# Request to Conclude DKIST HCP and ITL

**Dave Boboltz, Caroline Blanco (NSF);**

**Laurie Allan, Charlie Fein (KC Environmental, Inc.);**

**Huisheng Chen, Rex Hunter, Mark Warner (DKIST Project)**

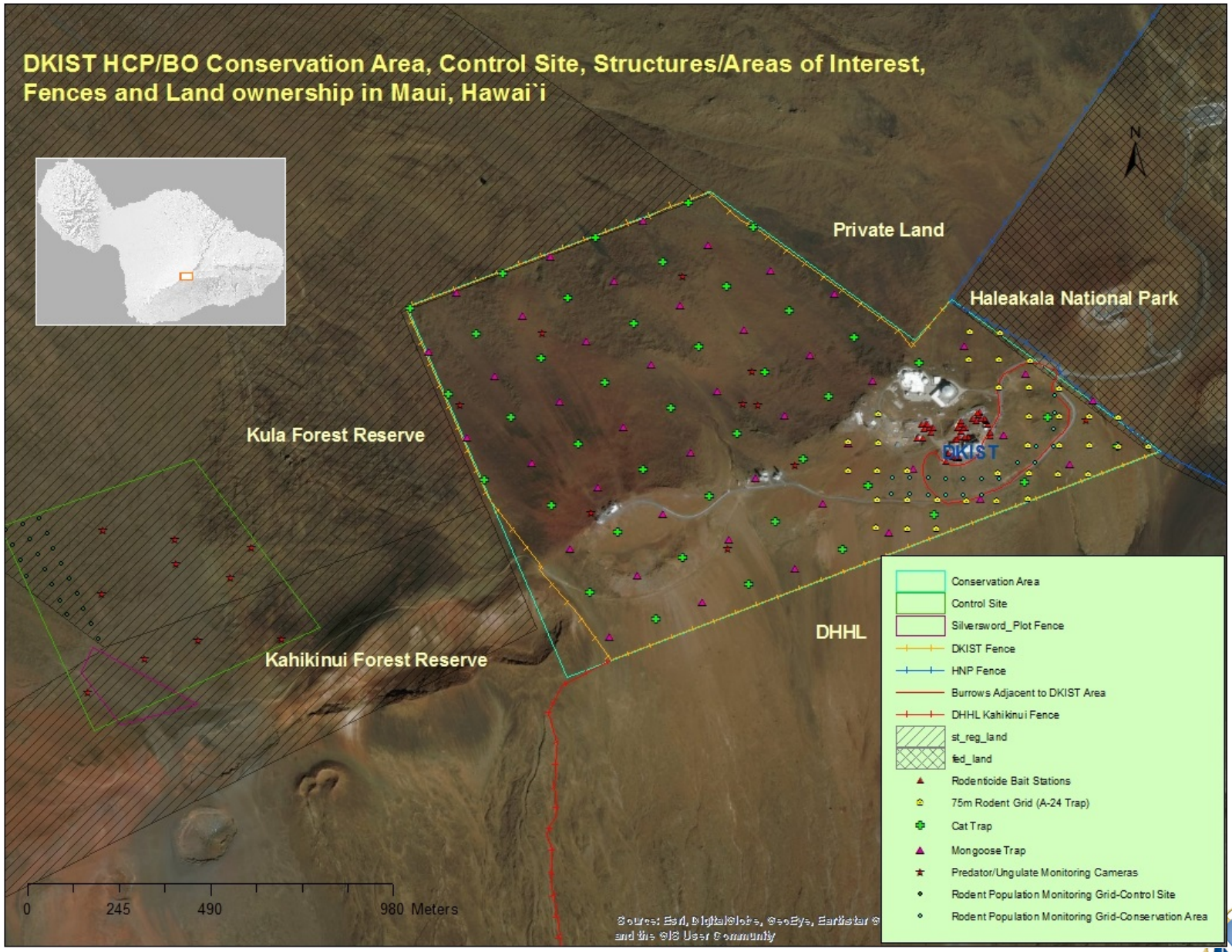
**Endangered Species Recovery Committee (ESRC) meeting**

