCL prior to the end of the permit term (Appendix 3b). For this analysis, the detection probability for future years is assumed to match the detection probability of FY 2025 (0.362; 95 percent CI 0.34, 0.38), and the fatality rate is unaltered for all future years (rho=1). Future indirect take is unknown and will potentially vary based on the timing of any ODT. Based on historical Project data, we assumed total indirect take for the Project over the permit term would be a maximum of two adult equivalents (approximately four juveniles based on an assumed nēnē survival rate from juvenile to adult of 0.512; SWCA 2011), or 4.54 percent of the permitted take limit in the HCP. Currently, the proportion of total take that is attributable to indirect take is 3.11 percent (0.85 adult nēnē equivalents estimated from indirect take / 27.36 nēnē estimated combining the direct and indirect take) making the assumption of two adult indirect take conservative.

The permitted take limit for the nēnē is 44 (Tier 3). Future indirect take is unknown and will potentially vary based on the timing of ODT. Assuming two adult nēnē equivalents are attributed to the Project as indirect take, the permitted direct take under the HCP would be 42 nēnē (44 nēnē [permitted take] minus 2 nēnē [estimated indirect take = 42 nēnē [estimated direct take maximum]).

Based on the analysis, there is approximately 72.1 percent probability that the 80 percent UCL of cumulative take at the Project *will not* exceed the permitted amount during the permit term (Appendix 3b); EoA calculated a median estimate of 20 years of Project operation without a direct take estimate exceeding 42 nēnē.

KWP II has taken actions to address mitigation need at the Tier 3 level (See Section 9.3) in addition to minimizing threats to the nēnē at the Project. Minimization actions include limiting the attractiveness of the habitat within the project area through vegetation management. KWP II continues to work with USFWS, DOFAW, and technical experts to address mitigation and further reduce risk (Section 10.0).

7.3 Non-listed Species

Three non-listed bird species were documented as WTG-related fatalities at the Project site in FY 2025: black francolin (*Francolinus francolinus*; four individuals), gray francolin (*Ortygornis pondicerianus*; one individual), and rock pigeon (*Columba livia;* one individual). All three species are non-native, introduced birds that are not protected under the Migratory Bird Treaty Act (MBTA). For details of these fatalities for FY 2025, see Appendix 4.

8.0 Wildlife Education and Observation Program

The wildlife education and observation program (WEOP) helps to ensure the safety and well-being of native wildlife in work areas and along site access roadways. The training provides useful information to assist staff, contractors, and visitors to be able to conduct their business in a manner consistent with the requirements of the HCP, the Conditional Use Permit, land use agreements and applicable laws. Personnel are trained to identify Covered Species and other species of wildlife that may be found on-site and what protocol to follow, as determined in the HCP and through relevant agency guidance (e.g., USFWS and DOFAW 2020), when downed wildlife is found. The trainees are also made aware of driving conditions and receive instruction on how to drive and act around wildlife. Records of wildlife observations by WEOP-trained staff are also used by the HCP program to identify the patterns of wildlife use of the site.

During FY 2025, 37 people received WEOP training. WEOP training will continue to be conducted on an as-needed basis to provide on-site personnel with the information required to respond appropriately in the event they observe a Covered Species or encounter downed wildlife while on-site.

9.0 Mitigation

The Project's mitigation requirements are described in Section 6.0 of the HCP (SWCA 2011, SWCA 2019).

9.1 ʻŌpeʻapeʻa

9.1.1 Mitigation

Mitigation for Tier 1 and Tier 2 estimated ʻōpeʻapeʻa take was completely funded at Kahikinui State Forest Reserve (KWP II 2018). The habitat management program founded through Project mitigation funding continues under DOFAW management (DOFAW 2021). Mitigation for Tier 3 estimated take (19 ʻōpeʻapeʻa within Tier 3) was contracted to the U.S. Geological Survey Hawaiian Hoary Bat Research Group starting in FY 2018 to conduct bat ecological research on Hawaiʻi Island to better inform future bat conservation. The funding obligation was completed in FY 2022. Publications and manuscripts in process include:

- Montoya-Aiona, K., P. M. Gorresen, K. N. Courtot, A. Aguirre, F. Calderon, S. Casler, S. Ciarrachi, J. Hoeh, J. L. Tupu, and T. Zinn. 2023. Multi-scale assessment of roost selection by ʻōpeʻapeʻa, the Hawaiian hoary bat (Lasiurus semotus). PLoS ONE 18:e0288280. Available at: https://doi.org/10.1371/journal.pone.0288280
- Hoeh, J.P., Aguirre, A.A., Calderon, F.A., Casler, S.P., Ciarrachi, S.G., Courtot, K.N., Montoya-Aiona, K.M., Pinzari, C.A. and Gorresen, P.M., 2023. Seasonal and Elevational Differences by

Sex in Capture Rate of ʻŌpe ʻape ʻa (Lasiurus semotus) on Hawai ʻi Island. Pacific Science, 77(1), pp.1-26.

- Pinzari, C.A., P. M. Gorresen, R.W. Peck, and K.N. Courtot. in review. Mixed plate: Dietary composition and diversity in an endemic island bat, the Hawaiian ʻōpeʻapeʻa. [includes analyses of barcoding of 141 fecal samples, modeling of bat diet in relation to sex, season, and habitat].
- Gorresen, P. M., K.M. Montoya-Aiona, and K.N. Courtot. in prep. Roost ecology of the ʻōpeʻapeʻa, the Hawaiian hoary bat (Lasiurus semotus). [includes analyses of roost fidelity and activity from radio-telemetry, visual checks, and thermal video].
- Gorresen, P. M., R.W. Peck, C. A. Pinzari, and K.N. Courtot. in prep. Prey availability and diet of the ʻōpeʻapeʻa, the Hawaiian hoary bat (Lasiurus semotus). [includes analyses of 2 years prey availability data].

The Project in combination with KWP I had a total funding obligation of $1.7M to allocate to portions of each Project's mitigation requirement. KWP II, in combination with KWP I, exceeded its funding obligation by $131,500 over the original cost, for a total combined expenditure of $1,831,500.

Assuming the current take rate and search conditions remain unchanged through the remainder of the permit term, Tier 4 mitigation will not be necessary.

9.2 *Acoustic Monitoring at the Project*

The HCP commits KWP II to performing acoustic monitoring for ʻōpeʻapeʻa activity throughout the 20-year permit period. Acoustic monitoring for ʻōpeʻapeʻa activity has been conducted continuously beginning in 2012. In October 2013 (FY 2014) eight Song Meter SM2BAT+ ultrasonic recorders (SM2) were deployed, replacing Anabat SD2 bat detectors. Each SM2 unit is equipped with one SMX-U1 ultrasonic microphone (Wildlife Acoustics, Maynard, MA, USA) positioned horizontally, facing southwest (away from the prevailing NE trade winds), 6.5 meters above ground level. In October 2019 (FY 2020) the Pali brush fires burned across most of the Project destroying six SM2 units. For the remainder of the FY 2020 (October 2019 to June 2020) only two sites (WTGs 9 and 11) were monitored for acoustic ʻōpeʻapeʻa activity. In order to continue with the objectives of the monitoring program and address gaps in the spatial coverage of SM2 units resulting from the brush fire, the monitoring regime was redesigned in July 2020 with the deployment of five SM2 units (WTGs 2, 5, 9, 11, and 14; Figure 1). Additionally, because of differences in the equipment used prior to FY 2014, data collected in FY 2025 is only comparable to data collected between FY 2014 and FY 2024.

The objective of bat acoustic monitoring is to better understand the annual and seasonal variation in ʻōpeʻapeʻa activity at the Project. Analysis of variance (ANOVA) and a Tukey's Honest Significant Difference (HSD) were used to test for interannual differences in detection rates between sampling years. A linear model (LM) was constructed to test for a change in detection rates across all sampling years. FY 2014 was removed from the analysis because it did not represent a full sampling

year and excluded months known to have high detection rates (July, August, and September). All data were normalized with an Ordered Quantile Normalization transformation using the 'bestNormalize' package in R (Peterson 2021). The distribution of residuals from the LM were examined to check for violations of model assumptions. All tests were two-tailed, employed an alpha value of 0.05, and were conducted in R version 4.4.2 (R Core Team 2024). The characterization of Hawaiian hoary bat seasons corresponds approximately to Gorresen et al. (2013).

In FY 2025, ʻōpeʻapeʻa were detected on 96 nights out of 1,494 detector-nights sampled (6.4 percent; Table 3). Detection rates increased during the lactation and post-lactation reproductive periods, reaching a peak in October (0.17) and then declined in November (Figure 2). Detection rates continued to decline through the remainder of the post-lactation and pre-pregnancy reproductive periods. A second peak in detection rates occurred (0.07) in April followed by a decline in May and June (Figure 2). The annual trend in detection rates observed in 2025 is in-line with trends observed in previous monitoring years (Figure 3).

