Final Environmental Assessment for Use of *Wolbachia*-based Incompatible Insect Technique for the Suppression of Non-native Southern House Mosquito Populations on Kaua‘i

OCTOBER 2023

PREPARED BY

Hawai‘i Department of Land and Natural Resources, Division of Forestry and Wildlife, U.S. Fish and Wildlife Service, and SWCA Environmental Consultants

FINAL ENVIRONMENTAL ASSESSMENT FOR USE OF *WOLBACHIA*-BASED INCOMPATIBLE INSECT TECHNIQUE FOR THE SUPPRESSION OF NON-NATIVE SOUTHERN HOUSE MOSQUITO POPULATIONS ON KAUA‘I

Prepared by

Hawai‘i Department of Land and Natural Resources,
Division of Forestry and Wildlife
1151 Punchbowl St., Room 325
Honolulu, HI 96813
Attn: Paul Radley

and

U.S. Fish and Wildlife Service,
Pacific Islands Fish and Wildlife Office
300 Ala Moana Blvd, Rm 3-122,
Honolulu, HI 96850
Attn: Michelle Clark

and

SWCA Environmental Consultants
1200 Ala Moana Blvd, #380
Honolulu, HI 96814
(808) 548-7922
www.swca.com

October 2023

SUMMARY

Project Name:	Environmental Assessment for use of *Wolbachia*-based Incompatible Insect Technique for the Suppression of Non-native Southern House Mosquito Populations on Kaua'i
Project Short Name:	Kaua'i mosquito suppression
Trigger(s):	Use of State or County lands or Use of State or County funds, use of Federal funds
Island(s):	Kaua'i
Judicial District(s):	Fifth Circuit
Tax Map Keys (TMKs):	1-4-001:001; 1-4-001:003; 1-4-001:010; 1-4-001:011; 1-4-001:012; 1-4-001:013; 1-4-001:014; 1-4-001:019; 1-4-001:020; 1-4-001:999; 1-4-003:004; 1-4-003:005; 1-4-003:006; 1-4-003:007; 1-4-003:008; 1-4-003:009; 1-4-003:010; 1-4-003:011; 1-4-003:012; 1-4-003:013; 1-4-003:014; 1-4-003:016; 1-4-003:017; 1-4-004:001; 1-4-004:002; 1-4-004:003; 1-4-004:004; 1-4-004:005; 1-4-004:006; 1-4-004:007; 1-4-004:008; 1-4-004:009; 1-4-004:010; 1-4-004:011; 1-4-004:012; 1-4-004:013; 1-4-004:014; 1-4-004:016; 1-4-004:017; 1-4-004:018; 1-4-004:019; 1-4-004:020; 1-4-004:021; 1-4-004:024; 1-4-004:027; 1-4-004:028; 1-4-004:029; 1-4-004:030; 1-4-004:031; 1-4-004:032; 1-4-004:033; 1-4-004:035; 1-4-004:036; 1-4-004:037; 1-4-004:038; 1-4-004:039; 1-4-004:040; 1-4-004:041; 1-4-004:042; 1-4-004:043; 1-4-004:044; 1-4-004:045; 1-4-004:046; 1-4-004:047; 1-4-004:048; 1-4-004:049; 1-4-004:050; 1-4-004:051; 1-4-004:052; 1-4-004:053; 1-4-004:054; 1-4-004:055; 1-4-004:056; 1-4-004:057; 1-4-004:058; 1-4-004:059; 1-4-004:060; 1-4-004:061; 1-4-004:062; 1-4-004:063; 1-4-004:064; 1-4-004:065; 1-4-004:066; 1-4-004:067; 1-4-004:068; 1-4-004:069; 1-4-004:070; 1-4-004:072; 1-4-004:073; 1-4-004:074; 1-4-004:075; 1-4-004:076; 1-5-001:001; 1-5-001:017; 1-7-001:001; 1-8-001:001; 3-8-001:001; 3-9-001:001; 4-2-001:002; 5-4-001:001; 5-7-001:001; 5-8-001:001; 5-8-002:002; 5-9-001:001; 5-9-001:002; 5-9-001:003; 5-9-001:016; 5-9-001:017; 5-9-001:021; 5-9-001:023
Joint Lead Agencies:	Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife, 1151 Punchbowl St., Room 325, Honolulu, HI 96813 U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office 300 Ala Moana Blvd, Room 3-122, Honolulu, HI 96850
Contact Information	Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife – Ph (808) 587-0160, Pacific Island Fish and Wildlife Office – Ph. (808)-792-9400
Contact Name, Email, Address	Michelle Clark, U.S. Fish and Wildlife Service, KauaiWolbachiaEA@fws.gov, 300 Ala Moana Blvd, Honolulu, HI 96850. Lainie Berry, Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife, mosquitocontrol@hawaii.gov, 1151 Punchbowl St., Room 325, Honolulu, HI 96813

PROJECT SUMMARY

Hawai'i's native forest bird species have undergone precipitous declines and extinctions since the arrival of humans to the archipelago, particularly Europeans; 39 of the 56 native Hawaiian honeycreepers have gone extinct and 11 of the remaining 17 species are endangered or threatened. Although several factors have led to declines of these remaining species, the main threat to Hawaiian honeycreepers is currently avian malaria (*Plasmodium relictum*) and avian pox (*Avipoxvirus* spp.); non-endemic diseases that are principally spread by the non-native invasive southern house mosquito (*Culex quinquefasciatus*). Until recently, there were no viable means available to control mosquito vectors at the landscape scale within natural areas in Hawai'i.

The Incompatible Insect Technique (IIT) is neither novel nor an experiment, but the application of an established method for controlling insect populations. Based on existing literature, IIT has been successfully implemented to control mosquitoes that are a human health concern in at least 17 countries worldwide including, but not limited to, New Caledonia, Fiji, Vanuatu, Australia, French Polynesia, Indonesia, Singapore, Malaysia, Vietnam, Thailand, Sri Lanka, India, China, Brazil, Columbia, Mexico and the United States (Florida, California, Puerto Rico, Texas, Kentucky and New York). The technique uses lab-raised male mosquitoes carrying a select strain of *Wolbachia*, a bacterium that naturally occurs in at least 65% of insect species. When male mosquitoes, which do not bite or transmit diseases, are released into a target habitat and mate with wild female mosquitoes that either contain different or no strains of *Wolbachia*, the eggs fail to develop owing to the cytoplasmic incompatibility of the differing *Wolbachia* strains of the male and female mosquitoes. The development of IIT for mosquito-borne diseases that affect humans presents a unique opportunity to use this tool to control mosquitoes that spread avian diseases to native forest bird species in Hawai'i. This approach does not employ genetic engineering and does not involve or result in the genetic modification of either mosquitoes or bacteria.

The State of Hawai'i Department of Land and Natural Resources (DLNR) and U.S. Fish and Wildlife Service (USFWS) proposes employing IIT to reduce mosquito populations within approximately 59,204 acres (23,959 hectares) of forest reserves, state parks, and private lands in the Kōke'e and Alaka'i Wilderness areas of Kaua'i to protect birds from mosquito-borne diseases in key higher-elevation native forest bird habitat. This effort is consistent with the statutory missions and responsibilities of the DLNR and USFWS. The multi-stakeholder project would raise and sequentially mass-release male mosquitoes that carry a strain of *Wolbachia* that is incompatible with natal females. Extensive pre- and post-release monitoring would be implemented to monitor the effectiveness of releasing incompatible male mosquitoes on the wild mosquito populations. A similar unconnected project has been proposed for implementation by the National Park Service and DLNR on the island of Maui[1]. To comply with their respective obligations under the National Environmental Policy Act (NEPA) and Hawai'i's environmental review process pursuant to Hawai'i Revised Statutes (HRS) Chapter 343, the USFWS and DLNR are preparing a joint environmental assessment (EA) to address the impacts of the release of male mosquitoes with incompatible *Wolbachia* in the Kōke'e and Alaka'i Wilderness areas.

[1] See: https://files.hawaii.gov/dbedt/erp/Doc_Library/2023-04-08-MA-FEA-Suppression-of-Mosquitoes-on-East-Maui.pdf

This EA provides background information concerning IIT and outlines the proposed action, potential impacts, and strategies to avoid and minimize potential negative effects of the proposed release of incompatible male mosquitoes within the project area on Kaua‘i.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

ABBREVIATIONS AND ACRONYMS

4WD	four-wheel-drive
biocontrol	biological control
CI	Cytoplasmic Incompatibility
CIA	Cultural Impact Assessment
DLNR	Department of Land and Natural Resources
DOFAW	Division of Forestry and Wildlife
DOH	Department of Health
DSP	Division of State Parks
EA	Environmental Assessment
HDOA	Hawaiʻi Department of Agriculture
HRS	Hawaiʻi Revised Statutes
IIT	Incompatible Insect Technique
KFBRP	Kauaʻi Forest Bird Recovery Project
KISC	Kauaʻi Invasive Species Committee
KRCP	Kōkeʻe Resource Conservation Program
KWA	Kauaʻi Watershed Alliance
LZ	Landing Zone
NEPA	National Environmental Policy Act
SHPD	State Historic Preservation Division
TMK	Tax Map Key
TNC	The Nature Conservancy
UAS	Unmanned Aerial Systems
U.S.	United States
USFWS	U. S. Fish and Wildlife Service

1 INTRODUCTION

To comply with their respective obligations under the National Environmental Policy Act of 1969, as amended (NEPA), the Council on Environmental Quality (CEQ) NEPA Regulations (40 CFR 1500-1508), Department of the Interior NEPA Regulations (43 CFR 46), and the Hawaiʻi Revised Statutes (HRS) Chapter 343, the U.S. Fish and Wildlife Service (USFWS) and Hawaiʻi Department of Land and Natural Resources (DLNR) are preparing a joint environmental assessment (EA) to address the release of male mosquitoes with incompatible *Wolbachia* (Incompatible Insect Technique, or IIT) in the Kōkeʻe and Alakaʻi Wilderness areas on Kauaʻi (Figure 1). The NEPA and HRS Chapter 343 regulations state that an agency shall prepare an EA for a proposed action that is not likely to have significant effects or when the significance of the effects is unknown. Project area lands are managed by DLNR Division of Forestry and Wildlife (DOFAW), DLNR Division of State Parks (DSP), and private parties (see Table 1). The DLNR and USFWS are joint lead agencies for this EA. The USFWS is considering provisional financial assistance for aspects of the mosquito suppression project. For the conservation of listed forest birds, this agency is therefore joint lead agency for this EA.

This EA analyzes environmental consequences associated with the implementation of the proposed action and the no-action alternative. Additional alternatives considered but dismissed are described in Section 3.3. The proposed action presented in this EA is the suppression of the non-native and invasive southern house mosquito (*Culex quinqufasciatus*) in 23,959 ha (59,204 acres) of forest bird habitat on Kauaʻi (Figure 1) through the release of male, *Wolbachia*-incompatible southern house mosquitoes (hereafter referred to as incompatible male mosquitoes, described in Sections 2.4 and 2.5). Breeding interactions between released male and wild female mosquitoes are anticipated to result in a reduction of the mosquito population on this portion of Kauaʻi. This EA provides background information concerning IIT and outlines the proposed action, potential impacts, and strategies to avoid and minimize any negative effects of the proposed release of incompatible male mosquitoes within the project area on Kauaʻi. This document has been prepared consistent with the NEPA, NEPA implementing regulations, and the HRS Chapter 343 and provides compliance for project implementation under both Acts and associated regulations.

The no-action alternative evaluates conditions as they would occur in the foreseeable future if the DLNR did not release incompatible male mosquitoes to manage southern house mosquito populations in forest bird habitat on Kauaʻi. Current management strategies focused on larval habitat source reduction are limited to fencing to exclude ungulates, particularly feral pigs, that create wallows and hollows in tree fern stems that are utilized by mosquitoes as breeding habitats. This strategy, however, does not address other cryptic larval habitat over the landscape. The DLNR and USFWS assume that under the no-action alternative, no new actions to control non-native southern house mosquito would be implemented. DLNR and USFWS also assume that the southern house mosquitoes would continue to persist in forest bird habitat, including federally designated critical habitat for ʻakikiki (*Oreomystis bairdi*) and akeke'e (*Loxops caeruleirostris*) on Kauaʻi, and would continue to act as a vector for mosquito-borne diseases.

The DLNR manages 22 natural areas[2] comprising the most ecologically intact habitats on Kaua'i with the intent of safeguarding these habitats and species, as well as the cultural heritage associated with them. The proposed project would occur on 34,921 acres (14,132 hectares) within 10 DLNR managed natural areas on the island (Table 1). These natural areas include forest reserves, natural area reserves, state parks, wildlife sanctuaries, and wilderness reserves. This project is consistent with the statutory missions and responsibilities of the DLNR. This EA has been prepared to comply with DLNR obligations under HRS Chapter 343.

Table 1. The Reserves that Comprise the Proposed Project Area

Name of Reserve	Land Management Agency	Total Size of Reserve (acres)	Acres within Project Area	Designation
Hā'ena State Park	DSP	184	<1	State Park
Halele'a Forest Reserve	DOFAW	14,994	1,206	Forest Reserve
Hono O Nā Pali Natural Area Reserve	DOFAW	3,570	3,570	Natural Area Reserve
Kōke'e State Park	DSP	4,359	3,438	State Park
Kuia Natural Area Reserve	DOFAW	1,606	691	Natural Area Reserve
Līhu'e-Kōloa Forest Reserve	DOFAW	10,845	598	Forest Reserve
Nā Pali Coast State Wilderness Park	DSP	4,883	4,619	State Wilderness Park
Nā Pali-Kona Forest Reserve	DOFAW	13,085	9,637	Forest Reserve
Nā Pali-Kona Forest Reserve/Alaka'i Wilderness Preserve	DOFAW	9,940	9,940	Forest Reserve/ Preserve
Pu'u Ka Pele Forest Reserve	DOFAW	13,973	1,222	Forest Reserve
Private	None	N/A	24,283	Private
Total	-	77,439	59,204	

[2] Sourced from:
https://dlnr.hawaii.gov/ecosystems/nars/kauai-2/
https://dlnr.hawaii.gov/forestry/frs/reserves/kauai/

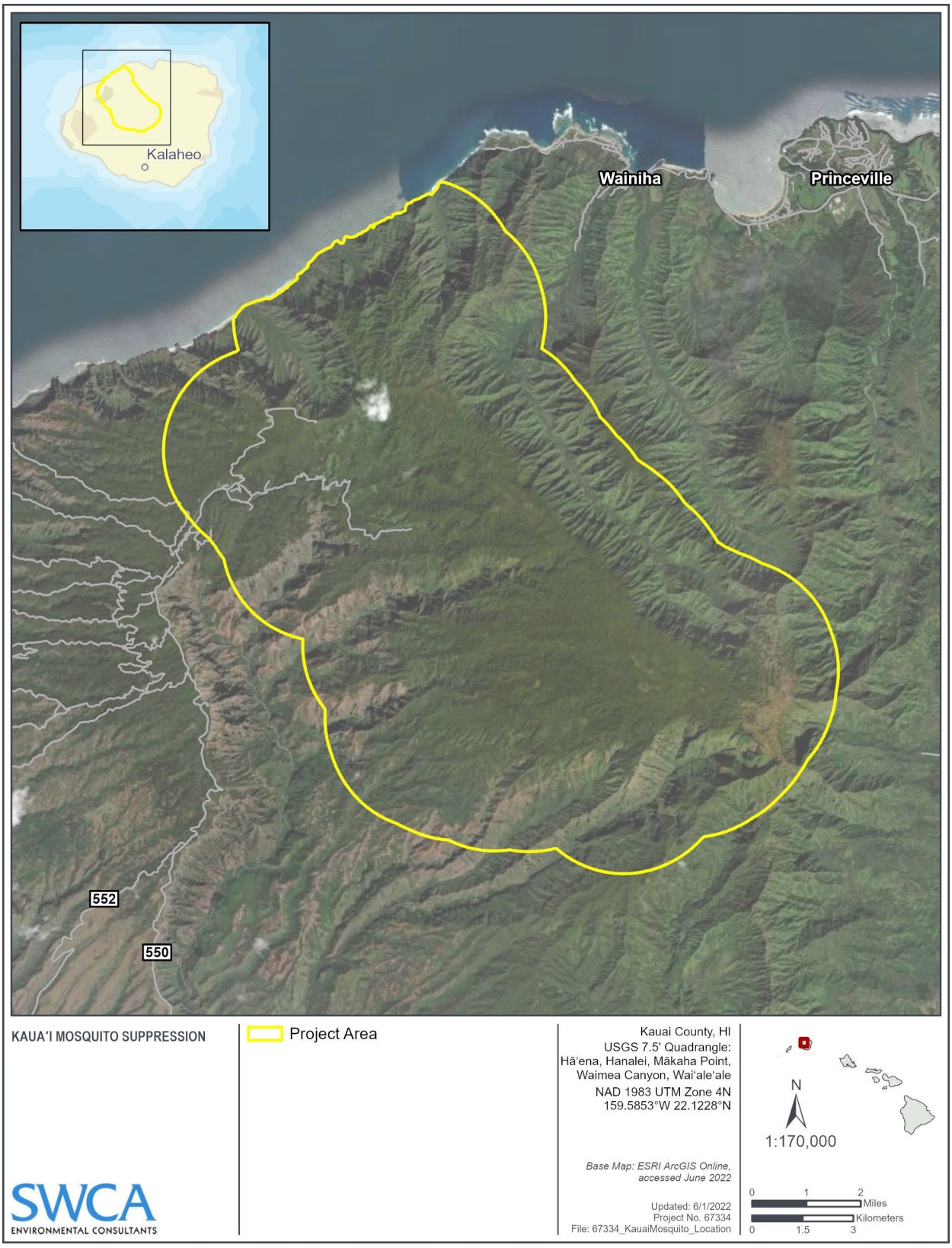

Figure 1. Project Area.

1.1 Applicable Laws, Executive Orders, and Supporting Guidelines

The suppression of non-native mosquito populations from the project area is consistent with several laws requiring resource managers to conserve and restore wildlife and habitats under their jurisdiction. The proposed action would be carried out in compliance with the various Federal and state laws listed below.

The USFWS mission is to work with others to "conserve, protect and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people" (USFWS 2023). The threat that introduced species pose to habitat and native wildlife makes addressing their impacts one of the USFWS's top management priorities.

The mission of DOFAW is to protect, manage, and restore natural and cultural resources in collaboration with the people of Hawai'i. The threat that invasive species pose to habitat and native wildlife makes addressing their impacts one of the DOFAW's top management priorities.

1.1.1 Federal

Migratory Bird Treaty Act of 1918 (MBTA), as amended. The MBTA prohibits the incidental take of MBTA-protected bird species, a list of which may be found at 50 C.F.R. §10.13. Under the MBTA, "take" means to "pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect" (50 CFR 10.12). Bird species can be protected under the MBTA even if they do not migrate, and no matter their origin.

National Environmental Policy Act of 1969 (NEPA), as amended. NEPA requires that Federal agencies evaluate the impacts of their proposed actions on the human environment, that these impacts be considered by the decision maker(s) prior to implementation, and that the public be informed of these impacts. This EA was prepared in compliance with NEPA (42 USC Section 4231, *et seq*.), the CEQ NEPA Regulations, 40 CFR Section 1500 – 1508, and the DOI NEPA Regulations (43 CFR 46).

The Fish and Wildlife Act of 1956 (16 U.S.C. 742a–742j, not including 742 d–l, 70 Stat. 1119), as amended, gives general guidance requiring the Secretary of the Interior to take steps "required for the development, management, advancement, conservation, and protection of fish and wildlife resources."

Endangered Species Act of 1973, as amended (16 U.S.C. 1531–1544, 87 Stat. 884). The Endangered Species Act (ESA) requires that all Federal agencies shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the purposes of the ESA (Sec.2[c]).

Presidential Executive Order 13112 on Invasive Species (February 3, 1999). Section 2(a)(2), on Federal agency duties, states: "Each Federal agency whose actions may affect the status of invasive species shall, to the extent practicable and permitted by law, subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (1) prevent the introduction of invasive species; (2) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner;

(3) monitor invasive species populations accurately and reliably; (4) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (5) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (6) promote public education on invasive species and the means to address them." Executive Order 13112 defines "invasive species" as "an alien species [a species that is not native with respect to a particular ecosystem] whose introduction does or is likely to cause economic or environmental harm or harm to human health."

Presidential Executive Order 13751 on Invasive Species (December 5, 2016). This order amends Executive Order 13112 and directs actions to continue coordinated Federal prevention and control efforts related to invasive species. This order maintains the National Invasive Species Council (Council) and the Invasive Species Advisory Committee; expands the membership of the Council; clarifies the operations of the Council; incorporates considerations of human and environmental health, climate change, technological innovation, and other emerging priorities into Federal efforts to address invasive species; and strengthens coordinated, cost-efficient Federal action.

