United States Department of the Interior

FISH AND WILDLIFE SERVICE
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Honolulu, Hawai'i 96850

In Reply Refer To:
2011-F-0113

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Memorandum

To: Chief, Division of Consultation and Conservation Planning
Region 1, Portland, Oregon

From: Field Supervisor, Pacific Islands Fish and Wildlife Office
Honolulu, Hawaii

Subject: Kauai Island Utility Cooperative Final Short-term Seabird Habitat Conservation Plan and Incidental Take Permit Application, TE-234201-0

This document represents the biological and conference opinions (hereafter referred to as the BiOp) of the Fish and Wildlife Service (Service) regarding the effects of operating and maintaining existing and new electric utility facilities, as covered under the subject proposed Habitat Conservation Plan (HCP) and proposed Permit, on the endangered Hawaiian petrel *(Pterodroma sandwichensis)*, threatened Newell's (Townsend's) shearwater *(Puffinus auricularis newelli),* and the band-rumped storm petrel (*Oceanodroma castro*), a candidate for listing, over the next 5 years on the island of Kauai, Kauai County, Hawaii. This BiOp was prepared in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). The above species are hereafter referred to as the "Covered Species." Your November 2, 2010, request for formal consultation and conference was received on (November 2, 2010).

This BiOp relies upon the following sources of information: (1) the Kauai Island Utility Cooperative Final Short-term Seabird Habitat Conservation Plan (Short-term HCP) for the operation and maintenance of existing and anticipated facilities on Kauai, Hawaii (Planning Solutions Inc. et al. 2010); (2) the Final Environmental Assessment for the Proposed Issuance of an ESA Section 10(a)(1)(B) Permit for the Incidental Take of Listed Species in accordance with the Short-term HCP (Service 2011); (3) the Hawaiian Dark-rumped Petrel and Newell's Manx Shearwater Recovery Plan (Service 1983; Recovery Plan); (4) and other biological literature cited herein (see Literature Cited at the end of the document). Our log number for this consultation is 2011-F-0113. The decision record for this consultation is on file at the Service's Pacific Islands Fish and Wildlife Office in Honolulu, Hawaii.

Consultation History

The Pacific Islands Fish and Wildlife Office and the Kauai Island Utility Cooperative (KIUC) have been working together since 2001 to address take of the Newell's shearwater and the Hawaiian petrel resulting from attraction to lights and collisions with KIUC power lines.

In November 2002, the Service and KIUC signed a Memorandum of Agreement (MOA) by which the Service would not prioritize an enforcement action against KIUC as long as the company implemented certain interim conservation measures (ICMs) to reduce seabird light attraction and power line collisions while more long-term conservation actions were being developed in a HCP.

Accordingly, in 2003, KIUC shielded all streetlights on KIUC power poles to minimize the lighting disorientation that often causes seabird fledglings to collide with power lines; placed aviation warning balls on power lines, where needed, to provide visual cues to alert seabirds to the presence of power lines in "hot spot" flight corridors; partially funded the state's "Save Our Shearwaters" (SOS) Program to rescue downed fledglings; and conducted field surveys to identify seabird nesting colonies on Kauai that are accessible to management.

In the spring of 2004, KIUC conducted searches for nesting seabird colonies on Kauai but was unable to secure landowner permission to access identified colony sites. A Notice of Intent (NOI) to prepare a National Environmental Policy Act (NEPA) evaluation of the Service's proposed issuance of the subject incidental take permit was published in the Federal Register in the summer of 2004, with a final decision on the HCP application expected by 2006 or earlier.

In May 2004, the MOA lapsed and was extended for a month.

On September 16, 2004, the Service held a public scoping meeting on Kauai in anticipation of preparing an Environmental Impact Statement on the proposed permit action and implementation of the HCP.

On December 8, 2004, KIUC submitted the first four chapters of its draft HCP for Service review.

On January 18, 2005, the Service and KIUC signed a second MOA negotiated by the Office of Law Enforcement (OLE). In January 2005, a new Chief Executive Officer (CEO) was selected at KIUC and retained a second lawyer to review the MOA and the HCP process.

On July 7, 2005, out of concern for the lack of progress on the HCP, the Service met with KIUC regarding the status of the HCP and the MOA. KIUC was informed of its commitments undertaken by the previous CEO in order to comply with the ESA. The Service also informed KIUC that it was dis-inclined to enter into a third MOA, especially if KIUC was not committed to obtaining a permit. KIUC was advised that failure to pursue a permit in good faith would no

longer enable the Service to exercise enforcement discretion given the high levels of take occurring.

In November 2005, HCP planning meetings resumed between the Service, the State of Hawaii, and KIUC.

On November 18, 2005, instead of providing the Service with additional detailed chapters for the draft HCP, KIUC informed the Service that it had retained additional counsel (a third lawyer) and requested to see the evidence (of take) against KIUC from the Service's Office of Law Enforcement.

On November 28, 2005, KIUC informed the Service of its new legal counsel and their participation in future HCP planning meetings.

In October 2007, KIUC submitted the first full draft of the HCP with an Incidental Take Permit (ITP) application and processing fee.

On December 13, 2007, the Service published an NOI announcing another public scoping meeting on January 23, 2008, in anticipation of preparing an Environmental Impact Statement on the proposed permit issuance and HCP implementation.

The Service continued to coordinate with KIUC during 2008, and in October met with KIUC and recommended that KIUC prepare a short-term HCP that would gather additional data, and recommended that KIUC participate in an island-wide Kauai Seabird HCP (KSHCP) being developed by the Hawaii Department of Fish and Wildlife (DOFAW) under an ESA section 6 grant from the Service. The Service made these recommendations because the commitments in the draft HCP were not sufficient to issue a long-term ITP, and because the draft HCP lacked information necessary to prepare a long-term plan that would not likely increase the chances of extinction of the Covered Species.

In January 2009, the Service and DOFAW met with KIUC to discuss basic components of a short-term HCP. KIUC submitted the first draft of the Short-term HCP in April 2009.

In September 2010, KIUC submitted a revised draft of the Short-term HCP to the Service after addressing many of the comments identified during the public review conducted by the State of Hawaii during their incidental take license review process in late 2009.

On October 13, 2010, the Service published a Federal Register Notice of Availability (NOA) announcing a 45-day public review of the draft Short-term HCP and an Environmental Assessment (EA) that closed on November 29, 2010 (Service 2010). Following that date, the Service and KIUC's consultants coordinated on the preparation of a final Short-term HCP and EA, and the Service prepared a Finding of No Significant Impact.

On November 2, 2010, the Service's Pacific Regional Office in Portland, Oregon initiated a request for intra-Service ESA section 7 consultation with the Pacific Islands Fish and Wildlife Office on the proposed permit action.

On December 2, 2010, KIUC signed a plea agreement with the U.S. Department of Justice (DOJ) over past violations of the ESA and the Migratory Bird Treaty Act that included, among other terms, a commitment to implement a subset of the minimization measures included in the Short-term HCP.

BIOLOGICAL OPINION

I. Description of the Proposed Action

The Service proposes to issue an ITP to provide incidental take authorization for the continued operation and maintenance of all existing KIUC facilities, and for the installation, operation and maintenance of certain limited future KIUC facilities on Kauai, Hawaii. In issuing the ITP the Service also needs to determine that the proposed Short-term HCP for incidental take of the Covered Species is adequate.

As required under section 10 of the ESA, the applicant has developed and proposes to fund and implement the Short-term HCP to avoid, minimize, and mitigate the effects of the anticipated incidental take on the Covered Species. KIUC has instituted operational controls to ensure that unauthorized take of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) does not occur in connection with vegetation management that it must carry out to keep its system operational.

The action area for this consultation can generally be described as the entire island of Kauai, or specifically, anywhere KIUC facilities exist and the locations where any of the proposed habitat management will occur to mitigate for impacts to the Covered Species.

The following information is summarized from the Short-term HCP (Planning Solutions Inc. et al. 2010) and the Service's Final EA for the proposed permit action (Service 2011), which are incorporated herein by reference.

A. Existing Facilities & Activities

Overview

KIUC owns and operates a variety of electric utility installations on the island of Kauai. The locations of major KIUC facilities are depicted in Figure 1. These facilities include fossil-fuel-fired generating stations at Port Allen and Lihue, the upper and lower Waiahi hydroelectric stations in the Wailua watershed, seven electrical substations and five switchyards located throughout the island, over 160 miles of electrical transmission lines, approximately 560 miles of

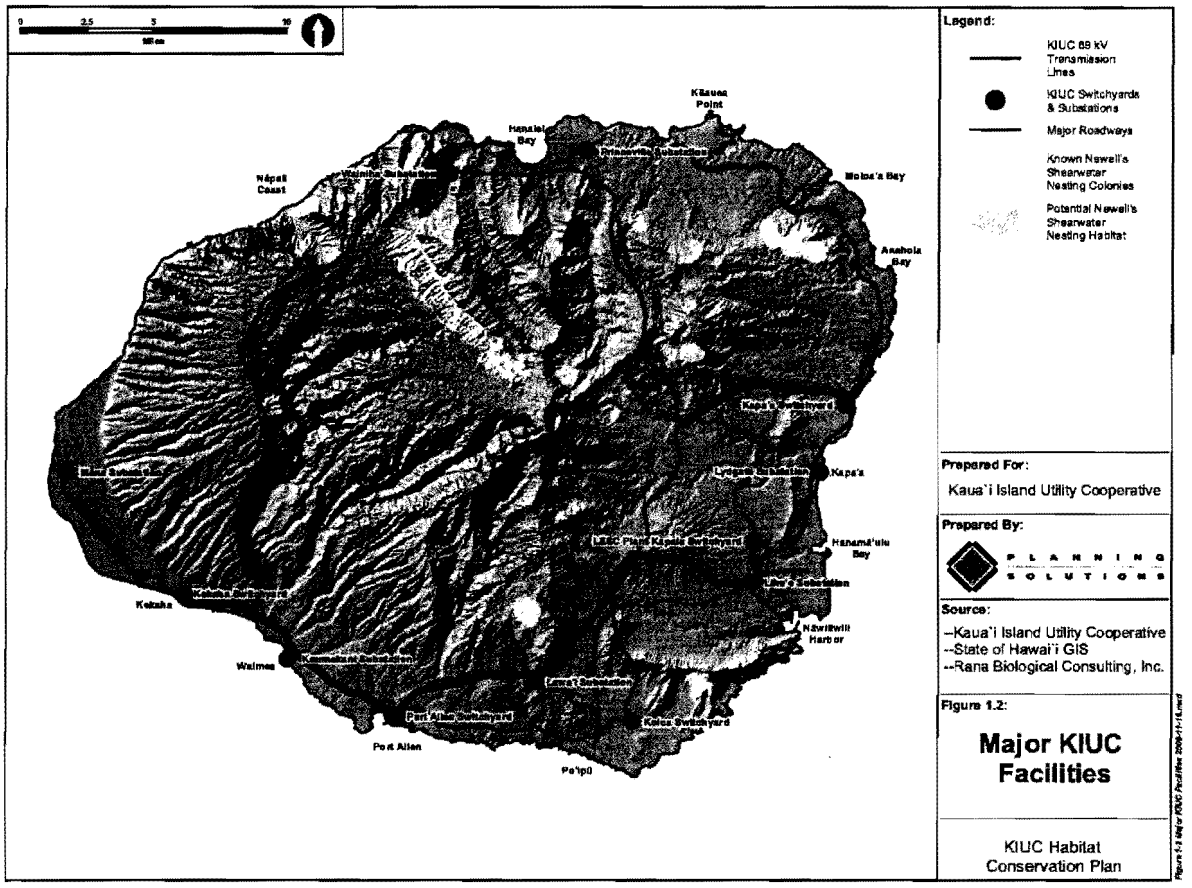

Figure 1. Major KIUC Facilities (Source: Planning Solutions Inc. et al. 2010)

12.5 kilovolt (kV) electrical distribution lines, and approximately 425 miles of secondary lines (120/240 volts) that carry power from step-down transformers that are part of the distribution network to individual homes and businesses. Approximately 17,500 poles of various heights support electrical distribution and transmission lines.

KIUC also owns and operates approximately 3,500 streetlights on behalf of the County of Kauai that are all shielded to prevent light from escaping upwards. While these represent most of the streetlights on the island, a number of public facilities and private developments also own and operate streetlights that are not under KIUC's control.

KIUC Generating Stations

The two largest facilities in the system are KIUC's two fossil fuel-fired generating stations. The Port Allen Generating Station is located on the southern side of the island near the town of Eleele. It is the older of the two stations and has the most installed generating capacity

(approximately 96 megawatts [MW]). In addition to the generating units, the facility includes a switchyard, offices, and warehouse space. The total area of the site is approximately 9 acres. The Kapaia Generating Station is located at the Lihue Energy Service Center (LESC) in Kapaia on the outskirts of Lihue. At present, the 14-acre LESC site contains a 27.5 MW advanced steam-injected combined cycle power plant and support facilities, including fuel storage tanks, water treatment facilities, a control and maintenance building, warehouse and office space, and various mechanical and electrical equipment. The generating facility delivers electrical power to a switchyard at the southwestern corner of the LESC. A 1.1-mile-long transmission line that runs along an old cane haul road connects the switchyard to the remainder of KIUC's transmission system. In addition to these fossil-fuel fired generating facilities, KIUC also owns and operates two small hydroelectric units near Lihue that it purchased from the Lihue Plantation Company.

Electrical Switchyards and Substations

KIUC's generating units produce energy at various lower voltages; this is then "stepped up" by power station transformers to a common higher voltage for transmission over long distances to grid exit points (substations). On Kauai, the transmission is typically done at 57 kV. Switchyards also serve as interconnecting and switching points for transmission lines and distribution circuits. Substations are used to reduce the voltage from transmission lines through "step-down" transformers and to route it to the areas where it is needed through distribution circuits. While they all perform similar functions, the electrical substations and switchyards in KIUC's system vary in age, size, and location with respect to existing urban development. Most are between one and two acres in size. They are all surrounded by 7-foot or higher chain link fences and all contain a variety of electrical transformers and switchgear that allow KIUC to step-up or step-down the voltage. The largest of the transformers are a little more than 10 feet high. The tallest structures in most of the substations and switchyards are the structures that support wires coming into and out of the facilities; these are typically about 25 feet high.

Utility Pole Heights and Cable Arrangements

The wire sizes and pole heights vary widely for each type of line according to the particular physical circumstances of their installation. Moreover, the configuration switches from one type to another (and often back again) within distances of as little as a few hundred feet.