Table 3. Number of Nights Sampled, Number of Nights with Detections and Proportion of Nights with Bat Detections Between FY 2014 and FY 2025

Dates[1]	No. of Nights Sampled	No. of Nights with Detections	Proportion of Nights with Detections
FY 2014 (October 2013 - June 2014)	2,138	85	0.040
FY 2015 (July 2014 - June 2015)	2,864	204	0.071
FY 2016 (July 2015 - June 2016)	2,038	110	0.054
FY 2017 (July 2016 - June 2017)	2,217	166	0.075
FY 2018 (July 2017 - June 2018)	2,103	161	0.077
FY 2019 (July 2018 - June 2019)	2,549	211	0.083
FY 2020 (July 2019 - June 2020)	1,146	117	0.102
FY 2021 (July 2020 - June 2021)	1,671	232	0.139
FY 2022 (July 2021 - June 2022)	1,780	163	0.092
FY 2023 (July 2022 - June 2023)	1,727	197	0.114
FY 2024 (July 2023 - June 2024)	1,781	161	0.090
FY 2025 (July 2024 - June 2025)	1,494	96	0.064
1. Number of monitoring sites: FY 2014 - 2019 (n = 8), FY 2020 (n = 2) beginning in October 2019, FY 2021 - 2025 (n = 5).			

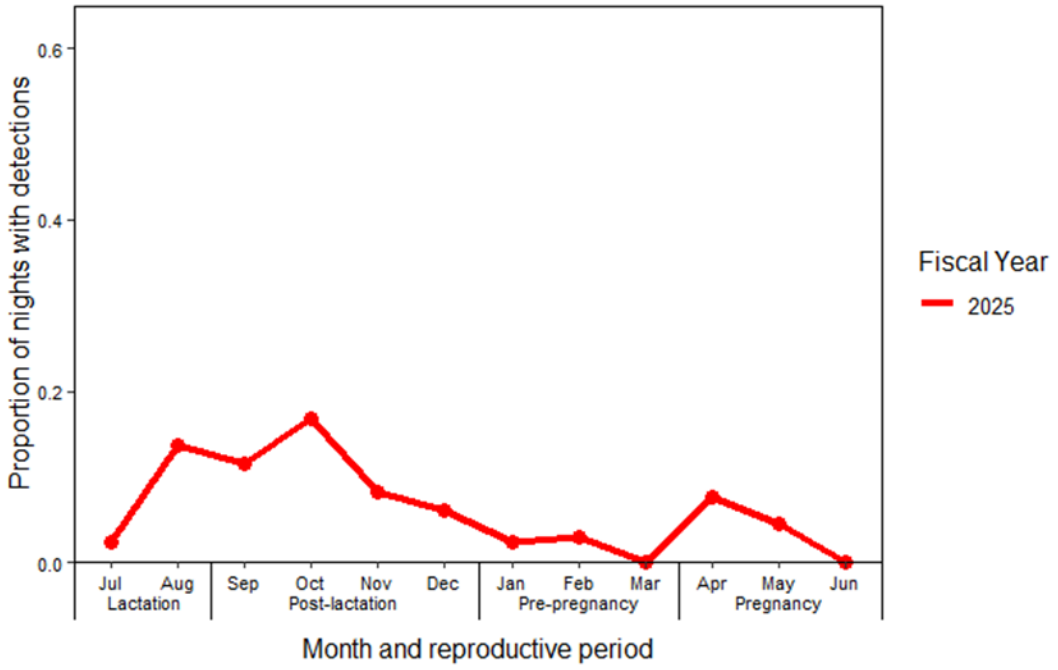

Figure 2. Monthly Detection Rates at the Project in FY 2025 with Corresponding Reproductive Periods

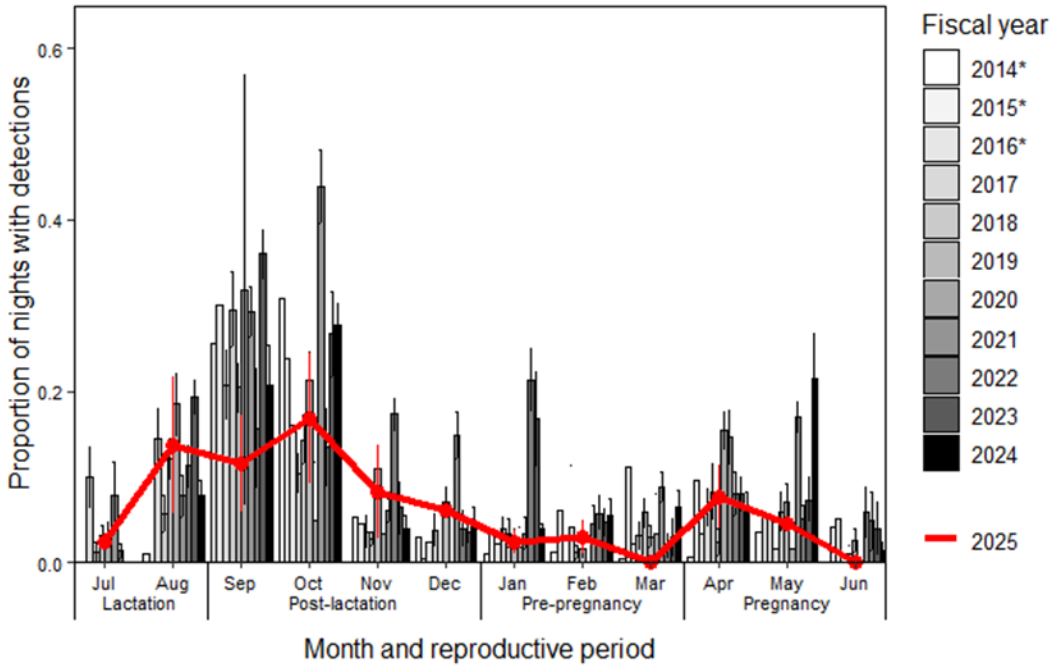

Figure 3. Monthly Bat Detection Rates at the Project for FY 2014 to FY 2025 with Corresponding Reproductive Periods

*Note: Error bars (SE) not available for fiscal years 2014, 2015, and 2016

The annual detection rate in FY 2025 (6.4 percent) was marginally lower than the annual detection rate in FY 2024 (9.0 percent). Annual detection rates varied between all monitoring years (Table 3) but were not significantly different (ANOVA: $F_{10,121} = 1.38$, $P > 0.196$). Across all monitoring years (FY 2015 to FY 2025) there is an increasing trend in the annual detection rate, though marginal and not statistically significant (LM: $R^2 = 1.72$ percent; $F_{1,130} = 2.27$, $P > 0.134$; Figure 4).

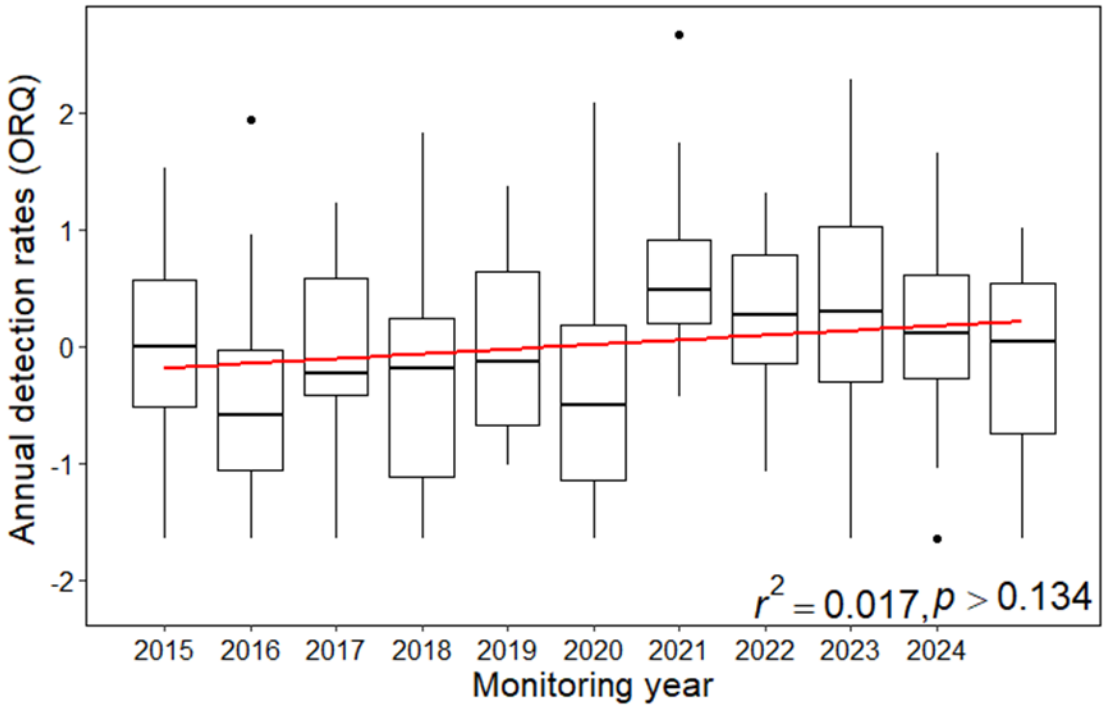

Figure 4. Box-plot with Linear Regression Showing the Increasing Trend in the Annual Detection Rate at the Project Between FY 2015 and FY 2025

*Note: Ordered Quantile normalization transformation (ORQ). All data were normalized using this transformation.