National Historic Preservation Act of 1966 (NHPA), as amended (U.S.C. 470 et seq.). The primary Federal law governing the preservation of cultural and historic resources in the United States. Section 106 of the NHPA requires that Federal agencies consider the effects of their undertakings (including funding, licensing, or permitting the undertakings of other entities) on historic properties and stipulates that affected American Indian tribes and Native Hawaiian organizations must be consulted.

1.1.2 State

Hawai'i Environmental Policy Act (Hawai'i Revised Statutes [HRS] Chapter 343). HRS Chapter 343 was passed to "integrate the review of environmental concerns with existing planning processes of the State and Counties and alert decision makers to significant environmental effects, which may result from the implementation of certain actions" (HRS Section 343-1). Nine triggers are defined for when a proposing or approving agency must prepare an EA. This EA was prepared in compliance with HRS Chapter 343.

Hawai'i Revised Statues Chapter 195D. The purpose of HRS Chapter 195D is "to insure the continued perpetuation of indigenous aquatic life, wildlife, and land plants, and their habitats for human enjoyment, for scientific purposes, and as members of ecosystems." A list of Endangered and Threatened species is defined under the Hawai'i Administrative Rules, including several of Kaua'i's forest birds described in this EA. HRS Chapter 195D-5 explains that all state agencies would carry out conservation programs that further the protection of such species.

In 2017, the Hawai'i Invasive Species Council (HISC) passed Resolution 17-2 "Supporting Evaluation and Implementation of Technologies for Landscape-scale Control of Mosquitoes, With a Focus on Mitigating Both Human and Wildlife Health Risks" https://dlnr.hawaii.gov/hisc/files/2013/02/HISC-Reso-17-2-Mosquitoes.pdf

1.2 Purpose and Need of the Environmental Assessment

The purpose of the proposed action is to prevent extinction of Hawaiian forest birds on Kauaʻi by reducing avian disease caused by non-native southern house mosquitos (avian malaria). To achieve his, the abundance of non-native southern house mosquito populations must be substantially suppressed in threatened and endangered forest bird habitat on the island of Kauaʻi. The need for Southern House Mosquito suppression is evidenced by Hawaiian forest bird recovery plans and documented by research showing that the ʻakekeʻe and ʻakikiki would be driven to extinction within the next decade unless immediate action is taken (USFWS 2006, USFWS 2021, Paxton et al. 2022). Southern house mosquito populations and avian malaria have recently expanded into higher elevation habitat, which is the last refugia for these endangered avian species. This expansion of non-native mosquitoes and the diseases they carry and transmit, is contributing to the rapid decline of endangered species and their inability to recover. Immediate management actions are needed to prevent the extinction of listed Hawaiian forest birds on Kauaʻi.

The proposed action will be implemented by the State and its contractors. The USFWS will provide technical assistance during implementation and, in accordance with applicable law, process applications for funding proposed action implementation. Potential funding sources for the proposed action may include, but are not limited to, Recovery Challenge grants, Section 6 funds, State Wildlife Grants, Bipartisan Infrastructure Law, Inflation Reduction Act fund, Stewardship grants, Migratory Bird Conservation Act grants, America the Beautiful Challenge grants, funds awarded via the Pacific Island Fish and Wildlife Office or the Science Applications Program, and other similar funding programs.

1.3 Project Location and Description

The project area is comprised of 59,204 acres (23,959 hectares) of Kauaʻi (Figure 1). This area encompasses the Kōkeʻe State Park, Hono o Nā Pali Natural Area Reserve, Kuʻia Natural Area Reserve, Nā Pali Coast State Wilderness Park, Nā Pali-Kona Forest Reserve, the Alakaʻi Wilderness Preserve, and private lands (Table 1, Figure 2). The Kōkeʻe State Park, Nā Pali-Kona Forest Reserve, and the Alakaʻi Wilderness Preserve overlap with extant native forest bird habitat, including critical habitat for ʻakekeʻe and ʻakikiki on the island of Kauaʻi (Paxton et al. 2016; species accounts provided below). The project area was developed collaboratively between USFWS, University of Hawaiʻi-Pacific Cooperative Studies Unit-Kauaʻi Forest Bird Recovery Project (KFBRP) and the DLNR. The project area includes a buffer zone to account for mosquito dispersal and incorporates lower elevation areas outside the current range of forest birds to target mosquitoes that may emigrate from these lower elevation areas into this forest bird habitat.

1.4 Resource Issues to be Analyzed

The resources considered in this EA are threatened and endangered species, wildlife, vegetation and cultural resources, public health and safety, recreation and wilderness air quality, greenhouse gas emissions and climate change, and environmental justice. These resources were selected

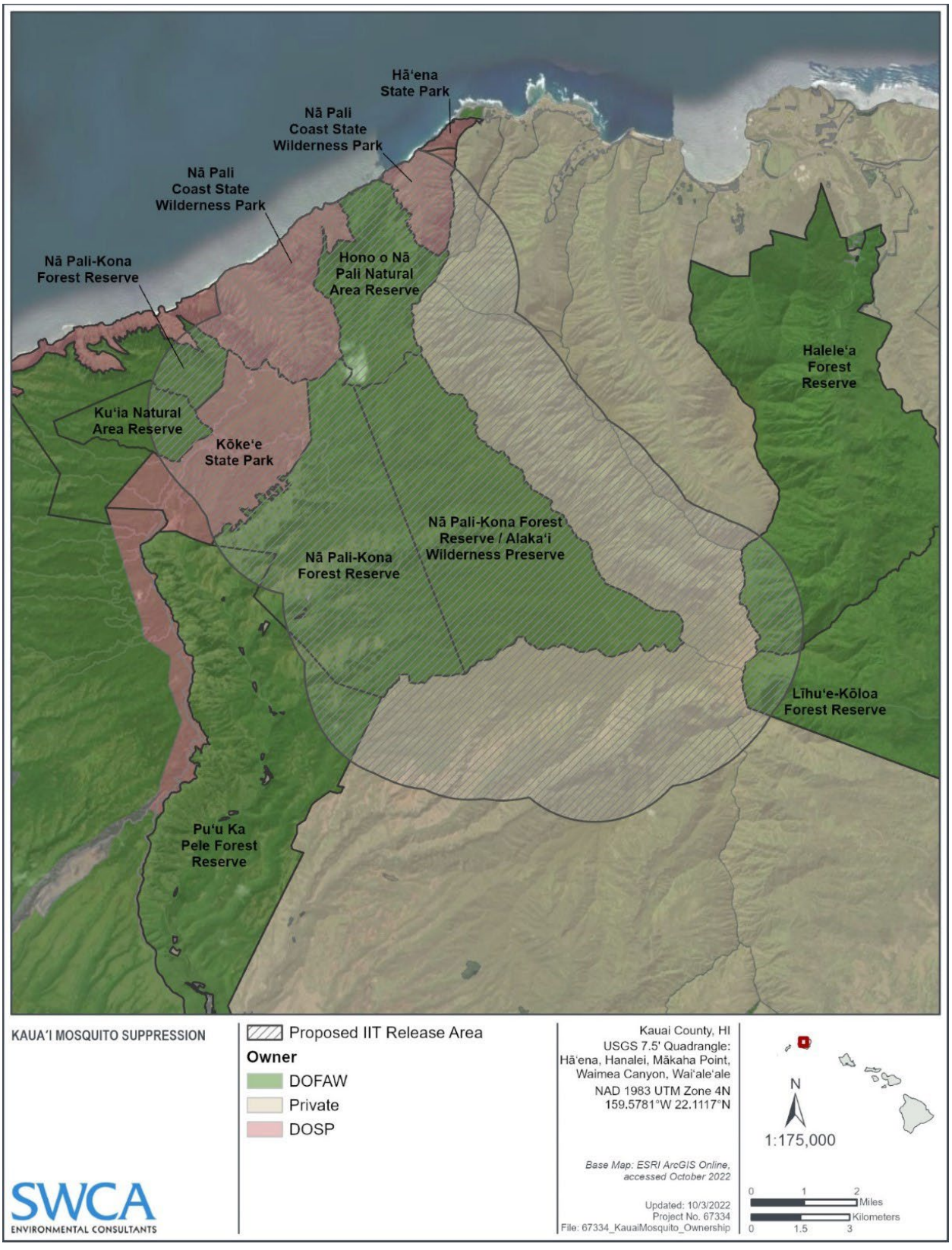

Figure 2. Land ownership in the project area.

based on their potential to be impacted by the proposed action or no-action alternative. Consistent with NEPA and HRS Chapter 343, potential direct, indirect, and cumulative impacts to these resources are described for the proposed action and no-action alternative. Resources considered but excluded from further consideration are presented in Appendix A.

2 PROJECT BACKGROUND

The following section provides background information on Kaua‘i forest birds and their cultural importance along with mosquito ecology and avian diseases.

2.1 Kaua‘i Forest Birds

The Hawaiian archipelago is the most isolated landmass on Earth. This isolation, combined with the geographical diversity and enormous range of ecosystems, resulted in the wide-scale evolution of genera and species of plants and animals that are found nowhere else (known as endemic) (Ziegler 2002). One of the most spectacular examples of the evolutionary process of adaptive radiation (related species that evolve to fill separate ecological niches) in Hawai‘i is that of the Hawaiian honeycreepers, an endemic lineage of forest birds. Honeycreepers constitute approximately 56 species evolved from a single species of rosefinch that reached either Ni‘ihau or Kaua‘i approximately 5.7 million years ago (Lerner et al. 2011), a relatively short span of time in evolutionary terms. The striking diversity of feeding preferences and bill morphology within Hawaiian honeycreepers is thought to have evolved in response to the array of ecosystems present within the archipelago. As a result, each honeycreeper species specializes in feeding on either nectar, fruits, seeds, snails, or insects, while other species have generalist diets that incorporate a range of food sources (Pratt 2005).

Like many isolated island archipelagos, the pre-human biota of Hawai‘i evolved in the absence of terrestrial mammals and numerous lineages of plants, insects, and diseases that are present on continental landmasses. As such, much of the native flora and fauna of Hawai‘i was poorly adapted for the habitat alterations and rapid and mass introduction of alien species that followed the arrival of humans to the archipelago, particularly the Europeans. Wide-scale extinction and declines of Hawaiian honeycreepers is the result of the combined impact of the loss of lowland forest habitat; the introduction of avian malaria- and avian pox-carrying mosquitoes, particularly the southern house mosquito; the invasion of predators such as ship rats (*Rattus rattus*) and feral cats (*Felis catus*); competition from introduced birds; and the ongoing spread of invasive plants and feral ungulates (e.g., feral pigs [*Sus scrofa*]) (Pratt 2005). Today, only 17 of the original estimated 56 honeycreeper species persist (39 species are extinct). Of these 17, the USFWS lists 10 as endangered and one as threatened (Atkinson and LaPointe 2009, USFWS 2022).

On Kaua‘i, six honeycreeper species (the Kaua‘i endemics ‘akeke‘e [*Loxops caeruleirostris*], ‘akikiki [*Oreomystis bairdi*], ‘anianiau [*Magumma parva*], and Kaua‘i ‘amakihi [*Chlorodrepanis stejnegeri*], as well as ‘apapane [*Himatione sanguinea*], and ‘i‘iwi [*Drepanis coccinea*]); one endemic thrush (puaiohi [*Myadestes palmeri*]); and one endemic flycatcher species (Kaua‘i ‘elepaio [*Chasiempis sclateri*]), are restricted to intact areas of native forest in higher elevation areas of the island. ‘Akeke‘e, ‘akikiki and puaiohi are federally endangered, ‘i‘iwi is threatened

(USFSW 2022), and these species as well as the non-listed ʻanianiau and Kauaʻi ʻamakihi are undergoing declines in population size and range owing to the upward elevational range increase of southern house mosquito and the avian diseases they vector (Paxton et al. 2016, 2020).

Current management of montane native forest birds and their habitat on Kauaʻi is primarily carried out by the KFBRP, the Kauaʻi Watershed Alliance (KWA), Kōkeʻe Resource Conservation Program (KRCP), Kauaʻi Invasive Species Committee (KISC) and DOFAW. The KWA is a partnership of 11 government and private organizations, including The Nature Conservancy, Kamehameha Schools, and the National Tropical Botanical Garden. Management activities include the monitoring of native forest bird populations, ungulate control through public hunting, eradication of feral ungulates within fenced management units, invasive plant control, habitat restoration via outplanting, and trapping of invasive rodents and cats. KFBRP carries out species specific management actions for the forest birds such as rodent control, monitoring, and research. DOFAW and KWA members manage ecosystem-level actions such as fencing, ungulate control, outplanting, and invasive plant control.

2.1.1 Cultural Importance of Forest Birds

From a Native Hawaiian worldview, each native forest bird species is unique and precious. Not only do they play an essential role in maintaining the native ecosystem, but they also factor prominently into several aspects of traditional Hawaiian customs, practices, and beliefs. Native forest birds are woven into the creation stories of the islands and appear in numerous traditional songs, sayings, and stories as representations of natural, spiritual, and human phenomena. Native forest birds are regarded as conduits for *akua*, the divine, functioning as the *kinolau*, or physical manifestations of deities. Among some families, they are *ʻaumakua* or family gods (Paxton et al. 2022).

The ethnohistorical literature associated with native birds, *kia manu* (birdcatchers), and the project area is extensive (see Appendix B: Cultural Impact Assessment). Numerous oral traditions describe kia manu who lived and gathered feathers within the project area (Wichman 1998). Traditional place names within and near the project area are additionally rich in references to native birds, indicating the presence of particular bird resources and their significance (Gomes 2016).

Traditional Hawaiian featherwork exemplifies the importance of native forest birds to traditional Hawaiian society. Forest bird feathers were used for creating regal garments and accessories such as *ʻahuʻula* (capes), *mahiole* (helmets), *kāhili* (standards), and *lei hulu* (feather garlands) donned by Hawaiian nobility. Their brilliant feathers linked the chiefly *aliʻi* class with the upland realm of the gods, the *wao akua* (Appendix B). Though feather work practitioners no longer use the feathers of native birds, the knowledge of producing feather creations still exists and is still practiced. Contemporary Hawaiian feather workers use their creations to bring attention and awareness to the plight of native forest birds (see Appendix B).

Although many of Hawaiʻi's native forest birds have gone extinct, one way they remain relevant to contemporary Hawaiian culture is through classic and beloved *mele* (songs that preserve their legacy). The mele *Manu ʻŌʻō* is one example. The ʻōʻō bird has long been presumed extinct but the memory of the bird lives on with this song, which has become a Hawaiian music and hula classic (Appendix B).

As evidenced in Hawaiian language newspaper articles of the nineteenth century, Native Hawaiians noticed declining native bird populations and were very concerned for the survival of native bird species. One such writer, Penukahi, anthropomorphized native birds by referring to them as, "the natives of the uplands" and relating that they were childhood playmates (T.N. Penukahi *Ke Au Okoa* June 29, 1871). Translation assumed to be Mary Kawena Pukui, Hawaiian Ethnological Notes Newspapers). The interviewees of the current project's Cultural Impact Assessment (CIA) speak about native forest birds in a similar manner, regarding them as equal members of our island communities, deserving of every right to live as humans do.

2.2 Mosquito Ecology

Mosquitoes are a group of 3,600 species of small flies (Order Diptera) in the family Culicidae that collectively play important ecological roles as pollinators, food sources for vertebrate and invertebrate predators, and as vectors for human and wildlife diseases (Becker et al. 2020). Species within this family are either native or have been accidentally introduced to every major landmass except Antarctica (Mullen and Durden 2009). While it is believed that several thousand mosquito species feed on the blood of animals, only a small proportion of mosquito species are known to act as vectors of human and wildlife diseases (Mullen and Durden 2009). For example, only 12 of the 200 species of mosquitoes known to occur within the continental U.S. and its territories are disease vectors (CDC 2022a). Of these biting species, only females possess proboscises that allow them to blood feed. By contrast, male's proboscises are adapted to primarily feed on plant nectar and secretions, and do not feed on blood (Mullen and Durden 2009). Therefore, male mosquitoes cannot transmit disease.

Six biting species of mosquitoes have been accidentally introduced to Hawai'i by humans, beginning with the southern house mosquito to Lahaina on Maui in 1826 (Dine 1904). The southern house mosquito and the floodwater mosquito (*Aedes vexans nocturnus*) are night-biting, while the remaining four species are active during the day: yellow fever mosquito (*Aedes aegypti*), Asian tiger mosquito (*Aedes albopictus*), the bromeliad mosquito (*Wyeomyia mitchellii*), and the Asian bush mosquito (*A. japonicus japonicus*) (Leong and Grace 2009). The target species of this proposed project, the southern house mosquito, is native to West Africa but has been introduced throughout tropical and warm temperate regions of the world by humans (Belkin 1962, Vinogradova 2000). Southern house mosquitoes are typically found within and near human settlements but will naturalize in remote natural areas on tropical and subtropical oceanic island systems such as Hawai'i (Becker 1995, LaPointe et al. 2009). The species has significant global impacts on human and wildlife health owing to its role as the primary vector of lymphatic filariasis, West Nile Virus (*Flavivirus* sp.), avian malaria (*Plasmodium relictum*), and avian pox (*Avipoxvirus* spp.) (LaPointe et al. 2012, Samy et al. 2016).

The southern house mosquito is present on all the main Hawaiian Islands as well as Midway Atoll in the Northwestern Hawaiian Islands. Although the species was detected on Kure Atoll in 2016 following a high wind event, a collaborative control effort by DLNR and Department of Health Vector Control Branch staff resulted in its eradication from the atoll in 2019. On the main Hawaiian Islands, this species occurs from sea level to approximately 4,921 feet (1,500 meters) elevation (LaPointe 2000). Population densities vary across this elevational gradient with high, more stable densities of mosquitoes occurring at lower elevations and lower densities at mid

(approximately 1,968-3,280 feet [600-1,000 meters]) and higher elevations (approximately 4,265-4,921 feet [1,300-1,500 meters]) that are subject to seasonal fluctuations (LaPointe 2000).

In lowland areas of Hawai'i, population densities of southern house mosquito have been shown to expand with increasing land development and associated breeding sites (McClure et al. 2018). Within higher elevation areas that principally contain native forest and shrubland, southern house mosquitoes lay their eggs in feral animal wallows, water-filled cavities in native tree ferns (*Cibotium* spp.) that are created by feral pigs, natural tree holes, and in pools in intermittent streams (Goff and van Riper 1980, Aruch et al. 2007, Reiter and LaPointe 2009, Atkinson et al. 2014). The ability of southern house mosquito to survive within a wide range of habitats across a diversity of altitudinal gradients has resulted in this mosquito species acting as the primary vector for avian malaria and avian pox, which was likely transmitted from infected non-native bird species following the introduction of this mosquito to Hawai'i (Warner 1968).

2.3 Avian Diseases

Forest birds on Kaua'i, the oldest of the main Hawaiian Islands, are particularly vulnerable to the combined effects of climate change, disease, and other invasive species as almost all areas of the island occur below ~5,000 feet (1,500 meters). Historically, mosquito breeding and disease development was rare above ~3,300 feet (1,000 meters) on Kaua'i because upland forests on the island experienced approximately 3˚Celcius (5.4˚ Fahrenheit) cooler temperatures compared to similar elevations on Maui and Hawai'i Island (LaPointe et al. 2010). Recent analysis of long-term survey data for seven of the eight native forest bird species on Kaua'i, however, found that six species had significantly declined in abundance over the past 25 years within the uppermost elevations of their available habitat on Kaua'i (Paxton et al. 2016), concurrent with increases in prevalence of mosquitoes and avian malaria in forest bird habitat (Atkinson et al. 2014). The two rarest of these species, 'akikiki and 'akeke'e, have undergone dramatic declines in recent years and are at risk of imminent extinction (Paxton et al. 2022). Future increases in temperature within forest bird habitat on Kaua'i may also further degrade habitat through the increased upward expansion of invasive plants (e.g., strawberry guava; *Psidium cattleianum*) and invasive animals (e.g., pigs and rats).