69 kV transmission lines are typically carried on poles that are 70 to 85 feet tall. A wide variety of line arrangements are used. These include vertical arrays, where the wires are immediately above one another on the pole; diamond arrays, where cables are mounted on the top and on either side of the pole; and horizontal arrays, where the lines are mounted on horizontal crossarms or post type insulators. Sometimes lower-voltage distribution lines are mounted lower on the same poles.

12 kV distribution lines are typically on poles that are 40 to 60 feet tall. As with the poles carrying transmission lines, the electrical cables carrying the power are arranged in a variety of

ways depending upon each pole's specific circumstances. Moreover, circuits frequently change from one configuration to another over a short distance. Small, pole-mounted step-down transformers make the final voltage reduction (to 120/240 volts) at which power is delivered to individual homes.

Ongoing Operation & Maintenance Activities

Most of the activities associated with maintaining KIUC facilities do not significantly affect the configuration of existing facilities and transmission lines. Examples of such maintenance include responding to mechanical failures of equipment within substations or on transmission lines due to corrosion and wear, replacing damaged and rotting poles, trimming tree branches near lines, and restoring and testing wood poles.

Some regular maintenance activities necessarily result in raising pole heights, relocating poles, and/or increasing the number of poles in the system. One example is "reconductoring," or the replacement of a smaller conductor with a heavier one. This must be done occasionally to accommodate increasing electrical loads on the transmission lines. In order to maintain a proper offset distance between the lines strung on the poles, the line height must be increased and/or the distance between poles reduced, which may entail replacing poles, adding more poles, and replacing insulators. KIUC is also required to move their facilities from time to time to accommodate road widening or other County and State projects. The ITP will cover the installation of up to 425 such new, replacement, or relocated poles that result in a pole height increase (an average of 85 per year for 5 years), but not to exceed 140 such poles in any one year.

B. Future KIUC Activities and Facilities

KIUC is required by the State Public Utility Commission (PUC) to provide and ensure the availability of reliable electrical service. Two categories of future additional facilities would be covered under the proposed incidental take authorization:

- Future additional facilities that are relatively minor in terms of size and extent, are constructed routinely, but are unlikely to have any observable or measurable effect on the Covered Species (e.g., a new distribution line to provide service to a new home).

- Specific reasonably foreseeable future additional facilities that are larger in size and extent, already planned, and which KIUC expects it must begin to make substantial financial commitments within the term of the ITP that is being sought. These facilities are to be covered under the requested incidental take permit.

Other facilities that may be in KIUC's long-term facility plans but which need not be initiated within the period covered by the requested take permit will not be covered by the ITP.

Minor Facilities

The following categories of routine KIUC facilities and activities necessary to serve the utility's customers are minor in size and extent and, due to their physical attributes, have extremely limited, if any, potential to affect the Covered Species. The construction and operation of these facilities are to be Covered Activities under the ITP for the term of the Short-term HCP. These activities will also be covered under the coverage of a longer-term permit that KIUC plans to seek under the KSHCP being developed by the State of Hawaii.

New Connections within Existing Service Areas (< 1,320 feet)

New residential and commercial customers regularly request new connections to the existing electrical distribution network. Approximately 75 percent of these requests can be satisfied by installing 50 to 125 feet of new wire from an existing pole or line to the customer's meter. The remaining requests typically require installation of one to three poles (and often a transformer), but they are occasionally longer. The poles used for this purpose typically extend no more than 35 to 40 feet above ground, and the service lines from poles to homes typically start from the pole at a takeoff height of approximately 30 feet above the ground and descend to attachment points on the eaves of homes at about 8 feet above the ground. Hence, their average height above the ground is less than 20 feet. Under very rare circumstances, poles slightly higher than 45 feet above ground (e.g., 50 feet) may need to be installed as "risers" (i.e., poles used when power lines are transitioning from overhead to underground) or may be needed in order to maintain minimum code-required clearances between poles in areas of uneven terrain. In such rare situations, all installations will be done in a manner that ensures that the average ground clearance of conductors between two adjacent poles is less than 45 feet. In addition, any potential impact to the Covered Species will be minimized by using such higher poles only when absolutely necessary, and when used all lines strung to such poles will utilize a horizontal rather than vertical configuration. The ITP will cover the installation of up to 375 new connection poles over 5 years (an average of 75 per year), but not to exceed 150 new connection poles in any one year. In addition, to limit the number of new connection poles that could be installed in the darker North portion of the island (west of Princeville), no more than 13 new connection poles will be placed in the area west of Kumu Road and Highway 56 during the five-year permit term, or no more than five in any one year. The limitation on the number of additional new connection poles (and new lights) is based on the proportional area occupied by the KIUC service area within the darker North portion of the island (approximately 3.47 percent). All new connections installed within this area will be included in the underline monitoring program developed and implemented during the term of the HCP.

Electrical Equipment Additions to Existing Substations and Switchyards

Periodically, KIUC must install additional electrical equipment in its existing substations and switchyards. In some cases the need stems from KIUC's ongoing conversion from 57 kV to the 69 kV transmission system that is more compatible with standard equipment now being

produced by electrical equipment manufacturers. In other cases, the equipment additions are related to the need to expand the substation capacity to meet growing electrical demand. The tallest additional equipment that might be installed at a substation is less than 20 feet high.

Minor Generating Station Equipment and Structure Additions

Mechanical and electrical equipment must periodically be added to generating stations to accommodate changes in operating procedures, improved technology, or governmental permitting requirements. This equipment is typically less than 25 feet high (i.e., below the height of existing structures on the generating station sites). Low structures containing space for storage (e.g., warehouses), offices, training, and other utility related activities may also be added from time to time to allow the facilities to carry out their functions. Some of these may involve a few, low-intensity outdoor lights. Any new lights will be shielded and used only when needed.

Voltage Upgrade on Existing Poles

As discussed above, while the island's electrical transmission system was initially designed to operate at 57 kV, all of the new facilities installed over the past several decades have been designed to 69 kV standards to facilitate eventual conversion to this industry-standard voltage. Hence, it will not be necessary to modify transmission lines if and when a complete voltage conversion to 69 kV is made. Instead, relatively straightforward changes in connections at substations will suffice. The steel transmission poles along KIUC's main transmission corridor across the center of the island have been designed so that they could accommodate 138 kV should the utility reach the point where this is needed to reduce line-losses and increase long-distance transmission capacity.

Installation of Shielded Street Lights at Government or Private Request

KIUC periodically receives requests from the County and State agencies to install and operate additional streetlights to serve new subdivisions or existing thoroughfares. KIUC will continue obliging those requests and responding to them in a timely manner. As with all the existing KIUC-owned streetlights on Kauai, any new streetlights would be equipped with full-cutoff lights to eliminate upward-projecting light that could disorient seabirds. The ITP will cover the installation of up to 375 new shielded streetlights over 5 years (an average of 75 per year), but not to exceed 100 new shielded streetlights in any one year. In addition, to limit the number of streetlights that could be installed in the darker North portion of the island (west of Princeville), no more than 13 new lights will be placed in the area west of Kumu Road and Highway 56 during the five-year permit term, or no more than three in any one year. The limitation on the number of additional new lights (and new connection poles) is based on the proportional area occupied by the KIUC service area within the darker North portion of the island (approximately 3.47 percent). All new lights installed within this area will be included in the underline monitoring program developed and implemented during the term of the HCP.

Fiberoptic Cable Installation

KIUC is continuing to install fiberoptic cables that link major facilities in its system. These will complement fiberoptic cables it has already installed linking the Port Allen Generating Station, Kōloa Switchyard, Lihue Switchyard, Hana Kukui Main Office, Kapaia Power Station, Lydgate Substation and Kapaa Switchyard. These fiberoptic cables come in two forms: ADSS (All Dielectric Self Supporting) and Optical Ground Wire (OPGW). ADSS fiber cable has its strength built in and requires no externally lashed messenger; it is installed on existing utility poles, either in the space allocated for communication lines (approximately 21 feet above the ground) or at the lowest position in the electrical space (approximately 27 feet above the ground). OPGW (which looks like a normal aluminum stranded cable) is usually strung at the top of the pole, in place of the static wire. It provides both lightning protection and fiber communications. KIUC will continue to install OPGW fiber conductors in place of the existing static wire – in situ.

In-situ Replacement of Existing Lines or Other Facilities

KIUC is periodically required to replace existing lines or other facilities in their current location for maintenance, service reliability or other such reasons. KIUC normally performs *in-situ* replacement work during daylight hours. It will only conduct such work during nighttime hours in emergency situations or when system conditions require nighttime work. Lighting of the work area will be required in this situation, but all lights will be shielded and directed downward to the maximum extent practicable. KIUC workers will be trained in how to handle any downed birds and will have appropriate equipment onsite to hold and transport any retrieved downed birds to an appropriate SOS facility.

Larger, Planned, Short-Term Projects

KIUC has committed to, or may need to commit to, a few new facilities within the term of the proposed ITP that are larger in size and extent than the categories of facilities described above, but are sufficiently well defined such that the construction and operation of these facilities are covered activities under the ITP. These projects, which are described in more detail in the HCP, include: completion of the construction of the Aepo (formerly Kumanu) Substation; upgrading the Lydgate Substation; constructing the North Shore Reliability Enhancement project; and additions to the Kapaia Power Station. The ITP will also cover the switchyard and substation associated with a biomass electric generating facility proposed by Green Energy Hawaii LLC, that would be conveyed to KIUC upon completion, which will thereafter operate and maintain them.

C. Project Duration

While KIUC's operations and facilities are ongoing, the term of the ITP is up to 5 years, and stems from the expectation that KIUC will seek and obtain long-term coverage through

participation in the KSHCP being prepared by the State of Hawaii under grants from the Service. The ITP would be valid until such time as the KSHCP is approved, or up to 5 years from the time of issuance, whichever is shorter. KIUC, DOFAW, and the Service all anticipate that the Short-term HCP and associated take authorizations will be in place for a far shorter amount of time, as the HCP clarifies that it will be superseded by the KSHCP and associated take authorizations once those are approved and issued. Such approval is currently anticipated to occur in early 2012. The potential 5-year term of the ITP ensures that KIUC will continue implementing conservation measures in the event the completion of the KSHCP is delayed. In the unlikely event that long-term take authorizations under the KSHCP are not available to KIUC at the end of the 5-year term of the ITP, the ITP may be extended with the agreement of KIUC, DOFAW and the Service, to the extent allowed by law.

D. Habitat Conservation Plan

KIUC's Short-term HCP describes measures that it will implement over the term of the ITP to minimize, mitigate, and monitor the impacts of its facilities and operations on the Covered Species. KIUC drew on several resources when it established biological goals for its conservation measures. These include the Service's Recovery Plan, the related Five-year action plan, available scientific literature, State conservation strategies, and extensive consultations with Service, DLNR, and State Endangered Species Recovery Committee (ESRC) experts. These goals are listed in Table 1; the table also notes the types of measures that KIUC proposes to implement to achieve those goals.

Minimization of Impacts to Covered Species Due to Existing Facilities and Operations

While in many cases, placing utility lines at or below ground level is the only way to eliminate the risk of bird collision, given KIUC's limited financial resources, and the high cost of undergrounding existing lines, it is not financially feasible within the scope of this Short-term HCP for KIUC to underground any significant amount of its existing lines except in situations where road realignments or other factors make sizeable cost-sharing possible. KIUC will continue to pursue and support such opportunities.

KIUC has identified a number of existing line segments where it can reconfigure existing overhead wires to reduce the risk of seabird collisions. In some cases, this involves modifying the overhead conductor arrangements (especially 12 kV distribution circuits) so that there are fewer wire layers. In other cases, collision risk can be reduced by placing distribution wires underground (which is much less costly than undergrounding transmission voltage conductors) and lowering/reconfiguring the overhead 69 kV transmission lines so that they are better-shielded by existing topography, trees, or other barriers.

Table 1. Biological goals and objectives of the KIUC Short-term Seabird HCP.

Biological Goals	***Conservation Measures***
Goal 1: Minimize the impact of existing and future KIUC facilities on the Covered Species so as to assist in their recovery.	1.A: Continue to minimize KIUC's contribution to light attraction by using only full-cutoff light fixtures on existing and future facilities.
	1.B: Minimize the impact of existing KIUC power lines by avoiding the construction of new lines that would increase take above present levels, and implementing specific modifications to certain power line segments to reduce the potential for take.
	1.C: Ensure that minimization measures at power plants, substations and other facilities are institutionalized (i.e., made part of each facility/department's standard operating procedures).
	1.D: Provide downed seabird and monitoring training to KIUC personnel.
	1.E: Provide sufficient support for SOS to ensure its continued operation for the duration of the ITP/ITL. (Also listed as 2.A.)
Goal 2: Mitigate for unavoidable adverse impacts of KIUC facilities on Covered Species so as to assist in their recovery.	2.A: Ensure the continued operation of the SOS+ Program for the duration of the ITP/ITL.
	2.B: Provide for and ensure the implementation of seabird colony habitat restoration, predator control, and/or other appropriate conservation strategies contributing to the recovery of Covered Species as approved by the agencies, commensurate with the level of take to provide net benefit to the species and environment.
Goal 3: Monitor impacts to Covered Species, report, and provide for adaptive management so as to ensure that conservation resources provide the greatest possible contribution toward their recovery.	3.A: Ensure that monitoring measures at power plants, substations and other facilities are implemented per approved monitoring plan to track performance with respect to the Covered Species.
	3.B: Continue to explore and consider alternative avoidance, minimization, monitoring and mitigation options for improvement, and implement as agreed and appropriate.
	3.C: Provide for and ensure compliance monitoring, including but not limited to underline take monitoring, and review of HCP activities.
	3.D: Fund development and implementation of underline monitoring program.
Goal 4: Assure funding for activities under the HCP so that conservation measures are certain to be implemented.	4.A: Provide funding assurances per HRS 195-D.
Goal 5: Provide information that will inform long-term take authorization following the end of the short-term permit.	5.A: Assist efforts to develop an island-wide HCP on Kaua'i.
	5.B: Fund update of Spear et al' (1995) at-sea seabird population estimates.
	5.C: Fund two-year auditory survey to locate additional seabird breeding colony/habitat opportunities for future mitigation.
Source: Compiled by Planning Solutions, Inc.	

KIUC evaluated 10 segments of existing power lines that previous analyses had identified as having a relatively high potential for take of the Covered Species (Ainley et al. 1995, pp. 29-34). The primary objective of the evaluation was to identify potential reconfiguration options that would (in combination with existing topography/vegetation/ other obstructions) reduce or eliminate the risk of bird strikes by ensuring that power lines are at or below the average current height of existing obstructions that serve as natural barriers to bird flight (Table 2). The electrical power line segments were broken down into sub-segments to allow evaluation of segments of similar characteristics in line design and land-based features. Typical construction reconfigurations that were evaluated included various combinations of undergrounding, rearranging overhead wires to reduce the number of layers of wire, and rearranging the wires to decrease their height (with the goal of bringing them down to a height beneath adjacent barriers to bird flight). In addition, KIUC evaluated various types of stream crossings, including attachment to bridges and horizontal direct bore under the stream or river.