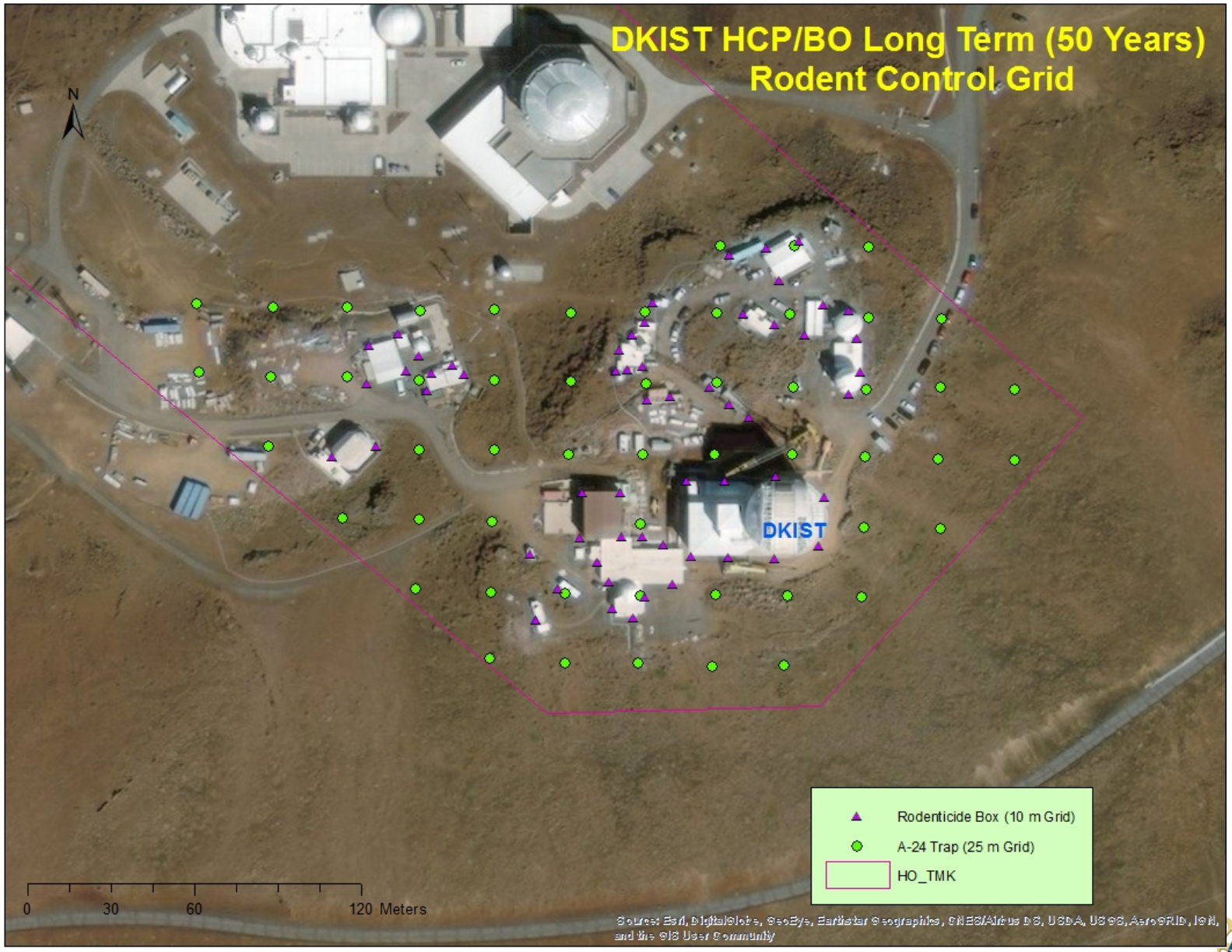
**March 6, 2019**

# Overview of the DKIST Project

- When the telescope is operational, NSF's Daniel K. Inouye Solar Telescope (DKIST) will be the world's most powerful solar observatory
- DKIST will enable the study of magnetic phenomena from the solar photosphere to the outer corona. These magnetic phenomena drive the space weather that impacts our Earth
- DKIST is located within the 18.166-acre University of Hawai‘i Institute for Astronomy (IfA) Haleakalā High Altitude Observatory (HO) site at the summit of Haleakalā, County of Maui, Hawai‘i
- The DKIST Environmental Impact Statement (EIS) and accompanying Record of Decision (ROD) were completed in 2009.
- Post-EIS consultation efforts led to:

  1. The publication of a Biological Opinion (BO; 2011) by the US Fish and Wildlife Service (USFWS)
  2. A Habitat Conservation Plan (HCP; approved October 2010) for the State of Hawaii. A 10-year Incidental Take License (ITL) 30 fledglings and 5 adult Hawaiian Petrels or `Ua`u (*Pterodroma sandwichensis*) was issued in January 2011 along with the HCP


DKIST HCP/BO Conservation Area, Control Site, Structures/Areas of Interest, Fences and Land ownership in Maui, Hawai`i
N
Private Land
Haleakala National Park
Kula Forest Reserve
DKIST
DHHL
Kahikinui Forest Reserve
0
245
490
980 Meters
Conservation Area
Control Site
Silversword_Plot Fence
DKIST Fence
HNP Fence
Burrows Adjacent to DKIST Area
DHHL Kahikinui Fence
st_reg_land
fed_land
Rodenticide Bait Stations
75m Rodent Grid (A-24 Trap)
Cat Trap
Mongoose Trap
Predator/Ungulate Monitoring Cameras
Rodent Population Monitoring Grid-Control Site
Rodent Population Monitoring Grid-Conservation Area


DKIST HCP/BO Long Term (50 Years)
Rodent Control Grid
N
DKIST
Rodenticide Box (10 m Grid)
A-24 Trap (25 m Grid)
HO_TMK
0
30
60
120 Meters
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

# Conservation Measures to Avoid/Minimize Impacts

| Potential Anticipated Effects | Measures Adopted to Avoid, Minimize, and Offset Impacts |
|---|---|
| **Collision of Hawaiian petrels with equipment and buildings** | Framing lattice and all completed structures painted white, construction crane lowered at night and marked with white visibility polytape or approved alternative. Polytape incorporated into conservation fencing. Outdoor lighting restricted.<br>Birdstrike Monitoring implemented, including SEEF and CARE trials |
| **Burrow collapse from construction vibration and trampling** | Engineers set vibration threshold for burrow collapse. Vibration restricted to minimize the likelihood of burrow collapse. Several burrows near construction activities were monitored for vibration and ground disturbance |
| **Reductions in breeding attempts and reproductive success resulting from disturbance to adult birds** | 313-ac mitigation area surrounding HO fenced and managed with predator and ungulate control measures to achieve project net recovery benefit for the Hawaiian petrel. Burrow activity and results were monitored and reported annually. |
| **Predator population increase** | Trash contained. Predator control implemented around the facility using bait stations and traps. |
| **Transport of invasive species to Haleakalā** | Cargo thoroughly inspected for introduced non-native species. All ATST facilities and grounds thoroughly inspected for introduced species on an annual basis. |
| **Incidental live trapping of Hawaiian petrels in predator traps** | Mammal traps monitored every other day. Any incidental captures released unharmed within 24 hours of capture.<br>(One petrel within the Conservation Area was inadvertently trapped on 5/25/17, but was banded and released unharmed by Maui Nui Seabird Recovery.) |
| **Reduction of Hawaiian petrel population** | Installation and maintenance of fencing and predator control measures to facilitate development of the Hawaiian petrel population within a 313-ac conversation area (fence completed November 2013) |