In FY 2025, KWP II collected data at the five Song Meter SM2BAT+ acoustics recorders SMX-U1 microphones and at a second set of five detectors: the newest models available, the Song Meter SM4BAT-FS and SMM-U2 microphone. KWP II monitored at side by side detectors at each sampling location in order to understand how the more sensitive SMM-U2 microphones affected the detection of ʻōpeʻapeʻa activity at the Project. This is analysis is ongoing and will be presented in the final report.

9.3 Nēnē

The Project provided funds to DOFAW in FY 2017 for management of Maui-based nēnē release pens with significant activity or nesting. Specifically, the funding supported predator control, fence maintenance, vegetation management and monitoring of a nēnē release pen at Piʻiholo Ranch in FY

2017, FY 2018, and part of FY 2019. The Project also provided funding for a technician at the Haleakalā Ranch release pen from October 2018 through February 2019. In May 2020, the Project provided $112,682 to fund nēnē mitigation activities performed by DOFAW at the Piʻiholo Ranch release pen. DOFAW was unable to process these funds in May 2020 when they were received due to internal limitations (pers. comm., A. Siddiqi, DOFAW, June 16, 2021). During FY 2024, KWP II worked closely with DOFAW to allocate $107,316 of the unspent funding to mitigation work that was previously completed: at Piʻiholo Ranch in FY 2021 and at Haleakalā Ranch in FY 2023. In 2021, the Piʻiholo Ranch was sold and the release pen was no longer available for mitigation opportunities.

In FY 2024 and FY 2025, mitigation offsets accrued at the Haleakalā Ranch release pen were allocated to KWP I in discussion with agencies due to the approaching permit expiration for that Project. KWP II is currently working with DOFAW, USFWS, and KWP I to determine future credit allocations, with the intent being that all permits will achieve mitigation credits annually (i.e., every permit should be achieving some mitigation credits each year). Nēnē credit allocation through FY 2025 is summarized in Appendix 2b.

KWP II recognizes that nēnē mitigaiton is lagging; the cumulative increases in adult and juvenile survival and productivity achieved by KWP II's mitigation projects have not been sufficient to fully offset the mitigation obligations of Tier 1 or Tier 2. Through FY 2024, KWP II has met 12.59 adult nēnē equivalents of their required mitigation. KWP II continues to adaptively manage the nēnē mitigation program to address lagging mitigation through release pen management at the Puʻu O Hōkū Ranch on the island of Molokaʻi. KWP II, DOFAW and the Puʻu O Hōkū Ranch signed an MOU in early FY 2026 and will begin implementing the Scope of Work (SOW) to manage the release pen supporting nēnē translocated to the island (as well as the existing population on the island) to further offset the take accrued from KWP I. On April 4, 2025 DOFAW translocated 24 nēnē to the pen, with a translocation plan outlining the continued release of approximately 25 breeding nēnē pairs and their young over a five-year timeframe (DOFAW 2025).

KWP II has implemented pen habitat and infrastructure improvements at the Haleakalā Ranch release pen in FY 2025 breeding season towards increasing productivity (Appendix 6), and will assume management of the Molokaʻi-based release pen at Puʻu O Hokū Ranch in FY 2026. KWP II is actively working with agencies to address the nēnē mitigation deficit and Tier 3 mitigation needs.

9.4 Seabirds

KWP II is committed to seabird protection and recovery on Maui and within Maui Nui. KWP II completed its mitigation obligation for both the ʻaʻo and ʻuaʻu prior to FY 2025, and to date, no take of either ʻaʻo or ʻuaʻu has been documented at the Project.

9.4.1 ʻAʻo Survey – East Maui

KWP II funded surveys for potential mitigation sites on east Maui, which were completed in September 2015 (KWP II 2016). These surveys identified potential colony locations, estimated the

numbers of birds present, assessed predator activity, and evaluated management feasibility at the colony locations.

9.4.2 ʻAʻo – Makamakaʻole

Mitigation efforts at Makamaka'ole began with the construction of the two predator exclosures completed in September 2013. Mitigation efforts at Makamaka'ole involved predator monitoring and trapping, artificial burrow checks and monitoring using game cameras, seabird social attraction using decoys and sound systems, and ongoing maintenance, including vegetation management, of both enclosures through January 31, 2023.

On December 5, 2022, DOFAW provided a letter assessing that after the 2022 breeding season at Makamakaʻole, credit for 148 adults and two fledglings translated into 8.53 ʻaʻo mitigation credits for KWP II (in conjunction with KWP I), and that KWP II had completed its mitigation obligation for the ʻaʻo. On December 8, 2022, USFWS provided a letter assessing credit for 149 adults and two fledglings, translating to an ʻaʻo mitigation credit of 8.54, and that the mitigation obligation for KWP II (in conjunction with KWP I) had been met. Although Makamaka'ole had been managed to benefit the ʻuaʻu, as well as the ʻaʻo, no ʻuaʻu activity has been detected at burrows within the enclosures since 2017, and mitigation for the ʻuaʻu was adaptively managed to Lānaʻi (Section 9.3.3).

In September 2024, KWP II signed a Memorandum of Agreement (MOA) with DOFAW (in conjunction with KWP I) to provide $750,000 in funding for a fence replacement at Makamaka'ole and to resume specified management and monitoring activities at the site. Funding was provided to Maui Nui Seabird Recovery Project in February 2025 for management actions for the 2025 calendar year, and will continue to fund specific actions throughout the term of the current ITL.

9.4.3 ʻUaʻu – Lānaʻi ʻUaʻu Protection Project

The ʻuaʻu have not been observed occupying the Makamaka'ole mitigation site since 2017. Therefore, both KWP projects worked with USFWS an DOFAW to adaptively manage mitigation efforts for this species to ensure that their mitigation obligations are met.

Beginning in the 2018 ʻuaʻu breeding season, both KWP projects worked with USFWS and DOFAW to adaptively manage ʻuaʻu mitigation efforts in an interim fashion. As a result of this adaptive management, KWP I provided funding to Pūlama Lānaʻi to supplement ʻuaʻu breeding colony protection efforts on Lānaʻi in 2018. The success of this program and difficulties in attracting ʻua'u to Makamaka'ole suggested that both KWP projects could benefit the ʻuaʻu and make progress on mitigation obligations by continuing support for the Lānaʻi petrel breeding program.

From FY 2021 to FY 2023 (two breeding seasons), the two KWP projects adaptively managed their seabird mitigation programs by providing funding to Pūlama Lānaʻi.

On March 27, 2023, USFWS provided a letter assessing that after the 2022 breeding season, the total estimated benefit provided for the ʻuaʻu from ʻuaʻu breeding colony protection efforts on Lānaʻi was 89.20 credits based on a previously agreed upon assessment framework (pers. comm. E. Gosliner, USFWS, October 31, 2022 and P. Radley, DOFAW, November 16, 2022). Additionally,

based on ʻuaʻu activity at Makamakaʻole in 2016 and 2017, in their March 27th letter, USFWS approved an estimated benefit for the ʻuaʻu of 0.56. Thus, the total mitigation benefit achieved across mitigation projects is 89.72 adult ʻuaʻu for both KWP II and KWP I. KWP II's ʻuaʻu mitigation obligation per the ITP is 43 ʻuaʻu (including adults, subadults, fledglings, nestlings, and eggs). In the March 27 letter, USFWS acknowledges that KWP II has meet its ʻuaʻu mitigation obligation. In a letter dated February 27, 2025, DOFAW provided concurrence that KWP II earned an estimated benefit 89.72 adult ʻuaʻu for Makamakaʻole and Lānaʻihale from 2015 to 2022 in conjunction with KWP I, fulfilling the mitigation requirement for both projects.

10.0 Adaptive Management

In accordance with the HCP, low wind speed curtailment (LWSC) was implemented from the start of Project operations at wind speeds of up to 5 meters per second (m/s) at all WTGs for the months of April through November. LWSC is expected to reduce the risk of ʻōpeʻapeʻa take, as explained in the HCP. This curtailment period was extended to begin mid-February and continue through December 15 in response to ʻōpeʻapeʻa fatalities documented at the Project on March 13, 2013 and February 26, 2014, and a fatality at the KWP I Project on December 14, 2013. On June 6, 2014, the Project proposed an additional adaptive management measure to the USFWS and DOFAW, increasing the LWSC cut-in speed. On July 29, 2014 the LWSC was raised to 5.5 m/s between February 15 and December 15 from sunset to sunrise. The Project continues its site-wide ʻōpeʻapeʻa activity assessment as committed to in the approved HCP Amendment.