Avian malaria and pox have been particularly devastating to Hawaiian honeycreepers as these birds evolved in the absence of these diseases. The results of studies that have experimentally infected honeycreeper species with avian malaria provide the clearest evidence regarding the impacts of these avian diseases. For example, Atkinson et al. (1995) demonstrated that 90% of 'i'iwi exposed to a single infected mosquito bite died, while Atkinson et al. (2000) found that 65% of Hawai'i 'amakihi (*Chlorodrepanis virens*) died following a single mosquito bite. Those Hawaiian honeycreepers with low resistance to both avian malaria and pox, such as 'i'iwi, are now primarily limited to forests above ~3,300 feet (1,000 meters) on Kaua'i, and ~5,000 feet (1,500 meters) elevation on Maui and Hawai'i Island. The cooler temperatures above these elevations act to constrain mosquito breeding and malaria development (Atkinson and LaPointe 2009). The results of modelling studies, however, suggest that these high elevation refugia are at risk from the upslope movement of disease transmitting mosquitoes due to rising mean temperatures resulting from climate change (Atkinson et al. 2014, Benning et al. 2002, Fortini et al. 2015, Liao et al. 2015).

2.4 Management of Mosquitoes Using the *Wolbachia*-based Incompatible Insect Technique

Wolbachia is a genus of bacteria that naturally occurs within the cells of approximately 65% of all insect species (Hilgenboecker et al. 2008). A unique feature of *Wolbachia* is that if individuals of the same insect species that contain different strains of the bacteria mate, or if the female supports no *Wolbachia*, the sperm of the male may be unable to fertilize the egg of the female insect (technically called cytoplasmic incompatibility) (Kozek and Rao 2007).

As discussed in Section 2.2, the southern house mosquito is currently present across Hawai'i and already naturally carries a strain of *Wolbachia*. The strain of the *Wolbachia* bacterium used to generate incompatible male mosquitoes for this project likewise occurs naturally in the Asian tiger mosquito. No new organisms would therefore be introduced to Hawai'i by this project. *Wolbachia* cannot live within vertebrate cells and cannot be transferred to humans even through the bite of a mosquito that carries it (Popovic et al. 2010). Residents of Hawai'i are commonly bitten by the Asian tiger mosquito, which is distributed statewide and has remained one of the most abundant mosquitoes at lower elevations since its establishment in the islands in 1896. Residents of Hawai'i are also commonly bitten by the southern house mosquito, which likewise naturally carries *Wolbachia* and occupies both lower elevation and upper elevation habitats across the state. People in Hawai'i therefore are regularly bitten by mosquitoes containing *Wolbachia*, including the strain that would be used in the proposed action. No adverse effects have ever been reported in humans, nor is there a biological mechanism allowing adverse effects to occur.

There is no indication that mosquitoes released as a part of this project would be any better at transmitting disease to humans or wildlife than those mosquitoes already present on the landscape (Popovici et al. 2010). The southern house mosquito does not transmit any human diseases in Hawai'i. In contrast, the southern house mosquito is already a remarkably efficient vector of the avian malaria parasite, with an estimated 85–97% of southern house mosquitoes being susceptible to infection and transmission (LaPointe et al. 2005). Increasing the vector competence (i.e., the ability to transmit disease) of the southern house mosquito is therefore highly unlikely and ecologically insignificant when compared to the known risk of allowing these mosquitoes to continue to proliferate on the landscape.

The southern house mosquitoes that currently occur in Hawai'i carry a strain of *Wolbachia* referred to as wPip and different populations of the Asian tiger mosquito carry strains called wAlbA and wAlbB. To produce the incompatible male southern house mosquitoes for this project, a laboratory line of Hawai'i mosquitoes was generated with the wAlbB strain of *Wolbachia*. This was accomplished through a multi-step process that involved rearing Hawai'i mosquitoes in the lab and removing the wPip *Wolbachia* from their bodies with common antibiotics. The wAlbB strain of *Wolbachia* was then transferred into the eggs of these *Wolbachia*-free Hawai'i mosquitoes. The resulting mosquitoes are a Hawai'i line of southern house mosquitoes containing wAlbB *Wolbachia*, which are reared for several generations and carefully tested. All this work was done in sterile laboratory conditions.

The success of the suppression program is predicated on releasing only male southern house mosquitoes. As *Wolbachia* is maternally inherited, no local establishment of wAlbB southern

house mosquitoes is likely to occur. Regardless, as no organisms (mosquito or *Wolbachia*) used in this proposed project are novel to Hawaiʻi, local establishment would not constitute introduction of any foreign species.

Wolbachia-induced cytoplasmic incompatibility was first used to control populations of mosquitoes (*Culex pipiens fatigans* now: *C. quinquefasciatus*) in a village in Myanmar (Burma) in the 1960s (Laven 1967). Since this initial research, IIT has been developed and can be applied via the mass rearing and release of males of an insect species that contain a strain of *Wolbachia* that is either not present or is a different strain from those present within wild females. Small-scale field trials have demonstrated that when sufficiently large numbers of laboratory-raised male insects are released, the wild population of the target insect species decline because mating events result in no offspring. The release of *Wolbachia*-infected male mosquitoes has no effect on humans (see Section 4.5) or native wildlife because male mosquitoes are exclusively pollinators and do not bite.

Insectivorous native Hawaiian taxa may opportunistically consume mosquito species (including southern house and Asian tiger mosquitoes). There is no evidence that the *Wolbachia* species consumed would cross the gut barriers and survive in the hemolymph or blood or recombine with *Wolbachia* from other prey consumed. *Wolbachia* cannot live in vertebrates and thus cannot affect the ʻopeʻapeʻa (Popovici et al. 2010). Hawaiʻi's native fauna evolved over millions of years and thus species of native Hawaiian wildlife did not historically rely on mosquitoes as part of their prey base. The suppression of southern house mosquito would not deplete the mosquitos available for prey given the coexistence of *Aedes* mosquitoes.

It is important to note that IIT as a technique does not involve any genetic engineering and therefore does not result in any "genetically modified organisms" (GMOs). No part of the genome of either mosquitoes or the *Wolbachia* bacteria would be modified, and GMOs would not be released on Kauaʻi in any form. According to the U.S. Environmental Protection Agency (EPA), a GMO is "a plant, animal, or microorganism that has had its genetic material (DNA) changed using technology that generally involves the specific modification of DNA, including the transfer of specific DNA from one organism to another"; this process is often referred to as genetic engineering. The EPA does not regulate or recognize IIT as producing genetically engineered products or GMOs.

For discussion of unintended release of incompatible female mosquitoes, horizontal transfer of *Wolbachia*, and horizontal gene transfer, please refer to Appendix A: Issues and Potential Impact Topics.

2.4.1 Incompatible Insect Technique

There is a substantial body of data that demonstrate the the IIT approach is safe, targeted, and results in no adverse effects to humans or the environment (Laven 1967; Moreira et al. 2009; Atyame et al. 2011; Atyame et al. 2015; Kittayapong et al. 2019; Zheng et al. 2019; Crawford et al. 2020; Beebe et al. 2021). The potential benefits of IIT in the management against human diseases and their insect vectors have led to a growing body of research on the utility of *Wolbachia* for population control in mosquito-borne diseases. While this project is the first proposed use of incompatible male mosquitoes with *Wolbachia* for conservation purposes, and

the first time the approach would be used in Hawai'i, it is an established method for controlling insect populations (e.g., Laven 1967; Moreira et al. 2009; Atayme et al. 2015; Kittayapong et al. 2019; Zheng et al. 2019; Crawford et al. 2020; Beebe et al. 2021). Crawford et al. (2020) trialed the use of incompatible yellow fever mosquitoes in a proof-of-concept study in Fresno County, California. They released 14.4 million male mosquitoes within a 724-acre (293-hectare) area. This release resulted in, on average, a 95% reduction in the mosquito population during the peak mosquito breeding season.

Mains et al. (2016) developed multiple *Wolbachia* strains to artificially infect Asian tiger mosquitoes that were released at a field site in Lexington, Kentucky. The researchers monitored mosquito populations before and after the release of *Wolbachia*-infected mosquitoes. The release of these incompatible male mosquitoes resulted in a considerable reduction of mosquito egg hatch rates in treated compared to untreated areas, suggesting that the release of *Wolbachia*-infected mosquitoes was effective at reducing mosquito populations during the experiment. O'Connor et al. (2012) released *Wolbachia*-infected male Polynesian tiger mosquitoes (*Aedes polynesiensis*) on Toamaro Island in French Polynesia and compared results with nearby Horea Island. The release of the incompatible male mosquitoes resulted in a 24% reduction in fertile eggs at the treatment site (Toamaro Island) compared to the non-treatment or control site (Horea Island).

2.5 Potential use of the *Wolbachia*-based Incompatible Insect Technique in Hawai'i

Until now there was no feasible method for controlling southern house mosquitoes at the landscape level within natural areas in Hawai'i. Existing management strategies have been limited to installing fencing that excludes ungulates, particularly feral pigs, that create wallows and hollows in tree fern stems, which are subsequently used by mosquitoes as breeding habitat, and small-scale Bti (*Bacillus thuringiensis israelensis*) broadcast. The use of IIT for the control of mosquitoes within native forest bird habitat as part of the proposed action therefore has the potential to reverse the decades of population declines recorded for the remaining native forest bird species and bolster the available habitat for these species. The successful implementation of this novel technique could potentially reduce the populations of southern house mosquitoes, which transmit mosquito-borne avian diseases in native forest bird species and would represent a paradigm shift for DLNR's management of mosquitoes within forest bird habitats.

IIT is neither novel nor an experiment, but the application of an established method for controlling insect populations. This method has been used for decades to protect human health in at least 17 countries worldwide including, but not limited to, New Caledonia, Fiji, Vanuatu, Australia, French Polynesia, Indonesia, Singapore, Malaysia, Vietnam, Thailand, Sri Lanka, India, China, Brazil, Columbia, Mexico and the United States (Florida, California, Texas, Kentucky, New York and Puerto Rico); it is not being "tested" in Hawai'i. IIT is a highly effective and safe technique with a strong record of peer-reviewed studies and successful applications around the world. What is new about this proposed project, however, is that it has not previously been employed in Hawai'i, nor for the purpose of wildlife conservation. As such, protocols would be developed for its use in Kaua'i's native forest and other local conditions.

The IIT method requires consistent releases of incompatible male mosquitoes to maintain suppression of mosquito populations; this method can be used on a landscape-scale over long periods of time. This repetition is by no means unusual, as it is common for management projects to require repeated actions over long periods to maintain the success and meet the goals of the project. For example, fencing to keep out invasive hoofed mammals (e.g., goats, pigs, and deer) from sensitive habitats requires regular inspection and maintenance, and rat control requires continuous trapping and/or bait applications. Controlling weeds or invasive insects similarly requires repeated visits to affected sites, sometimes for many decades after an infestation is discovered. In general, conservation and resource management in Hawai‘i can be labor intensive, costly, and takes time.

In recognition of the potential of IIT to benefit native forest bird populations, the Birds, Not Mosquitoes Project, a collaboration between state, federal, university, and non-profit partners, was established to evaluate planning and implementation for landscape level control of mosquitoes in Hawai‘i. The specific purpose of the Birds, Not Mosquitoes Project is to coordinate and advance efforts to develop, permit, test, register, and implement a *Wolbachia*-carrying southern house mosquito for population suppression to reduce disease prevalence in native forest birds, as well as to advance the approach such that it can also be used for the benefit of human health in Hawai‘i. Collaborators on the project are listed in Table 2.

Table 2. List of project collaborative government agencies, universities, and non-governmental organizations.

American Bird Conservancy	National Park Service
Coordinating Group on Alien Pest Species	Office of Native Hawaiian Relations
Hawai‘i Department of Agriculture	Pacific Rim Conservation
Hawai‘i Department of Health	The Nature Conservancy
Hawai‘i Department of Land and Natural Resources	U.S. Geological Survey
Island Conservation	University of Hawai‘i
Kaua‘i Forest Bird Recovery Project	University of Kentucky
Maui Forest Bird Recovery Project	U.S. Fish and Wildlife Service
Michigan State University	

The use of IIT for mosquito control has been recommended by both executive and legislative branch leadership across the state.

In 2017, the Hawai‘i Invasive Species Council (HISC) passed Resolution 17-2 “Supporting Evaluation and Implementation of Technologies for Landscape-scale Control of Mosquitoes, With a Focus on Mitigating Both Human and Wildlife Health Risks”
https://dlnr.hawaii.gov/hisc/files/2013/02/HISC-Reso-17-2-Mosquitoes.pdf

In 2019, House Resolution (HR) 297, later Act 106, passed the Hawai‘i State Legislature and directed the “[Department of Agriculture] to review the *Aedes aegypti* mosquito with *Wolbachia* bacteria, including *Aedes aegypti* mosquitoes originating from Hawai‘i stock that could be imported for landscape scale mosquito control, and render a determination to place it on the

appropriate animal import list." The resolution required the DOH, HDOA and DLNR to collaborate on a report to the Legislature with recommendations for appropriate vector control programs. https://www.capitol.hawaii.gov/slh/Years/SLH2019/SLH2019_Act106.pdf

In 2021, House Resolution (HR) 95 subsequently passed the Hawai'i State House urging DLNR, HDOA, DOH and UH to implement a mosquito control program using *Wolbachia* to reduce mosquito population levels throughout the state:
https://www.capitol.hawaii.gov/sessions/session2021/bills/HR95_HD1_.htm

On September 7, 2022, the Kaua'i County Council passed Resolution No. 2022-31 "Resolution Urging Federal, State, and County Elected Officials to Support the Funding and Implementation of the Use of Mosquito Birth Control to Bring Kaua'i's Native Forest Birds Back From Near-Extinction and Towards Abundance."
https://www.kauaigovonline.org/WebLink/DocView.aspx?id=3280034&dbid=0&repo=LF-IMAGING

On May 12, 2023, the Kaua'i County Council passed Resolution 2023-43, "Resolution Urging Federal, State, and County Elected Officials to Support Funding and Implementation of Mosquito Birth Control Measures to Mitigate the Rapid Decline of Native Bird Species."

Funding for the proposed action is expected to be provided by state, Federal, and private organizations including DLNR, American Bird Conservancy, USFWS, National Fish and Wildlife Foundation, and the Hawai'i Invasive Species Council.

2.5.1 Required Permits and Approvals

In June 2022, the State of Hawai'i Board of Agriculture approved the addition of the southern house mosquito to the Chapter 4-71, Hawai'i Administrative Rules (HAR) "Non-Domestic Animal Import Rules" list of restricted animals (Part A) and set permit conditions to allow the importation and field release of male southern house mosquitoes containing incompatible strains of *Wolbachia* bacteria. In October 2022, the Hawai'i Department of Agriculture (HDOA), Plant Quarantine Branch issued a permit to DLNR to allow for the import and release of southern house mosquitoes for mosquito control projects.

The Environmental Protection Agency (EPA) regulates incompatible male mosquitoes as a "biopesticide" product. The EPA defines biopesticides as "naturally occurring substances that control pests (biochemical pesticides), microorganisms that control pests (microbial pesticides), and pesticidal substances produced by plants containing added genetic material (plant-incorporated protectants) or PIPs." Many biopesticides registered by the EPA can be used in and around lands cultivated for certified organic food production if the ingredients also meet U.S. Department of Agriculture standards.

A Federal Insecticide Fungicide Rodenticide Act (FIFRA) Section 18 application was submitted by the HDOA to the EPA, in collaboration with the USFWS and DLNR, to request an emergency exemption from Section 3 pesticide registration, given the imminent extinction risks to threatened and endangered forest bird species. The Section 18 process results in temporary product registration and a label that identifies appropriate product use, application rates, restrictions, safety, and quality control requirements. On April 25, 2023, the EPA approved the Section 18 and issued Specific Emergency Use Directions for use of *Wolbachia pipientis* wAlbB

in *Culex quinquefasciatus* (DQB Strain) (Appendix C: Federal Insecticide, Fungicide, and Rodenticide Act Section 18 Specific Emergency Use Label for Imcompatable Insect Technique Application and U.S. EPA Letter of Authorization). As control projects are initiated for the southern house mosquito, HDOA, DLNR and USFWS would then collect and share post-application monitoring data with the EPA to contribute towards a formal Section 3 pesticide registration package.

3 ALTERNATIVES

This chapter describes the No-action Alternative (Alternative 1) and the Proposed Action (Alternative 2) for reducing mosquito populations and, thus, avian malaria transmission to threatened and endangered forest birds in the Kōkeʻe and Alakaʻi Wilderness areas of Kauaʻi. Avoidance and minimization conservation measures are included in the proposed action. Other potential alternatives were identified during internal and public scoping but were dismissed from detailed analysis in this EA as described in Section 3.3: "Alternatives Considered but Dismissed from Detailed Analysis".

3.1 Alternative 1 (No-Action Alternative)

Under the no-action alternative, releases of incompatible male mosquitoes would not occur. Although ongoing conservation and other management activities would continue in the project area (e.g., fencing, construction of field camps, removal of non-native ungulates and predators, and invasive plant control), native forest birds would continue to be adversely affected by their primary threat, avian malaria, because the mosquitoes that carry this disease would remain uncontrolled and are anticipated to continue to spread into the remaining forest bird habitat. Under the no-action alternative, the ʻakikiki is predicted to go extinct by 2025 and the ʻakekeʻe by 2034 (Paxton et al. 2022). The ʻakikiki and ʻakekeʻe have experienced 11% and 15% yearly declines, respectively, since the 1980sand currently have very limited ranges, and therefore could be extinct sooner than projected (Paxton et al. 2020; Paxton et al. 2022).

3.2 Alternative 2 (Proposed Action)

DLNR and the other partners are proposing the sequential and continued release of lab-raised male southern house mosquitoes that carry a strain of *Wolbachia* that is incompatible with those strains that are present within the wild mosquito population. It is important to note that male mosquitoes do not bite humans or animals. The southern house mosquito is typically most active at dusk through to the middle of the night (Subra 1981). The mosquitoes would be released from the ground and air within 59,204 acres (23,959 hectares) on Kauaʻi (Project Area; Figure 1). The section below describes the proposed action with sufficient detail necessary to analyze the impacts that may occur from the action.

3.2.1 Goals and Objectives of the Project

The overarching goals of the project are to:

- Suppress breeding of southern house mosquitoes within the project area.

- Reduce the populations of southern house mosquitoes to prevent the extinction of some native forest bird species within the project area, and to promote the recovery and health of native forest bird species within the project area.

The objectives of the project are to:

- Implement releases of incompatible male mosquitoes within the project area.
- Conduct pre- and post-release monitoring to assess changes in southern house mosquito populations and integrate data to inform project planning and future releases.
- If applications of incompatible male mosquitoes are determined to be effective in suppressing southern house mosquito populations, integrate releases of incompatible males into long-term management of the project area, using adaptive management to maintain or adjust efficiency and efficacy.

3.2.2 Environmental Compliance

The project would comply with all applicable Federal laws, regulations, Executive Orders, state statutes, and administrative rules, such as those pertaining to management of Forest Reserves, Natural Area Reserves, the Alaka‘i Wilderness Area, State Parks, and threatened and endangered species. Additional Federal and state permits and processes that would be required for the proposed action are listed in Table 3.

Table 3. Required Relevant Permits and Approvals

Permit or Approval	Responsible Agency
Section 7, Endangered Species Act	USFWS
Section 106, HRS 6E, Historic Preservation	USFWS and DLNR-SHPD
Import Permit	HDOA
Section 18 Approval/Section 3 Registration	EPA
DLNR-Division of State Parks Special Use Permit	DLNR-DSP
HEPA and NEPA	USFWS and DLNR

3.2.3 Mosquito Procurement

Incompatible male mosquitoes would initially be raised in the continental U.S. and then transported to Hawai‘i, with shipping frequency depending on the project release schedule. To ensure that Hawai‘i’s mosquito genetics are >99% contained within an incompatible male mosquito, only males that have been backcrossed over at least seven generations with a population of mosquitoes originating from Hawai‘i stock would be used for this project. Southern house mosquitoes originating from Hawai‘i have been collected and provided to partners on the continental U.S. to establish incompatible lines for use in Hawai‘i. In October 2022, DLNR was granted a permit by the Hawai‘i Department of Agriculture, Plant Quarantine

Branch to import incompatible male southern house mosquitoes, and DLNR must adhere with all relevant import permit conditions, as well as State of Hawaiʻi administrative rules and statutes relating to restricted animals and microorganisms. Approval for DLNR to import and complete direct releases of incompatible male mosquitoes into the environment has been approved by the State of Hawaiʻi Board of Agriculture (June 2022). DLNR is also exploring future options for establishing a state-run incompatible mosquito-rearing facility in Hawaiʻi. Should DLNR pursue this option, the appropriate regulatory permits and documentation (environmental reviews and facility compliance) would be necessary.

3.2.4 Release Area Prioritization

No new roads, trails, or helicopter landing zones (LZs) would be created to support this project; only existing facilities and access points would be used. Release areas would be prioritized based on ease of access, availability of support resources, presence of southern house mosquitoes, and proximity to core endangered forest bird populations. Project management units would be demarcated by access roads and trails, and vegetation types. In terms of ease of access, some higher priority areas would include accessible fence lines, roads, trails (Figure 3), and field camps used for other resource management activities (described below in Section 3.2.4.1). Field camps accessible by road may be of higher priority than those accessible by helicopter. Available times to occupy camps would be coordinated through the appropriate management agency.