The results of the above analyses indicated that there are several areas where it may be practicable to reduce the potential for bird strikes on overhead electrical power lines within the limited time frame of the Short-term HCP, and given applicable constraints as discussed above. (KIUC committed to implement all of the projects included in Table 2, except for the Hanapepe H-3 and H-4 segments, as a component of its plea agreement with DOJ, but they are also components of the Short-term HCP). The list of minimization possibilities includes some that involve placing telecommunications and/or communications line underground; they do not include projects that require undergrounding of 69 kV electrical facilities in order to remove the risk of take because those require further analysis to determine if their extraordinarily high cost is warranted by resulting benefits. That analysis will be included in the long-term minimization program that KIUC will seek approval for through applications submitted in conjunction with the KSHCP. Once underline monitoring produces sufficient data to quantify the reduction in collision risk for all options, it will be possible to reevaluate potential power line modifications covering these segments.

Because lights attract the Covered Species, KIUC will only conduct work during nighttime hours in emergency situations. If system conditions require non-emergency nighttime work during the autumn fallout season (September 15 through December 15), use of lighting will be restricted to between 10:00 PM and 4:00 AM, when very few of the Covered Species are flying between the ocean and inland nesting colonies (Cooper and Day 2003, p.65; Day and Cooper 1995, p. 1015). In such cases, lighting of the work area will be required in such situations, but all lights will be shielded and directed downward to the maximum extent practicable. KIUC workers will be trained in how to handle any downed birds and will have appropriate equipment onsite to hold and transport any retrieved downed birds to an appropriate SOS facility.

Table 2. Proposed line reconfigurations under the KIUC proposed Short-term Seabird HCP (Source: Table 5.2 from Planning Solutions Inc. et al. 2010).

Description of Segment	*Cost ($ & $/mi.)*	*Selected Option and Justification*
Keālia Segment D1, Hwy 56 - mile 9.1 Kawaihau Rd. to Mailihuna Road. 4,600 feet. Hill and tall trees, some open areas.	$721,474 ($885,903/mile)	**KIUC selected Option 4** (shielded 69kV overhead with 12.5 kV flat-construction underbuild). Converting the distribution circuit to flat construction will reduce the number of layers of conductors from 9 to 5 and also allow lowering of the transmission circuit into a compact configuration from about 65' to about 57', at or below the average heights of the shielding hillside and vegetation on the mauka side of the highway. This is with the exception of the first 900' (20% of segment) at the south end of this segment which has average shielding heights of only 45'. Otherwise, the hillside and vegetation directly *mauka* of the highway shields the reconfigured lines, allowing birds to pass safely over the remaining facilities.
		KIUC rejected Options 1,2 and 3. The reduction in the number of wires could not be shown to provide a significant reduction in the risk to the Covered Species.
Keālia, Segment D-Bridge, Hwy 56 Kealia Stream Bridge.	$187,680	**KIUC selected Option 4** (attaching the distribution circuit and communication wires to the bridge was selected because it has only 3 wire layers and allows the highest conductor to be lowered to about 35' above the highway. Evaluation of the feasibility of attaching transmission conductors to the bridge and having adequate space available for manholes in and along the highway right-of-way continue to be an issue for the bridge crossing, but KIUC is optimistic that a satisfactory solution can be found. [Note: KIUC temporarily reconfigured this segment and the segment adjoining it to the north (from its original configuration of 9 layers to 3 and from 65' to its current 52') in 2007 as part of a two-phase project intended to reduce the threat to seabirds. The temporary change was possible because KIUC was not at that time energizing the circuit at its intended 69-kV transmission circuit voltage. Phase 2 of the Kealia reconfiguration, will return the circuit to its full 69-kV capacity. This is needed to complete the long-planned second 69 kV circuit to the Princeville Substation (see discussion of the North Shore Reliability project for additional detail).
		KIUC rejected Option 1, which would take all lines underneath the river, eliminating all above-ground wires, because the very high cost ($1.2 million) was not warranted by the demonstrable reduction in collisions and due to the limited space available for placement of manholes in the highway right-of-way to accommodate the transmission conductors. KIUC did not select Option 2 because its higher cost was not warranted by a demonstrable reduction in collisions and due to the limited space available for placement of manholes in the highway right-of-way to accommodate the transmission conductors. In addition, structural analyses have not confirmed that the bridge structure can hold the additional weight of the transmission conductors. KIUC did not select Option 3 because no further reduction in take risk for KIUC facilities would result from this option while its cost would be higher. KIUC rejected Option 5 & Option 6[Option 1b] because no further reduction in take risk for KIUC facilities would result from this option while its cost would be higher.

Table 2. Proposed line reconfigurations under the KIUC proposed Short-term Seabird HCP (Source: Table 5.2 from Planning Solutions Inc. et al. 2010) - continued.

Description of Segment	*Cost ($ & $/mi.)*	*Selected Option and Justification*
Hwy 50, mile 13.5 to Hwy 50, mile 16 (13,200 feet.) Open Areas -		transmission and distribution circuits between the Port Allen Generating Station and Kalaheo cannot be modified to substantially reduce or eliminate take without undergrounding. The technical challenges and very high cost of undergrounding dual-circuit steel pole segments (~$12,000,000 per mile) is not practicable within the timeframe of this Short-term HCP. The data that are now available do not allow KIUC to demonstrate that the slight lowering or reduction of layers of these power lines, that may be technically possible, would reduce the potential for collisions appreciably.
Port Allen, Segment H2, Port Allen Waialo Road Before Hanapepe River by the shore (1,800 feet.) By the pier	$0 (n/a)	**KIUC did not select any of the options for implementation as part of the Short-term HCP**. Option 1 was not selected because completely undergrounding all lines (the only proven way to reduce the risk of take through this open area substantially) cost more than $11 million/mile and can only be justified after the cost-benefit analysis being performed, as part of the long-term KSHCP, is available. Options 2, 3, & 5 were not selected because they would leave many wire layers above ground (albeit at potentially lower heights) and the relative benefit of the reduction (but not elimination) of wires cannot be accurately addressed at this time. If distribution lines are undergrounded, transmission lines would still remain above the vegetation by more than 10 feet and would not appreciably reduce seabird risk more than the selected option. Option 4 was not selected because while it would lower the existing double circuit transmission lines on the poles approximately 10 feet, the number of layers would remain the same (6). If distribution lines are undergrounded, transmission lines would still remain above the vegetation by more than 10 feet. Only undergrounding of all lines would eliminate take. A cost-benefit analysis comparing undergrounding costs to mitigation costs (based on bird take per segment) in the long-term KSHCP will inform decisions for undergrounding in the future.
Hanapēpē, Segment H3, from Port Allen side of Hanapepe River By the shore to Hanapēpē side of Hanapēpē River By the shore,700 feet.	$157,020 ($1,184,379/mile)	**KIUC selected Option 2** because it would permit lowering the dual circuit of transmission, which would leave it at or below average vegetation level. That, in turn, eliminates risk except across water. Note, however, that this preferred option needs to be assessed for potential risk to fishermen before a final decision can be made to implement the measure. The area across the water where there is no vegetation requires full undergrounding to eliminate take, however a decision to underground in the long-term will be made in the KSHCP. KIUC rejected Option 1 (boring beneath the river) because its high cost (over $6 million/mile) mandates that it first be supported by the cost-benefit analysis that is being prepared in support of the long-term KSHCP. KIUC did not select Option 3 because the technical challenges of installing 16-foot-long crossarms and the reduction of one layer with lines at the same height as the selected option does not appreciably reduce take risk in the area with trees. Crossing the river, the reduction of one layer with lines at the same height as the selected option would not appreciable reduce take risk. Finally, a decision to completely underground transmission across the river should be first supported by the cost-benefit analysis in the long-term KSHCP.
Hanapēpē, Segment H4, After Hanapēpē River to Intersection of Lele Rd. (1,800 feet.) Fronting	$403,766 ($1,184,379/mile)	**KIUC selected Option 2** (which involves lowering of the dual 69 kV transmission conductors) because it would lower lines to the 45' level, providing a level of minimization and could be implemented within the period covered by the Short-Term HCP.

Table 2. Proposed line reconfigurations under the KIUC proposed Short-term Seabird HCP (Source: Table 5.2 from Planning Solutions Inc. et al. 2010) - continued.

Description of Segment	*Cost ($ & $/mi.)*	*Selected Option and Justification*
Keālia, Segment D2, Mailihuna Road to Ka'ao Road. 3,300 feet adjacent to tall ironwood trees.	$1,939,124 ($3,102,598/mile)	**KIUC Selected Option 2** was selected because undergrounding distribution and communication facilities will maintain the number of layers of conductors at 3 and keep the remaining transmission conductors below the average height of surrounding vegetation. KIUC will attempt to seek a vegetation easement from the land owner to preserve the existing ironwoods mauka of the highway and to plant trees in a 25' gap within them. Total undergrounding will remove the potential for take, but is not necessary due to the shielding that is present.
		KIUC did not select Option 1 because trees provide 90% shielding for this line segment; hence further undergrounding will not provide a significant reduction of risk to seabirds. KIUC rejected Option 3 because this option has a greater number of layers (4) and lines 10 feet higher.
Keālia, Segment D3. Hwy 56 Ka'ao Road to Hwy 56 - mile 11 , near Kealia Kai. 2,700 feet.	$0 (n/a)	**KIUC rejected all options**. KIUC did not propose any changes to this line segment because the limited vegetation along the highway meant that minimization methods short of total undergrounding would not reduce conductor height to vegetation level and would not, therefore, have demonstrable benefit. This segment is adjacent to the immediate valley area. Option 1 (which involves placing all lines underground) was not selected because completely undergrounding all lines (the only proven way to reduce the risk of take through this area) would cost more than $4.5 million/mile and can only be justified after the cost-benefit analysis being performed, as part of the long-term KSHCP, is available. Option 2 (which entailed a compact overhead transmission circuit together with underground distribution and communication facilities) was not selected even though it would lower transmission wires to approximately 10 feet above tree-top level where trees are present because most of the segment does not have shielding trees. Option 3 (which entailed a compact overhead transmission circuit together with underground distribution and overhead communication facilities) was not selected because it would only lower transmission wires to approximately 20 feet above tree-top level where trees are present. Options 4 (which entailed a compact overhead transmission circuit together with flat distribution and overhead communication facilities) was not selected even though it reduced the layers (from 9 to 5) and was the least cost alternative because this option would not remove the risk of take, leading to the possibility of additional minimization at a later date. Upon agreement with landowners, shielding vegetation will be planted and the options will be reevaluated and be justified after the cost-benefit analysis being performed, as part of the long-term KSHCP, is available.
Wailua [All Underground] A1, Hwy 56, mile 5.0 (Lydgate Sub) Hwy 56, mile 5.9 (Coco Palm) (5,700 feet.) plus A2 Hwy 56, mile 5.9 Coco Palms At Kuamo'o Rd to Hwy 56, mile 6.4 2,640 feet. Segment is entirely in Wailua Corridor project. Includes HDD cost for boring beneath river.	$1,000,000 (KIUC paid only for design) n/a	**KIUC selected Option A** (complete undergrounding) because it eliminated the potential for take of the Covered Species by KIUC lines in this important segment. KIUC has worked with Hawai'i State Department of Transportation (DOT) on the Wailua Corridor Road Widening project which includes undergrounding of all electrical and communication utilities between Lydgate Switchyard and Kapa'a Bypass Road. The total cost of the undergrounding is $17,300,000. As a result of this effort and of the availability of special funding from the Federal government, KIUC planned to underground the existing overhead lines between the Lydgate Substation and the Kapa'a bypass, a distance of approximately 1.7 miles, which was subject to the resolution of pending litigation and the continued availability of Federal funding support. Due to delays in finding a prompt resolution to this legal issue, DOT has reallocated the funds to other projects on Kaua'i. DOT and KIUC are seeking alternative means of financing this project.
Coffee Field, Segment H-Steel	$0 (n/a)	**KIUC did not select any of the options for implementation as part of the short-term HCP**. The "steel pole" electrical

Table 2. Proposed line reconfigurations under the KIUC proposed Short-term Seabird HCP (Source: Table 5.2 from Planning Solutions Inc. et al. 2010) - continued.

Description of Segment	*Cost ($ & $/mi.)*	*Selected Option and Justification*
Stadium/Park.		KIUC did not select Option 3 (which involves a dual 69 kV circuit arranged horizontally on the existing poles) because of the technical and right-of-way challenges of 16 foot-long crossarms on wooden poles. KIUC rejected Option 1 (which involves placing all lines underground) because completely undergrounding all lines would cost more than $11 million/mile and can only be justified after the cost-benefit analysis being performed as part of the long-term KSHCP is available.
Salt Pond, Segment H5 Intersection of Lele Rd. to Intersection of Hwy Marker 17 (2,000 feet.) Lele Road-	$0 (n/a)	**KIUC did not select any of the options for implementation as part of the Short-term HCP**. Due to the limited vegetation along this segment, options other than undergrounding of transmission and distribution lines will not eliminate risk to seabirds. A decision to underground the transmission and distribution lines to *eliminate* take versus lowering/reducing layers to *reduce* take risk should be first supported by the cost-benefit analysis comparing undergrounding costs to mitigation costs (based on take per segment) in the long-term KSHCP.
Kaumakani, Segment H6, Hwy 50 mile 17 to Hwy 50 mile 18 (5,280 feet). High way – makai.	$0 (n/a)	**KIUC did not select any of the options for implementation as part of the Short-term HCP**. Due to the limited vegetation along this segment, options other than undergrounding of transmission and distribution lines will not eliminate risk to seabirds. A decision to underground the transmission and distribution lines to *eliminate* take versus lowering/reducing layers to *reduce* take risk should be first supported by the cost-benefit analysis comparing undergrounding costs to mitigation costs (based on take per segment) in the long-term KSHCP.
Hanapēpē, Segment H7, Town Bridge (500 feet.) Crossing River.	$216,000 ($2,280,960/mile)	**KIUC selected Option 2,** attaching the distribution circuit to the bridge over the Hanapēpē River. This option eliminates the potential for take by KIUC facilities. Communication cables will remain overhead. The river is an important seabird flight path and believed to be used for navigation.
		KIUC did not select Option 1 (horizontal boring beneath the river) because it would cost more than the selected option without providing a greater reduction in take risk for KIUC facilities. KIUC rejected Option 3 (overhead reconfiguration) because it has higher take risk than the selected option.
Lāwai, Segment G Lāwai tap Hwy 50, mile 9 to Kalaheo town Hwy 50, mile13.5 (15,000 feet.). Valleys Building, trees	$0	**KIUC did not select any of the options for implementation as part of the Short-term HCP**. The electrical facilities on steel pole in this segment cannot be modified to eliminate the potential for take without undergrounding. The technical challenges and very high cost of undergrounding steel pole segments (~$12,000,000 per mile) make this impractical within the 1 to 5 year timeframe of this short-term HCP. The data that are now available do not allow KIUC to demonstrate that the slight lowering or reduction of layers of these power lines, that may be technically possible, would reduce the potential for collisions appreciably. See discussion in Section 5.4.2.3 for further information.
Kapa'a, Segment C1, Hwy 56, mile 7.5 Taco Bell to Hwy 56, mile 8.0 Kapa'a SUB (2,640 feet.). Dense load area Building	$158,400 ($316,800/ mile)	**KIUC selected Option 2**. This option reconfigures transmission into a compact configuration, lowering lines to about 60 feet and reducing layers from 7 to 6 which may reduce take at a low cost ($60 per foot) relative to other options.
		KIUC rejected Options 1 & 3 because they require undergrounding. A decision to underground should be first supported by the cost-benefit analysis in the long-term KSHCP.
Kapa'a, Segment C2, Bridge (130 feet.). concrete bridge	$73,008, ($1,800,480/mile)	**KIUC selected Option 4**, attaching the dual distribution circuits to the bridge. This option was selected because it eliminates the potential for take by KIUC facilities by attaching the lines to the bridge. Communication cables will remain overhead. The river is an important seabird flight path and believed to be used for navigation.
		Options 1, 2 &3 were not selected. No further reduction in take risk by KIUC facilities would result from this option at a higher

Table 2. Proposed line reconfigurations under the KIUC proposed Short-term Seabird HCP (Source: Table 5.2 from Planning Solutions Inc. et al. 2010) - continued.