# Amendments

| Date | Amendment | HCP | BO |
|---|---|---|---|
| July-Oct 2014 | (1) Fence monitoring schedule for downed birds reduced from twice weekly to every two weeks<br>(2) 60-day CARE trial requested by USFWS to determine whether fence monitoring every 30 days was enough (it was)<br>(3) The fall CARE trial was removed | *<br>*<br>✓ | ✓<br>✓<br>✓ |
| Oct-2014 | Hawaiian Petrel "Reproductive Success was" replaced by "Fledgling Success" | ✓ | ✓ |
| Feb-2015 | Landscape scale rodent control requirement was removed | * | ✓ |
| Feb-Apr 2015 | Long-term rodent grid was amended | ✓ | ✓ |
| May-2015 | (1) Requirement for Hawaiian Petrel social attraction project was removed<br>(2) Requirement for Hawaiian Petrel artificial burrow placement was removed<br>(3) Hawaiian Petrel adult survivorship was removed as a measure of success | ✓<br>✓<br>✓ | ✓<br>✓<br>✓ |
| Jan-Mar 2018 | Amended to identity termination process and allow request for termination of HCP after five years of mitigation following construction of the conservation fence (Nov 2013) | ✓ | |

* Not a requirement provided for in the HCP.

# Termination Process for the HCP

If:

1. External construction activities are complete
2. No further risk of construction-related take
3. A Final Report is submitted by January 2019 to the ESRC addressing the DKIST project's conservation measures; monitoring actions; observations and conclusions; and demonstration that mitigation goals and net recovery benefit have been met

Then:

1. ESRC can recommend termination to be confirmed by DOFAW administrator

# Measurable Goals and Adaptive Management

**Conservation Actions**

- Fencing of Conservation Area (~313 acres)
- Invasive species/predator control

**Take Monitoring** (35 permitted, 0 take)

- Vibration and noise monitoring
- Bird strike monitoring
- Searcher efficiency (SEEF) trial (92.5% cumulative efficiency)
- Carcass removal (CARE) trials (0% carcass removal)

**Ecological Monitoring**

- Burrow searches
- Burrow monitoring with cameras/scopes
- Reproductive success monitoring

# Measurable Goals and Adaptive Management

**Rodent and Predator Control Requirements**

- Requirements in HCP for control were met throughout construction
- The HCP and USFWS BO require NSF to maintain rodent control for 50 years
  - This redundant requirement was removed from the HCP

**Net Recovery Benefit**

- NSF required to demonstrate a “Net Recovery Benefit”
- In consultation with DOFAW and USFWS it was determined that the most accurate measure would be a comparison of “before and after” predation rates

# Net Recovery Benefit

- Defined after years of consultation with DOFAW and USFWS, a review of 2 years of pre-construction data, and 6 years of data taken during construction
- Proposed measure of net recovery benefit was derived from a comparison of predation rates prior to and during construction after conservation measures were implemented
- DKIST initiated monitoring for 2 nesting seasons prior to the start of construction in December 2012
- 2011 – 2012 predation rates (pre-mitigation)
  - Chick predation rate = 12.7%
  - Adult predation rate = 3.6%
- 2013 – 2018 predation rates (post-mitigation)
  - Chick predation rate = 1.6%
  - Adult predation rate = 0.6%

# Net Benefit: Predation Rates

# Net Recovery Benefit: Results

| Hawaiian Petrel Predation Rates Before (2011-2012) and After (2013-2018) DKIST Mitigation Efforts in the DKIST Conservation Area at the Summit of Haleakalā, Maui. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | Total |
| Active Burrows | 159 | 153 | 125 | 165 | 168 | 119 | 189 | 200 | |
| Chicks Produced | 38 | 17 | 30 | 44 | 29 | 49 | 54 | 51 | |
| Chicks Fledged | 32 | 16 | 27 | 44 | 29 | 49 | 53 | 50 | |
| Chicks predated | 6 | 1 | 3 | 0 | 0 | 0 | 1 | 0 | |
| Expected Chick Predation at 12.7% | | | 3.82 | 5.60 | 3.69 | 6.24 | 6.87 | 6.49 | |
| Annual Chick Benefit | | | 0.82 | 5.60 | 3.69 | 6.24 | 5.87 | 6.49 | 28.71 |
| Annual Chick Predation Rate | 0.16 | 0.06 | 0.10 | 0.00 | 0.00 | 0.00 | 0.02 | 0 | |
| Adults predated | 1 | 3 | 0 | 1 | 0. | 1 | 1 | 0 | |
| Expected Predation at 3.6% | | | 2.18 | 3.20 | 2.11 | 3.56 | 3.93 | 3.71 | |
| Annual Adult Benefit | | | 2.18 | 2.20 | 2.11 | 2.56 | 2.93 | 3.71 | 15.69 |
| Annual Adult Predation Rate | 0.01 | 0.09 | 0.00 | 0.01 | 0.00 | 0.01 | 0.01 | 0.00 | |