3.2.4.1 FIELD CAMPS

There are several established field camps in the project area that are used regularly by KWA, KFBRP, and DLNR staff to support ongoing forest bird recovery and management activities. These field camps are small, situated on flat sites, and are primarily located within forest habitat. Some of these field camps are accessible by roads and trails, while access to more remote camps requires helicopter transport. Waiʻalae cabin in the Alakaʻi Wilderness Preserve is available for public use and is occasionally used by resource management and research staff. Additional field camps would likely be developed to support the construction of ungulate exclusion fences within Mōhihi Watershed, and for upgrades to fences within the Drinking Glass and Koaiʻe units. Established field camps and these potential additional field camps may be used to support the release of incompatible male mosquitoes into remote areas. No new field camps would be created solely for this project. Waiʻalae cabin may be used occasionally, but no other publicly available cabins or campsites are anticipated to be used.

Available times to occupy field camps would be coordinated through the appropriate management agency. The proposed action would increase the frequency of use of some of these field camps because the camps that support forest bird recovery and management activities are typically used most in the spring and summer seasons, whereas mosquito releases would occur year-round. All foreign material brought into the camps would be removed when exiting the camp.

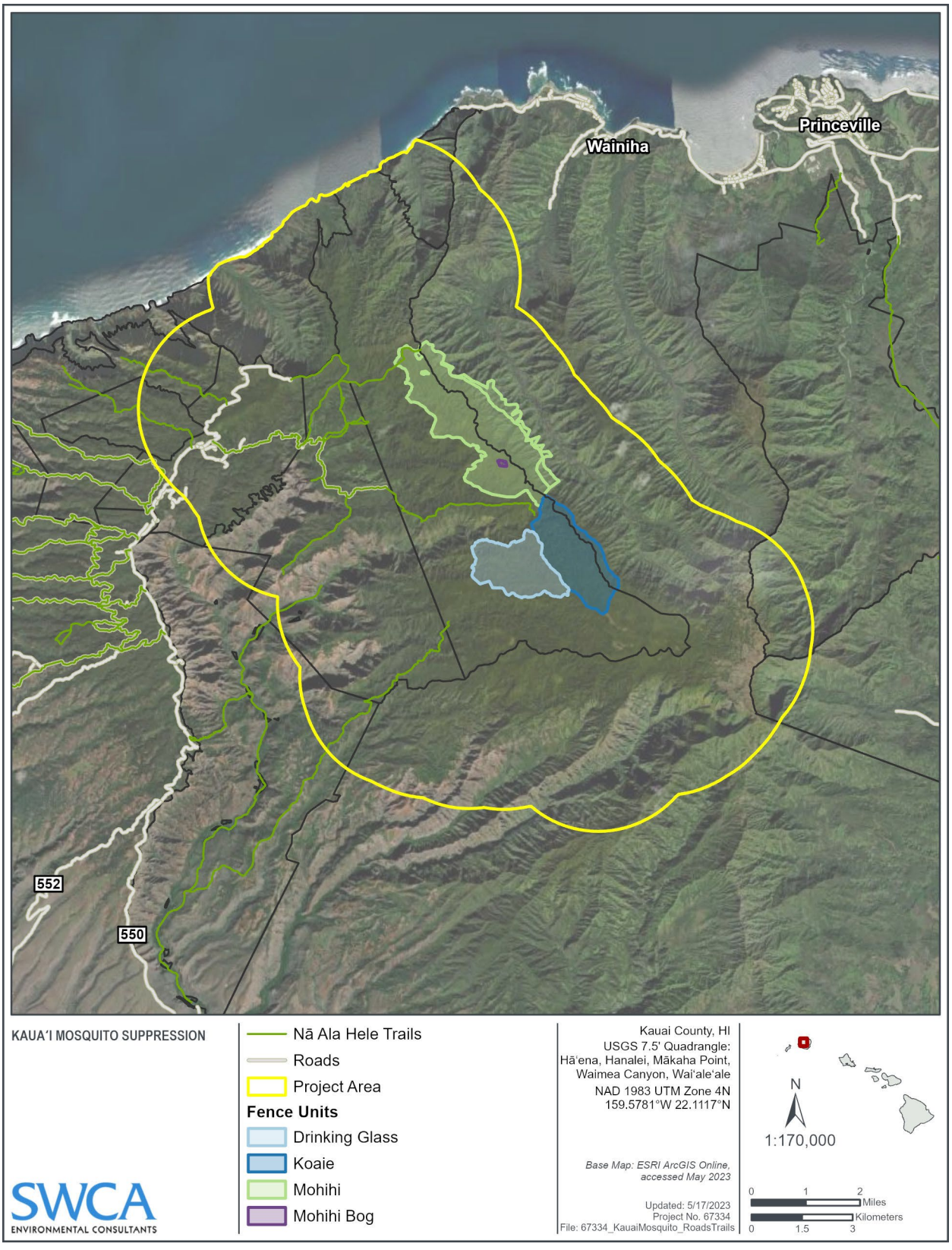

Figure 3. Project area roads and trails.

3.2.5 Frequency, Application Rate, and Timing of Release

The goal of the proposed action is to reduce the distribution and abundance of the mosquito population within the project area to reduce avian disease and contribute to the stabilization and recovery of threatened and endangered avian species on Kaua'i. Many previous successful IIT projects resulted in mosquito population declines of 90% or more (Beebe et al. 2021, Crawford et al. 2020, and Zheng et al. 2019). A similar decline would ensure that there would be very few remaining mosquitoes capable of biting and infecting threatened or endangered forest birds with avian malaria. Population densities of mosquitoes are dependent on precipitation patterns, habitat availability, and temperature. Adults, eggs, and larvae develop faster and in higher densities within warmer low-elevation areas (Ahumada et al. 2004). Estimates range from an abundance of approximately 600 mosquitoes per acre near sea level on Hawai'i Island where monthly temperatures average 70–75° F, to an abundance of five mosquitoes per acre at an elevation of approximately 4,000 feet where temperatures average 55–60° F (Samuel et al. 2011, Atkinson et al. 2014). Estimates assume an equal sex ratio of males to females; therefore, the number of prescribed incompatible male mosquitoes released would be based on approximately one-half of the estimated mosquito population. Incompatible males would need to outcompete wild males; thus, it is desirable to release males in such numbers as to "overflood" the wild males. Statistical models suggest that 10 to 20 incompatible males for every wild male mosquito in the population may be required to achieve population suppression (McClure 2020).

The timing and volume of releases of incompatible male mosquitoes would be determined by mark release recapture research completed in advance of control applications and in compliance with the FIFRA Section 18 Specific Emergency Use Directions (Appendix C). Subsequent release actions and frequency would be based on the results of mosquito population monitoring (described below), including overflooding ratios observed on the landscape as calculated based on pre- and post-release trapping data. Releases may occur weekly to monthly in the project area. Releases may be more frequent initially, with the interval between releases increasing depending on the season and efficacy of applications. The quantity of incompatible mosquitoes released for this project would likely be less than other IIT mosquito projects that have occurred in urban areas throughout the world (involving yellow fever mosquitoes) because the southern house mosquito population density on Kaua'i is believed to be lower than yellow fever mosquito population densities in these urban areas. In addition, the uppermost elevations in the project area may have even fewer mosquitoes than estimated by Samuel et al. (2011) and population suppression in these areas may only require infrequent releases of incompatible mosquitoes. Alternatively, suppression at lower elevations may be sufficient to reduce or eliminate the threat of disease at the higher elevations by eliminating the individuals that could disperse uphill.

3.2.6 Release Methods

Four methods would be used to release the incompatible male mosquitoes within the project area depending on available technology and factors such as weather and staff capacity:

1. Pedestrian release
2. Helicopter aerial release
3. Fixed-wing aircraft aerial release

4. Drone aerial release

It is anticipated that 1,300 feet (400 meters) between release points may be sufficient to achieve mosquito suppression, however, data gathered during initial applications (see Section 3.2.7 below) would be used to inform the release program. These release methods are described in more detail below.

Incompatible male mosquitoes may be released directly or in small biodegradable packages designed to open on contact with the canopy or forest floor. Packages would be composed of weed-free, environmentally friendly material derived from plants. The material used would have been heat treated during the manufacturing process, which reduces the likelihood of introduction of any foreign contaminants or invasive species, similar to other plant-based media products commonly used in forestry/reforestation projects. Although many thousands of release packages would be dropped across the project area throughout the duration of the project, the small packages would be spread diffusely, and the biodegradable material would decompose quickly, and are expected to pose no risk to the environment.

From a visitor experience standpoint, the release packages are unlikely to be observed by members of the public. The appearance of these packages is not yet entirely known and would depend on how they are designed to fall and land (i.e., on the ground or in trees). To fit into a release mechanism employed by a drone, the release packets would likely only be a few inches wide and light in mass. The visibility of the packages to members of the public would depend on two primary factors, 1) public access to the project area, and 2) spacing of releases. Most of the project area is not publicly accessible. Public users are unlikely to encounter release packages because the package is biodegradable and the proposed 1,300 feet (400 meter) spacing between release points would make encountering packages very unlikely. Chances of the public finding the remainder of a release packages before degradation would be equivalent to finding an object only a few inches wide within an area of dense forest approximately the size of 30 football fields. The rate of decay of the packages will dictate how many packages within an area one could observe at any given moment, but this decay rate is likely very high given the typical rainfall patterns in the project area, making the chance of observing multiple packages unlikely.

3.2.6.1 PEDESTRIAN RELEASE

Pedestrian release of incompatible male mosquitoes would occur along existing roads via four-wheel-drive (4WD) vehicles or via pedestrian hiking trails and fence line corridors. The appropriate DLNR permit process would be followed, where necessary. Most trails, access roads, and LZs would not require vegetation maintenance in addition to what is already maintained to support the KFBRP and other ongoing DLNR programs. Vegetation clearing around infrastructure, camps, trails, fence lines, and LZs is a standard management practice approved under DLNR Chapter 343 exemptions filed with the Hawai'i Office of Planning and Sustainable Development[3]. No new roads or trails would be created for this project.

All helicopter operations would be conducted by contracting a private helicopter company and would utilize existing LZs, some of which would require small amounts of vegetation

[3] See: http://oeqc2.doh.hawaii.gov/Agency_Exemption_Lists/State-Department-of-Land-and-Natural-Resources-Exemption-List-2020-03-03.pdf

maintenance of these areas, as for other resource management purposes. Existing remote campsites (described in Section 3.2.4.1) would be utilized for field crews and require routine maintenance or vegetation clearance, as for other resource management purposes.

For each release event, which is anticipated to last one day, efforts would be made to minimize traffic (the number of technicians and vehicles or helicopter flights) required to travel to the release sites and field camps. An established camp would be used if an overnight stay is required.

3.2.6.2 HELICOPTER AERIAL RELEASE AND FIXED-WING AIRCRAFT AERIAL RELEASE

The helicopter aerial release and fixed-wing aircraft aerial release methods are still under development in Hawai'i and elsewhere and have not, to date, been used in practice. The intent of these methods is to provide improved access to remote parts of the project area. The methods deployed would be informed by known similar operations. Although helicopter aerial release has been used to apply highly targeted micro-doses of liquid pesticide for the control of invasive pines, miconia, and little fire ants on the island of Maui; Australian tree fern on Kaua'i; and native seed dispersal for reforestation projects, the release mechanism has yet to be developed for deployment of incompatible male mosquitoes.

Helicopters would be used to aid in the dispersal of incompatible male mosquitoes in inaccessible areas of the project area by flying predetermined transects spaced from 328–1,640 feet (100–500 meters) within the project area with a helicopter fitted with a mosquito release mechanism. The release mechanism would be attached to the aircraft by ground teams at the airport or at a temporary helibase. The helicopter would then fly to the release areas where incompatible male mosquito releases would occur at a minimum of 50 feet (15 meters) above the tree canopy; release would be triggered remotely by either the pilot or a spotter. The helicopter would likely spend 15 seconds or less hovering over each mosquito release location. The helicopter could complete up to three operations per day. It is assumed that repeat visits to any given area would not likely occur more than twice per week, and this schedule would be refined over time based on monitoring of mosquito populations.

For the fixed-wing aircraft aerial release, an airplane carrying a mosquito release mechanism would release mosquitoes from a system compatible with the aircraft. Incompatible male mosquito releases would be informed by mark release recapture data, ongoing monitoring, and aircraft performance and terrain characteristics. The specific release method is still under development.

3.2.6.3 DRONE AERIAL RELEASE

Unmanned Aerial Systems (UAS) or "drones" (the preferred term used in this document) may be used to disperse mosquitoes across the project area via a release mechanism compatible with the craft. Although the specific mosquito release mechanism is still under development, it is expected that it may be available by the time the project is ready for implementation. All Federal Aviation Administration (FAA) regulations and DLNR Best Management Practices for drones would be followed.

Drones would be launched from existing locations such as LZs, campsites, and access points where infrastructure is preexisting and/or where resource management operations already occur. No vegetation clearing would be conducted for drone release, other than routine maintenance of trails, campsites, fence corridors, and trails. Operators of these drones would be positioned in areas where they can safely and effectively operate drones and maintain compliance with FAA regulations. Drones would be flown on a prescribed route, releasing incompatible male mosquitoes at pre-determined release locations. It is estimated that drones would fly approximately 50–100 feet (15–30 meters) above the tree canopy during mosquito releases but no higher than 500 feet (~150 meters) Above Ground Level (AGL).

The drone operator would ensure that the drone and release mechanism are operating correctly and safely during each flight at an estimated speed of 22 mph (following Bouyer et al. 2020) during mosquito releases and 62 miles per hour while in fixed wing mode when ferrying to and from release locations. Proposed release locations would be spaced 1,300 feet apart, so a drone flying at 22 mph would be able to release incompatible mosquitoes at 24 release locations in a 15-minute period. At 62 miles per hour, the ferry times for the various parts of the core area vary widely. For example, a drone would only need to travel for approximately 1.5 minutes to reach some release locations in State Park lands but would need more than 5 minutes to reach more remote natural areas in the project area.

The exact drone model(s) to be used is undetermined and depends on environmental conditions, agency approvals, and other factors. The choice of drone model affects the release rate as different models have varying flight speed capabilities and battery capacities. Available convertible fixed wing/multirotor drone models that could be used for this project can fly approximately 15 minutes in multirotor mode or 90 minutes during fixed wing mode before battery life is expended with a maximum payload (carrying weight). An example of a drone considered for the project includes the *Freefly Alta-X,* which the U.S. Forest Service uses to deploy aerial ignition pods across a landscape to fight wildfires. There is considerable overlap and similarities between other UAS payload operations, like aerial ignition, which would inform UAS mosquito release development.

This project would utilize aircraft with similar capabilities and further develop capacity for the mosquito deployment use-case. For example, the Freefly Alta-X paired with the Drone Amplified IGNIS release mechanism is rated to cover 4,500 acres in 8 hours, dropping one ignition sphere per acre. The drone batteries are continuously charged and replaced to power the aircraft for the duration required. The Alta-X is rated to fly for approximately 30 minutes with a 10-pound payload allowing it to fly back and forth from the staging site to the treatment area as needed to refresh power and complete the dispensing mission. The flight speeds possible during releases of incompatible male mosquitoes depend on drone model used, weather conditions (e.g., wind speed) and optimal speeds for the release mechanism, which are still to be determined. The drones would likely spend 15 seconds or less hovering over each mosquito release location, and it is possible that drones would be able to release the mosquitoes without pausing.

The sound produced by a consumer-grade battery-powered rotary or fixed-wing drone at ground level is similar to loud highway noise (Table 4) (Schaffer et al. 2021). Most consumer-grade drones are far quieter than helicopters with some being up to 40 dBA quieter than a manned helicopter at roughly 328 feet AGL (Airborne Drones 2020). For this project, drones would fly at approximately 50–100 feet above the tree canopy (likely approximately 100–200 feet AGL)

during mosquito releases. When multiple drones are in use, they would likely be releasing in different areas rather than releasing close to each other. Therefore, it is not anticipated that noise impacts would be compounded using multiple drones.

When ferrying to and from release locations, drones would fly no higher than 500 feet AGL. Drone noise levels for various heights above ground are presented in Table 4 and are based on a decrease of 6 dB for every doubling of distance from a sound perceiver. Along the same lines, the noise produced by a drone would likely blend in with the existing ambient noise levels of the project area at a lateral distance of approximately 0.25–0.5 mile depending on the height of flight (Airborne Drones 2020, Schaffer et al. 2021). Notably, the noise levels presented in this section are not actual measured noise levels; actual noise levels during mosquito releases would vary during specific operations depending on altitudes, topography, vegetation, speed, and drone power settings.

Table 4. Drone noise levels in decibals (dBA) at ground level and various Altitudes.

Drone type	Height in Feet Above Ground Level (AGL) from Source			
	25 ft AGL	**100 ft AGL**	**200 ft AGL**	**500 ft AGL**
Consumer Multirotor	~ 68–75 dBA	~ 58–65 dBA	~ 52–59 dBA	~ 44–52 dBA
Small, fixed wing drone	~ 63–70 dBA	~ 53–60 dBA	~ 47–54 dBA	~ 40–47 dBA
Quiet Commercial Multirotor	~ 57–68 dBA	~ 47–58 dBA	~ 41–52 dBA	< 44 dBA

3.2.7 Pre- and Post-Release Monitoring

Pre- and post-release monitoring are important components of the mosquito suppression project because they inform dispersal methods for ensuring the highest success. The cost of production, sorting, quality control and shipping of incompatible male mosquitoes is high. Monitoring to determine the most effective rate of application is critical to both ecological effectiveness and financial sustainability of the control program. Baseline mosquito monitoring has been conducted by U.S. Geological Survey and KFBRP personnel in the project area (Kōke'e State Park, Alaka'i Wilderness Preserve, Hono o Nā Pali Natural Area Reserve and Nā Pali-Kona Forest Reserve) since 2016 per the DLNR Chapter 343 Exemption List (revised November 10, 2020). Pre-release monitoring is currently being undertaken by KFBRP personnel who are using 4–8 Biogents Traps (BGs) and occasionally Biogents Gravid *Aedes* Traps (BG-GATs) at a variety of sites across the project area. Traps are placed along trails and other easily accessible areas and are being monitored nightly for up to a week at each site.

In 2021 and 2022, three sites within the project area were sampled by KFBRP for relative mosquito abundance for 8-10 six-night periods per site. The mosquito abundance data collected are currently being used by USFWS ecologists to develop a Bayesian model to assess the potential spread of incompatible males, spatial coverage of releases, effective overflooding ratios, and overall effectiveness of suppression efforts. Mosquito sampling has and would also be undertaken to conduct stable isotope and genomic studies to determine the migration patterns of mosquitoes across elevational gradients, and genetic screening for the avian malaria parasite, *Plasmodium relictum*. Larval habitat was and continues to be surveyed on dedicated routes for

each visit to each of those sites, and opportunistically as KFBRP staff accessed different areas in the Alaka‘i Plateau for field work.

Ongoing monitoring following the release of incompatible male mosquitoes would likely utilize the same methods and trap types as the pre-release monitoring described above. Dedicated monitoring would be increased from pre-release monitoring levels during the initial trial phase of releases. Prior to and during the second phase of releases, monitoring would increase substantially with 50 traps placed in a control site and 100 traps in a treatment site. In addition to easily accessible areas, some of these traps would be placed in more remote backcountry sites. Each of the 150 total traps would be run one time per week during each week of monitoring.

A monitoring plan will be developed and include measures of success and certain provisions seeking unanticipated outcomes, such as unintended release of females. Monitoring would occur in a control area representative of forest bird habitat and the treatment site. At the conclusion of a given trapping interval (1–4 nights), specimens may be transported to a laboratory for analysis, and traps would either be redeployed or moved to another survey location. Although traps would target male and female southern house mosquitoes, limited bycatch of native and non-native dipterans and other flying arthropods could also occur (bycatch released alive when possible).

While the methods and objectives are similar, post-release monitoring would differ from pre-release monitoring in that mosquito traps would be deployed simultaneously over a larger area, would be serviced with greater frequency, and would be required for as long as control efforts are ongoing. All monitoring data collected would be analyzed to improve project efficiency, serve as quality control for mosquito applications across the landscape, and to evaluate the success of suppression efforts by determining if the overflooding release ratio of wild to released mosquitoes described in Section 3.2.5 was achieved. Future mosquito releases will be based on monitoring results.

3.2.8 Implementation Schedule

After the NEPA and HRS Chapter 343 processes are completed, DOFAW anticipates moving forward with releases using the pedestrian method as quickly as possible. Implementation of the proposed action would be contingent on the availability of funding, resources, and personnel.