Description of Segment	*Cost ($ & $/mi.)*	*Selected Option and Justification*
		cost.
Kapa'a, Segment C3, Other side of Kapa'a Stream Bridge to ABC Store (1,870 feet.). Dense load area.	$0 (n/a)	**KIUC has not proposed any changes in this segment for implementation as part of the Short-term HCP**. This segment is already minimized. Single-circuit distribution already has flat construction at 35 feet with 3 layers. Because the facilities are shielded by surrounding buildings, further lowering would not reduce the potential for take.
Kapa'a, Segment C4, ABC Store to Lehua Street (850 feet.). Dense load area.	$0 (n/a)	**KIUC has not proposed any changes in this segment for implementation as part of the Short-term HCP**. It rejected Option 1 because it believes a decision to underground should be first supported by the cost-benefit analysis in the long-term KSHCP. Option 2 was not selected because this option requires horizontal configuration of existing vertical lines which is not feasible due to the proximity of lines to buildings.
Kapa'a, Segment C5, Lehua Street to Hwy 56, mile 9.0 Kawaihau Rd. (2,000 feet.) River Crossing (Bridge).	$0 (n/a)	**KIUC has not proposed any changes in this segment for implementation as part of the Short-term HCP**. KIUC did not select undergrounding (Option 1) because its benefits cannot yet be shown to warrant the high cost. It will be evaluated further by the cost-benefit analysis in the long-term KSHCP. KIUC rejected Option 2 because it requires horizontal configuration of existing vertical lines, which is not feasible due to the proximity of lines to buildings.

Minimization of Impacts to Covered Species Due to Future Facilities and Operations

If, during the term of the ITP, the need arises to construct facilities that are not being planned for at this time and are not, therefore, discussed in the Short-term HCP, KIUC will review the concept plans for such facilities to determine potential impacts to Covered Species. Only those projects for which it is clear (either from analysis or from discussion with the regulatory agencies) will not cause harm to the Covered Species will be pursued without seeking additional permit coverage. Implementation of any projects that KIUC determines will require additional incidental take authorization for the Covered Species will be delayed until that coverage is available, either through participation in the KSHCP or through a separate permit process. If, during the term of the ITP, KIUC determines that a particular new activity/facility will not require incidental take authorization, impacts due to those facilities, should they occur, would not be authorized unless the ITP is amended to include them.

Under the proposed Short-term HCP, if any new connections require the installation of new poles that extend higher than 45 feet above ground level, KIUC will submit the proposed exception to the Service and DOFAW for review and approval. If the Service or DOFAW objects to the proposed exception, it must notify KIUC of its objections within 30 calendar days of receipt of the request. The Service or DOFAW may request up to 10 additional business days of review time so long as they submit their request for an extension no later than 25 calendar days after their receipt of KIUC's request. If the Service or DOFAW do not respond within the allotted time, their lack of response shall be deemed approval of KIUC's request.

While KIUC is obligated to respond to requests for new streetlights, it will forward to the Service and DOFAW with five business days, all requests and/or applications it receives. This will provide the Service and DOFAW the opportunity to evaluate the new streetlights and contact the requesting entity should there be concerns.

KIUC will continue to use bird-friendly outdoor lighting at all of its facilities, and will promote bird-friendly practices by its members/customers.

Anticipated Impacts to the Covered Species discussed in the Short-term HCP

The impacts occurring to each of the Covered Species due to utilities in the early 1990's were analyzed by Alaska Biological Research, Inc. (ABR)(1995) and Ainley et al. (1995), who modeled data collected by the SOS Program between 1980 and 1993 and field data collected by its authors in 1993 and 1994, using corrective indices to account for various perceived shortcomings in the SOS Program data. These estimates were adjusted to account for changes that occurred since then to estimate anticipated future impacts due to existing operations and facilities. The take anticipated due to KIUC facilities and operations is expected to continue to decline as it implements more minimization measures. The decreases in take of the Covered Species that are expected due to the minimization efforts will require long-term monitoring before they can be quantified. Based on the minimization measures KIUC will implement under

the Short-term HCP, the limited number of new facilities anticipated during the term of the proposed ITP are not expected to increase the level of take beyond the authorized level, but will require long-term monitoring before the take can be quantified.

Newell's Shearwater

Table 3 combines all of the factors relevant to estimating take of this species using the approach developed by Ainley et al. (1995, pp. 41-44) to arrive at an estimated annual take of Newell's shearwater by KIUC power lines and lights. Based on these estimates, KIUC rounded upwards and is seeking incidental take authorization through the Short-term HCP for 125 Newell's shearwater mortalities and 55 Newell's shearwaters non-lethal injuries. These estimates were based on impacts due to KIUC's existing facilities, and were not reduced according to any anticipated reductions in take associated with the avoidance and minimization actions described in the Short-term HCP.

Table 3. Estimated annual take of Newell's Shearwaters by KIUC lights and facilities.

Take Categories	***Estimated Annual Take***	
	Mortalities	***Non-Lethal Downings***
POWER LINES		
Breeding Adult Mortalities	17.3	
Non-breeding Adult/Subadult Mortalities	69.3	
Indirect Chick Mortalities	17.3	
LIGHT ATTRACTION	0	
Fledgling Mortalities	17.9	
Fledgling Downings	0	53.7
TOTAL	***121.8***	***53.7***

Hawaiian Petrel and Band-rumped Storm-petrel

Hawaiian petrels represent less than one percent of the number of Newell's shearwaters retrieved via the SOS Program on Kauai, and even fewer band-rumped storm petrels are recovered. While similar approaches as those used to estimate the take of Newell's shearwater are not feasible for the Hawaiian petrel and the band-rumped storm-petrel, for the purposes of the Short-term HCP, the annual take authorized under the ITP would be two birds of each species.

Mitigation and Adaptive Management for Anticipated Impacts to the Covered Species

The work that KIUC proposes to carry out under the Short-term HCP is intended to enhance our knowledge of the Covered Species' biology and distribution and improve their chances of reproductive success to offset the impacts of take caused by KIUC activities. KIUC is proposing

mitigation measures that include: (1) fully funding implementation of the SOS Program as described in the latest Operations Manual (Appendix C of Planning Solutions Inc. et al. 2010); (2) funding Covered Species colony management and predator control in both the Limahuli Valley and the Hono o Na Pali Natural Area Reserve (NAR) according to protocols developed by State of Hawaii seabird biologists; (3) updating estimates of at-sea Covered Species populations that have not been updated since the 1990's; (4) funding a 2-year auditory survey to locate additional Covered Species breeding colonies that could be used for future mitigation; (5) funding development and implementation of an under-line monitoring program aimed at better understanding the amount of take of Covered Species caused by overhead utility structures; and (6) should the ITP still be in effect during the fourth and fifth years, funding Covered Species colony management and predator control in the Wainiha Valley or another suitable location. The Short-term HCP also includes adaptive management provisions to allow for modifications to the mitigation and monitoring measures as knowledge is gained during their implementation.

Personnel conducting field work associated with implementation of the Short-term HCP will be trained in identifying and avoiding impacts to nesting individuals of the Covered Species, as well as any listed plants species that may be present, and no impacts are anticipated.

Monitoring and Reporting

For each year (July 1 to June 30) that the ITP remains in effect, KIUC will prepare and submit an Annual Report to the Service by July 31 that will include a description of Short-term HCP program activities and accomplishments, an analysis of the problems and issues encountered in meeting or failing to meet the objectives set forth in the HCP, areas needing additional technical advice, the status of funding, and plans and management objectives for the next fiscal year, including any proposed modifications thereto.

As described in Chapter 5 of the Short-term HCP, several different entities will be responsible for implementing specific tasks pursuant to the issuance of the ITP. KIUC's Annual Report will describe and discuss all of the implementation work performed by KIUC during the year. It will also describe and discuss tasks implemented by other entities, based on the reports which those entities are obligated to provide to KIUC. The Service will provide to KIUC any comments they may have on the draft Annual Report by August 31. The Service's comments will include an analysis of the underline monitoring data and the prior year's SOS data, and KIUC's compliance with the take authorized by the ITP and whether those take limits should be altered. KIUC will submit a final Annual Report to the Service by September 30 of each year.

Funding

As described in the Short-term HCP, KIUC has already implemented many minimization and mitigation measures and paid for these out of their funds. The total estimated cost of implementing the Short-term HCP for up-to 5 years is estimated at $11.3 million (this includes costs for projects that KIUC committed to implement under its plea agreement with DOJ).

As the public utility which provides the sole electrical service on the island, KIUC receives a continual and reliable stream of income from its residential, commercial and governmental customers. As required by the Public Utilities Commission, its rates for electrical service provide sufficient revenue to cover the cost of its operations. KIUC's Board of Directors has determined that its revenue stream is sufficient to cover the cost of implementing the Short-term HCP.

By resolution, the KIUC Board of Directors will approve the Short-term HCP and Implementing Agreement, which will bind KIUC to carrying out the terms and conditions and funding obligations of the Short-term HCP. As part of these obligations, for the duration of the Short-term HCP, KIUC in its annual budget process will include a budget line item that is sufficient to cover all Short-term HCP obligations. KIUC will document the approval of this budget line item each year in the annual report it will file with the Service. In addition, KIUC will post a bond or provide an irrevocable letter of credit in the amount of $250,000 to further guarantee that funding will be available to implement its obligations under the Short-term HCP.

II. STATUS OF THE SPECIES

A. Newell's Shearwater

Taxonomy and Species Description

Newell's shearwater is a member of the genus *Puffinus* and utilizes open tropical seas and offshore waters near its island breeding grounds on forested mountain slopes. Newell's shearwater is approximately 12 to 14 inches (in) long, with a wingspan of 30 to 35 in, and weighs approximately 14 ounces. Its plumage is glossy black above, and white below. It has a black bill that is sharply hooked at the tip. Its claws are well adapted for burrow excavation and climbing.

Historic and Current Distribution

Newell's shearwater was once abundant on all of the main Hawaiian islands. The most recent population estimate is roughly 84,000 birds (Spear et al. 1995, p. 624), with approximately 75 percent of the population nesting on the island of Kauai. Newell's shearwater also breeds on several other of the main Hawaiian islands where they nest in mountainous terrain between elevations of 500 and 2,300 feet. This species is known to nest on Hawaii, almost certainly on Molokai, and may still nest on Oahu. The occurrence on Maui of injured, dead, or grounded adults in the summer, low numbers of radar-detected birds exhibiting Newell's shearwater-like timing of movement, and the presence of juveniles in autumn suggest that this species also nests on Maui. The strictly nocturnal behavior of Newell's shearwater makes determination of its status and distribution more difficult than that of the more crepuscular Hawaiian petrel.

Population models incorporating best estimates of Newell's shearwater breeding effort and success yielded a population decreasing at a rate of 3.2 percent annually (Ainley et al. 2001, p. 118). When variables describing the anthropogenic mortality suffered by Newell's shearwater (predation, light attraction and collision) were included, these models predicted a population decline of 30 to 60 percent over 10 years (Ainley et al. 2001, p. 122). Recent ornithological radar surveys, combined with returns of downed birds to the SOS program show an apparent decline of 75 percent between 1993 and 2008 (Holmes, pers. comm. 2010), resulting in a current population estimate of 21,000 Newell's shearwaters.

Life History

Most of the life history information for this species is based on studies of the Kauai population; life histories of birds on other Hawaiian islands may differ slightly. During their nine-month breeding season from April through November, Newell's shearwaters live colonially in burrows under ferns on forested mountain slopes. These burrows are used year after year and usually by the same pair of birds. A single egg is laid in late May or early June (Ainley et al. 1997b, pp. 13-15). Both sexes incubate and this period lasts approximately 45 days. Fledging occurs between October and November. The Newell's shearwater needs an open downhill flight path to become airborne.

Daily flights of breeding adults to and from the colonies occur only at night. On Kauai, Newell's shearwaters were found to exhibit almost no movement until after complete darkness, whereupon they moved inland in a wave that peaked for 30-40 minutes (Day and Cooper 1995, p. 1015). After that peak, the rate of movement decreased steadily until 90 min after complete darkness, after which few birds were seen. In the morning, Newell's shearwaters begin moving to sea in numbers approximately 40 min before the first measurable light and movement rates increase rapidly and peak just after the point of complete darkness (Day and Cooper 1995, p. 1016).

Three age classes of Newell's shearwaters are recognized based on demographic factors and assumptions (from Ainley et al. 2001, p. 115): (1) young-of-year; (2) pre-breeding immature/adult (if recognizable); and (3) breeding adults. There is a high incidence of Newell's shearwater non-breeding on Kauai: only 46 percent of pairs that actively use a burrow actually breed in a given year (Ainley et al. 2001, p. 117). First breeding occurs at approximately 6 years of age (Ainley et al. 1997b, p. 17).