The Project has previously implemented a variety of actions to minimize risk to the nēnē, which continued in FY 2025. Scavenger trapping efforts implemented at the Project to improve persistence of carcasses during fatality monitoring have likely reduced the risk of predation of the resident nēnē, while targeted predator control around discovered nesting sites improves the opportunity for successful fledging. Safety measures to avoid interactions between nēnē and canine search teams have been identified and are implemented as needed. In response to the current projections of potential take of the nēnē at the Project, KWP II has taken practicable actions to minimize the threats to the nēnē. In FY 2023, KWP II implemented a vegetation management plan developed with concurrence from the agencies reducing the amount of woody vegetation on site. The goal was to minimize the attractiveness of onsite habitat to the nēnē. Because nēnē have a continued breeding presence at the site, KWP II will continue to manage woody vegetation on site in FY 2026 in conjunction with agency approval. Additionally, KWP II will continue to monitor nēnē activity on site to inform vegetation management successes and needs, and continue to work with USFWS, DOFAW, and technical experts to further reduce risk to the species.

11.0 Agency Meetings, Consultations, and Visits

KWP II communicated actively with USFWS and DOFAW throughout FY 2025 with the implementation of biweekly check in conference calls, along with an in-person meeting, submittal of quarterly reports, and email communications. These communications were developed to provide frequent and close communication regarding HCP implementation, along with ESRC review of the annual report and focused discussions regarding nēnē mitigation. A summary of agency coordination is presented in Table 4.

Table 4. Summary of Agency Coordination and Communication in FY 2025 or Related to FY 2025 Reporting

Date	Communication	Participants
July 1 – June 30 (biweekly)	Recurring check-in calls	KWP I, Tetra Tech, USFWS, DOFAW
July 1, 2024	Call to discuss potential expansion of Haleakala nēnē pen	DOFAW Maui, KWP I, KWP II
July 12, 2024	USFWS edits/comments on Haleakala MOU	To: KWP I and KWP II From: USFWS
July 16, 2024	DOFAW edits/comments on Haleakalā MOU and SOW	To: KWP I and KWP II From: DOFAW
July 17, 2024	Letter accepting nēnē mitigation proposal for allocation of leftover funds	To: KWP I and KWP II From: DOFAW
July 18, 2024	DOFAW email accepting nēnē mitigation proposal for providing past funding shortages, and instructions for providing payment	To: KWP I and KWP II From: DOFAW
July 23, 2024	Haleakala Annual Report	To: DOFAW Maui From: KWP I and KWP II
July 31, 2024	Annual report submission	Submitted by Terraform to DOFAW, USFWS
August 12, 2024	Edits and comments on Makamaka'ole MOA	To: KWP I and KWP II From: DOFAW
August 30, 2024	USFWS comments on annual reports	To: KWP II From: USFWS
September 5, 2024	DOFAW comments on annual reports	To: KWP II From: DOFAW
September 13, 2024	Call to discuss Molokai nēnē translocation	DOFAW Maui, KWP I
September 19, 2024	Haleakla SOW and MOU	To: KWP I and KWP II From: DOFAW

Date	Communication	Participants
September 24, 2024	Call about the nene translocation to Molokai	DOFAW, DOFAW Maui, USFWS, KWP, POH Ranch
September 25, 2024	DOFAW-Maui Haleakala Nene Report	To: KWP I and KWP II From: DOFAW Maui
October 11, 2024	Final Annual Report submitted	To: DOFAW and USFWS From: KWP II
October 18, 2024	Request for nēnē banding opportunity at the Project (email)	To: DOFAW Maui From: KWP II
November 1, 2024	Submission of Q1 report	To: USFWS and DOFAW From; KWP II
December 9, 2024	Draft MOU for management of Makamaka'ole submitted	To: DOFAW From: KWP I and KWP II
January 30, 2025	Comments on MOU for makamaka'ole received	To: KWP I and KWP II From: DOFAW
January 31, 2025	Revised Haleakala MOU	To: KWP I and KWP II From:DOFAW
January 31, 2025	Submission of Q2 report	To USFWS and DOFAW From: KWP I
January 31, 2025	Draft MOU for Haleakalā Ranch Nēnē Pen, changes to incorporate request from Ranch	To KWP II From DOFAW
February 11, 2025	Sent revised makamaka'ole supplemental agreement	To: DOFAW From: KWP I and KWP II
February 12, 2025	Supplemental agreement for Makamaka'ole – final version with request for funding	To: KWP I and KWP II From: DOFAW
February 13, 2025	Draft SOW for Pu'u O Hoku Ranch	To: DOFAW and USFWS From: KWP I and KWP II
February 26, 2025	Request for a call to discuss nēnē banding opportunities at the Project	To: DOFAW Maui From: KWP II
February 27, 2025	Final signed Haleakalā Ranch MOU	To: DOFAW From: KWP I and KWP II
February 27, 2025	Signed supplemental agreement for makamaka'ole	To: DOFAW From: KWP I and KWP II
March 4, 2025	Fully executed Haleakalā Ranch MOU	To; KWP I and KWP II From: DOFAW
March 17, 2025	KWP I and II Hawaiian Petrel Credit letter from DOFAW	To: KWP I and KWP II From: DOFAW

Date	Communication	Participants
March 26, 2025	Draft Puʻu O Hoku MOU and Scope of Work with DOFAW edits	To: KWP I and KWP II From DOFAW
April 2, 2025	POH nēnē translocation information	To: KWP I and KWP II From; DOFAW
April 3, 2025	Final Molokai Supplemental Nēnē Translocation Plan_2025	To: KWP I and KWP II From USFWS
April 9, 2025	POH nēnē release pen draft SOW comments	To: KWP I and KWP II From: USFWS
April 30, 2025	Q3 report	To USFWS and DOFAW From: Tetra Tech on behalf of KWP I
August 15, 2025	Draft annual report submitted	To: DOFAW and USFWS From: KWP II
September 26, 2025	Comments on draft annual report	To: KWP II From: USFWS
January 30, 2026	Comments on draft annual report	To: KWP II From: DOFAW
February 12, 2026	FY 2025 annual review meeting	DOFAW, KWP II, Tetra Tech

12.0 Expenditures

Total HCP-related expenditures for the Project in FY 2025 were $312,300 (Table 5).

Table 5. HCP-related Expenditures at the Project in FY 2024

Category[1]	Amount
Permit Compliance	$53,000
Fatality Monitoring	$76,000
Acoustic Monitoring for ʻōpeʻapeʻa	$24,000
Vegetation Management and Scavenger Trapping	$69,000
Nēnē Mitigation: Haleakalā Ranch Release Pen Project [2]	$4,100
Makamaka'ole	$61,200
Hawai'i Wildlife Center[3]	$25,000
Total Cost for FY 2025	**$312,300**

1. Staff labor and equipment costs are included in the overall costs for each category.

2. This total is co-funded with KWP I and was primarily paid for by KWP I in FY 2025.

3. KWP II contributed $25,000 to HWC in FY 2025 to fulfill voluntary mitigation for pueo, previously reported as paid in FY 2013. Because neither HWC nor KWP II could locate documentation confirming the earlier payment, KWP II opted to make the contribution again to ensure the mitigation obligation was met.

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Appendix 1. Dalthorp et al. (2017) Fatality Estimation for the ʻŌpeʻapeʻa and Nēnē at the Project through FY 2025

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Appendix 1a. Dalthorp et al. (2017) Fatality Estimation for the ʻŌpeʻapeʻa at the Project through FY 2025

Modelling Parameter		Modelling Period												
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13 (Current)**
FY		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
LWSC		5.0 m/s	5.0 m/s	5.5 m/s	5.5 m/s	5.5 m/s	5.5 m/s	5.5 m/s	5.5 m/s	5.5 m/s	5.5 m/s	5.5 m/s	5.5 m/s	5.5 m/s
Date Range	Begin	7/1/2012	7/1/2013	7/1/2014	7/1/2015	7/1/2016	7/1/2017	7/1/2018	7/1/2019	7/1/2020	7/1/2021	7/1/2022	7/1/2023	7/1/2024
	End	6/30/2013	6/30/2014	6/30/2015	6/30/2016	6/30/2017	6/30/2018	6/30/2019	6/30/2020	6/30/2021	6/30/2022	6/30/2023	6/30/2024	6/30/2025
Period length (span)		364	364	364	364	364	364	364	362	364	364	364	364	364
% of Year (rho)		1	1	1	1	1	1	1	1	1	1	1	1	1
Search Interval (days)		7	7	7	7	7	7	7	7.1	7	7	7	7	7
Number of Searches in Modelling period		52	52	52	52	52	52	52	51	52	52	52	52	52
Observed fatality (X)		1	2	0	0	0	0	0	0	0	0	0	0	0
K		0.7	0.7	0.7	1[1]	1[1]	1[1]	1[1]	1[1]	1[1]	1[1]	1[1]	1[1]	1[1]
DWP		1	1	1	0.562	0.562	0.562	0.56	0.56	0.56	0.56	0.56	0.56	0.56
$\hat{g}$	$\hat{g}$	0.443	0.359	0.336	0.362	0.442	0.375	0.372	0.476	0.409	0.354	0.517	0.453	0.392
	min	0.241	0.235	0.187	0.27	0.374	0.287	0.304	0.437	0.333	0.271	0.481	0.398	0.326
	max	0.656	0.493	0.503	0.46	0.511	0.467	0.440	0.516	0.486	0.441	0.553	0.509	0.46
B	Ba	9.08	18.5	10.95	35.09	87.96	41.22	74.23	289.1	63.53	42.51	383.0	139.4	78.8
	Bb	11.41	33.02	21.68	61.84	111.1	68.77	125.3	318.1	92.00	77.67	358.0	168.5	122.4
M*[3]		5	12	12	12	11	12	12	11	11	11	11	11	11

1. Searches performed by canine teams increases the probability that a missed carcass will be detected on the next search.
2. Search area reduced to graded and cleared portions of and roads within 70-meter radius from turbine.
3. Cumulative value representing estimate of total direct take from the start of operations through the identified monitoring period at the 80 percent UCL.