3.2.9 Avoidance and Minimization Measures

Table 5 summarizes the measures that would be implemented to avoid and minimize potential impacts on each resource from the project. Table 6 summarizes species-specific measures recommended by USFWS. Please see Appendix D, USFWS Avoidance and Minimization Measures and Biosecurity Protocols. All measures, recommendations, and protocols would be followed and adhered to under the proposed action (e.g., DOFAW 2011b; Loope 2016). Additionally, any activity with a DLNR permit will have all conditions prescribed by the permit followed, including following all rapid ‘ōhi‘a death (ROD) protocols, cleaning all equipment and apparel off-site, avoiding damage to potentially sensitive botanical, wildlife, or archaeological features, and prohibiting littering and open fires.

Table 5. Avoidance and Minimization Measures by Resource

Resource	Avoidance and Minimization Measures
Flora and Fauna (General Botany and Wildlife, includes other non-native and native non--listed species)	Forest bird nesting season (February to June) would be considered for air-based releases and known nests would be avoided by ground personnel and aircraft whenever possible. In some highly sensitive areas, restrictions/limitations may be placed on helicopter use during the forest bird nesting season (February to June); alternative landing zone locations may be used to avoid known nesting sites. The use of ground transportation and aircraft would be minimized to the greatest extent possible to reduce disturbance to native fauna. All FAA rules for drone, helicopter, and fixed-wing aircraft operation would be followed and operators will hold all necessary certificates and licenses. Project personnel would, to the greatest extent possible, avoid the creation of stagnant water habitat. Project personnel would avoid activities that could increase the risk of wildfires and spread of ROD and invasive species. Existing biosecurity SOPs would be followed by trained and experienced project personnel. Drone and helicopter operations will follow best practice protocols established by the National Wildfire Coordinating Group. Following the Land Fire Protection Law, Chapter 185, Hawai'i Revised Statute, DOFAW would cooperate with the Hawai'i Fire Department and take measures to prevent, control, and extinguishment of wildland fires in the case of downed crewed aircraft or drone.
Threatened and Endangered Species	In addition to the general flora and fauna measures outlined above, the following guidelines would also be followed: Follow State of Hawai'i regulations concerning endangered species (Chapter 195D) and reserve lands (Chapter 183), as well as all regulations for state parks and wilderness preserves. Where possible, avoid known locations of Threatened and Endangered species. Communicate the location of threatened and endangered species populations on the margins of trails and landing zones to project personnel. Train personnel in the identification of all threatened and endangered species that are likely to be encountered within the project areas (e.g., avoid crushing rare plants).

Resource	Avoidance and Minimization Measures
	Ensure that all project personnel follow USFWS Avoidance and Minimization Measures when working near threatened and endangered species. Avoid damage to arthropod host plants during the clearance of vegetation along trails and at landing zones. Existing biosecurity SOPs would be followed by trained and experienced project personnel.
Public Health and Safety	Outreach campaigns/press releases, such as the ongoing Birds, Not Mosquitoes campaign, would be developed and supported as needed to address public comments or concerns received on the project. DOFAW would use established methods (e.g., posting flyers at trailheads and other publicly accessible sites within the project area, use of social media) to educate the public about the project and to address associated health and safety concerns.
Recreation	Provide public notice (e.g., signs at trailheads or other publicly accessible sites) of any changes in recreational use or access. The use of ground transportation and aircraft would be minimized to the greatest extent possible to reduce disturbance to recreationists. DOFAW would notify commercial helicopters of program activities (especially aircraft use) and recommended avoidance areas so that the aircrafts do not impact each other.
Cultural Resources (including historic sites)	The use of ground transportation, helicopters, fixed-wing aircraft, and drones would be minimized to the greatest extent possible to reduce noise disturbances to cultural practitioners. DOFAW would continue to provide notice of any changes in use or access to DOFAW-managed areas, including areas frequented by cultural practitioners, through social media announcements or updates on the DOFAW website. DOFAW also maintains a hunter email list that could be used to notify hunters about any changes to access or use of public hunting areas. If changes in public access do arise, DOFAW would consult with the 'Aha Moku representative for the area to ensure that dispersal and monitoring efforts are coordinated with cultural practitioners who may be using those areas to gather forest plants, hunt, or carry out other cultural practices. Due to the nature of the proposed project activities, it is anticipated that no cultural and historic sites will be physically impacted by project activities. Project personnel would avoid impacts to cultural sites by staying on designated roads and trails. Project related activities would

Resource	Avoidance and Minimization Measures
	be limited to existing routes of travel (fence line corridors, trails, and roads), established helicopter landing zones, and field camps already utilized for other resources management activities. No new roads, trails, landing zones, or camps would be created to support this project.

Table 6. USFWS Avoidance and Minimization Measures for Federal and StateThreatened and Endangered Species that are Known to Occur within the Project Area

Species	Threat Status	Avoidance and Minimization Measures
Puaiohi (M*yadestes palmeri*), 'Akikiki (*Oreomystis bairdi*), Akeke'e (*Loxops careuleirostris*)	Endangered (Federal and State)	Project personnel will avoid conducting activities within forest bird habitat that: Promote the spread or survival of invasive species Increase mosquito populations or stagnant water habitat Increase wildfire threat to montane forest habitats
'I'iwi (*Drepanis coccinea*)	Threatened (Federal); Endangered (State)	Remove tree cover during peak breeding season between January 1 and June 30.
Nēnē (Hawaiian goose; *Branta sandvicensis*)	Threatened (Federal); Endangered (State)	Nēnē would not be approached, fed, or disturbed. If nēnē are observed loafing or foraging within the project area during the breeding season (September through April), a biologist familiar with nēnē nesting behavior will survey for nests in and around the project area prior to resumption of any work. Project personnel will cease work and contact the Service if a nest is discovered within a radius of 150 feet of the project, or a previously undiscovered nest is found within 150-feet radius after work begins. In areas where nēnē are known to be present, reduced speed limits would be implemented, and project personnel and contractors would be informed about the potential presence of endangered species on-site.

Species	Threat Status	Avoidance and Minimization Measures
Koloa maoli (Hawaiian duck; *Anas wyvilliana*)	Endangered (Federal and state)	In areas where waterbirds are known to be present, reduced speed limits would be implemented, and project personnel and contractors would be informed about the presence of endangered species on-site. If a nest is observed, a 100-foot buffer would be established and maintained around all active nests and/or broods until the chicks/ducklings have fledged.
ʻAkēʻakē (band-rumped storm-petrel; *Hydrobates castro*); ʻuaʻu (Hawaiian petrel; *Pterodroma sandwichensis*)	Endangered (Federal and State)	DLNR would undertake all aircraft flights during daylight hours, thereby avoiding interactions with night-flying seabirds. Project personnel will fully shield all outdoor lights at campsites so the bulb can only be seen from below.
ʻAʻo (Newell's shearwater; *Puffinus auricularis newelli*)	Threatened (Federal and State)	
ʻŌpeʻapeʻa (Hawaiian hoary bat; *Lasiurus cinereus semotus*)	Endangered (Federal and State)	Project personnel would not disturb, remove, or trim woody plants greater than 15 feet tall during the bat birthing and pup rearing season (June 1 through September 15). DLNR would undertake all aircraft flights during daylight hours, thereby avoiding interactions with night-flying ʻōpeʻapeʻa. Hovering in one place during drone operations would be minimized to limit the risk of disturbing day roosting ʻōpeʻapeʻa Where possible, helicopters would avoid rotor wash of the forest canopy.
Newcomb's snail (*Erinna newcombi*) (aquatic invertebrate)	Threatened (Federal and State)	Pedestrian activities would be limited to established trails and stream crossings in and around any aquatic environments.
Hawaiian picture-wing fly (*Drosophila musaphilia*)	Endangered (Federal and State)	Project personnel will avoid clearing forest vegetation within 200 feet of a site potentially occupied by endangered *Drosophila*

3.3 Alternatives Considered but Dismissed from Detailed Analysis

3.3.1 Application of conventional pesticides/adulticides

Of the six conventional pesticide spray formulations currently registered in Hawai‘i and labeled for control of mosquitoes in non-agricultural areas, none are labeled for use against mosquitoes in conservation areas, forests, bogs or waterways. More notably, the use of conventional pesticide products containing active ingredients that kill arthropods are unacceptable for use in natural areas due to the presence of native insect species. There are over 1,400 described arthropod species that are endemic to the island of Kaua‘i. The natural areas that serve as the last refuges for native forest birds also support a diversity of the remaining endemic arthropods, including federally listed endangered and threatened species. For example, *Drosophila musaphilia* is endemic to Kaua‘i and its known range and critical habitat is in Kōke‘e within the proposed application area. Furthermore, the repeated application of pesticides within the proposed project area could potentially contaminate soil and water due to pesticide runoff or drift, as well as the potential development of pesticide resistance within target and non-target insects.

3.3.2 Application of conventional larvicides

Similar to conventional spray formulations, conventional larvicides containing active ingredients with modes of action known to broadly impact arthropods; these are also unacceptable for application in natural areas. Rare native arthropod species occur within the proposed application area, and larvicides could threaten species outside of the project area if run-off or pesticide drift occurs. The remote high elevation habitat in which endangered forest birds persist is additionally inaccessible and challenging to traverse, therefore surveying for cryptic larval habitat and applying larvicides to achieve comprehensive control is logistically unfeasible. Even if pursued, this method is also unlikely to be successful given that the proposed project area receives extensive rainfall, which would dilute and disperse chemicals outside of intended target areas.

3.3.3 Application of bacterial larvicides

There are at least 11 products registered in Hawai‘i and labeled for control of mosquitoes in the larval stage that use the bacteria *Bacillus thuringiensis israelensis* (Bti) as the active ingredient. While many of these products can be used in natural areas, including bogs and waterways, there are significant constraints on locating larval habitat and applying the larvicide in remote, inaccessible areas. Bti is not effective in controlling late instar mosquito larvae, which could still emerge as adult mosquitoes. This approach is also quickly rendered ineffectual in high rainfall environments where Bti is likely to be quickly diluted after application.

3.3.4 Cultural controls

Management in natural areas can help to decrease the presence of larval habitat, but it cannot completely eliminate it. To prevent the degradation of native forests and the creation of larval habitat by introduced hoofed animals, activities such as fencing and ungulate control are

essential. These measures, however, do not address the breeding of larvae in areas with natural standing water, such as tree cavities, bogs, and streamside pools.

There are also actions that can be taken to reduce the availability of larval habitat created by humans. These actions include filling potholes on roads and removing man-made materials that may hold water. Regardless, these measures are not effective in achieving area-wide control of mosquitoes.

3.3.5 Biological control

Biological control of mosquitoes has been undertaken using *Toxorhynchites* mosquitoes, which are natural predators of mosquito larvae in aquatic habitat (Steffan 1968). While they are generalist predators, *Toxorhynchites* have been documented to prefer mosquito larvae. Two *Toxorhynchites* species (*T. brevipalpis* and *T. amboinensis*) were released to control mosquitoes and have established self-sustaining populations in Hawai'i (in 1950 and 1953, respectively) (Steffan 1968). While the two species may contribute to localized control, they appear incapable of providing effective area-wide suppression of southern house mosquito populations (Nakagawa 1963).

3.3.6 Application of males sterilized by irradiation

The application of incompatible males for fruit fly control and eradication programs has been highly successful worldwide. The process of releasing male mosquitoes sterilized by irradiation would be logistically similar to the application of incompatible male southern house mosquitoes (*Culex quinquefasciatus*). Previous studies, however, indicate that irradiation levels required to sterilize male mosquitoes reduce their competitiveness in locating and mating with female mosquitoes, when compared to wildtype males (Bellini et al. 2013, Yamada et al. 2014).

3.3.7 Self-limiting genetically modified mosquitoes

Self-limiting, genetically modified (GM) mosquitoes are being used in other places around the world (Florida, California, Brazil, Panama) to achieve mosquito control, with the goal of reducing arboviral disease transmission for public health and safety (Waltz 2016, EPA 2021). The release of GM mosquitoes requires similar logistics to the use of incompatible male mosquitoes or irradiated sterile male mosquitoes. Such technology, however, has not yet been developed for southern house mosquito and concerns have been expressed by communities in Hawai'i relating to the safety of genetically engineered or modified organisms (GMOs), and GM mosquitoes in particular.

3.3.8 Other Mosquito Control Methods

In 2017 a group of biologists, entomologists, biotechnology experts, and public health specialists met over three days to discuss the possible solutions to the problem of mosquito-borne diseases in Hawai'i (https://reviverestore.org/the-plan-to-restore-a-mosquito-free-hawaii/). The group identified the sterile insect technique (SIT; i.e., sterilizing mosquitoes with radiation), IIT using the *Wolbachia* bacteria, and self-limiting insect approaches using next generation gene tools (i.e., "gene drive") as possible options. At the time, SIT research had not yielded promising results for area-wide mosquito control programs. Concerns with gene drive technology, similar to those

identified for self-limiting genetically modified mosquitoes above, were also acknowledged. Furthermore, there was no existing gene drive approach developed for mosquito control nor was there an accompanying regulatory pathway for such a tool to be registered and utilized. *Cordyceps* or other fungus species were not identified as tools for suppressing mosquito populations, and there is no fungus that is effective at suppressing populations of the southern house mosquito. New technology as it becomes available will be explored as potential options in the future.

3.3.9 Reforestation and Habitat Restoration

Reforestation and habitat restoration have occurred in the past and are ongoing actions in and around the project area and are expected to continue. While these efforts contribute significantly to the long-term restoration of suitable habitat throughout endangered forest bird critical habitat on Kaua‘i, these efforts alone will not prevent the extinction of the species.

Loss of suitable habitat has been extensive in the Hawaiian Islands and is a significant threat to forest birds generally. Introduced and established mosquitoes, however, are also a threat because forest birds on Kaua‘i are highly susceptible to mosquito-borne diseases and are not expected to persist in areas where mosquitoes are present. Restoration of suitable habitat through reforestation of areas in which mosquitoes are present is therefore not expected to be an effective alternative strategy to prevent the extinction of forest bird species. Restoration of suitable habitat in higher elevation areas where mosquitoes are expected to become prevalent as global temperatures rise, is an important part of recovery efforts. However, restoration alone does not constitute an effective alternative to mosquito control at this time because, 1) the acreage of potential suitable habitat at those higher elevations is vanishingly small, and 2) restoration of suitable habitat in those areas takes decades and cannot be completed before the projected extinction timeline of the affected species. Lastly, reforestation and habitat restoration would not remove the southern house mosquito from the project area and therefore not abate the spread of avian malaria.

As previously mentioned, the proposed action would be part of a suite of management actions designed, at least in part, for the preservation of native forest birds. The U.S. Fish and Wildlife Service (USFWS) detailed a long-term conservation and recovery plan for several taxa of endangered Hawaiian forest birds, including the remaining populations of ‘akikiki and ‘akeke‘e on Kaua‘i (USFWS 2006). The plan prioritized measures to improve and restore degraded habitat through invasive species control and reforestation. Population viability models, however, predicted time to extinction of both the ‘akikiki and ‘akeke‘e as soon as 2023 (Paxton et al. 2022), which further demonstrates the urgency for implementing mosquito suppression techniques in both current and previously occupied ranges where habitat restoration and invasive species control are ongoing.

3.3.10 Restoration of Natural Water Flow

Although it is true that human infrastructure in streams in Hawai‘i can create additional larval habitat for the southern house mosquito, the abundance of mosquitoes in high elevation habitat on Kaua‘i is not caused by stream diversions or other human-caused water flow disturbances. Mosquitoes breed in various natural water sources including, but not limited to, tree cavities, pig

wallows, natural depressions, and streamside pools. Restoration of natural water flow throughout relevant habitat on Kaua'i would therefore not decrease or eliminate the presences of southern house mosquitoes on the island, nor decrease the spread of avian malaria in forest bird habitat.

3.3.11 Application of Mosquito Fish as a Biological Control

The dispersal of mosquito fish into aquatic habitat can be an effective tool to reduce mosquito populations under certain conditions. Mosquito fish predate the larval stage of mosquitoes and have been used historically in Hawai'i as a part of an integrated pest management strategy for mosquito vector control in urban and suburban areas (Seale 1905). To be effective, the fish must be introduced, or disperse, to available habitat where mosquitoes are breeding. In natural areas, such as those included in the proposed project area, southern house mosquitoes often breed in ephemeral larval habitat (e.g., standing water on roadsides, tree cavities, pig wallows and intermittent streams). The lack of waterway connectivity throughout core forest bird habitat on Kaua'i would limit the mosquito fish's ability to control mosquitoes in all areas where endangered forest birds exist. Locating and distributing mosquito fish to such larval habitat on Kaua'i would not be logistically feasible. Furthermore, mosquito fish are generalist predators and do not target mosquitoes exclusively. As a result, they are documented having significant adverse impacts on native invertebrate fauna. In lowland waterways, mosquito fish consume native arthropods (such as the endangered *Megalagrion* damselflies and anchialine pond shrimps *Vetericaris chaceorum* and *Procaris hawaiana*) and crustaceans causing major declines of native biota in waterways and pools where they are present.

3.3.12 Application of Avian Vaccine for At-risk Forest Birds

At present there is no vaccine available for avian malaria. DLNR and FWS will evaluate all available tools, including the use of a vaccine if one becomes available and would consider the most efficient methods for its deployment. Researchers are investigating the causes of malaria resistance in 'amakihi, and project that is in progress and for which results are not yet available.

4 AFFECTED ENVIRONMENT AND IMPACTS

Following guidelines provided by the Council on Environmental Quality (CEQ), agencies must compare the impacts of the proposed action and alternatives with the existing and expected future conditions of the affected environment in the absence of the action, which is referred to as the no-action alternative. The CEQ guidelines for implementing NEPA state that agencies "may contrast the impacts of the proposed action and alternatives with the current and expected future conditions of the affected environment in the absence of the action, which constitutes consideration of a no-action alternative" (85 FR 43323). The current state of the environment, environmental consequences, and the potential effects of the proposed action and the no-action alternatives on each resource category are outlined in this chapter. Additional issues and impacts that were considered but dismissed from detailed analysis are provided in Appendix A.

The code of Federal Regulations (40 CFR § 1508.1(g) defines effects or impacts as "changes to the human environment from the proposed action or alternatives that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives, including those effects that occur at the same time and place as the proposed action or alternatives and may

include effects that are later in time or farther removed in distance from the proosed action or alternatives." The implementation of NEPA requires an evaluation of direct impacts, indirect impacts, cumulative impacts and ecological impacts as a part of the decision-making process. The description of the affected environment and analysis of impacts follow the CEQ NEPA regulations, as amended in May of 2022 and the DOI NEPA regulations.

Direct impacts are caused by the action and occur at the same time and place. Indirect impacts are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect impacts may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. Cumulative impacts refer to the effects on the environment resulting from the incremental impact of the action when combined with other past, present, and foreseeable future actions, regardless of the agency or person undertaking those actions [40 CFR 1508.1(g)(3)]. Ecological impacts (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes that the effects would be beneficial.

For this analysis, direct, indirect, and cumulative impacts were determined for several resources: threatened and endangered species, wildlife resources, vegetation resources, cultural resources, public health and safety, recreation and wilderness, air quality, greenhouse gas emissions and climate change, and environmental justice. The analysis identified ongoing or foreseeable future projects within the project area and incorporated them into the assessment, as summarized in Appendix E.

4.1 Threatened and Endangered Species

4.1.1 Affected Environment

Species that are listed under the Endangered Species Act (1973) and/or the Hawai'i Revised Statutes (Chapter 195D) are at risk of extinction over some or all their distributional range. In addition, the Migratory Bird Treaty Act (MBTA) prohibits the take of listed migratory bird species without prior authorization from the USFWS. The following section only includes impacts analyses for listed species that have potential to be impacted by the no-action alterative and proposed actions. For brevity, listed species that were considered but are unlikely to be impacted by the no-action alterative and proposed action are not included here. A list of these species is provided in Appendix F.

Based on a search of the USFWS rare plants database, 66 federally endangered and two threatened plant species have been recorded within the project area (Appendix F)[4]. Twenty-three of the endangered species are being actively managed as part of the Plant Extinction Prevention

[4] See Figure 1 for the project area. The area of analysis for the proposed action aligns with this project area except for bird and bat species that range beyond the project area. For these species, the wider island of Kaua'i is the analysis area.

Program (PEPP). The remaining species potentially benefit from landscape-level management actions such as the installation of ungulate-proof fences and invasive species control efforts.