A study of reproductive success at one Newell's shearwater colony on Kauai documented an average annual production of 0.66 young per pair (Ainley et al. 2001, p.117). No specific data exist on the longevity for this species, but other shearwaters may reach 30 years of age or more.

Habitat Description

On Kauai, Newell's shearwaters breed at elevations between 528 and 3,960 feet. Newell's shearwater usually nests where the terrain is vegetated by an open canopy of trees with an

understory of densely matted uluhe ferns (*Dicranopteris linearis*). Some Newell's shearwaters nest in other types of habitat such as on the walls of Waimea Canyon, Kauai, where a forest canopy is absent. Burrows used by Newell's shearwaters are most commonly placed at the base of trees, where the substrate may be easier for the birds to excavate.

Threats, Recovery Strategy, and Ongoing Conservation Measures

Newell's shearwater was listed as a threatened species by the Service in 1975 (Service 1975). *The Hawaiian Dark-rumped Petrel and Newell's Manx Shearwater Recovery Plan* was published in 1983 (Service 1983). During the last 150 years, 75 percent of the forests on the main islands of the Hawaiian archipelago have been converted to agricultural, military, commercial or residential land uses, leading to a depletion of available nesting habitat for this species. The introductions of the mongoose (*Herpestes auropunctatus*), black rat (*Rattus rattus*), and Norway rat (*Rattus norvegicus*) have also played a primary role in the reduction of ground-nesting seabirds. Predation by feral cats (*Felis domesticus*) and barn owls (*Tyto alba*) has been observed. In addition, feral pigs (*Sus scrofa)* are known to collapse burrows as well as consume or prey upon shearwaters.

Another major threat is the species' attraction to light. Increasing urbanization and the accompanying artificial lights have resulted in substantial problems for fledgling Newell's shearwaters during their first flight to the ocean from their nesting grounds. When attracted to manmade lights, fledglings become confused and may suffer temporary night blindness. They often fly into utility wires, poles, trees, and buildings and fall to the ground. Since 1979 the Kauai District of Hawaii's Division of Forestry and Wildlife has supported the SOS program to collect "downed" Newell's shearwaters and Hawaiian petrels (*i.e.*, birds that have either collided with structures or fallen out, or have been injured or killed due to exhaustion caused by light attraction). According to SOS files, over 33,000 seabirds have been recovered to date (DOFAW unpublished). The majority of the birds are Newell's shearwaters, which nest in greater numbers on Kauai than Hawaiian petrels. The lower number of Hawaiian petrels recovered is thought to be a function of their population size on Kauai, not due to differences in behavior or ability to detect structures in the dark.

The draft Newell's shearwater and Hawaiian petrel five-year Action Plan describes the recovery strategy to 1) protect and enhance existing colonies, 2) create new colonies, 3) mitigate new and existing threats by a) implementing prioritized management actions, and b) undertaking research and outreach to support those actions. Actions identified to accomplish this strategy include conducting surveys for existing colonies, controlling threats at the highest priority colonies, and minimizing and monitoring terrestrial threats away from the colonies (light attraction, power line collisions).

The Hawaii DLNR has been conducting auditory surveys for new areas containing nesting Newell's shearwater through their Kauai Endangered Species Recovery Program and is developing colony ranking criteria to identify where the goals of the action plan can be most

successful. As part of its efforts to develop an HCP, KIUC retained biologists to conduct searches for sites where colony management could be implemented that provided updated information on a number of nesting areas (David 2003a, 2003b; David, Day and Cooper 2002). The minimum conditions necessary to effectively implement colony management that would be expected to achieve a measureable increase in seabird survival and/or reproduction include evidence of species presence, access to the areas occupied by breeding seabirds, landowner authorization and commitment to maintain the managed area in way that is consistent with seabird conservation. To date, only two known nesting colonies occupied by Newell's shearwater (Hono o Na Pali NAR and Upper Limahuli Valley) are currently suitable for immediate implementation of management actions focused on increasing seabird survival and reproduction. The State has developed a management plan for the Hono o Na Pali NAR that includes feral ungulate control, but little progress has been made due to the lack of funding. A 400-acre portion of the privately-owned Upper Limahuli Preserve has been fenced to create an ungulate free area known to contain nesting Newell's shearwater. Efforts to control feral cats within the Preserve has begun, but the landowner does not have funds to sustain the efforts.

While some efforts to protect existing nesting colonies of Newell's shearwater have begun to be implemented on Kauai, they have been limited to constructing ungulate fencing around remaining areas of relatively intact habitat (Wainiha Valley, Upper Limahuli Valley, etc.). Habitat degradation due to feral ungulates is recognized as the primary threat to native ecosystems in Hawaii and the conservation and restoration of such areas is unsuccessful in the presence of ungulates (Hawaii Conservation Alliance 2005, p.1). The only active control of cats and/or rats within an area occupied by nesting Newell's shearwaters on Kauai (on private property in Upper Limahuli Valley) began in 2009, but the program has no secure funding source to continue the efforts beyond that which would be available via the proposed short-term HCP.

As described above, the efforts to recover and release downed, but still living, seabirds began in 1979. However, since 2004, KIUC has provided staff and funding (up to $200,000 per year) for the Kauai Humane Society to expand the SOS program to include more outreach to the public and enhanced rehabilitation protocols for downed birds that do not meet established criteria for immediate release. Without an opportunity to capture adult shearwaters to determine the percent of the population that has been banded, the benefits from the increased care can only be speculated. A settlement agreement reached between the County of Kauai and the DOJ in 2010 resulted in the SOS program receiving an additional $30,000, which is being used to additional staff hours and repair/replace equipment.

Efforts are underway as part of the development of the KSHCP to determine the number and size of nesting colonies that would need to be managed to adequately compensate for the Newell's shearwater light attraction and utility line collisions occurring on the island. Because detailed site-specific information regarding burrow density and distribution or predation threats are not yet available, preliminary population and habitat modeling efforts are focusing on broad-scale selection of colonies for management, and an adaptive management strategy will be applied as site-specific information is obtained. While the models have not been finalized or gone through

peer review yet, early estimations are that it may be necessary to address the predation threats within up to 25 percent of the island's population of breeding pairs (750) to compensate for the ongoing light attraction and power line impacts that would be authorized under the KSHCP.

Efforts to reduce the level of light attraction and power line collisions began in the 1980's when KIUC (and its predecessor Kauai Electric) began replacing unshielded street lights with full-cutoff (shielded) lights across the island as part of its normal maintenance program. All of the over 3,500 streetlights operated by KIUC are now shielded, as are the lights at the facilities it operates. In 2002 KIUC prepared an assessment of the power line segments originally identified by Ainley et al. (1995) as causing the most collisions (David and Day 2002). In 2007, KIUC began reconfiguring the lines along one of the "hotspot" areas along Kealia Beach by temporarily changing the uppermost electrical circuit from a vertical to a horizontal arrangement which eliminated three of four wire layers in the circuit and reduced the height by about 10 feet. KIUC has been coordinating with the Hawaii Department of Transportation to plan for the undergrounding of the lines along another hotspot segment near the Wailua River but the implementation has been delayed while issues related to the potential impacts of the project to cultural resources are being resolved. As described above in the description of the HCP, KIUC evaluated 10 hotspot segments of existing power lines to identify potential reconfiguration options that would (in combination with existing topography/vegetation/ other obstructions) reduce or eliminate the risk of bird strikes. KIUC committed to implement all of those projects except for two as part of its plea agreement with DOJ.

B. Hawaiian Petrel

Taxonomy and Species Description

The endangered Hawaiian petrel is a medium-sized seabird in the family Procellariidae (shearwaters, petrels, and fulmars). The Hawaiian petrel is a large petrel, approximately 16 in long with a wing span of 3 feet. Previously known as the dark-rumped petrel, the Hawaiian petrel, has a dark gray head, wings, and tail, and a white forehead and belly. The Hawaiian petrel has a stout grayish-black bill that is hooked at the tip, and feet that are pink and black.

Historic and Current Distribution

The Hawaiian petrel was once abundant on all of the main Hawaiian Islands, except Niihau. Today, Hawaiian petrels breed in high-elevation colonies, primarily on east Maui and Mauna Loa on Hawaii Island, on Lanai, and to a lesser extent, on Kauai, and probably Molokai, Lehua, and sea stacks off Kahoolawe.

Based on pelagic observations, the total population including juveniles and subadults is estimated at 20,000 with a breeding population of 4,500 to 5,000 pairs (Spear et al. 1995, p. 629). At least 1,000 pairs nest in Haleakala National Park, Maui (Bailey, pers. comm. 2008). The colony on Mauna Loa is estimated to be approximately 75 breeding pairs (Hu, pers. comm.

2008). Kauai populations are difficult to assess, and Cooper and Day (1994, p. iv) estimated that there were between 1,400 and 7,000 individuals on that island in 1993. Ainley et al. (1997a, p. 28) estimated that there were 1,600 breeding pairs of Hawaiian petrel on Kauai. A breeding colony of the Hawaiian petrel was rediscovered on Lanai in 2006, near the summit of Lanaihale. Although the petrel colony was historically known to occur, its status was unknown and thought to have dramatically declined until surveys were conducted in 2006 (Penniman, pers. comm. 2007). The nesting habitat used by the Hawaiian petrel colony on Lanai is delineated by the approximate area of the uluhe ferns. Monitoring of and research on this population is ongoing, and its size has not been estimated with statistical confidence, but the population appears to be similar in abundance to the Haleakala population, where the largest number of breeding birds is currently known to exist (Penniman, pers. comm. 2007).

Life History

Similar to other members of its family, the Hawaiian petrel has a well-defined, highly synchronous nesting season, and it is nocturnally active at its colonies. Birds arrive in their colonies in late February, and after a period of burrow maintenance and social activity, return to sea until late April, when they return to the colony site and egg-laying commences. Non-breeding birds visit the colony from February until late July (Simons and Hodges 1998, pp. 13-14). Many of these may be young birds seeking mates and prospecting for nest sites, but some proportion is thought to be mature adults that do not breed. Non-breeders and failed breeders typically begin leaving the colony once the eggs have hatched. Chicks fledge between late September and late November. Both adults participate in incubating the egg and feeding the chick; after a brief brooding period, both adults are foraging at sea and are absent from the nest (Simons and Hodges 1998, p. 16-17). Alaska Biological Research, Inc. (ABR)(1995, pp. 32-34) found that Hawaiian petrels flew inland to their nesting areas primarily between sunset and the point of complete darkness. In the morning hours, Hawaiian petrels first move to sea while it was completely dark, starting 60 minutes prior to sunrise, and movement rates increased rapidly until they peaked just after the point of complete darkness had been crossed and movement continued at a decreasing rate until sunrise (ABR 1995, pp. 32-34). Although adults are occasionally observed to remain after fledglings depart, colonies generally are vacated by the end of November. A hiatus of only about three months occurs between the end of one breeding season and the beginning of the next. Hawaiian petrels are thought to begin breeding at about five or six years of age, and roughly 90 percent of breeding-age birds attempt to breed each year (Simons 1984, p. 1067).

Habitat Description

On Hawaii and Maui, Hawaiian petrels have been pushed to the limits of their habitat, nesting in the cold, xeric environment above 8,000 feet primarily in national parks. On Kauai, there is evidence that Hawaiian petrels nest at lower elevations in densely vegetated rainy environments (Ainley et al. 1997a, p. 24). Hawaiian petrels are colonial and nest in burrows, crevices in lava,

or under ferns. Their burrows are generally 3 to 6 feet long (from entrance to nest chamber), although some may be as long as 30 feet (Simons and Hodges 1998, p. 14).

Threats, Recovery Strategies, and Ongoing Conservation Measures

Hawaiian petrels were abundant and at one time, widely distributed; their bones have been found in archaeological sites throughout the archipelago (Olson and James 1982b, p. 32). This species has no natural terrestrial predators other than the pueo, or Hawaiian short-eared owl, (*Asio flammeus sandwichensis*). Early Polynesian hunting; predation by introduced mammals such as Polynesian rats (*Rattus exulans*), dogs, and pigs; and habitat alteration caused initial decline of the Hawaiian petrel population and probably its extirpation from Oahu (Olson and James 1982a, p. 634). The introduction of cats, mongoose, and two additional species of rats (*R. rattus* and *R. norvegiceus*) since Euro-American contact along with accelerating habitat loss has led to small relict colonies of Hawaiian petrels in high-elevation, remote locations. The primary reason for the relatively large numbers of petrels and their successful breeding around Haleakala summit today is the fencing and intensive predator control maintained by the National Park Service since about 1982. Elsewhere on Maui and in Hawaii, the Hawaiian petrel faces severe threats from non-native predators including rats, cats, mongoose, and introduced barn owls. Other significant anthropogenic sources of Hawaiian petrel mortality are light attraction and collision with communications towers, power transmission lines and poles, fences, and other structures (Simons and Hodges 1998, pp. 21-22). These problems are likely to be exacerbated by continuing development and urbanization throughout Hawaii. Predator control in key habitat areas, the establishment of bird salvage-aid stations, and light attraction studies have been initiated to help conserve the Hawaiian petrel.

The recovery goals for the Hawaiian petrel are similar to those for the Newell's shearwater and include: 1) protect and enhance existing colonies, 2) create new colonies, 3) mitigate new and existing threats by a) implementing prioritized management actions, and b) undertaking research and outreach to support those actions. Actions identified to accomplish these goals for Hawaiian petrel are also the same as for Newell's shearwater and include conducting surveys for existing colonies, controlling threats at the highest priority colonies, and minimizing and monitoring terrestrial threats away from the colonies (light attraction, power line collisions).

Like for Newell's shearwater, the Hawaii DLNR has been conducting auditory surveys for new areas containing nesting Hawaiian petrels through their Kauai Endangered Species Recovery Program and will use the same colony ranking criteria to identify where the goals of the action plan can be most successful. As discussed above, only two known nesting colonies occupied by Hawaiian petrel (Hono o Na Pali NAR and Upper Limahuli Valley) are currently suitable for immediate implementation of management actions focused on increasing seabird survival and reproduction. The State has developed a management plan for the Hono o Na Pali NAR that includes feral ungulate control, but little work has been implemented due to the lack of funding. A 400-acre portion of the privately-owned Upper Limahuli Preserve has been fenced to create an

ungulate free area known to contain nesting Hawaiian petrels. Efforts to control feral cats within the Preserve has begun, but the landowner does not have funds to sustain the efforts.