Appendix 1b. Dalthorp et al. (2017) Fatality Estimation for Nēnē at the Project through FY 2025

Modelling parameter		Modelling Period												
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13 (Current)**
FY		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Date Range	Begin	7/1/2012	7/1/2013	7/1/2014	7/1/2015	7/1/2016	7/1/2017	7/1/2018	7/1/2019	7/1/2020	7/1/2021	7/1/2022	7/1/2023	7/1/2024
	End	6/30/2013	6/30/2014	6/30/2015	6/30/2016	6/30/2017	6/30/2018	6/30/2019	6/30/2020	6/30/2021	6/30/2022	6/30/2023	6/30/2024	6/30/2025
Period length (days)		364	364	364	365	364	364	364	362	364	364	364	364	364
% of Year		1	1	1	1	1	1	1	1	1	1	1	1	1
Search Interval (days)		7	7	7	7	7	7	7	7.1	7	7	7	7	7
Number of Searches in Modelling period		52	52	52	52	52	52	52	51	52	52	52	52	52
Observed fatality (X)		1	0	2	1	0	1	0	3	0	1	1	0	0
K		1	1	1	1	1	1	1	1	1	1	1	1	1
DWP		0.7	0.7	0.7	0.372	0.372	0.372	0.372	0.372	0.372	0.372	0.372	0.372	0.372
$\hat{g}$	$\hat{g}$	0.654	0.653	0.681	0.358	0.361	0.36	0.361	0.347	0.361	0.368	0.367	0.367	0.362
	min	0.503	0.474	0.583	0.288	0.294	0.285	0.295	0.319	0.338	0.355	0.343	0.354	0.341
	max	0.791	0.812	0.771	0.431	0.43	0.437	0.429	0.375	0.384	0.381	0.391	0.380	0.383
B	Ba	26.32	18.94	62.8	61.66	68.06	54.62	70.09	380.2	633.1	1811	567.7	1847	715.3
	Bb	13.91	10.05	29.46	110.5	120.7	97.27	124.2	717	1120	3110	980.2	3187	1262.4
M*[2]		3	3	6	9	10	13	13	21	22	25	25	26	26

1. Search area reduced to graded and cleared portions of and roads within 70-meter radius from turbine.
2. Cumulative value representing estimate of total direct take from the start of operations through the identified monitoring period at the 80 percent UCL.

Appendix 2. Indirect Take for the ʻŌpeʻapeʻa and Nēnē at the Project in FY 2025

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Appendix 2a. Indirect Take for the ʻŌpeʻapeʻa at the Project in FY 2025

Parameter	Description	Fiscal Year													
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
A	Observed Breeding Female Take	0	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**	**0**
B	Indirect Take from Observed Breeding Female Take (A x 1.8)	0	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**	**0**
C	Observed Breeding Unknown Sex Take	0	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**	**0**
D	Indirect Take from Observed Breeding Unknown Sex Take (C * 0.5 * 1.8)	0	0	0	0	0	0	0	0	0	0	**0**	**0**	**0**	**0**
E	All Observed Take (Search and Incidental)	1	2	0	0	0	0	1	0	0	0	**0**	**0**	**0**	**4**
F	Estimated Take Multiplier (11/4=2.75)	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	–
G	Estimated Direct Take (E x F)	2.75	5.5	0	0	0	0	2.75	0	0	0	**0**	**0**	**0**	**11**
H	Unobserved Direct Take (G - E)	1.75	3.5	0	0	0	0	1.75	0	0	0	**0**	**0**	**0**	**7**
I	Indirect Take Calculated from Unobserved Take (H * 0.5 * 0.25 * 1.8)	0.39	0.79	0	0	0	0	0.39	0	0	0	**0**	**0**	**0**	**1.58**
Total Indirect Take (B + D + I; juveniles)															**1.58**
Total Indirect Take (B + D + I)*0.3 (adults)															**0.47**

Appendix 2b. Indirect Take and Lost Productivity for the Nēnē at the Project in FY 2025

Parameter	Description	Fiscal Year														
		2013	2014	2015	2016	2017	2018		2019	2020	2021	2022		2023	2024	2025	Total
A	Observed Take	1	0	2	1	0	2	2	1	3	0	1	1	0	0	0	14
A1	Observed Take (Goslings) Not Attributable to Wind Farm Operation	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
B	Estimated Take Multiplier (26/14=1.86)	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	–
C	Estimated Direct Take (A x B)	1.86	0.00	3.71	1.86	0.00	3.71	3.71	1.86	5.57	0.00	1.86	1.86	0.00	0.00	0.00	26
D	Observed Indirect Take Multiplier (Season Defined)	0.04	0	0.09	0.09	0	0	0.09	0.09	0.09	0	0.04	0.09	0	0.00	0.00	–
E	Observed Indirect Take (A x D)	0.04	0	0.18	0.09	0	0	0.18	0.09	0.27	0	0.04	0.09	0	0.00	0.00	0.98
F	Unobserved Direct Take (C - A)	0.86	0.00	1.71	0.86	0.00	1.71	1.71	0.86	2.57	0.00	0.86	0.86	0.00	0.00	0.00	12
G	Unobserved Indirect Take (F x 0.3*0.375*0.5)	0.048	0.000	0.096	0.048	0.000	0.096	0.096	0.048	0.145	0.000	0.048	0.048	0.000	0.00	0.00	0.68
H	Accrued Adult Take (Previous Year's Accrued C + J2 - L -N)	0.00	1.86	1.93	5.84	7.84	7.98		15.81	19.83	25.96	22.87		29.8	31.82	35.52	–
I	Lost Productivity from accrued adult take (Current year's H x 0.1) (fledglings)	0.00	0.19	0.19	0.58	0.78	0.80		1.58	1.98	2.60	2.29		2.98	3.18	3.55	20.7
J	Indirect Take + Lost Productivity (E + G + I + A1)(fledglings)	0.09	0.19	0.47	0.72	0.78	2.17		1.72	2.40	2.60	2.51		2.98	3.18	3.55	23.35
J2	Indirect Take + Lost Productivity as Adult (2 year's previous J x 0.9^2) (annual survival rate is 0.9)	–	–	0.07	0.15	0.38	0.58		0.63	1.76	1.39	1.94		2.1	2.03	2.41	–
K	Mitigation fledglings produced (fledglings)	0.00	0.00	0.00	0.00	0.00	3.00		11.55	0.00	2.60	0.00		3.24	0.00	0.00	20.39
L	Mitigation adult survival (adults)	0.00	0.00	0.00	0.00	0.33	0.68		0.61	0.00	0.40	0.00		0.12	0.00	0.00	2.15

Appendix 2b. Indirect Take and Lost Productivity for the Nēnē at the Project in FY 2025

Parameter	Description	Fiscal Year													
		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
M	Net fledglings remain (Current Year K - J)	-0.09	-0.19	-0.47	-0.72	-0.78	0.83	9.83	-2.40	0.01	-2.51	0.26	-3.18	-3.55	-2.96
N	Net adults 3 yrs. later (Three year's previous M x 0.512)	---	---	---	-0.05	-0.10	-0.24	-0.37	-0.40	0.42	5.03	-1.23	0.00	-1.29	1.80
Total Direct Take from Collisions with WTGs (adults; C)															26
Total Direct Take from Non-Collision Causes (adults; A1 x 0.512)															0.51
Total Indirect Take (fledglings; E + G)															1.65
Total Indirect Take (adults; [E + G] x 0.512)															0.85
Total Lost Productivity (fledglings; I)															20.70
Total Lost Productivity (adults; I x 0.512)															10.6

Appendix 3. ʻŌpeʻapeʻa and Nēnē 20-year Projected Take at the Project as of FY 2025