- Total Chick Recovery = **28.71** chicks
- Total Adult Recovery = **15.69** adults

# Summary

NSF, after extensive consultation with DOFAW and USFWS, seeks ESRC concurrence to end the DKIST Habitat Conservation Plan and associated Incidental Take License for the take of 35 Hawaiian Petrels, incidental to the construction of the DKIST facility, consistent with BLNR's directive

- ✓ External construction activities are complete (December 2018)
- ✓ There has been no DKIST construction-related take
- ✓ DKIST submitted a Final Report to the ESRC (January 2019) that addresses the DKIST project's conservation measures; monitoring actions; observations and conclusions; and demonstration that mitigation goals and net recovery benefit have been met

# Back-up Slides

# BO Terms and Conditions Satisfied

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

In Reply Refer To:
01EPIF00-2011-F-0085
01EPIF00-2019-TA-0176

February 22, 2019

David Boboltz, Ph.D.
Program Director, Daniel K. Inouye Solar Telescope
Division of Astronomical Sciences
National Science Foundation
2415 Eisenhower Avenue
Alexandria, Virginia 22314

Subject: Completion of Project Activities and Conservation Actions for the Biological Opinion for the Daniel K. Inouye Solar Telescope, Maui

Dear Dr. Boboltz:

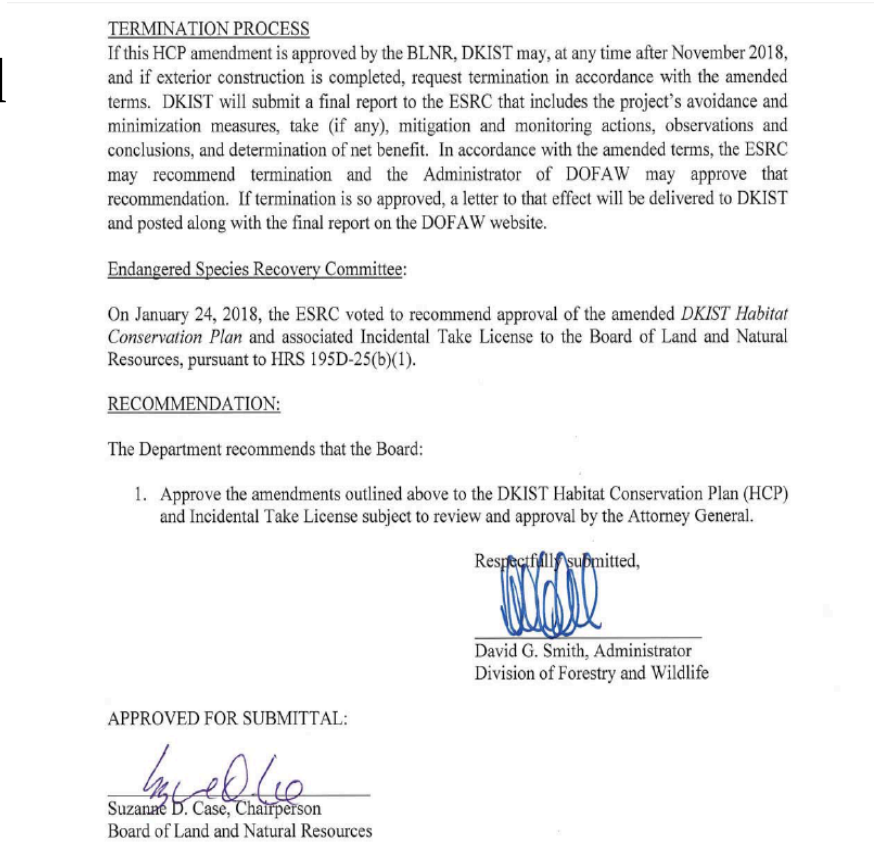
The U.S. Fish and Wildlife Service (Service) signed the *Biological Opinion for the Construction and Operation of the Advanced Technology Solar Telescope (ATST)* (since renamed the Daniel K. Inouye Solar Telescope (DKIST)) *at the Haleakala High Altitude Observatory Site* on June 15, 2011. The Biological Opinion was amended on July 29, 2014, to modify the monitoring requirements associated with endangered Hawaiian petrel (*Pterodroma sandwichensis*) carcass searches along the perimeter of the ungulate exclusion fence. The Service received your Draft *Daniel K. Inouye Solar Telescope (DKIST) Habitat Conservation Plan and Biological Opinion Final Report* on December 18, 2018. Following our review of this report, the Service indicated via email that we have no further comments or concerns. Based on our records, we have confirmed that all of the terms and conditions in the Biological Opinion, including performance of all mitigation obligations, have been satisfied. This letter has been prepared under the authority of and in accordance with provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq.*), as amended.