The efforts to protect existing nesting colonies of Newell's shearwater also benefit Hawaiian petrel, but as discussed above, they have been limited to constructing ungulate fencing around remaining areas of relatively intact habitat (Wainiha Valley, Upper Limahuli Valley, etc.). The only active control of cats and/or rats within an area occupied by nesting Hawaiian petrels on Kauai (on private property in Upper Limahuli Valley) began in 2009, but the program has no secure funding source to continue the efforts beyond that which would be available via the proposed short-term HCP.

As described above, the efforts to recover and release downed, but still living, seabirds through the SOS program also apply to Hawaiian petrels. Because the number of individual Hawaiian petrels impacted by light attraction and line collisions is so much lower that the number of Newell's shearwaters impacted, and the nesting sites of the two species overlap, the colony management efforts developed to offset impacts to Newell's shearwaters are expected to more than compensate for the Hawaiian petrel impacts. Efforts underway to reduce the level of light attraction and power line collisions described for Newell's shearwater also reduce these threats to Hawaiian petrel.

C. Band-rumped Storm-petrel

Taxonomy and Species Description

The band-rumped storm-petrel is a small seabird about 8 inches long. It is an overall blackish-brown bird with a white rump. Sexes are alike in size and appearance. The species is long-lived (15-20 years) and age of first breeding varies by locations and ranges between 5 and 7 years (Slotterback 2002, p. 16). Although the Hawaiian population was previously recognized as a distinct subspecies, taxonomists today generally combine the various Pacific populations into a single taxon. Austin (1952, pp. 395-396) examined eleven museum skins from the Hawaii population and studied the taxonomy of the band-rumped storm-petrel and concluded that, although the various populations exhibited minor size differences, these differences were not significant and the populations were best considered as belonging to a single species with no separable subspecies. The American Ornithologists' Union (AOU) currently regards the band-rumped storm-petrel as monotypic with no recognized subspecies (AOU 2010).

Historic and Current Distribution

The band-rumped storm-petrel probably was common on all of the main Hawaiian Islands when aboriginal Polynesians arrived about 1,500 years ago (Berger 1972, pp. 25-26; Harrison et al. 1990, p. 47). As evidenced by abundant storm-petrel bones found in middens on the island of Hawaii (Harrison et al. 1990, p. 47) and in excavation sites on Oahu and Molokai (Olson and James 1982b, p. 33), band-rumped storm-petrels once were very numerous and nested in

sufficiently accessible sites, including coastal areas, to be used as a source of food and possibly feathers (Harrison et al. 1990, p. 48). They were also known from French Frigate Shoals (Henshaw 1902, p. 118).

The band-rumped storm-petrel is found in several areas of the subtropical Pacific and Atlantic oceans (Slotterback 2002, p. 1). In the Pacific, there are three widely separated breeding populations – one in Japan, one in Hawaii, and one in the Galapagos (Slotterback 2002, p. 1).

In Hawaii, band-rumped storm-petrels are currently known to nest only in remote cliff locations on Kauai and Lehua Islet, and in high-elevation lava fields on Hawaii (Wood et al. 2002, Hu, pers. comm. 2005, VanderWerf et al. 2007). Given the current scarcity of breeding colonies in Hawaii and their remote, inaccessible locations compared to prehistoric population levels, the band-rumped storm-petrel was significantly reduced in numbers and range following settlement of the Hawaiian Islands by aboriginal Polynesians. This likely was the beginning of a decline in the band-rumped storm-petrel population that has continued to the low numbers found today in the Hawaiian Islands. Wood et al. (2002) estimated that there were 171-221 nesting pairs of band-rumped storm petrel on Kauai in 2002.

Life History

Band-rumped storm-petrels nests are placed in crevices, holes, and protected ledges along cliff faces, where a single egg is laid (Slotterback 2002, pp. 12-14). Adults visit the nest site after dark, where they can be detected by their distinctive calls. In Hawaii, the nesting season occurs during the summer months, with adults establishing nesting sites in April or May. The incubation period averages 42 days (Slotterback 2002, p. 14) and the young reach fledging stage in 64 to 70 days (Slotterback 2002, p. 15).

Habitat Description

When not at nesting sites, adults spend their time foraging on the open ocean. In the Hawaiian Islands, this species nests in remote cliff locations on Kauai and Lehua Islet and in high-elevation lava fields on Hawaii. An active nest has yet to be discovered and only three inactive nests have been found in the Hawaiian Islands, one in a small lava tube at 8,500 feet elevation on the southeastern slope of Mauna Loa volcano on Hawaii (Hu, pers. comm. 2008), one on a sheer cliff in remote Pohakuao Valley on the Na Pali coast of Kauai (Wood et al. 2002), and one in a small cave on Lehua Islet (VanderWerf et al. 2007, p. 47), which is located 0.6 mi. north of Niihau. All nests were located in small caves or crevices, and were confirmed to be nests of this species by skeletal remains found in the nest. No other nests have been found despite intensive searching (Slotterback 2002).

Threats, Recovery Strategies and Ongoing Conservation Measures

Introduced predators are believed to be the most serious terrestrial threats facing the band-rumped storm-petrel in Hawaii. Rats, cats, dogs, mongoose, and barn-owls are likely culprits. The band-rumped storm-petrel, like the other seabirds discussed above, lacks effective anti-predator behavior, and has a lengthy incubation and fledgling period, making adults, eggs, and young highly vulnerable to predation by introduced mammals. Wood et al. (2002) observed owls flying along basalt cliff faces where the band-rumped storm-petrels nest in Pohakuao. These observations included consistent detection of the Hawaiian short-eared owl during the day and the screeching of barn owls in the evening. Another impact to the band-rumped storm-petrel results from the effects of artificial lights on fledgling young and, to a lesser degree, adults. Artificial lighting of roadways, resorts, ballparks, residences, and other development in lower elevation areas both attracts and confuses night-flying band-rumped storm-petrel fledglings, resulting in "fall-out" (Harrison et al. 1990) and collisions with buildings and other objects (Banko et al. 1991).

Distinct Population Segment (DPS)

The band-rumped storm-petrel (Hawaii Distinct Population Segment) is a candidate for listing under the ESA. The species' status is a continuing candidate, with listing petitions received by the Service on May 8, 1989, and May 11, 2004. The definition of "species" in section 3(15) of the ESA includes any distinct population segment(s) of any species of vertebrate fish or wildlife that interbreed when mature. For a population to be listed under the ESA as a distinct vertebrate population segment, three elements are considered: (1) the discreteness of the population segment in relation to the remainder of the species to which it belongs; (2) the significance of the population segment to the species to which it belongs; and (3) the populations segment's conservation status in relation to the ESA's standards for listing (Service 1996). The available information indicates that distinct populations of band-rumped storm-petrels are definable and that the distinct population segment of band-rumped storm-petrel in the Hawaiian Islands is discrete in relation to the remainder of the species as a whole. The population segment is distinct based on geographic and distributional isolation from other band-rumped storm-petrel populations in Japan, the Galapagos Islands, and the Atlantic Ocean. A population also can be considered "discrete" if it is delimited by international boundaries across which exist differences in management control of the species. The Hawaiian Islands population of the band-rumped storm-petrel is the only population within U.S. borders or under U.S. jurisdiction.

A population segment is considered "significant" if its loss would constitute a significant gap in the range of the taxon. The Hawaiian Islands population constitutes the Central Pacific distribution of band-rumped storm-petrels between the Galapagos and Japan populations. The loss of this population would cause a significant gap in the distribution of the band-rumped storm-petrel in the Pacific, and could result in the complete isolation of the Galapagos and Japan populations without even occasional genetic exchanges. Based on the discreteness and

significance of the Hawaiian Islands population, the Service considers it to be a distinct vertebrate population segment which warrants review for listing under the ESA (Service 1989).

There have not been recovery goals established for the band-rumped storm-petrel, but the Service's Regional Seabird Conservation Plan (Service 2005, p. 200) contains recommended actions for the species that include controlling predators in nesting areas, assessing status of the population, locating and describing nesting areas, and identifying limiting factors and developing a recovery strategy.

Auditory surveys conducted by the State DLNR for new areas containing nesting Newell's shearwater and Hawaiian petrels are also able to detect the presence of band-rumped storm-petrels and the ranking criteria to identify where management efforts should be implemented include the presence of this species as an important criteria. Of the two known nesting colonies occupied by Newell's shearwater and Hawaiian petrel currently suitable for immediate implementation of management actions focused on increasing seabird survival and reproduction, only one (Hono O Na Pali NAR) is known to be occupied by band-rumped storm-petrels.

The efforts to protect existing nesting colonies of Newell's shearwater and Hawaiian petrel also benefit band-rumped storm-petrels, but as discussed above, they have been limited to constructing ungulate fencing around remaining areas of relatively intact habitat (Wainiha Valley, Upper Limahuli Valley, etc.).

As described above, the efforts to recover and release downed, but still living, seabirds through the SOS program also apply to band-rumped storm-petrels. Because the number of individual band-rumped storm-petrels impacted by light attraction and line collisions is so much lower that the number of Newell's shearwaters impacted, and the nesting sites of the two species overlap, the colony management efforts developed to offset impacts to Newell's shearwaters are expected to more than compensate for the band-rumped storm-petrel impacts. Efforts underway to reduce the level of light attraction and power line collisions described for Newell's shearwater also reduce these threats to band-rumped storm-petrel.

III. ENVIRONMENTAL BASELINE

The environmental baseline describes the status of the species or critical habitat and the past and present factors (adverse and beneficial) affecting the species or critical habitat in the action area for the proposed action at the time of consultation. Unrelated Federal actions within the action area that have already undergone formal or informal consultation are also a part of the environmental baseline.

As discussed in the "Description of the Proposed Action," the action area for this project generally includes the entire island of Kauai, and specifically includes those areas where KIUC facilities exist, where Covered Species colony management will occur to compensate for ongoing impacts, and in areas where surveys will be done to locate additional nesting colonies of

the Covered Species. None of the Covered Species are known to nest near any KIUC facilities, but do fly through areas where they exist to commute to and from the ocean to their high elevation nest sites in the mountains. During their first trip to the sea, fledglings of each of the Covered Species fly through areas where KIUC facilities exist, and are attracted to brightly lit areas and become disoriented by them.

KIUC owns a variety of existing electric utility installations on the island of Kauai that are responsible for most of the take described in the HCP. That take has been ongoing since at least the late 1970's. Those effects are part of the baseline conditions for this consultation. KIUC's facilities include fossil-fuel-fired generating stations at Port Allen and Lihue, upper and lower Waiahi hydroelectric stations in the Wailua watershed, seven electrical substations and five switchyards located throughout the island, over 160 miles of electrical transmission lines, approximately 560 miles of 12.5 kilovolt (kV) electrical distribution lines, and approximately 425 miles of secondary lines (120/240 volts) that carry power from step-down transformers that are part of the distribution network to individual homes and businesses. KIUC also owns approximately 3,500 streetlights on behalf of the County of Kauai that have all been shielded to prevent light from escaping upwards. While these represent most of the streetlights on the island, a number of public facilities and private developments also own and operate streetlights that are not under KIUC's control.

Because KIUC, under the terms of its plea agreement, committed to implement a subset of the power line reconfiguration projects included in the HCP, those projects are considered both as part of the environmental baseline, and the effects of the action. In addition, as part of KIUC's settlement agreement, KIUC agreed to establish an escrow account of $50,000 to be used during the 18-month probationary period to mitigate for the take of any protected seabirds by KIUC's power lines or lights. A process was established where for each bird proven to be taken by a KIUC power line or light and not successfully rehabilitated by SOS, KIUC must transfer $10,000 to NFWF for use in mitigating takings of seabirds on Kauai, whereas birds proven to be taken by some other entity and rehabilitated by SOS using KIUC funding will result in $1,000 offset to the account. KIUC has also agreed to replenish the escrow account as it is used, up to a total of $200,000. Any funds remaining in the escrow account at the end of the probationary period will be returned to KIUC.

Newell's Shearwater

Approximately 90 percent of the population of Newell's shearwater is located on the island of Kauai (Ainley et al. 1995, p. 16), and thus, an estimate of 18,900 individuals occur within the action area. Newell's shearwater habitat on Kauai has been degraded by feral ungulates such as pigs (*Sus s. scrofa*) and goats (*Capra h. hirca*), as well as hurricanes. Such disturbances facilitate the invasion of nonnative plants and perhaps predators. While there are no mongoose known to occur on Kauai, predation by feral cats and barn owls has been observed. In addition, feral pigs are known to collapse burrows as well as consume or prey upon shearwaters.

Urbanization on Kauai, chiefly on the eastern and northern shores, has been positively correlated with increased groundings or "fallout" of fledgling shearwaters on their first nocturnal flight from the burrow to the sea (Telfer et al. 1987, p. 406, Ainley et al. 2001). According to SOS files, over 33,000 seabirds have been recovered to date, and the majority of those birds are Newell's shearwaters (DOFAW unpublished). Ainley et al. (1995) found that the autumn fallout was correlated with lights, with the highest rates at brightly lit facilities, and summer mortality is correlated with power line arrays having many lines in a vertical arrangement greater than 50 feet high.

Ainley et al. (1995, p. 16) estimated that the Kauai Island population of Newell's shearwater in the mid-1990s was approximately 65,000 birds, with a breeding population of about 14,600 pairs. Using population models incorporating best estimates of breeding effort and success, Ainley et al. (2001, p. 118) projected an annual population decrease of 3.2 percent. When anthropogenic variables influencing Newell's shearwater mortality (e.g., predation, light attraction, and power line collision) were included, their models predicted an annual population decline of 6.1 percent, or approximately 60 percent every 10 years. Available scientific data (particularly radar studies conducted over the past decade and SOS data (Day et al. 2003, Planning Solutions Inc. 2003a, 2003b, 2004) suggest that the population of Newell's shearwater on Kauai has declined sharply over the past 10 years. The number of fledglings retrieved by the SOS program on Kauai averaged about 1,500 per year between 1979 and 1990 to an average of less than 500 collected between 1999 and 2006, and the annual average is now less than 200 (DOFAW unpublished). Recent analysis of data trends from radar surveys revealed an overall decline of roughly 50-70 percent in detection rates between 1993 and 2001 (Day et al. 2003). A smaller level of decline (less than 10 percent) may have occurred during the period 1999-2008; however, statistical evidence of a decline could not be detected using the current radar survey design (Deringer and Holmes 2009). Recent ornithological radar surveys, combined with returns of downed birds to the SOS program show an apparent decline of 75 percent between 1993 and 2008 (Holmes, pers. comm. 2010).