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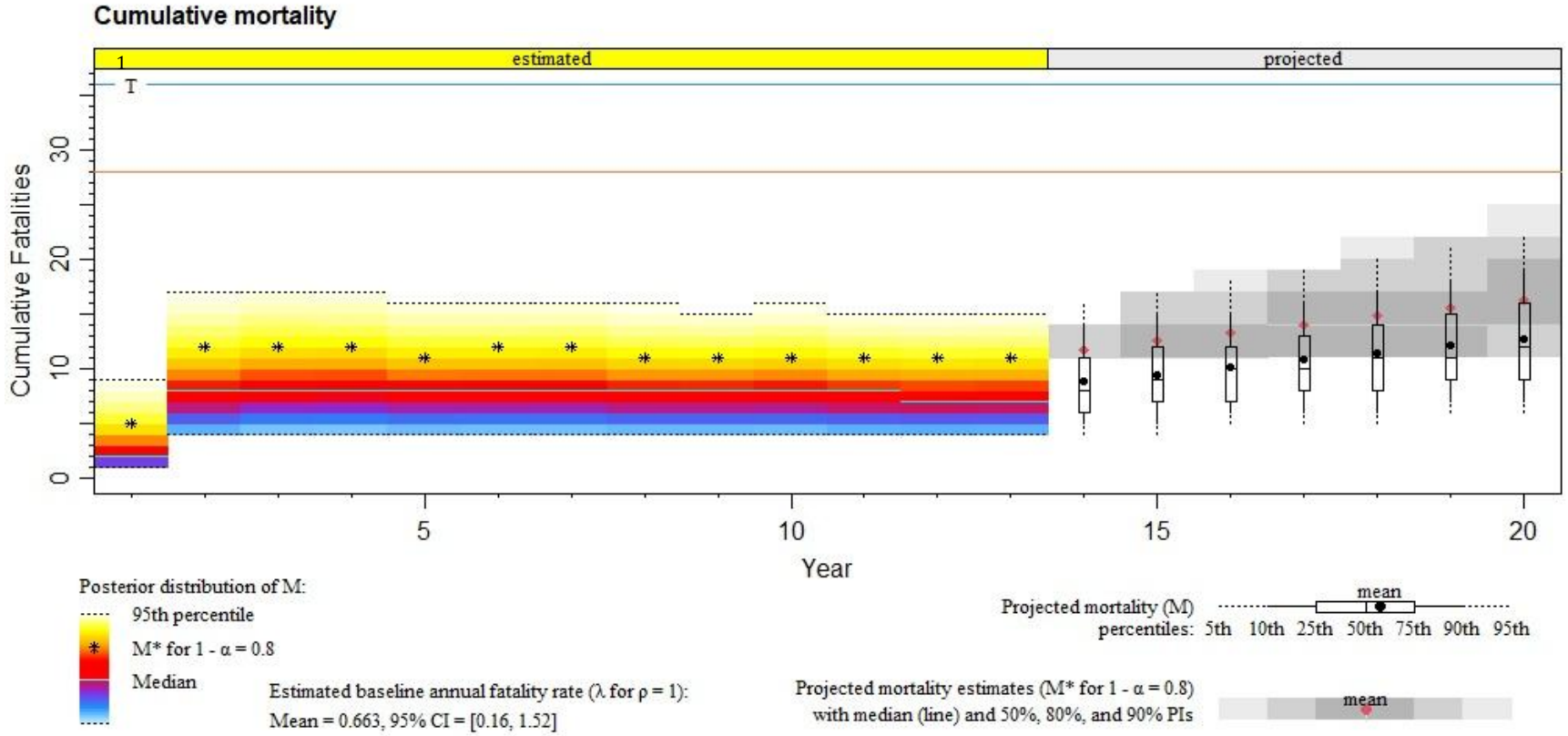
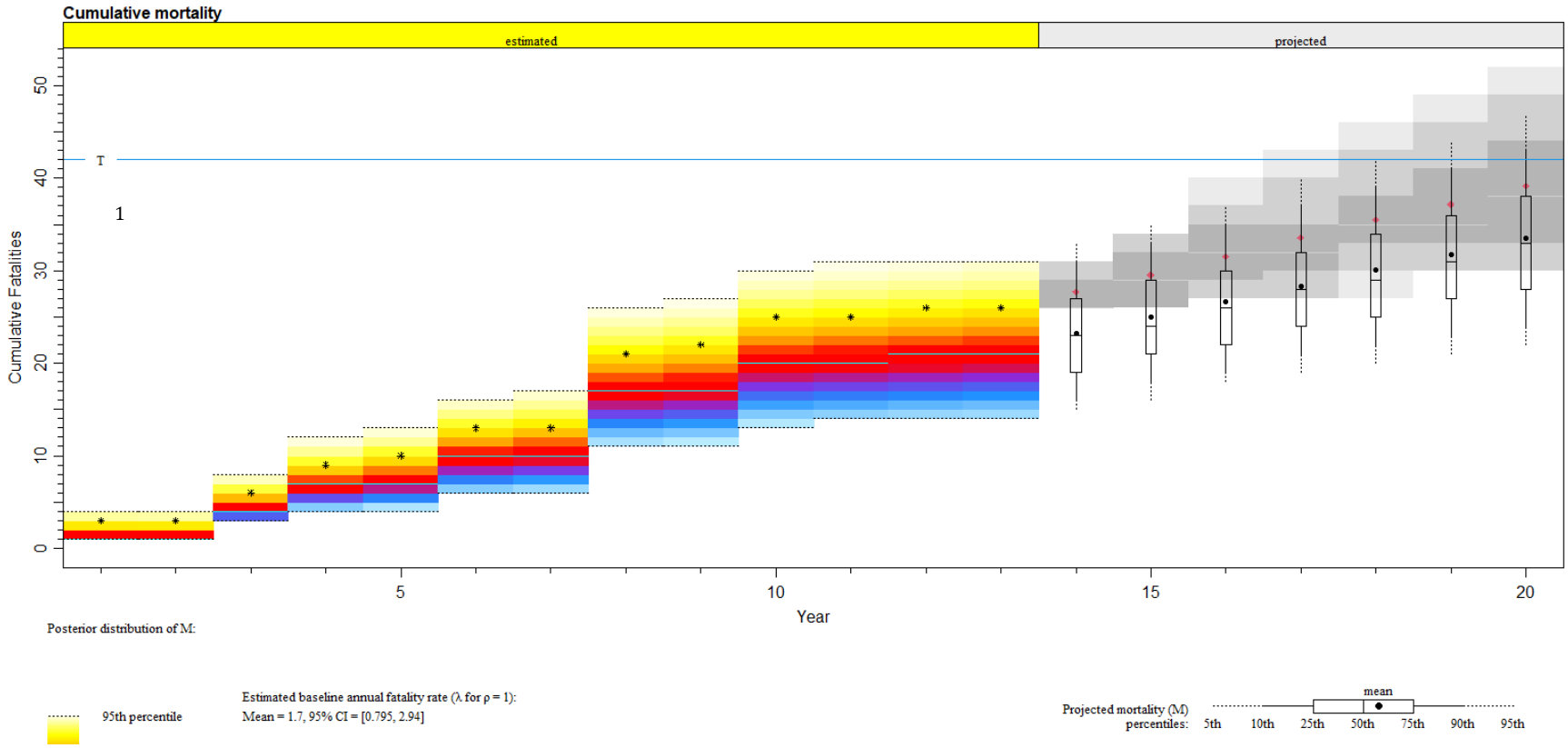
Appendix 3a. Projected Cumulative Mortality for the ʻŌpeʻapeʻa at the Project



1. The fully permitted take for the ʻōpeʻapeʻa at the Project is 38. Take, however, as calculated from EoA only includes direct take. To account for indirect take in this figure, an approximate Tier Four take threshold (T) of 36 is shown, representing fully permitted bat take (38) minus 2 adult equivalents of indirect take (5.3 percent of the requested authorized limit). Currently, the proportion of total take that is attributable to indirect take is 4.1 percent. The orange line represents the Tier Three threshold of 28 bats representing Tier Three permitted bat take (30 minus 2 adult equivalents of indirect take).

Appendix 3b. Projected Cumulative Mortality for the Nēnē at the Project



1. Permitted take for the nēnē at the Project is 44; however, take as calculated from EoA only includes direct take. To account for indirect take in this figure, an approximate take threshold (T) of 42 is shown, representing requested authorized nēnē take (44) minus 2 adult equivalents of indirect take (4.5 percent of the requested authorized limit). Currently, the proportion of total take that is attributable to indirect take is 3.11 percent.

Appendix 4. Documented Fatalities at the Project during FY 2025

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Species	Date Documented	WTG	Distance to WTG (meters)	Bearing from WTG (degrees)
Ortygornis pondicerianus (gray francolin)	7/24/2024	13	2	355
Francolinus francolinus (black francolin)	8/7/2024	8	1	333
Columba livia (rock pigeon)	12/12/2024	14	200	190
Francolinus francolinus (black francolin)	4/10/2025	11	15	175
Francolinus francolinus (black francolin)	5/21/2025	2	1	30
Francolinus francolinus (black francolin)	6/11/2025	14	1	300

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Appendix 5. Nēnē Monitoring and Predator Control Management at Haleakalā Ranch, DOFAW Maui Annual Report, FY 2025

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Maui

Haleakalā Ranch Report: FY 2025

Sighting:

Management of the Haleakalā Ranch pen was transferred to KWP/TetraTech and is now carried out by a local contractor as of January 2023. This includes mowing, weed control, fence maintenance, water maintenance, predator control, trapping, and road maintenance. DOFAW conducts monthly nēnē monitoring surveys, tracks nesting success, and banding.
During this period, a total of forty-three (43) banded adult birds were observed at the pen with an additional eleven (11) unbanded adults.

Nesting:

A total of ten (10) nests were located inside the open-top release pen and one (1) in the Koa enclosure. A total of twenty-four (24) eggs hatched, and eight (8) were fledged, and five (5) were banded.