In addition to the three endangered (ʻakekeʻe, ʻakikiki and puaiohi) and one threatened (ʻiʻiwi) native forest bird species that have been previously mentioned, the following endangered fauna (Appendix F) are also recorded within the proposed project area: the two seabirds ʻakēʻakē (*Hydrobates castro*) and ʻuaʻu (*Pterodroma sandwichensis*); koloa maoli *(Anas wyvillania)*; nēnē (*Branta sandvicensis*); ʻōpeʻapeʻa (*Lasiurus cinereus semotus*); one Hawaiian picture wing fly species (*Drosophila Musaphilia*), and the aquatic Newcomb's snail *(Erinna newcombi*) (DLNR 2009a,b, 2011, DLNR 2014, PBR Hawaii 2018). The threatened Newell's shearwater (*Puffinus auricularis newelli*) has additionally been recorded in the project area (DLNR 2011).

Federally designated critical habitat for Newcomb's snail, and lowland wet, lowland mesic, montane mesic, montane wet, wet cliff, and dry cliff forest ecosystems (Appendix F) overlaps the project area. This includes critical habitat for two bird species (ʻakikiki and ʻakekeʻe), one Hawaiian picture wing fly species (*Drosophila musaphilia*), and 117 native vascular plant species (Figures 4 and 5 below).

4.1.2 Potential Impacts from No-Action Alternative

Under the no-action alternative, conditions would remain the same or like those that presently occur within the proposed project area. Current management actions within the project area would continue to be ineffective at controlling southern house mosquitoes and the avian diseases they transmit and carry. In the absence of meaningful interventions, the upslope migration of disease-vectoring southern house mosquito due to climate change is predicted to lead to the gradual loss and eventual elimination of safe habitat for listed forest bird species that are vulnerable to avian malaria and avian pox. Without the direct management of southern house mosquitoes, it is likely that the ʻakekeʻe and ʻakikiki would be driven to extinction within the next decade (Paxton et al. 2022). Populations of the threatened ʻiʻiwi would probably be extirpated on Kauaʻi but would still likely persist in remnant populations on Maui and Hawaiʻi Island at the end of the century (Fortini et al. 2015).

The continued decline of Hawaiian honeycreeper species that serve as pollinators and seed dispersers of threatened and endangered native plants could result in declines for native plant species due to lowered reproduction and seed dispersal. ʻIʻiwi, for example, is potentially the most important extant native bird pollinator as it has the longest bill and is therefore capable of pollinating larger flowered native species (Pender 2013). Numerous plant species (for example, many species of hāhā [*Cyanea* spp.] and ʻōhā wai [*Clermontia* spp.]) are now reliant on this species of bird because of the size of their flowers, which prevent all the remaining native and non-native bird species from effectively pollinating them. In general, however, predicting which species are most threatened from mutualistic breakdowns is complicated by a limited understanding of pollination and seed dispersal networks in Hawaiʻi (Barton et al. 2021).

Ongoing management of the reserves that comprise the proposed project area by DOFAW and its partners, in addition to recreational activity by the general public within the project area, has the potential to unintentionally damage or disturb threatened and endangered plant and animal species. These activities include the construction and maintenance of ungulate exclusion fences, the control of feral ungulates in and outside of these fences, recreational hunting, ongoing

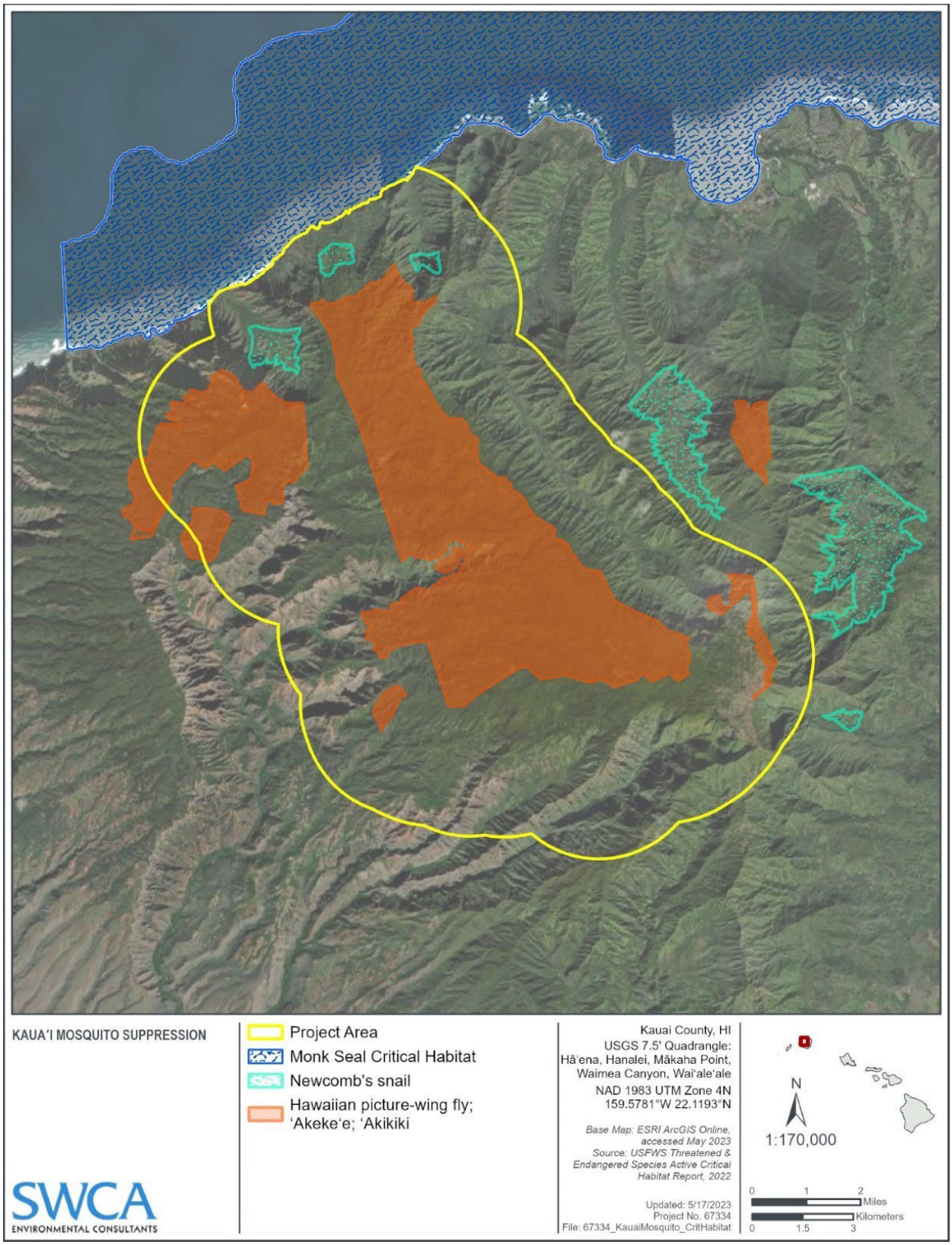

Figure 4. Federally designated critical habitat for fauna in and near the project area.

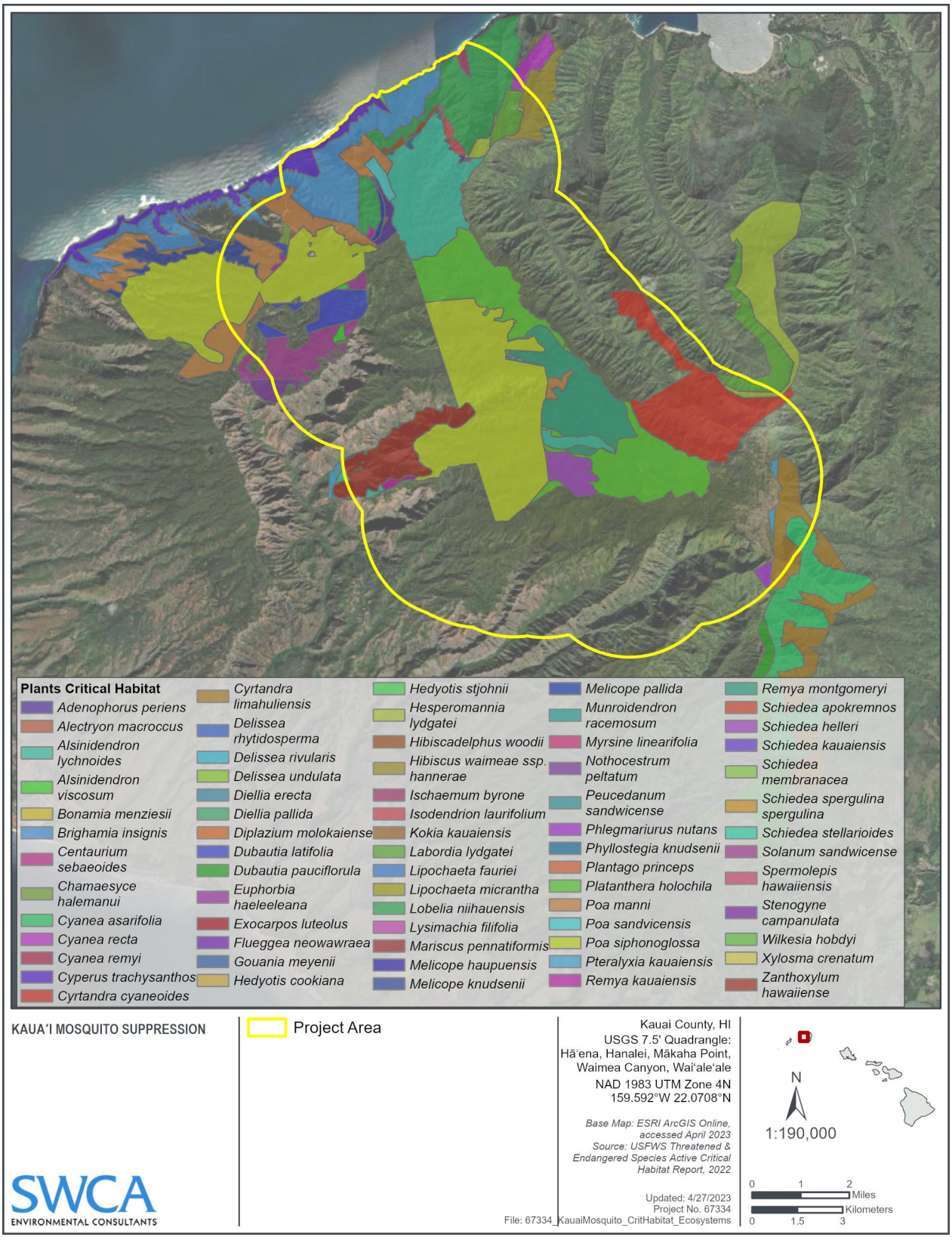

Figure 5. Federally designated critical habitat for plants in and near the project area.

monitoring of populations of threatened and endangered species, invasive plant control, wildfire management, and recreational hiking. Due to the lack of 4WD roads and trails, most of the proposed project area is accessed by DOFAW and its partners by helicopters that land at designated landing zones. Some of these landing zones also have campsites or permanent shelters and toilets (DLNR 2011). The use of helicopters has the potential to disturb wildlife through noise and damage native plants through rotor wash, including those that are threatened and endangered. All land management agencies that work within the reserves that comprise the proposed project area follow existing state and Federal biosecurity SOPs (Appendix D) to ensure that management activities limit the spread of invasive species to, within, and among the reserves (DOFAW 2011b).

4.1.3 Potential Impacts from Proposed Action

The impacts of the proposed action would be the same as those outlined in section 4.1.2 for the no-action alternative with the addition of the effects and impacts of reducing populations of southern house mosquito through the release of incompatible male mosquitoes within the proposed project area. The impacts of the proposed action are summarized below.

The control of southern house mosquito within the project area are expected to reduce populations of this non-native mosquito species and lower the incidence of avian malaria and avian pox transmission to listed Hawaiian birds, including the two endangered (‘akeke‘e and ‘akikiki) and one threatened (‘i‘iwi) Hawaiian honeycreeper species that occur within the proposed project area. Successful mosquito control through released incompatible mosquitoes has been successfully implemented in 15 countries throughout the world to control mosquitoes that carry human diseases, including five locations in the United States (O’Conner et al. 2012, Hoffmann et al 2014, Mains et al 2016, Schmidt et al. 2017, Crawford et al. 2020).

If all other limiting factors are simultaneously managed (e.g., competition with non-native bird species, genetic impacts associated with small population sizes, mammalian predation, and habitat degradation from feral ungulates) (Freed et al. 2008, Camp et al. 2010, Mounce et al. 2015, Banko et al. 2019), the release of incompatible male mosquitoes and the resulting population reductions of disease-vectoring southern house mosquitoes could potentially stabilize populations of ‘akeke‘e,‘akikiki, and other honeycreepers and avian species of concern over sustained periods of time. This could prevent the global extinction of these species and allow their populations to expand within suitable habitat on Kaua‘i. Likewise, sustaining viable habitat where mosquitoes are suppressed for Kaua‘i honeycreepers would allow populations of these species to expand and, with available habitat on Maui and Hawai‘i Island, would ensure that these species maintain evolutionally and ecologically viable populations over the coming decades if all other limiting factors are also managed.

Tangible reductions in southern house mosquito and the incidence of avian malaria/avian pox, would have positive impacts including increased listed as well as native bird populations and thereby partial restoration of mutualisms (pollination and seed dispersal) for threatened and endangered plant species that are reliant on bird pollination and seed dispersal. The i‘iwi, for example, are potentially the most important extant native bird pollinator for large-flowered plant species. Increases in populations of this species may benefit the reproduction of listed bird pollinated plant species. An increase in pollination and seed dispersal of listed and other native

plant species could potentially increase populations of these plant species if pollination and seed production are currently limited by the loss or drastic decline of avian mutualists.

Avian malaria is occasionally recorded in seabirds on Kauaʻi and has been implicated in the death of at least one threatened Newell's shearwater (Molly Bache, Save Our Shearwaters, 2022 pers. comm.). Although avian malaria appears to be rare in seabirds on Kauaʻi (André Raine, Archipelago Conservation and Research, 2022 pers. comm.), the control of southern house mosquitoes within the project area may reduce the limited cases of this disease that are recorded in the three threatened and endangered seabird species that occur within the project area.

Listed seabirds are active during the dusk to dawn hours (nighttime) when they may be in flight or outside of their burrows. The sounds and visual effects of the delivery methods that are proposed to occur durring the daylight after dawn and before dusk are not expected to impact seabirds in their burrows.

Reductions in southern house mosquito populations within the proposed project area are unlikely to tangibly impact foraging resources for ʻōpeʻapeʻa. This bat species has a generalist diet comprised of a diverse range of insect orders, principally feeding on larger insects such as beetles and moths, rather than tiny mosquitoes (Pinzari et al. 2019) because the bat did not evolve in an ecosystem that included mosquitoes as an available food resource.

The impacts of vegetation disturbance on endangered Hawaiian picture wing fly species are likely negligible. *Drosophila musaphilia* feeds on fungi and bacteria on decomposing plant material that is more likely to be on the forest floor and *D. musaphilia* breeds in the sap fluxes from koa trees. As koa is common within the landscape, any trimming or damage of koa is unlikely to impact this picture wing fly species (USFWS 2012).

The impacts of the control of southern house mosquitos on the population dynamics of other non-native mosquitoes within and near the project area are unknown. There is very little existing research concerning the population dynamics of non-target mosquito species following the control or eradication of one or more mosquito species within an area. Any increase in the populations of non-target mosquito species in the project area resulting from the control of southern house mosquito would likely be due to increases of available habitat and resources for the non-target species. However, it is probable that the mosquito species, and particularly the females of the species present within the project area, are more likely limited by lack of blood hosts than by available habitat. Lafferty et al. (2018) found that Asian tiger mosquito went extinct on Palmyra Atoll following the eradication of black rats (*Rattus rattus*) while the ornithophilic (i.e., preferring birds) southern house mosquito persisted, suggesting that black rats were sustaining the persistence of the Asian tiger mosquitoes.

4.1.3.1 PEDESTRIAN RELEASE AND MONITORING

The pedestrian release of incompatible male mosquitoes and subsequent monitoring of the mosquito population may impact listed species from the following activities:

- The trampling and disturbance of listed native plants and invertebrates, and the disturbance of native forest birds within transport corridors such as roads, trails or fence-lines, or at discrete sites such as campsites, long-term monitoring sites, and LZs due to vehicle or personnel movement

- Secondary impacts from the dispersal and establishment of invasive species as a result of proposed project activities

Because of their relative scarcity across the landscape, there is a low risk that listed native insects, snails, or plants would be trampled or damaged by project vehicles or personnel within the project area. All releases of incompatible male mosquitoes and monitoring would be undertaken from existing transport corridors and sites. This increases the chances of avoiding species that are vulnerable to trampling (e.g., native gastropods, non-volant insects, and plants) by limiting activity within established corridors and sites. In addition, as these transport corridors and sites are frequently used by DOFAW and partner staff, the location of populations of listed plants and non-volant fauna species are often known and can be avoided during the project. Any unintentional damage or death of listed species as a result of trampling will be avoided by employing qualified personnel who adhere to SOPs (Tables 5 and 6 and Appendix D) regarding the use of vehicles, trails, and other backcountry infrastructure. If these measures are taken, the impacts of elevated foot and vehicle traffic are expected to be negligible.

Vehicles and personnel within the project area may disturb wildlife during the project, particularly listed forest birds. This may result in brief flight responses but are unlikely to cause lasting impacts to these bird species due to the relative infrequency of the pedestrian field operations. These disturbances will be short duration and are unlikely to result in significant adverse impacts to these birds.

The release and monitoring of incompatible male mosquitoes would temporarily increase human and vehicle traffic within the proposed project area, which can transport invasive microorganisms (e.g., spores and soil containing bacterial cells), plant propagules (seeds and vegetative sections), and eggs or live individuals of animals either into or between sites in the project area. The potential impacts of spreading invasive species to the project area are varied, ranging from nominal effects such as the dispersal of ruderal weeds along the margins of existing trails through to consequential impacts such as the accidental spread of the fungal pathogens that cause rapid ʻōhiʻa death, which could negatively impact listed native plant species in the subcanopy. However, implementation of existing biosecurity SOPs by qualified personnel during project implementation, would be expected to negate the risk of spreading invasive species.

4.1.3.2 HELICOPTER AND FIXED-WING AIRCRAFT AERIAL RELEASE

Helicopters and fixed-wing aircraft are proposed for use to disperse incompatible male mosquitoes throughout parts of the project area that are inaccessible by other means. The potential impacts for listed species from the use of these aircraft are as follows:

- Disturbance of listed native birds from helicopter rotor wash, visual detection, and noise from helicopter and fixed-wing aircraft
- Collision of listed and other wildlife with helicopters and fixed-wing aircraft
- Death or injury of listed terrestrial invertebrates or plants due to crushing by helicopter skids and personnel, and helicopter rotor wash and exhaust within the immediate vicinity of LZs
- Potential dispersal of invasive species by helicopters and the personnel and equipment that they transport

- Potential death or injury of listed and other wildlife, or destruction of habitat, by wildfire caused by helicopters

Noise-related impacts from helicopter operations could potentially disturb threatened and endangered native birds, particularly forest birds. The average sound volume of a Hughes 500 helicopter, the most common model used for natural area access in Hawai‘i, ranges from 76 to 90 decibels when passing 150 ft/45 meters at 85-125 knots above ground level (the zone in which helicopter longline operations would occur) (Newman et al. 1984). Noise from the helicopter, however, would be present within a particular area for relatively short periods of time (15 seconds or less). Studies of the effects of helicopters on native and non-native forest birds in Hawai‘i found that helicopter noise volumes of 75 decibels or greater impacted bird vocalizations (Gallardo Cruz et al. 2021), implying that the bird species could potentially be affected by helicopter operations that occur over sustained periods of time. Due to the operating height of the helicopter, rotor wash is unlikely to impact the forest canopy during flight and would instead be limited to the margins of LZs during take-off and landing during loading and personnel transport operations. This would greatly reduce any potential areas of impact for listed native wildlife from helicopter rotor wash to the immediate areas around LZs.

The duration and frequency of helicopter use will be the minimum necessary to complete aerial releases when drone-based or pedestrian releases are not a viable option. Minimizing flight times would reduce any potential adverse effects to native wildlife (both listed and non-listed) including noise and/or visual disturbances, rotor wash, or collisions, and is also crucial for fiscal and logistical project planning and implementation. There is a low potential that fixed-wing aircraft would disturb listed native wildlife (principally native birds) during take-off, flight, and landing within both the proposed project area and wider analysis area (wider island). These impacts are anticipated to elicit only short-term avoidance responses (i.e., flight) from listed and non-listed birds to the noise of the aircraft during flight operations. However, there is also a low possibility of listed bird species colliding with fixed-wing aircraft, particularly during aircraft take-off and landing (FAA 2021).