It is possible that changes in the ocean have contributed substantially to the observed seabird population fluctuations. The exact nature of these oceanic changes and the way in which they affect the Covered Species are unknown. However, because scientists have documented decreased reproduction and increased mortality in seabirds coinciding with warmer water, it is possible that the fluctuations could be at least partially related to climate changes. Reductions in phytoplankton caused by warming sea temperatures can dramatically affect the food chain and, therefore, the health of seabirds near the top of the food chain. For example, Veit et al. (1996, p. 15) reported that between 1987 and 1994, populations of sooty shearwaters (*Puffinus griseus*) off the coast of California and Washington dropped to 10 percent of their former levels during a period when sea surface temperatures increased.

Shaffer et al. (2006) reported a decline in sooty shearwater populations in recent years both at breeding colonies in New Zealand and at wintering grounds in the eastern North Pacific that they

associate with concomitant increases in oceanic temperatures that may have limited regional biological productivity.

Veit and Montevecchi (2006) correlate a 70 percent decrease in zooplankton abundance and approximately a 1.3° Fahrenheit (F) surface temperature increase in the California Current with a concomitant decline in upper trophic level predators such as salmonids and seabirds. They conclude that the decline in sooty shearwaters referenced above is due, at least in part, to a decline in their prey base in the California Current.

Poor reproductive success of seabirds has been repeatedly documented in warmer years, including El Niño years (Schreiber and Schreiber 1984, Ainley et al. 1995, p. 18). Seabirds in the Farallon Islands off California laid fewer eggs, and fewer chicks hatched during warmer years (Ainley et al. 1994). Total reproductive failure and the deaths of tens of thousands of birds in large sooty tern (*Onychoprion fuscatus*) colonies on Christmas Island have been documented following significant El Niño years (Schreiber and Schreiber 1984).

Newell's shearwater abundance may also relate to their dependence upon tuna to chase small prey items to the near-surface zone where they are within the birds' reach. Commercial tuna fishing has already placed several tuna species in jeopardy, and Ainley et al. (1997b, p. 22) speculate that this may have made it more difficult for Newell's shearwaters to find food, thereby reducing the reproductive success of the species.

As part of its plea agreement with DOJ, KIUC agreed to donate $225,000 to the National Fish and Wildlife Foundation (NFWF) to be placed into an account for use to benefit and increase the population of Newell's shearwater on Kauai. These funds may not be used for any of the mitigation measures included in the proposed KIUC Short-term Seabird HCP. The NFWF account also contains $180,000 that was contributed by the County of Kauai under its own plea agreement with DOJ. The interagency seabird working group is developing project proposals in anticipation of applying for those funds.

Hawaiian Petrel

Spear et al. (1995, p.629) estimated from at-sea densities that the world population of Hawaiian petrels was 19,000, with at least 1,600 pairs nesting on Kauai (Ainley et al. 1997a, p. 28). On Kauai, the greatest number of Hawaiian petrels have been observed on the north shore (Ainley et al. 1997a, p. 25). ABR (1995, p. 64) estimated that 1,400-7,000 Hawaiian petrels visited Kauai during observations recorded in 1993, and estimated a Kauai population of approximately 2,400 breeding pairs.

During the first 30years of the Kauai SOS program, 293 Hawaiian Petrels were retrieved, for an average of 9.8 birds a year, which is less than one percent of the number of Newell's shearwaters retrieved during the same period. Two factors may account for the apparent difference in power line effect between the two species. One is the smaller population of Hawaiian petrels estimated

to be on Kauai and the other is that they tend to do more of their over-land flying before full darkness than do Newell's shearwaters, a pattern which may make it easier for them to see and avoid overhead wires.

Band-rumped Storm-petrel

Evidence of nesting populations of band-rumped storm-petrels in the Hawaiian Islands is based on auditory detection of adult birds during breeding season surveys and by retrieval of fledglings in the fall. Kauai likely has the largest population of band-rumped storm-petrels in the Hawaiian Islands (Harrison et al. 1990). Wood et al. (2002) estimated there were 171-221 nesting pairs on Kauai. As with the Newell's shearwater and Hawaiian petrel, the band-rumped storm-petrel is susceptible to light attraction and collisions. A total of 24 band-rumped storm-petrels were collected during the first 30 years of the Kauai SOS program.

IV. EFFECTS OF THE ACTION

Existing Facilities

Ainley et al. (1995) modeled data collected by the SOS Program between 1980 and 1993 and field data collected by its authors in 1993 and 1994, using corrective indices to account for various perceived shortcomings in the SOS Program data. Among other things, these indices compensate for incomplete on-ground survey coverage and for scavenger and observer bias; but they do not account for the impact of adult (i.e., parent) mortality on egg and chick survival (i.e., indirect take). Based on their analyses, Ainley et al. (1995, p. 44) concluded that during the 1980-1993 period, 'utility structures' (which included overhead electric power lines as well as telephone lines and cable television lines strung on the same poles) were responsible for the deaths of between 122 and 350 birds per year, with the high figure being considered the "best estimate." The total pelagic population of the species at that time was estimated to be on the order of 84,000 birds (Spear et al. 1995, p. 624) and the number on Kauai estimated to be 65,000 (Ainley et al. 1995, p. 27). Based on the age distribution of the birds collected, Ainley et al. (1995, p. 27) estimated that of the 350 annual power line mortalities they modeled, 70 were breeding adults and 280 were either non-breeding adults or subadults (i.e., 2 to 5 years old).

Because the Ainley et al. (1995) estimate encompassed all utility structures, not just those owned by KIUC, the mortality estimates likely include harm caused by bird collisions with telephone and cable television lines as well as electrical power lines. KIUC electric power lines are located higher up on joint-use utility poles than are telephone and cable television lines. Based on that fact, on unpublished flight altitude data collected by ABR Inc., and on observations of flight behavior obtained during its own radar studies at locations previously identified as high bird activity areas (Denis and Verschuyl 2007a, 2007b, 2008; Verschuyl and Denis 2007a, 2007b, 2008; Denis et al. 2008; Verschuyl et al. 2008) KIUC concluded that KIUC facilities probably account for between 80 and 95 percent of all collisions between the Covered Species and utility structures. For the purposes of the Short-term HCP, KIUC assumed that its power lines and

associated structures are responsible for 90 percent of such collisions and the Service agrees with and uses that assumption in this analysis.

Although not accounted for in Ainley et al. (1995), Newell's shearwater chicks require parental care from both adults until very near fledging, therefore, it is expected that one chick is indirectly taken for each breeding adult killed due to power line collisions and this indirect take is included in the analysis of take anticipated and authorized under the proposed ITP.

The anticipated take levels for Newell's shearwater used for the ITP (125 mortalities and 55 non-lethal injuries) are based on Ainley et al. (1995) estimates, after being adjusted to account for the population changes that are believed to have occurred since those estimates were made. The Service considers this take estimate to be as accurate as can be made at this time, and if incorrect, it is an overestimate of the current take because that estimate did not consider actions KIUC implemented (i.e., shielding all existing streetlights) to reduce both light attraction and collision risk. The take levels of Hawaiian petrel and band-rumped storm petrel that would be authorized under the ITP (two injured or killed of each species annually) are based on the numbers recovered through the SOS program and the Service anticipates the impacts that will occur due to KIUC facilities and operations may be even lower.

KIUC will regularly evaluate new SOS data and any anecdotal information it may receive, to identify any specific individual KIUC streetlights that appear to have caused the downing of more than one seabird within one fallout season. Within 60 days, KIUC will evaluate the feasibility of implementing different streetlight technologies or practices at that location, and then proceed immediately to implement any such feasible technologies or practices that appear likely to reduce effects on the Covered Species. It is not possible to anticipate how many such lights will be identified that be able to be altered in a way to reduce attraction risk to the Covered Species, but KIUC will track and report on all such changes so that they can be quantified. Such lights will be included as part of the underline monitoring program developed and implemented during the term of the ITP and the results will be used to inform the anticipated level of impacts to be covered under the KSHCP or a long-term KIUC HCP.

Ongoing Maintenance

Because lights attract the Covered Species, KIUC will only conduct work during nighttime hours in emergency situations during the autumn fallout season. If system conditions require non-emergency nighttime work during the autumn fallout season (September 15 through December 15), use of lighting will be restricted to between 10:00 PM and 4:00 AM, when very few of the Covered Species are flying between the ocean and inland nesting colonies (Cooper and Day 2003). In all cases when lights are necessary, all lights will be shielded and directed downward to the maximum extent practicable. KIUC workers will be trained how to handle any downed birds and will have appropriate equipment onsite to hold and transport any retrieved downed birds to an appropriate SOS facility.

Some regular maintenance activities necessarily result in raising pole heights, relocating poles, and/or increasing the number of poles in the system. Under the ITP, KIUC will be authorized to replace or relocate an average of 85 existing poles that result in a pole height increase per year, which represents a 0.49 percent increase over the current total of approximately 17,525 poles. The maximum number of poles permitted during the 5 year ITP term (425) represents a 2.43 percent increase over the current total. It is not expected that this maximum number will be reached, and KIUC will take opportunity to reduce both pole and line height during ongoing maintenance activities so some reduction in collision risk to the Covered Species will also occur.

The Service does not anticipate that ongoing maintenance activities will cause the death of any individuals of the Covered Species, and because KIUC will only perform work during nighttime hours during the autumn fallout season in emergency situations, we do not anticipate that more than two Newell's shearwaters (and no Hawaiian petrels or band-rumped storm-petrels) would be downed due to attraction to the lights used during ongoing maintenance annually.

New Connections within Existing Service Areas (< 1,320 feet)

The ITP will cover the installation of up to 375 new connection poles over 5 years (an average of 75 per year), but not to exceed 150 new connection poles in any one year. The average number of new connection poles that would be allowed to be installed under the ITP annually (75) represents a 0.43 percent increase over the current total of approximately 17,500 poles and the maximum during the 5 year ITP term represents 2.14 percent increase over the current total. Approximately 75 percent of these requests can be satisfied by installing 50 to 125 feet of new wire from an existing pole or line to the customer's meter. Under very rare circumstances, poles slightly higher than 45 feet above ground (e.g., 50 feet) may need to be installed as "risers" (i.e., poles used when power lines are transitioning from overhead to underground) or may be needed in order to maintain minimum code-required clearances between poles in areas of uneven terrain. In such rare situations, KIUC will ensure that the average ground clearance of conductors between two adjacent poles is less than 45 feet. To limit the number of new connection poles that could be installed in the darker North portion of the island (west of Princeville), no more than 13 new connection poles can be placed in the area west of Kumu Road and Highway 56 during the five-year permit term, or no more than five in any one year. In addition, any potential impact will be minimized by using such higher poles only when absolutely necessary, and when used all lines strung to such poles will utilize a horizontal rather than vertical configuration. Because Ainley et al. (1995, p. 24) found that summer mortality is correlated with power line arrays having many lines in a vertical arrangement greater than 50 feet high, it is anticipated that the additional connections installed with existing service areas will not cause additional take of any of the Covered Species. Such lines will be included as part of the underline monitoring program developed and implemented during the term of the ITP, however, and the results will be used to inform the anticipated level of impacts to be covered under the KSHCP or a long-term KIUC HCP.

Installation of Shielded Street Lights at Government or Private Request

The ITP will cover the installation of up to 375 new shielded streetlights over 5 years (an average of 75 per year), but not to exceed 100 new shielded streetlights in any one year. As with all the existing KIUC-owned streetlights on Kauai, any new streetlights would be equipped with full-cutoff lights to eliminate upward-projecting light that could disorient seabirds. The average number of new streetlights that would be allowed to be installed under the ITP annually (75) represents a 2.1 percent increase of the current total of 3,500 streetlights. To limit the number of streetlights that could be installed in the darker North portion of the island (west of Princeville), no more than 13 new lights can be placed in the area west of Kumu Road and Highway 56 during the five-year permit term, or no more than three in any one year.

The Service anticipates that the installation of the limited number of new streetlights will cause the death or fallout of no more than two Newell's shearwater (and no Hawaiian petrels or band-rumped storm-petrels). Such lights will be included as part of the underline monitoring program developed and implemented during the term of the ITP, and the results will be used to inform the anticipated level of impacts to be covered under the KSHCP or a long-term KIUC HCP.

Fiberoptic Cable Installation

KIUC is continuing to install fiberoptic cables that link major facilities in its system. These will complement fiberoptic cables it has already installed linking the Port Allen Generating Station, Kōloa Switchyard, Lihue Switchyard, Hana Kukui Main Office, Kapaia Power Station, Lydgate Substation and Kapaa Switchyard. It is not anticipated that the installation of fiberoptic cables will cause additional take of Covered Species because they are only replacing existing lines rather than installing additional lines. Such lines will be included as part of the underline monitoring program developed and implemented during the term of the ITP, and the results will be used to inform the anticipated level of impacts to be covered under the KSHCP or a long-term KIUC HCP.

In-situ Replacement of Existing Lines or Other Facilities

KIUC will only perform in-situ replacement work during nighttime hours during the autumn fallout season in emergency situations. Lighting of the work area will be required in this situation, but all lights will be shielded and directed downward to the maximum extent practicable. KIUC workers will be trained in how to handle any downed birds and will have appropriate equipment onsite to hold and transport any retrieved downed birds to an appropriate SOS facility. It is not possible to anticipate how many emergency situations requiring use of the lights will occur during the autumn fallout season during the term of the ITP, but based on past emergency replacement rates, is likely to be less than six in any one year. The Service does not anticipate that in-situ replacement activities will cause the death of any individuals of the Covered Species, and because KIUC will only perform work during nighttime hours during the autumn fallout season in emergency situations, we do not anticipate that more than one Newell's shearwater (and no Hawaiian petrels or band-rumped storm-petrels) would be downed due to attraction to the lights annually.

Future Additional Facilities: Larger, Planned, Short-Term Projects

KIUC has committed to, or may need to commit to, a few new facilities within the term of the permits that are larger in size and extent than the categories of facilities described above, but are sufficiently well defined such that the construction and operation of these facilities have been assessed and they can be considered Covered Activities under the ITP. These projects include: completion of the construction of the Aepo (formerly Kumanu) Substation; upgrading the Lydgate Substation; constructing the North Shore Reliability Enhancement project; and additions to the Kapaia Power Station. The ITP will also cover the switchyard and substation associated with a biomass electric generating facility proposed by Green Energy Hawaii LLC, that would be conveyed to KIUC upon completion, which will thereafter operate and maintain them. Because none of the additional facilities planned to occur within the term of the ITP include the installation of any significant lighting, and the only segments of new distribution and/or transmission lines will be placed in areas shielded by existing vegetation and/or topography, the Service does not anticipate that any of the additional facilities will cause an increase in take of any of the Covered Species.