Banding:

A total of eleven (11) individuals were banded at the Haleakalā Ranch pen this past season, six (6) adults and five (5) fledglings. Of the adults banded, three (3) were rebanded.

Pen Maintenance:

Maintenance is conducted by the contractor, AES, year-round. The one-acre pen was mowed 30 times this past year. The electric fence, grounding stakes, and batteries were maintained throughout this period. The storage shed was painted, and a new hinge for the entrance to the pen was fabricated and installed.

Habitat Management:

Approximately 1 acre of alien vegetation was mechanically removed, including lantana, strawberry guava, Bocconia, fireweed, and bur.

Trapping:

Predator control conducted by AES maintained ten (10) tomahawk live traps, twenty (20) DOC200 traps, ten (10) A24s, one (1) trapinator body grip, and 2 AT220 traps. Of these traps, four (4) mongoose, two (2) cats, and seven (7) rats were removed.

Deaths:

Fifteen (15) goslings were predated by either aerial predators or possibly mongoose; no carcasses were found in the area. Four (4) goslings died of natural causes, and their bodies were salvaged and placed in the DOFAW freezer.

Appendix 6. Haleakalā Ranch Nēnē Release Pen Program Annual Report FY 2025

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HALEAKALĀ RANCH NĒNĒ RELEASE PEN MITIGATION PROGRAM

MAUI

ANNUAL REPORT

FY 2025 (JULY 1, 2024, through JUNE 30, 2025)

1.0 Introduction

In May 2011, the Hawai'i Department of Land and Natural Resources—Division of Forestry and Wildlife (DOFAW), with funding from the Kaheawa Wind Power I (KWP I) project, established a Nēnē Introduction Program (Program) at Haleakala Ranch (Ranch), Maui. The purpose of this Program was to establish a population of the endangered nēnē, or Hawaiian goose (*Branta sandvicensis*), at the Ranch. The Program contributes to the mitigation requirements for the nēnē as identified in the KWP I and Kaheawa Wind Power II (KWP II; collectively, the Projects) Habitat Conservation Plans (KWP I 2006, SWCA 2019). As part of the Program, Haleakala Ranch, LLC committed to maintaining the Ranch premises, which are considered to provide a significant amount of habitat that may be suitable for nēnē, for renewable periods of 10 years over the 50-year term of the Haleakala Ranch Safe Harbor Agreement (SHA; USFWS et al. 2019). The Program has successfully produced fledglings at the Ranch since 2012.

In 2021, DOFAW requested that the Projects assume direct management of the release pen. Under an initial Memorandum of Understanding (MOU) both parties agreed that the Projects would assume management activities on December 8, 2022. The Projects contract Aloha Environmental Services (AES) to conduct the work as laid out in the Scope of Work (SOW), which is appended to the final MOU (fully executed March 4, 2025). Key needs for establishing a population of nēnē at the Ranch were identified in the SHA as nest monitoring, pen maintenance, habitat management, and predator control. This report and the activities described herein are in compliance with the Ranch's SHA and the Projects' commitments outlined in the SOW. This report provides detail of the 2024 – 2025 breeding season at the Ranch through the end of Fiscal Year (FY) 2025 (June 30, 2025).

2.0 Funding

Table 1 shows the expenditures during FY 2025.

Table 1. Expenditures During July 1, 2024 – June 30, 2025, for the Nēnē Release Pen Mitigation Program at Haleakalā Ranch, Maui

Category	Funded Amount
Road Improvement	$10,000
Nēnē Monitoring	$14,100
Banding	$0
Pen Maintenance	$11,000
Habitat Management	$20,996
Predator Control	$11,000
Reporting	$9,000
Adaptive Management Actions	$4,700
Total Cost for FY 25	**$80,796**

3.0 Mitigation Actions

3.1 Road Improvement

The road to the pen was maintained periodically by AES staff, as needed, by moving rocks and backfilling holes with dirt and rocks. Per Right of Entry agreement with Haleakala Ranch, LLC, the Projects provided $10,000 to the ranch for road repair activities in March 2025 (see Table 1).

3.2 Nēnē Monitoring

3.2.1 Release Pen Visitation

Biweekly visitations (every 2 weeks) began in July 2024 and transitioned to weekly visitations and monitoring by AES personnel at the Ranch from August 1, 2024 to May 31, 2025 when weather permitted and Ranch personnel approved access. Biweekly visitations and monitoring were resumed during the month of June 2025 after all nēnē goslings were confirmed to be fledged.

3.2.2 Sightings

Observations of banded and unbanded birds were recorded at the Ranch to monitor movements, distribution, and survival of nēnē using both visual, binocular surveys, as well as footage from four strategically placed game cameras within the pen. In FY 2025, 31 distinct banded adults and, at minimum, eleven unique un-banded adults were observed at the Ranch (Table 3). This is an increase from last year's monitoring data which accounted for 25 distinct banded adults.

3.2.3 Nesting

During nesting season, records were kept on mating pairs and the breeding status of females found at the Ranch. Nests found at the Ranch were marked using GPS and checked weekly to determine their status. Nesting activities, nest outcomes, hatching, and fledgling success were recorded for the nesting season. Survey methods for nesting activity/success included both weekly visual (binocular) surveys, as well as daily data collection by on site game cameras.

Ten nests or nesting attempts were located within the Ranch open-top release pen this year (Table 2/Map 1, Appendix B). Of these ten nests, nine successfully hatched goslings and three nesting pairs were able to raise goslings to successful fledging. Two of the successful nests were a result of re-nesting attempts (secondary nesting) by two different breeding pairs. A total of 24 nēnē hatched between the nine successful nests. Eight juvenile nēnē successfully fledged from the Ranch open-top release pen this season. AES personnel confirmed the fledging of all eight goslings by compiling data from both visual observations, as well as by daily photo documentation taken by game cameras between October 30, 2024, and June 30, 2025 (Appendix A).

One nēnē nest was observed outside of the nēnē pen during the 2024 – 2025 breeding season, inside of the adjacent koa (*Acacia koa*) grove enclosure[1]. AES deployed additional predator control traps with bird excluders installed (see Section 3.6) in this area while nēnē were incubating on nest. One mongoose was successfully caught in a cage trap set within close proximity to the nest site during the incubation period. Four goslings were confirmed hatched from this nest, but monitoring of this family group proved difficult over time as they moved in and out of the koa enclosure freely. This family group was last observed on December 20th, 2024, and the fledging outcome is unknown.

.

[1] Seed bank enclosure for wilt resistant Koa trees, managed by the Hawaii Agriculture Research Center

Table 2. Nēnē Nesting Summary for 2024-2025 Breeding Season at Haleakalā Ranch, Maui

Total Number of Nests	
Located in open-top pen	**10**
Located in Koa enclosure	**1**
Successful	**9**
Abandoned	**1**
Depredated	**0**
Failed (other reason)	**0**
Renests	**2**
Total Number of Eggs	
Known	**26**
Destroyed naturally	**0**
Depredated	**0**
Salvaged	**2**
Hatched	**24**
Total Number of Goslings/Fledglings	
Known goslings	**24**
Goslings depredated	**11**[1]
Goslings died (other reason)	**5**
Fledglings fledged from pen (credited for mitigation)	**8**
[1] Suspected depredation by aerial predators, but unconfirmed by direct evidence. See section 3.6.	

Table 3. FY2024-25 Nene observation table with leg band documentation

Solo	UNR
Solo	AL/EHR
Solo	EHT/AL
Solo	AL/EJE
Solo	AL/CXC
Solo	CXH/AL
Pair 1	AL/CUZ, CUY/AL (Four goslings hatched inside Koa pen. Pair and goslings were not documented after December 2024)
Pair 2	AL/EJJ, EJK/AL (One gosling hatched, went missing on 1/2)
Pair 3	$K10/AL, AL/$K08 (Three goslings hatched, one died in nest) 2 fledged 1/24 (one banded on 6/9 AL/ERH (female). Hatched 4 new goslings around 2/28. One gosling missing on 3/7) confirmed fledged on 5/29. All three banded on 5/9 AL/ERA (male), AL/ERC (female), AL/ERE (female).
Pair 4	EHY/AL, AL/EHX (Two goslings hatched, one missing on 1/3, one missing after 1/4
Pair 5	CXN/AL, AL/EPC (four goslings hatched 2/28. All four goslings missing on 3/7)
Pair 6	EJH/AL, AL/EJN
Pair 7	EHZ/AL, EJN/AL
Pair 8	AL/EJX, EJY/AL
Pair 9	-/AL, AL/ENX (Two goslings hatched, one found dead 12/27, one missing after 1/1
Pair 10	EJA/AL, AL/EHA

Pair 11	CXK/AL, UNR
Pair 12	AL/EAT, UNR
Pair 13	CEJ/AL, UNR
Pair 14	-/AL, AL/- . sitting on nest 2/28. Failed nesting attempt (2 eggs laid/abandoned)
Pair 15	-/AL, UNR
Pair 16	AL/EJC, EHU/AL (Four goslings hatched, two found dead 12/27, two missing on 1/3. Hatched 2 new goslings 3/4) confirmed fledged on 5/29
Pair 17	UNR, UNR
Pair 18	AL/ENU, EPZ/AL (hatched 1 gosling 3/3) confirmed fledged on 5/29. Gosling banded on 5/9. AL/EPY (male). Parent banded 5/9 *EPZ.