The potential for listed and non-listed bird species to collide with helicopters during dispersal and transport operations is extremely low due to the relative speeds at which helicopters fly. Similarly, there is also a low probability that listed and non-listed bird species would collide with fixed-wing aircraft either within the proposed project area or analysis area. Despite this low probability, collisions with larger bird species such as the threatened nēnē cannot be totally ruled out. For example, data from the FAA bird strike database (https://wildlife.faa.gov/search) for Līhu‘e Airport between 1990 and the end of 2022 indicate that bird strikes involving listed species are rare (~ 2% of the 1,164 strikes that identified the impacted species); aircraft collisions with koloa maoli and Newell’s shearwater accounted for all but one strike, which killed a nēnē. In addition, collisions between aircraft and birds also have the low potential to cause injury or death of personnel and material damage or loss of aircraft (See Section 4.5.3.2 for more detail). The project is therefore not anticipated to impact listed and non-listed species through bird strike due to the extremely low likelihood of occurrence, daytime only flight schedule, and infrequency of the actual project flights.

Listed and non-listed invertebrates and plants may also be killed or injured by personnel that are transported to LZs by helicopters and by the helicopter rotor wash, exhaust, and skids within and

on the margins of LZs. The effects of these impacts are likely to be limited to occasional disturbances in discrete areas within the immediate vicinity of the LZs. However, these impacts would be reduced to negligible by employing qualified personnel who receive training regarding the listed species and host plants that are present within the proposed project area.

The dispersal of incompatible male mosquitoes throughout the project area would require the use of LZs for landing and taking off. Although no native vegetation is proposed for removal from the margins of the LZs, there is a low risk that threatened and endangered native plant species would be impacted by trampling and crushing by personnel within and immediately adjacent to these LZs, and from helicopter downdraft when approaching/departing LZs from low altitudes.

Helicopters and the project personnel and equipment that they transport could also potentially spread invasive microorganisms, plants, and animals into and within the project area on helicopter skids and contaminated footwear, clothing, and equipment. Through the implementation of avoidance and minimization measures and biosecurity SOPs (Tables 5 and 6 and Appendix D), the effects of these adverse impacts would however be negligible.

The potential disturbance to listed native wildlife from helicopter and fixed-wing aircraft operations as part of the project would likely occur infrequently over short periods, which would reduce the potential lasting impacts for listed native flora and fauna. The indirect impacts to listed native species from accidentally dispersing invasive species during helicopter operations would effectively be avoided by the adoption of biosecurity SOPs (Appendix D). Overall, the impacts of helicopter and fixed-wing aircraft operations during the proposed project could be greatly minimized through limiting their use in favor of other dispersal measures. For helicopter operations specifically, the adoption of existing biosecurity SOPs would greatly reduce the potential dispersal of invasive species to and within the project area. If these measures are followed, the impacts from these operations would be greatly minimized.

Although helicopters and fixed-wing aircraft could ignite backcountry wildfires that could kill native wildlife and/or destroy critical habitat on which they rely, the potential for this is very low and does not exceed risks posed by standard resource management actions currently ongoing in the proposed project area. All crewed aircraft will be operated adhering to guidance and policies established by the FAA. Helicopter operations will additionally follow the best practice protocols established by the National Wildfire Coordinating Group, which provides guidance detailed in the Interagency Helicopter Operation Guide (NWCG 2016). DOFAW is mandated under the Land Fire Protection Law, Chapter 185, Hawai‘i Revised Statute to take measures for the prevention, control, and extinguishment of wildland fires within all forest reserves and natural area reserves on Kaua‘i (DOFAW 2018). This agency is statutorily required to cooperate with county and Federal government fire control agencies to develop plans for wildfire prevention. The Kaua‘i County Fire Department, in coordination with the DOFAW Fire Management Program, will respond to any on-site emergency, including downed helicopters and fixed-wing aircraft to ensure that there is no risk of wildfire.

4.1.3.3 DRONE RELEASE

Drones could be used to release incompatible male mosquitoes throughout the project area. This would require the use of existing 4WD roads, pedestrian trails, and LZs. Like the pedestrian

release and monitoring described in section 4.1.3.1, the following impacts could occur during the drone operations:

- Crushing or trampling of listed plant or invertebrate species within and on the margins of 4WD roads by vehicles and pedestrians, and by project personnel on trails, campsites, and in and on the margins of LZs
- Disturbance of listed native wildlife, particularly native forest birds, from drone visual detection and noise and onsite presence of project personnel
- Collisions of listed and other species of wildlife with drones
- Potential dispersal of invasive species by project vehicles, personnel, and equipment
- Potential death or injury of listed and other wildlife, or destruction of habitat, by wildlife caused by drones

Species of listed native invertebrates and plants could potentially be disturbed, injured, or killed by pedestrians and vehicles within and on the margins of 4WD roads, pedestrian trails, campsites, and LZs during drone operations. These impacts, however, are likely to be limited and can be effectively managed as outlined in Tables 5 and 6 and Appendix D.

The use of drones could disturb listed diurnal fauna during release operations. Listed native forest birds are at the greatest risk of disturbance because they are active during daylight hours and occur within or near the forest canopy. No studies have been undertaken to determine how drones impact native forest bird behavior in Hawai'i. A recent study of helicopter noise found that the aircraft didn't impact bird vocalizations when sound levels were below 75 decibels (Gallardo Cruz et al. 2021). As drones are considerably quieter than helicopters, this study implies that their use would avoid significant adverse impacts to the behavior of listed native forest birds. Due to the height above canopy at which drones would operate, and the intermittent nature of these operations with drones spending very short periods of time in one area, the agencies do not anticipate negative impacts from the sight or sound of drone operations.

Although the potential for collisions between drones and threatened and endangered fauna (principally birds) is very low, it cannot be fully ruled out (Rebolo-Ifrán et al. 2019). Species that fly well above the canopy in seasonal flocks, such as endangered nēnē during the summer months, are potentially at the greatest risk of colliding with drones due to the flock creating a larger collision area and the increased risk of distress responses (e.g., evasive flying maneuvers) within flocks. In the rare instance that a drone collides with a transiting bird, active avoidance measures would be used by pilots, which could include manually slowing forward flight to a stationary hover, manually decreasing altitude, or initiating an automated return home command to the aircraft.

Similar to the helicopter aerial releases described in Section 4.1.3.2, personnel and equipment involved with drone operations could potentially spread invasive organisms to and within the project area. These invasive organisms could have detrimental impacts on threatened and endangered native wildlife within the project area. These impacts, however, would be greatly reduced through adherence to avoidance and minimization measures and biosecurity SOPs (see Appendix D).

Additionally, drones could ignite backcountry wildfires that could kill native wildlife and/or destroy critical habitat on which they rely. However, the likelihood of this occurring is extremely low. All drones will be closely monitored by the operator and field teams while adhering closely to the guidance and policies established by the FAA. Drone operators under DOFAW operational control will follow DLNR's Aviation Policy and the Kaua'i DOFAW branch aviation safety plan and will be required to hold an up-to-date FAA 14 CFR Part 107 Remote Pilot Certificate and FAA Certificate of Waiver or Authorization. All drone operations will additionally follow best practice protocols established by the National Wildfire Coordinating Group, which provides guidance detailed in the Interagency Helicopter Operation Guide (NWGS 2016). As discussed in Section 4.1.3.2, DOFAW is required by law to take measures to prevent, control, and extinguish wildland fires within all forest reserves and natural area reserves on Kaua'i (DLNR, DOFAW 2018). The agency must cooperate with county and Federal fire control agencies to develop wildfire prevention plans and DOFAW's Fire Management Program will coordinate with Kaua'i County Fire Department to respond to any on-site emergency, including downed drones, to ensure that there is no risk of wildfire.

4.1.4 Cumulative Impacts

Foreseeable future activities within the project area (see Appendix E) include professional, subsistence and recreational hunting of feral ungulates, the management of other invasive mammals (primarily rats [*Rattus* spp.]) and invasive plant species, the installation and maintenance of ungulate proof fences, trail maintenance, camping for recreational and natural resource management purposes, tree harvesting along roadways, collection of material for cultural and research purposes, hiking, and the ongoing management of natural resources by organizations that partner with DOFAW (e.g., Kaua'i Forest Bird Recovery Project, The Nature Conservancy). As described in Appendix E, these activities would continue to occur in the future at existing or slightly increased levels.

4.1.4.1 PLANTS

Considering the past, present, and foreseeable future activities described in this section, the no-action alternative would not contribute additional impacts to rare or listed plants. Trends and impacts to the plants would be expected to remain the same. This includes the potential extirpation or extinction of native forest bird species due to uncontrolled avian malaria, which could potentially have a detrimental impact on native Hawaiian plants, including listed plants and plant species at risk due to the loss of pollinators. Compared to the no-action alternative, the proposed actions taken to suppress mosquito populations that carry avian malaria would support recovery of listed native Hawaiian birds, reducing the likelihood for extirpation or extinction of these species. This could potentially have a beneficial impact on the native Hawaiian plants that rely on native forest birds for pollination. The proposed alternative would potentially have an adverse impact on listed plant species, designated critical habitat, and plant species at risk from vegetation clearing and trampling and increased risk of invasion or spread of invasive plants or pathogens. However, with implementation of minimization and avoidance measures described in Table 5 and Appendix D, adverse impacts under the proposed alternative would be negligible for plants.

4.1.4.2 ANIMALS

Considering the past, present, and foreseeable future activities described in this section, the no-action alternative would not contribute additional impacts to rare or listed animal species. Trends and impacts from planned foreseeable actions would be expected to remain the same of similar to what is currently occuring. Under the no-action alternative, continued declines of rare and listed forest birds species is expected, potentially leading to extirpation or extinction of such species.

Compared to the no-action alternative, the proposed alternative could result in rare and listed wildlife being exposed to adverse impacts primarily in the form of noise or visual disturbance to wildlife from drones, helicopters, and pedestrian activities; indirect impact of increased risk of invasive species introduction from failed biosecurity during field operations; potential for trampling of invertebrate species, and an increased risk of wildlife collision. The most pronounced risk of impacts from noise disturbance, risk of collision, or biosecurity lapses would occur in the vicinity of LZs, helibases, campsites, fence lines, roads, and trails. Adverse impacts would be intermittent and of short duration and would infrequently affect individual birds and other wildlife.

The impacts from the proposed action and the foreseeable actions can be effectively reduced to negligible levels using the avoidance and minimization measures outlined in Tables 5 and 6, and Appendix D. Although there would be temporary and localized impacts to wildlife from mosquito release activities, the population and health of rare and listed species and their habitats would improve or remain stable. As previously described, the proposed action would directly reduce mortality of listed Hawaiian forest bird species due to the suppression of mosquitoes that spread avian malaria. The proposed action along with other planned foreseeable state and private management actions, including invasive plant control, feral ungulate control, and fence maintenance, would enhance survival of native forest bird species by reducing stressors. Over time, the populations of these listed bird species may increase due to the combined actions of the agencies and private partners to manage for avian malaria and other threats. Therefore, the overall cumulative increment of the proposed action would be substantially beneficial.

4.2 Wildlife Resources

4.2.1 Affected Environment

The project area[5] provides ecologically important habitat for non-listed native wildlife and non-native game animals and other non-native species. Non-listed native bird species that occur within the project area include the forest bird species ‘apapane, ‘anianiau, Kaua‘i ‘amakihi, and Kaua‘i ‘elepaio, black-crowned night heron (‘auku‘u*; Nycticorax nycticorax hoactli*), the Hawaiian short-eared owl (pueo*; Asio flammeus sandwichensis*), and the native seabird species black noddy (noio; *Anous minutus*), brown booby (noio kōhā; *Sula leucogaster*), great frigatebird (‘iwa; *Fregata minor palmerstoni*), red-tailed tropicbird (koa‘e ‘ula; *Phaethon rubicaudai*

[5] See Figure 1 for the project area. The area of analysis for the proposed action aligns with this project area except for bird and bat species that range beyond the project area. For these species, the wider island of Kaua‘i is the analysis area.

melanorhynchos) and white-tailed tropicbird (koa‘e kea; *Phaethon lepturus dorothea*) (DLNR 2009a,b, 2011, 2014).

The natural areas that comprise the project area provide habitat for a range of non-listed invertebrates including four pinao (damselfly) species (*Megalagrion heterogamies*, *M. oresitrophum*, *M. orobates*, and *M. vagabundum*), the rare fabulous green sphinx moth (*Tinostoma smaragditis*), the moth *Omiodes monogramma*, moths in the genus *Hyposmocoma*, seed bugs in the genus *Nysius*, spiders in the genus *Tetragnantha*, and a long-legged fly *Sigmatineurum napali* (Gillespie 1992, Evenhuis et al. 1994, Parnham 2008, DLNR 2009a, Schmitz and Rubinoff 2010 a, b). The proposed project area is likely to provide habitat for many additional native insect and snail species.

Non-native game animals that are present within the project area include three feral ungulate species (Columbian black-tailed deer [*Odocoileus hemionus columbianus*], goats [*Capra hircus*], and pigs) (DLNR 2009a, b, 2011, PBR Hawaii 2018). Recreational hunting of these game animals within State-managed lands is overseen by DOFAW’s Wildlife Program under the auspices of HRS Title 13, Chapter 123.

Other invasive, non-native mammals that are present within the project area include cats (*Felis catus*), rats (Norway rat [*Ratus norvegicus*], Pacific rat [*R. exulans*], and black or ship rat [*R. rattus*]), and mice (*Mus musculus*) (DLNR 2009a, b, 2011, 2014, PBR Hawaii 2018). Feral dogs (*Canis familiaris*) may also be present.

Non-native game birds that likely occur within suitable habitat in the project area include ring-necked pheasant (*Phasianus colchicus*), green pheasant (*Phasianus versicolor*), white-winged pheasant (*Phasianu colchicus chrysomelas*), Erckels’ francolin (*Francolinus erckelii*), Japanese quail (*Coturnix japonica*), chukar partridge (*Alectoris chukar*), gray francolin (*Francolinus pondicerianus*), black francolin (*Francolinus francolinus*), zebra dove (*Geopelia striata*), and spotted dove (*Streptopelia chinensis*) (DLNR 2011, 2014). The recreational hunting of these game birds on DLNR-managed land is administered by DOFAW’s Wildlife Program according to HRS Title 13, Chapter 122.

A range of other non-native bird species also occur within the project area. These include species listed under the Migratory Bird Treaty Act (MBTA) of 1918 such as barn owl (*Tyto alba*), cattle egret (*Bulbulcus ibis*), house finch (*Haemorhous mexicanus*), and northern cardinal (*Cardinalis cardinalis*). Other non-native species that occur within the project area include Chinese hwamei (*Garrulax canorus*), common myna (*Acridotheres tristis*), house sparrow (*Passer domesticus domesticus*), Japanese bush warbler (*Cettia diphone*), scaly-breasted munia (*Lonchura punctulata*), red-crested cardinal (*Paroaria coronata*), warbling white-eye (*Zosterops japonicus*), and white-rumped shama (*Copsychus malabaricus*) (DLNR 2009b, 2011, 2014).

The isolated, higher elevation streams within the project area provide habitat for ‘ōpae kala‘ole (*Atyoida bisulcata*), an endemic native shrimp species, and four fish species: ‘o‘opu ‘akupa (*Eleotris sandwicensis*) and three goby species: ‘o‘opu nakea (*Awaous stamineus*), ‘o‘opu ‘alamo‘o (*Lentipes concolor*), ‘o‘opu nōpili (*Sicyopterus stimpsoni*) (DLNR 2009b, Parham et al. 2008). Introduced rainbow trout (*Oncorhynchus mykiss*) occur within the project area (DLNR 2014). In addition, two non-listed mollusk species, hīhīwai (*Neritina granosa*) and *Lymnaea*

aulacospira, have been recorded within the Hono O Nā Pali Natural Area Reserve and may also occur elsewhere within the proposed project area (DLNR 2011).

4.2.2 Potential Impacts from No-Action Alternative

As outlined in Section 4.1.2, the upslope migration of disease-vectoring southern house mosquito due to climate change is predicted to lead to the gradual loss and eventual elimination of disease-free habitat for vulnerable native forest bird species. Three non-listed forest bird species present within the proposed project area are vulnerable to avian malaria and avian pox: ‘apapane, ‘anianiau, and Kaua‘i ‘amakihi. Populations of these species are expected to slowly decline by 2100 due to a drastic reduction of mosquito-free habitat (Benning et al. 2002, Fortini et al. 2015). Small populations of some species (e.g., ‘apapane and Kaua‘i ‘amakihi) may however persist in lower numbers due to potential disease resistance (Woodworth et al. 2005, Atkinson et al. 2013).

The ongoing impacts of this non-native mosquito species on native and non-native wildlife, other than forest birds (native and non-native birds, fish, freshwater invertebrates, and non-native mammals) are unknown.

The ongoing management and recreational activities within the reserves that comprise the proposed project area are summarized in Section 4.1.4.

4.2.3 Potential Impacts from Proposed Action

The impacts of the proposed action would be the same as those outlined in section 4.2.2 for the no-action alternative except for the effects of reducing populations of southern house mosquito through the release of incompatible male mosquitoes within the proposed project area. The impacts of the proposed action for non-listed wildlife are the same as for the proposed action described in Section 4.1.3. For brevity, only potential impacts that differ from those described in that section are summarized below.

The interactions between non-native mosquitoes and native insects and other non-avian native animals (fish, snails, bats) in Hawai‘i are poorly understood. It is possible that native and introduced fish eat mosquito larvae, but the reduction in this mosquito species is unlikely to impact fish species due to the presence of other mosquito species and the abundance of introduced aquatic invertebrates (i.e., native fish and introduced trout are unlikely to be food limited).

4.2.3.1 PEDESTRIAN RELEASE AND MONITORING

As addressed in Section 4.1.3.1, incompatible male mosquitoes would be released on foot in accessible areas of the project area. Trailheads would be accessed using 4WD vehicles and all-terrain vehicles (ATVs). The potential impacts and mitigation measures for this increased pedestrian traffic for native wildlife are the same as described in Section 4.1.3.1.

4.2.3.2 HELICOPTER AND FIXED-WING AIRCRAFT AERIAL RELEASE

As outlined in Section 4.1.3.2, helicopters would be used to disperse incompatible male mosquitoes throughout parts of the project area that are inaccessible by other means. Helicopters

are also likely to be used to ferry project personnel throughout the project area. The potential impacts and mitigation measures for native wildlife from the use of helicopters and fixed-wing aircraft during the course of the proposed project are the same as described in Section 4.1.3.2.

4.2.3.3 DRONE RELEASE

As outlined in Section 4.1.3.3, drones would be used to release incompatible male mosquitoes throughout the project area. This would require the use of existing 4WD roads, pedestrian trails, and LZs. The potential impacts and mitigation measures for native wildlife from the use of drones to disperse incompatible male mosquitoes during the proposed project are the same as described in Section 4.1.3.3.

4.2.3.4 CUMULATIVE IMPACTS

As described in Section 4.1.4, considering the past, present, and foreseeable future activities, the no-action alternative would not contribute additional impacts to the wildlife species beyond that of the ongoing and future known activities already occurring. Trends and impacts from planned foreseeable actions would be expected to remain the same of similar to what is currently occuring.

The proposed action would result in similar or identical cumulative impacts as described in section 4.1.4 for federal and state listed wildlife. The proposed action would result in limited adverse cumulative impacts to wildlife resources that would result from the presence of people, drones, or helicopters used for implementation of the proposed action. These proposed actions would be short lived and intermittent in nature. The impacts from the proposed action and the past, present, and foreseeable future actions can be effectively reduced to negligible levels using the avoidance and minimization measures outlined in Tables 4 and 5 and Appendix D, and the implementation of existing SOPs as described for listed species. Although the project would cause negligible, periodic and short-term adverse impacts (e.g. increased air and foot traffic), success of the project would reduce the prevalence of non-native *Culex* mosquitoes in the Kaua'i wilderness environment. Suppression of non-native populations in turn, indirectly impacts the rate of avian malaria. The indirect impact would result in long-term beneficial indirect impacts to general wildlife or wildlife habitat. Successful implementation of the proposed action would result in cumulative impacts that are overwhelmingly beneficial for wildlife resources that occur within the proposed project area.