Power Line Reconfiguration

The reductions in take due to the reconfiguration of the power lines cannot be quantified both because the amount of take due to specific line segments has not been determined and the degree to which take will be reduced are dependent on site-specific reconfigurations. In some situations, such as at the Kealia Bridge, the risk of take is being completely eliminated because the lines are going to be placed along the bridge, but in others, such as a segment in Kapaa, the existing lines are being lowered and rearranged from a vertical to a horizontal configuration and the resulting reductions in take cannot be estimated. However, as the line segments that KIUC has committed to modify under the HCP (and its plea agreement with DOJ) include most of those identified by Ainley et al. (1995, p. 57) as having the highest collision risk, the take reduction could be substantial. It is estimated that as many as 19 of the 70 subadult and adult Newell's shearwater thought to collide with KIUC's power lines annually occur in the segments that will be reconfigured. The reduction of collision risk to the Hawaiian petrel or to the band-rumped storm-petrel cannot be quantified but it is expected that the benefits will be apply equally to these species as to Newell's shearwater. The reconfigured line segments will be included as part of the underline monitoring program developed and implemented during the term of the Short-term ITP, and the results will be used to inform the anticipated level of impacts to be covered under the KSHCP or a long-term KIUC HCP.

SOS Program

The survival rate of individuals of the Covered Species retrieved, evaluated, rehabilitated (when required), and released by the SOS program cannot currently be quantified. All birds receive an initial health assessment and if they do not meet certain criteria for immediate release, they are transported to a facility where they receive extensive physical evaluation documenting their relative health (as measured by parameters such as size, weight, level of hydration and nourishment, blood

analysis, etc.) and must meet certain criteria before being released from rehabilitation. Over 90 percent of the birds retrieved through the program are released back to the wild and have at least an additional chance at survival that would not otherwise occur. The level of evaluation and care recovered birds receive through the SOS program has increased during the past 6 years since KIUC began contributing funds ($200,000 annually) to the program, which had previously been implemented by DOFAW using available funds and staffing. As management actions are implemented within nesting colonies, researchers will be able to begin collecting data to determine the relative abundance of birds banded through the SOS program and thus evaluate the benefits to the Covered Species.

Colony Management

The two colonies where management will be implemented during the term of the ITP (Upper Limahuli Valley and Hono O Na Pali) are both known to be used by Newell's shearwater and the Hawaiian petrel for nesting, and band-rumped storm-petrels have been heard calling (DOFAW unpublished). Therefore, implementation of the colony management under the Short-term HCP is anticipated to reduce predation on all three Covered Species and, thus reduce adult and chick mortality due to cat and rat predation and increase reproductive success. Habitat improvements for the Covered Species, such as invasive plant species control, will increase habitat availability for future nesting opportunities.

The increases in survival rates and reproductive success of the Covered Species that are expected due the colony management efforts will require long-term monitoring before they can be verified. The number of nesting pairs of the Covered Species within the colonies being managed under the Short-term HCP is unknown at this time, but the acreage of native habitat within the two areas that will receive management within the first 3 years of the ITP (approximately 2,635 acres) is estimated to be 7 percent of the intact native habitat in the northern portion of the island, where over 80 percent of the Newell's shearwater are believed to be breeding (Ainley et al. 1995, p. 27). The third colony, where management actions would be implemented during the fourth and fifth years, is expected to be up to 6,100 acres and contains an estimated 15 percent of the native habitat in the northern portion of the island. The number and distribution of seabird nesting burrows within the proposed mitigation sites would not be able to be precisely determined until the colony management begins. However, based on the area of intact habitat contained within them and assuming the total population on the island is 18,900, the population and habitat modeling efforts being conducted during the development of the KSHCP indicate that there may be as many as 574 active Newell's shearwater burrows within the three sites. Similarly, the scale of benefits the management actions will accomplish cannot be precisely determined until the actions begin. However, based on the impacts predators are known to be having, modeling efforts indicate that the reproductive success of the breeding pairs within the managed colonies could increase by as much as three-fold due to the increase survival of eggs laid. Thus, an initial estimate is that as many as 229 additional fledglings could be produced due to colony management annually once all three sites are being managed.

The benefits of colony management for Newell's shearwater are expected to apply to the Hawaiian petrel and/or the band-rumped storm-petrel as well since both species are known to occur within those areas, just in lower numbers. Moreover, all known locations where specific management actions that will benefit the Covered Species are included under the Short-term HCP. The monitoring that would be conducted in the nesting colonies where management will be implemented will provide information regarding the benefits that can be achieved and reduce the uncertainty involved in long-term planning.

At-sea Population Estimates

The absence of current population estimates of the Covered Species make it difficult to assess the effects of KIUC facilities and operations on such populations. Among other benefits, the completion of an analysis of the most recent National Oceanic and Atmospheric Administration (NOAA) research vessel data to update the Spear et al. (1995) population estimates for Newell's shearwater and the Hawaiian Petrel for the eastern and central tropical Pacific waters of the Hawaiian Archipelago will provide managers the data to relate population densities and trends to environmental parameters. The analyses will also provide updated estimates of population size that will allow natural resource managers to better characterize large-scale avian population changes that must be understood to make rational management decisions about the Covered Species. Updated population estimates are critical for confirming assumptions made about the population trends that have occurred since the population estimates were made in 1995 (Spear et al. 1995).

Auditory Surveys

Auditory surveys for additional nesting colonies of Covered Species to be conducted are expected to identify more opportunities where beneficial management measures can be implemented. The identification of such colonies is critical to the long-term recovery of the Covered Species because the number and extent of the colonies where management can currently be implemented is limited to the colonies where actions will be implemented under KIUC's Short-term HCP and they are not expected to be sufficient to compensate for both KIUC's impacts to the Covered Species and those from other light sources on the island that will be addressed under the KSHCP.

Underline Monitoring Program

The underline monitoring program that will be developed and implemented by the State of Hawaii using funds from KIUC during the term of the ITP will be used to develop updated estimates of the impacts due to KIUC facilities and operations. Analytical methods will be used to assess the statistical power of different monitoring approaches (and respective costs) that will be used in the development of a long-term monitoring plan for the island-wide seabird HCP or a long-term KIUC HCP.

Impacts of Take on the Covered Species

The take levels of each Covered Species that will be authorized under the ITP are based primarily on impacts due to KIUC's existing facilities, and were not increased or reduced according to any of the limited new facilities anticipated or the avoidance and minimization actions proposed. The effects of the action on the Covered Species are those due to ongoing operations and maintenance of KIUC facilities, the additional facilities and facility modifications that KIUC proposes to initiate during the term of the ITP, and the minimization, mitigation, and monitoring efforts included in the HCP. Cumulatively, the additional facilities are not expected to result in an increase in incidental take of the Covered Species beyond the level anticipated due to existing facilities after the avoidance and minimization measures proposed are implemented. The effects of KIUC's operations, maintenance and facilities are expected to decline as it implements more minimization measures, and those effects will be mitigated by the colony management measures that are expected to reduce adult mortality and increase reproductive success. The island-wide seabird HCP is expected to be completed prior to the termination of KIUC's ITP and, if approved, would implement actions to benefit the Covered Species with the intent of continuing and expanding some of the conservation measures initiated under KIUC's HCP.

Newell's Shearwater

The ongoing annual take of 87 adult Newell's shearwaters represents 0.46 percent of the 18,900 adults estimated to use the island. The indirect loss of 18 chicks/eggs represents impacts to 0.5 percent of the estimated 3,300 eggs laid by breeding pairs on Kauai annually. The authorization of the death or injury to 72 fledglings represents impacts to 3.3 percent of the 2,173 Newell's shearwater that are estimated to fledge annually on Kauai. Based on the estimated survival rate of Newell's shearwater from fledgling to breeding age of 0.333 (Ainley et al. 2001; p. 116), approximately 24 of those 72 fledglings would have survived until adulthood.

Based on the preliminary population and habitat modeling, the area within the two Newell's shearwater nesting colonies that will be managed under the proposed HCP may contain over six percent of the Kauai population and be used by up to 380 breeding pairs. If the HCP is still in effect for a fourth and/or fifth year, the colony management work will be expanded beyond the initial two areas and an additional area containing over 14 percent of the Kauai Newell's shearwater population and up to 1,270 breeding pairs.

Hawaiian Petrel

The ongoing annual take of 2 Hawaiian petrels represents 0.01 percent of the total population estimate of 20,000. While the number and distribution of Hawaiian petrels on Kauai is not known, based on the overlap in habitat used for nesting by Newell's shearwater, the management actions proposed under the Short-term HCP to be conducted within the seabird nesting colonies is expected to produce similar benefits to Hawaiian petrels.

Band-rumped Storm-petrel

The ongoing annual take of 2 band-rumped storm-petrels could represent as high as 5.8 percent of the total population estimate of 171-221 breeding pairs on the island (Wood et al. 2002). While the number and distribution of band-rumped storm-petrels on Kauai is not known, based on the overlap in habitat used for nesting by Newell's shearwater and Hawaiian petrel, the management actions proposed under the Short-term HCP to be conducted within the seabird nesting colonies is expected to produce similar benefits to band-rumped storm-petrels.

IV. CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, local, or private actions that are reasonably certain to occur in the action area considered in this BiOp. Future Federal actions that are unrelated to the proposed action area are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

While the County has not instituted regulations prohibiting the use of non-shielded lights, it is coordinating with the Service on new developments. The County of Kauai General Plan (Kauai Planning Department 2000, p. 2-1) establishes policies for future growth on the island that are intended to allow for incremental growth contiguous to existing development, where it is less likely to cause additional light attraction impacts. However, the Plan also supports additional residential use of the West side and North Shore districts that may lead to additional light attraction impacts to the Covered Species.

As discussed above in this document, the State of Hawaii is developing an HCP to address the long-term, ongoing take of the Covered Species by all non-federal entities (including KIUC) causing such impacts on Kauai. While we do not expect full participation, the mitigation program expected to be implemented under that HCP is expected to create nesting sites protected from predators sufficient to stabilize the populations of each of the Covered Species in the action area. For that reason, no significant cumulative effects to the Covered Species are expected during the term of the proposed action.

V. CONCLUSION

After reviewing the current status of the Newell's shearwater and the Hawaiian petrel, the environmental baseline of these species in the action area, the effects of the proposed HCP including the mitigation, and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the Newell's shearwater or the Hawaiian petrel. Implementation of the HCP's conservation strategy is expected to reduce adverse impacts and result in a net conservation benefit for each species relative to the baseline conditions by increasing survival and reproductive success. The anticipated impacts due to the new facilities authorized under the ITP are expected to be less than the reduction in impacts resulting

from the reconfiguration of existing power lines. No critical habitat has been designated for either the Hawaiian petrel or Newell's shearwater, therefore, none will be affected.

After reviewing the current status of the band-rumped storm-petrel, the environmental baseline of the species in the action area, the effects of the proposed HCP, and the cumulative effects, it is the Service's conference opinion that the action, as proposed, is not likely to jeopardize the continued existence of the band-rumped storm-petrel. Implementation of the HCP's conservation strategy is expected to adequately offset impacts by increasing survival and reproductive success and result in a net conservation benefit for the species.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations promulgated pursuant to section 4(d) of the ESA prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined by the USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harass is defined by the USFWS as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2) of the ESA, taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

Amount or Extent of Take Anticipated

Based on the proposed HCP and the analysis of the effects of the proposed action provided above, the USFWS anticipates the following take may occur as a result of the proposed action:

1. Up to 162 Newell's shearwaters (adults, subadults, or fledglings) may be injured (55) or killed (107) annually over the permit term as a result of attraction to, or collision with, KIUC facilities. Up to 18 eggs and/or chicks may also be killed as a result of the mortality of breeding adults.

2. Up to two (2) Hawaiian petrels (adults, subadults, or fledglings) may be injured or killed annually over the permit term as a result of attraction to, or collision with, KIUC facilities.

3. Up to two (2) band-rumped storm petrels (adults, subadults, or fledglings) may be injured or killed annually over the permit term as a result of attraction to, or collision with, KIUC facilities.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 USC 703-712), prohibits the take of migratory birds. The MBTA provides no process for authorizing incidental take of MBTA-protected birds. The Hawaiian petrel, Newell's shearwater, and the band-rumped storm-petrel are protected under the MBTA. The Service will not refer the incidental take of these species for prosecution under the MBTA, if such take is in compliance with the terms and conditions (including amount and/or number) specified in the ITP.

Effect of the Take

In the accompanying BiOp, the Service determined that the maximum level of incidental take authorized under the proposed HCP and permit is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat. Even though some additional facilities that may cause additional impacts to the Covered Species will be installed, the impacts of the new facilities are expected to minimal whereas the reductions in existing take levels due to proposed line reconfigurations are expected to be much larger, resulting in an overall decline in impacts to the populations. While it is not currently possible to quantify the increases in survival and/or reproduction due to predator control that would be implemented under the HCP, because predation appears to be the primary terrestrial threat to the Covered Species, the benefits could be substantial.

Reasonable and Prudent Measures

The proposed KIUC Short-term HCP and its associated documents identify anticipated impacts to affected species likely to result from the proposed taking and the measures that are necessary and appropriate to minimize those impacts. All conservation measures described in the proposed KIUC Short-term HCP, together with the terms and conditions described in any associated Implementing Agreement and any section 10(a)(1)(B) permit issued with respect to the proposed KIUC Short-term HCP, are hereby incorporated by reference as reasonable and prudent measures and terms and conditions within this Incidental Take Statement pursuant to 50 CFR 402.14(i). Such terms and conditions are non-discretionary and must be undertaken for the exemptions under section 10(a)(1)(B) and section 7(o)(2) of the ESA to apply. If the permittee fails to adhere to these terms and conditions, the protective coverage of the section 10(a)(1)(B) permit and section 7(o)(2) may lapse. The amount or extent of incidental take anticipated under the proposed KIUC Short-term HCP, associated reporting requirements, and provisions for disposition of dead or injured animals are as described in the HCP and its accompanying section 10(a)(1)(B) permit.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service believes that the following recommendations should be considered for implementation:

1. The Service should provide technical assistance to KIUC throughout the term of the ITP.

RE-INITIATION NOTICE

This concludes formal consultation on the proposed issuance of the ESA section 10(a)(1)(B) incidental take permit to KIUC. As required in 50 CFR §402.16, reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an adverse effect to the listed species that was not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by this action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending re-initiation. The Incidental Take Statement provided in this BiOp for unlisted covered species (i.e., the band-rumped storm-petrel) does not become effective until the species is listed and the conference opinion is adopted as the biological opinion issued through formal consultation. If you have any questions regarding any of the information contained in this BiOp, please contact Bill Standley of the Pacific Islands FWO at (phone) 808/792-9400, or (fax) 808/792-9581.

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