*Yellow highlighted pairs successfully hatched goslings. Green highlighted pairs successfully fledged goslings.

3.3 Banding

This year DOFAW staff banded a total of eight nēnē at the open-top release pen during two different site visits. The first visit was on November 7th, 2024, where DOFAW staff banded one unbanded male nēnē, and re-banded another adult male. The second visit took place on May 9th, 2025, where DOFAW staff banded 5 fledglings and re-banded one adult. Data was compiled and sent to AES on May 12th, 2025 (Table 3).

3.4 Pen Maintenance

Regular maintenance of the open-top pen followed the scope of work and included fence maintenance, vegetation management, water resource management among other tasks. The open-top pen's fence line was continuously monitored for breach points and maintained by AES throughout the fiscal year. The fence line was weed-whacked and mowed for weed control, and trees were trimmed along the exterior boundary to prevent bridge entry by predators. The water catchment system was checked for leaks regularly and bled of air buildup when needed. The large pond was cleaned and flushed twice a month, and smaller baths were cleaned and maintained weekly. The electric fence insulators, solar batteries, and grounding stakes/wires were maintained and operational throughout the nēnē nesting period. While outside of the scope of work, the on-site storage shed was given a fresh coat of weather resistant paint on October 25th, 2024, to preserve the shed's integrity for future years. A new hinged pen entrance door was fabricated, welded, and installed on February 28th, 2025, by AES technicians. This replaced the old guillotine style door that was used in the past and found damaged by wind events on multiple occasions.

3.5 Habitat Management

Short grass habitat was maintained at the open-top release pen. During the pre-breeding and breeding season (October– April), the 1-acre open-top pen was mowed once a week and the area around the outside of the pen was maintained as needed. During the non-breeding season (May – September), the open-top pen and the surrounding perimeter was mowed every other week and non-native/overgrown vegetation was cleared around potential nesting areas as needed. The 1-acre pen was mowed 30 times this year to maintain nēnē short grass habitat. Approximately 0.5

acre of alien vegetation was mechanically removed, including lantana (*Lantana camara*), strawberry guava (*Psidium cattleianum*), bocconia (*Bocconia frutescens*), and fireweed (*Senecio madagascariensis*), from both open top pens and covered secondary enclosures.

3.6 Predator Control

Predator traps are used to control rats (*Rattus rattus*), mongoose (*Herpestes javanicus*), and feral cats (*Felis catus*) that may pose a threat to nēnē. Traplines were baited and checked weekly at the Ranch during the breeding season, and biweekly during non-breeding season using 10 Tomahawk live traps, 20 DOC 200 traps, 10 A24s, 1 Trapinator body grip and 2 AT220 traps, .

In FY 2025 at the Ranch, five mongoose, seven rats and two cats were removed through predator control efforts. Of the five mongoose removed, three were trapped by Doc 200s outside of the nēnē pen, one mongoose was caught in a cage trap outside of pen, and one was caught inside the nēnē pen in a DOC 200 trap while there were active nests onsite. Of the two cats removed, one was caught in a cage trap inside of pen during the non-breeding season, and the other was caught just outside of pen with the new AT220 trap during the first week of May prior to gosling fledging. It should be noted that the A24s and AT220 traps may have removed additional rats or mongoose, and the numbers reported here are based on confirmed removals.

Multiple observations were made of pueo (Hawaiian short-eared owl, *Asio flammeus sandwichensis*) pairs hunting above and around the nēnē pen during nesting season. Between the months of January and early March, eleven hatched goslings disappeared from the site. No gosling carcass or remains of any kind were recovered after extensive searching, indicating the cause of predation may be avian given the lack of feathers which usually indicate a predation event. There is currently no formal program in place for the removal of avian predators; pueo is a culturally significant species.

Table 4. Traps Deployed and Predators Removed during 2024 – 2025

Location	Trap Type	Trap nights	Mongoose	Cat	Rat
Outside Pen	DOC200 (15)	365	3	0	2
	Cage (10)	263 [1]	1	0	0
	AT220 (2)	263	0	1	1
	Trapinator (1)	263	0	0	1
Inside Pen	DOC200 (5)	365	1	0	3
	A24 (10)	365	0	0	0
	Cage (2)	92	0	1	0
1. Live traps were closed and moved inside after all goslings were confirmed fledged. Traps were moved to avoid damage by cattle moved to the area for grazing.					

3.7 Relocations

No nēnē were reported to be relocated by DOFAW personnel throughout the 2024-2025 fiscal year.

3.8 Injury, Fatalities, Disease

Five documentable nēnē deaths occurred this season at the Ranch between the months of October and March. The first documented gosling fatality was discovered on October 18th, 2024, by AES staff, next to the nest where the first hatched nest was documented (Map 1). The carcass was not predated and looked to be less than one week old. Three additional carcasses were discovered on December 27th, 2025, by AES staff in the short grass habitat inside of the pen, away from nest sites. These goslings were less than 1 month old and had no signs of predation or scavenging visible on them. One more gosling fatality was reported by AES staff on March 7th, 2025, in the same short grass habitat, lacking any evidence to suggest predation or scavenging took place. In addition to these five documented gosling deaths, there were also a total of 11 hatched goslings that seemingly disappeared with no trace of predation left behind. Suspected depredation by aerial predators is a hypothesized cause for this but is still unconfirmed by direct evidence (e.g., game camera footage).

3.9 Adaptive Management Actions

During the breeding season, biologists on site witnessed multiple occurrences of competition/aggressive behavior between nesting pairs within close proximity to each other. Attempts continue to be made to trim back overgrown grass areas and expand the short vegetation corridors leading to favorable nesting locations inside of the pen. Nēnē continue to be seen regularly utilizing these new areas, helping to alleviate some of the pressures of other breeding pairs within close proximity. A lack of water availability from the onsite catchment system in the early months of the breeding season caused by drought was more severe than in years past. AES technicians addressed this issue by hauling large water totes to the site during each site visit to replenish the ponds. In FY 2026, the KWPs plan to increase this water hauling capacity to be better prepared for drought conditions during the critical early months of future breeding seasons.

Additionally, the site monitoring efficiency and frequency were improved with the use of newly installed solar/cellular equipped game cameras inside of the pen. Technicians can now check real time nēnē activity as well as weather conditions from a phone app. This technology has greatly improved data collection capabilities and efficiency while off site, as well as helping to efficiently schedule site visits around less than ideal weather conditions.

4.0 Results

4.1 Calculation of Nēnē Produced (Mitigation Credit)

Eight nēnē were produced and successfully fledged at the pen during the 2024 – 2025 breeding season. These fledglings, and the opportunity for increased adult survival for the thirty-one banded

and eleven unbanded occupants of the pen will contribute to mitigation credits for the Projects. Mitigation credits accrued with the 2024 – 2025 breeding year will be attributed to KWP I in FY 2025 to address lagging mitigation. Based on agency feedback early in FY 2026, mitigation credits will be allocated across multiple permits in future years so that all permits relying on this mitigation site are simultaneously fulfilling their mitigation obligations.

5.0 Literature Cited

KWP I (Kaheawa Wind Power, LLC). 2006. Kaheawa Pastures Wind Energy Generation Facility Habitat Conservation Plan. January 2006.

SWCA (SWCA Environmental Consultants). 2011. Kaheawa Wind Power II Wind Energy Generation Facility Habitat Conservation Plan. Prepared for Kaheawa Wind Power II, LLC. December 2011.

USFWS (U.S. Fish and Wildlife Service), Haleakala Ranch, and Department of Land and Natural Resources (DLNR). 2019. Safe Harbor Agreement for Nēnē at Haleakala Ranch, Island of Maui.

Appendix A

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Photo 1. First documented goslings of the 2024-25 breeding season 10/30/24. Both confirmed fledged on 1/24/25

Photo 2. New traps ready to be deployed on 10/10/2024

Photo 3. AL/CUZ, CUY/AL 4 egg clutch inside of koa enclosure

Photo 4. AL/EJC, EHU/AL and 4 fresh goslings on 12/20. Two found dead on 12/27, two missing on 1/3. Pair re-nested and successfully hatched/fledged two additional goslings on 5/29.

Photo 5. $K10/AL, AL/$K08 with their 3 new goslings after successfully re-nesting

Photo 6. AL/EJC, EHU/AL with their 2 new goslings after re-nesting on 3/20/25

Photo 7. AL/ENU, -, AL with their 1 gosling on 3/11/25

Photo 8. $K10/AL, AL/$K08 and AL/ENU, -, AL family pairs in April 2025

Photo 9-11. Custom fabricated hinged door installed before/after

Photo 12-13. Newly installed solar/cellular game camera

Photo 14-15. Tomahawk live trap and Doc200 trap with bird excluders installed

Appendix B

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Map 1. Nēnē nests/gosling fatality locations detected in 2024-2025 breeding season.

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