# DKIST HCP Summary Overview

- NSF entered into HCP and was issued an ITL – Oct. 2010
- Objective measurable goals and provisions for monitoring were established
- Adaptive management amendments made in consultation with DOFAW and USFWS have modified some of these measures
- ESRC recommended approval of amended HCP – Jan. 2018
  - Allows the termination of the HCP at the end of 5 years from completion of the ungulate fence
- BLNR recommended approval of amended HCP – Mar. 2018
- External construction completed and goals achieved – Dec. 2018
- Measurable goals/net benefit documented in Final Report – Jan. 2019

# Termination Process for ESRC Consideration

- NSF seeks ESRC concurrence to end the DKIST HCP and associated ITL for the take of 35 Hawaiian Petrels incidental to the construction of the DKIST facility.
- BLNR directed the conditions for concluding the DKIST HCP and ITL in its letter dated March 23, 2018



TERMINATION PROCESS

If this HCP amendment is approved by the BLNR, DKIST may, at any time after November 2018, and if exterior construction is completed, request termination in accordance with the amended terms. DKIST will submit a final report to the ESRC that includes the project's avoidance and minimization measures, take (if any), mitigation and monitoring actions, observations and conclusions, and determination of net benefit. In accordance with the amended terms, the ESRC may recommend termination and the Administrator of DOFAW may approve that recommendation. If termination is so approved, a letter to that effect will be delivered to DKIST and posted along with the final report on the DOFAW website.

Endangered Species Recovery Committee:

On January 24, 2018, the ESRC voted to recommend approval of the amended *DKIST Habitat Conservation Plan* and associated Incidental Take License to the Board of Land and Natural Resources, pursuant to HRS 195D-25(b)(1).

RECOMMENDATION:

The Department recommends that the Board:

1. Approve the amendments outlined above to the DKIST Habitat Conservation Plan (HCP) and Incidental Take License subject to review and approval by the Attorney General.

Respectfully submitted,

David G. Smith, Administrator
Division of Forestry and Wildlife

APPROVED FOR SUBMITTAL:

Suzanne D. Case, Chairperson
Board of Land and Natural Resources

# Compliance with Obligations

## DKIST HCP obligations include:

- ✓ short term predator control
- ✓ alien species interdiction
- ✓ burrow search and monitoring
- ✓ vibration and noise monitoring
- ✓ bird strike monitoring
- ✓ searcher efficiency (SEEF) trials
- ✓ carcass removal (CARE) trials
- ✓ burrow scoping
- ✓ monitoring burrow collapse
- ✓ monitoring impacts to reproductive success
- ✓ modeling changes in population size
- ✓ semi-annual and annual HCP reporting on accomplishment of goals for these obligations

# Hawaiian Petrel Response to Mitigation Efforts: Population