4.3 Vegetation Resources

4.3.1 Affected Environment

Approximately half the project area (30,275 acres/12,251 hectares) contains montane native wet forest and shrubland that primarily comprises a canopy of 'ōhi'a (*Metrosideros polymorpha*) and to a lesser extent koa (*Acacia koa*) that occurs between 730 and 5,220 ft elevation (222 – 1,591 m). These areas of forest typically contain a dense understory of native trees and shrubs such as kōlea lau nui (*Myrsine lessertiana*), 'ōhi'a hā (*Syzygium sandwicensis*), and 'ōlapa (*Cheirodendron* spp.); sedges such as *Gahnia vitiensis* subsp. *kauaiensis* and 'uki (*Machaerina angustifolia*); and ferns, principally uluhe (*Dicranopteris linearis*) (Gon et al. 2006, DLNR

2011). Close to a third of the project area (16,258 acres/6,580 hectares), primarily at lower elevations (sea level to 4,700 ft; 0 – 1,432 m), contains non-native forest and shrubland (10 – 5,080 ft; 3 – 1,548 m). The remaining vegetation and landcover types include smaller areas of native dry forest and shrubland (560 – 4,310 ft; 170 – 1,313 m) (2,316 acres/937 hectares), native vegetation on wet and dry cliffs (670 – 5,190 ft; 204 – 1,581 m) (6,916 acres/2,798 hectares), non-native grassland (70 – 4,120 ft; 21 – 1,255 m) (860 acres/348 hectares), and unvegetated areas (30 – 5,080 ft; 9 – 1,548 m) (2,252 acres/911 hectares).

4.3.2 Potential Impacts from No-Action Alternative

Under the no-action alternative, there would be no new impacts to vegetation within the project area and conditions would continue to be the same or very similar to their current state. However, if avian malaria and avian pox continue to cause the decline of Hawaiian honeycreeper species that serve as pollinators and seed dispersers of certain native plants, there could be longer term population declines for native plant species due to lowered reproduction and seed dispersal. Despite this general assumption, predicting which species are most at threat from mutualistic breakdowns is complicated by our limited understanding of pollination and seed dispersal networks in Hawai‘i (Barton et al. 2021). The ongoing management and recreational activities that impact or protect native vegetation within the natural areas that comprise the proposed project area are summarized in Section 4.3.4.

4.3.3 Potential Impacts from Proposed Action

The impacts of the proposed action would be the same as those outlined in section 4.3.2. for the no-action alternative with the addition of the beneficial effects of reducing populations of southern house mosquito through the release of incompatible male mosquitoes within the proposed project area. The impacts of the proposed action are summarized below.

The release and monitoring of incompatible male mosquitoes through the proposed action would result in an increase in human, vehicle, and helicopter traffic within the proposed project area. This increased traffic could potentially transport invasive microorganisms (e.g., spores and soil containing bacterial cells), plant propagules (seeds and vegetative sections), and eggs or live individuals of animals either into or between sites in the project area. The potential impacts of spreading invasive species to the project area are varied, ranging from nominal effects such as the dispersal of ruderal weeds along the margins of existing trails, to consequential impacts such as the accidental spread of the fungal pathogens that cause rapid ‘ōhi‘ā death. Increased foot, vehicle, and aircraft traffic would also result in damage to native vegetation within and on the immediate margins of hiking trails, fence lines, four-wheel-drive roads, campsites, and helicopter LZs due to trampling, and in the case of helicopter LZs, downdraft from the helicopter rotors when flying at very low altitudes. This may lead to the localized damage or death of native plants within and on the margins of this transport infrastructure. Potential effects from introducing or spreading invasive species will be avoided by implementation of Biosecurity Protocols (See appendix D).

Incompatible male mosquitoes may be released directly or in small biodegradable packages designed to open on contact when reaching the canopy or forest floor. Packages would be composed of weed-free, environmentally friendly material derived from plants. The material

used would have been heat treated during the manufacturing process, which reduces the likelihood of introduction of any foreign contaminants or invasive species, like other plant-based media products commonly used in forestry/reforestation projects. Although many thousands of release packages would be dropped across the project area throughout the duration of the project, the small packages would be spread diffusely and the biodegradable material would decompose quickly given the typical rainfall patterns in the project area, making the chance of observing multiple packages unlikely. Based on the degradable nature of the delivery packages and diffuse nature, the impacts on plant habitat are negligible.

Should the proposed action result in tangible reductions in southern house mosquitos and avian malaria/avian pox, we expect a beneficial impact from increasing native bird populations and the partial restoration of mutualisms (pollination and seed dispersal) for native plants. Potential increases in populations of ‘anianiau, ‘apapane, and Kaua‘i ‘amakihi, for example, could benefit the reproduction of ‘ōhi‘a and smaller-flowered species of native plants. An increase in native bird populations of species such as Kaua‘i ‘amakihi would likewise benefit the dispersal of native plant seeds as native bird species overwhelmingly forage on these plants compared to non-natives (Wu et al. 2014, Kaushik et al. 2018). An increase in pollination and seed dispersal of native plant species could potentially increase the resiliency of ecosystems to encroachment from invasive species as well as the persistence of those native plant species that are being pollinated or dispersed.

4.3.3.1 PEDESTRIAN RELEASE AND MONITORING

As stated in Section 4.1.3.1, the proposed action would result in increased foot traffic within existing trail systems, fence lines, campsites, and helicopter LZs. There is potential under the proposed action for minimal adverse impacts to vegetation from localized plant removal or disturbance along trails, fence lines, and at landing zones and camps by ground crews. These impacts would be temporary in nature and largely occur in previously disturbed locations. In addition, these activities have been approved through previous environmental compliance of the State. To minimize any vegetation or ground disturbance, monitoring efforts and the dispersal of incompatible mosquitoes via ground-based pedestrian releases would be conducted on existing resource management trails and fence lines to avoid disturbance of soils and plant communities. Additionally, best management practices (Appendix D) would be implemented to reduce or remove the threat of introducing invasive plants within the project area; however, a risk of introduction still exists. Crews would be trained to follow best management practices to minimize this risk (Table 5 and Appendix D). The potential impacts to and avoidance and minimization measures for native vegetation from this increased pedestrian traffic are the same as described in Section 4.1.3.1.

4.3.3.2 HELICOPTER AND FIXED-WING AIRCRAFT AERIAL RELEASE

As stated in Section 4.1.3.2, helicopters and fixed-wing aircraft are proposed for use to disperse incompatible male mosquitoes throughout parts of the project area that are inaccessible by other means. Helicopters would also be used to ferry project personnel throughout the remote parts of the project area and would require the use of LZs for landing and taking off. The potential impacts and mitigation measures for native vegetation from the use of helicopters during the proposed project area are the same as described in Section 4.1.3.2. No impacts to native vegetation are likely to result from aerial releases of incompatible male mosquitoes using fixed-

wing planes as these aircraft would take off and land outside of the project area. The impacts of these aircraft on the wider analysis area (wider island) are addressed in Section 4.1.3.2.

4.3.3.3 DRONE RELEASE

As outlined in Section 4.1.3.3, drones would be used to release incompatible male mosquitoes throughout the project area. This would require the use of existing 4WD roads, pedestrian trails, and LZs. The potential impacts and mitigation measures for native vegetation from the use of drones to disperse incompatible male mosquitoes during the proposed project are the same as described for listed plant species in Section 4.1.3.3.

4.3.4 Cumulative Impacts

As outlined in Section 4.1.4, the proposed action would result in limited cumulative impacts to native vegetation that would be short lived and intermittent in nature. There is potential under the proposed action, existing actions, and foreseeable future actions for minimal adverse impacts to vegetation from localized plant removal or disturbance along trails, fence lines, and at landing zones and camps by ground crews. These impacts would be temporary in nature and largely occur in previously disturbed locations. In addition, these activities have been approved through previous environmental compliance of the State. To help minimize any vegetation or ground disturbance, monitoring efforts and the dispersal of incompatible male mosquitoes via ground-based pedestrian releases would be conducted on existing resource management trails and fence lines to avoid disturbance of soils and plant communities. Additionally, best management practices (Appendix D) would be implemented to reduce or remove the threat of introducing invasive plants within the project area; however, a risk of introduction still exists. Crews would be trained to follow best management practices to minimize this risk (Table 5 and Appendix D). The impacts from the proposed action and the foreseeable actions can be effectively reduced to negligible using the avoidance and minimization measures outlined in Tables 5 and 6, and Appendix D. Projects that may occur in the project area in the future would also be expected to follow federal and state avoidance and minimizations during implementation.
The implementation of these measures would result in cumulative impacts that are overwhelmingly beneficial for native vegetation within the proposed project area.

4.4 Cultural Resources

This section describes the potential impacts of the proposed action on cultural resources (archaeological remains, places of cultural significance, and other traditional cultural resources), as well as contemporary cultural practices and beliefs).

As part of the environmental assessment process, a Cultural Impact Assessment (CIA) was conducted to assess the potential impacts of the proposed action on traditional cultural resources, practices, and beliefs, as well as on any current cultural practices being undertaken within the project area. This CIA (Traub et al. 2023, Appendix B of this EA), conducted by SWCA Environmental Consultants, was prepared in accordance with the methodology outlined in the Office of Planning and Sustainable Development's *Guidelines for Assessing Cultural Impacts*.

The information presented below provides a summary of the findings of the CIA (Appendix B), where this information is presented in greater detail with references.

4.4.1 Affected Environment

4.4.1.1 ARCHAEOLOGICAL RESOURCES

Although most of the project area has not been the subject of a formal archaeological survey, some locations within the area potentially impacted by incompatible male mosquito releases are known to contain Native Hawaiian cultural sites. During the pre-contact and early post-contact periods, habitation and intensive cultivation were concentrated in valleys and along the coast, while the high elevation forests and wetlands that comprise the majority of the terrain within the project area were not heavily utilized by Native Hawaiians. Many of the activities that took place in the uplands left little to no trace on the archaeological record. People did travel through the uplands to hunt birds, visit sacred sites, harvest trees for lumber, or gather other natural resources. These visitors to the area constructed temporary shelters and places of worship and created some of the trails that are still in use today (Yent 2004).

Nearly all previously recorded archaeological sites occur within Kalalau Valley in the northwestern section of the project area. Native Hawaiian communities in Kalalau built homes, practiced intensive irrigated agriculture, and constructed several *heiau* (temples) along the coastal trail (Major and Carpenter 1999). Some of the heiau, habitational structures, large agricultural terraces, and irrigation features in Kalalau Valley are located very near or even on trails used by modern hikers and hunters.

4.4.1.2 CULTURAL RESOURCES

The project area is rich in cultural resources that include places of traditional cultural significance as well as traditionally-gathered natural resources such as medicinal and ceremonial plants and trees such as ʻōhiʻa lehua and koa used in house and canoe construction. Several of these resources are collected and used by contemporary cultural practitioners. Not least among the culturally significant natural resources present within the project area are the native forest birds that the current project is intended to protect.

Native forest bird species play a unique and significant role in traditional and contemporary Hawaiian cultural customs, practices, and beliefs. References to forest birds are woven into the *mele* (chants and songs) and *moʻolelo* (stories and traditions) of the islands. They are regarded as *kinolau* (physical manifestations of the gods) and *ʻaumakua* (family ancestral deities). Their feathers were used to decorate the *ʻahuʻula* (capes), *mahiole* (helmets), *kāhili* (standards) and *lei hulu* (feather garlands) of the Hawaiian *aliʻi* (chiefs and chiefesses) (Rangi Hīroa 1957: 215-217).

Frederick B. Wichman's *Kauaʻi Ancient Place-Names and Their Stories*, one of the most comprehensive Kauaʻi place name resources, describes a place named Halemanu near the project area where Native Hawaiian birdcatchers had a permanent camp.

> A few miles above Puʻukāpele is Hale-manu, "bird house," where bird catchers lived while they hunted Kauaʻi's unique bird family, the brilliantly colored honeycreepers that lived in the ʻōhiʻa lehua forests. Especially prized were the

> yellow-green ʻamakihi and ʻanianiau, the bright yellow ʻakialoa and nukupuʻu, the orange-red ʻiʻiwi or olokele, and the deep crimson ʻapapane (Wichman 1998: 15-16).

Today, native forest birds are viewed as a link connecting contemporary Hawaiians with the natural environment of their islands. *Hula* (traditional dance) practitioner and *haku mele* (composer) Ms. Sally Jo Keahi Manea recently composed a mele in honor of Kauaʻi and Maui's native birds. The mele that speaks of the ʻākohekohe, kiwikiu, ʻakikiki and ʻakekeʻe, describing their habitat, the colors of their feathers, and the characteristic peculiar to each bird (Appendix B). As the composition of this mele illustrates, Kauaʻi's native forest birds remain a source of inspiration to contemporary cultural practitioners.

4.4.2 Potential Impacts from No-Action Alternative

If no-action is taken, the warming climate will likely result in the continued migration of southern house mosquito populations and avian disease upslope into the higher elevations of the project area. It is predicted that avian malaria and avian pox will eventually result in the extinction of both the ʻakekeʻe and ʻakikiki, the loss of ʻiʻiwi populations on Kauaʻi, and the reduction of other native honeycreeper species (Paxton et al. 2022, Fortini et al. 2015). Given the cultural significance of these bird species, reduction of their populations and/or extinction would represent a tangible loss to Hawaiian culture.

In addition, native forest birds form part of the larger native ecosystem and play an active role in preserving that ecosystem. Native honeycreeper species serve as pollinators and seed dispersers for certain native plants. Their decline or loss could contribute to longer term population declines of native plant species, adversely impacting the contemporary cultural practices that make use of and depend on those species.

4.4.3 Potential Impacts from the Proposed Action

The potential physical impacts that the proposed action would have on the landscape, both archaeological and cultural, would be minimal and no greater than the current level of use by the public and by DOFAW and its management partners in maintaining the State Parks, Forest Reserves, and Natural Area Reserves located within the project area.

Incompatible male mosquito releases, monitoring, and other project related activities would be limited to existing routes of travel (fence line corridors, trails, and roads), established helicopter landing zones, and field camps already utilized for other management activities. No new roads, trails, landing zones, or camps would be created to support this project. Most of the known archaeological sites and culturally significant places within the project area are located far from the trails and areas where the project activities would take place. Some of the heiau, habitational structures, large agricultural terraces, and irrigation features in Kalalau Valley are located near trails used by modern hikers and hunters. These trails, however, would not be used for the current project-related access and therefore the sites in Kalalau would not be impacted by the project. No archaeological or cultural sites have been recorded near planned project access routes, landing zones, or field camps. As has previously been mentioned, archaeological surface structures are relatively rare in the forested uplands where most incompatible male mosquito

releases would occur. For these reasons, it is expected that the project would have no adverse impact on archaeological sites or culturally significant places.

Given that not all of the project area has been archaeologically surveyed, it is possible that previously unrecorded sites could be present in the vicinity of the access routes where project activities would take place. To avoid and minimize effects, project personnel would stay on designated roads and trails. Project related activities would be limited to existing routes of travel (fence line corridors, trails, and roads), established helicopter landing zones, and field camps already utilized for other resources management activities. No new roads, trails, landing zones, or camps would be created to support this project (see the cultural resources section of Table 5).

The findings of the CIA (Appendix B) indicate that the proposed action is unlikely to adversely impact cultural resources, practices, and beliefs. While cultural practitioners may make use of roads or trails within the project area to gather forest plants, hunt, or to carry out other cultural practices, incompatible male mosquito releases and monitoring activities are unlikely to interfere with their access.

One of the primary impacts of the proposed action on cultural resources is the anticipated positive outcome that reduced mosquito populations would have toward protecting and preserving native forest bird populations. Their existence and presence within the forest environments they inhabit are important for maintaining cultural continuity between traditional and contemporary cultural customs, practices, and beliefs.

4.4.3.1 PEDESTRIAN RELEASE AND MONITORING

Overall, no impacts to archeological resources are anticipated to result from the proposed action. Much of the project area has not been surveyed, but no new ground disturbance would result from the proposed action. Pedestrian mosquito release would be limited to existing routes of travel (fence line corridors, trails, and roads) and field camps already utilized for other natural resource management activities. This would avoid potential effects to historic properties, such as unrecorded archaeological sites, and minimize impacts to culturally significant locations. The use of ground transportation would be minimized to the greatest extent possible to reduce noise disturbances to cultural practitioners and recreationists. The impact to established trails, some of which form part of the Nā Ala Hele trail network (Figure 3) and may be of traditional age, would not be substantially greater than that associated with current use.

Although no changes in public use or access are anticipated to be required for project operations, DOFAW would continue to provide notice of any changes in use or access to DOFAW-managed areas, including areas frequented by cultural practitioners, through social media announcements or updates on the DOFAW website. DOFAW also maintains a hunter email list that could be used to notify hunters about any changes to access or use of public hunting areas. If changes in public access do arise, DOFAW would consult with the ʻAha Moku representative for the area to ensure that dispersal and monitoring efforts are coordinated with cultural practitioners who may be using those areas to gather forest plants, hunt, or carry out other cultural practices.

4.4.3.2 HELICOPTER AND FIXED-WING AIRCRAFT AERIAL RELEASE

Some auditory impacts would be associated with all aerial operations, and helicopter and fixed-wing aircraft operations would constitute the greatest auditory disturbance. While helicopter and fixed-wing use could potentially act as a distraction to subsistence hunters and/or cultural practitioners carrying out cultural activities within the project area, these distractions would be minor and temporary. Project related aerial activities and the noise generated by them is not anticipated to be significantly greater than the current existing levels. The auditory impacts associated with the proposed project would be within the approximate background noise range of those generated from commercial helicopter tourism and would not be anticipated to result in significant noise impacts. It should also be noted that none of the interviewed participants noted noise as an impediment to cultural practice. The use of helicopter and fixed-wing aircraft would be minimized to the greatest extent possible to reduce noise disturbances to cultural practitioners.

Helicopter operations would utilize existing, previously disturbed landing zones. These existing areas (trails, fence lines, and landing zones or camps) have been cleared through previous state environmental compliance. Cultural impacts from use of helicopters and established LZs is considered discountable.

4.4.3.3 DRONE RELEASE

Drones would be launched from existing facilities and access points where infrastructure is preexisting and/or where resources management operations already occur. This would minimize the potential impact to previously unrecorded archaeological sites and culturally significant locations.

Auditory impacts associated with drone releases could potentially affect subsistence hunters and/or cultural practitioners carrying out cultural activities within the project area, though these distractions would be minor and temporary. Noise produced by drone operations would be at substantively lower levels than helicopter and fixed-wing auditory impacts. The sound produced by a consumer-grade battery-powered rotary or fixed-wing drone at ground level is similar to loud highway noise (Schäffer et al. 2021). Most consumer-grade drones are far quieter than helicopters with some being up to 40 A-weighted decibels (dBA) quieter than a manned helicopter at roughly 328 feet above ground level (AGL) (Airborne Drones 2020). Drones would likely spend 15 seconds or less hovering over each mosquito release location, and it is possible that drones would be able to release the mosquitoes without pausing. The use of drones would be minimized to the greatest extent possible to reduce noise disturbances to cultural practitioners. Again, it should also be noted that none of the interviewed participants noted noise as an impediment to cultural practice. The acoustic impacts to ethnographic resources and traditional cultural practices would likely be temporary at any given location, though releases would likely occur over the long term. In addition, reduction of avian malaria as proposed would conserve numerous rare birds important to Native Hawaiian culture providing a beneficial impact.

4.4.4 Cumulative Impacts

Considering past, present, and foreseeable future activities, the no-action alternative would have the same impacts as noted in Section 4.4.2 regarding the potential decline and possible

disappearance of native forest bird species and the resulting loss of their presence as a living component of Hawaiian culture.

Trends and impacts from planned foreseeable actions would be expected to remain the same as, or similar to what is currently occurring. Ongoing or reasonably foreseeable activities identified in Appendix E are expected to have a minimal and temporary adverse impact on cultural places, traditions, practices, and beliefs. The proposed action does not measurably increase the frequency or intensity of other ongoing or future activities in the project area. Known ongoing and future activites follow DLNR SOPs, and avoidance and minimizations in Tables 5 and 6 and Appendix D. Based on this, the cummulative impacts of the proposed action in addition with known past, ongoing, and future activities are not expected to appreciably increase adverse impacts in the project area. The overall cumulative impact of successful implementation of the proposed action would be expected to be largely beneficial on Hawaiian cultural practices and resources in the form of helping Hawaiian forest bird recovery.

The proposed use of incompatible male mosquitoes to suppress wild mosquito populations and reduce the incidence of avian malaria and avian pox transmission to native forest bird species is but one component of a much larger effort to *mālama* (take care of) the native environment of the project area (see Appendix E). The intent of this and other current and proposed stewardship efforts is to preserve and protect this unique natural and cultural landscape. The threatened and endangered native forest bird populations are a culturally significant element of this landscape, and their continued survival would serve to perpetuate the rich cultural heritage associated with them.

4.5 Public Health and Safety

4.5.1 Affected Environment

Mosquito-transmitted diseases can lead to serious illness in individuals and therefore pose a threat to public health and safety. The Hawai'i Interagency Biosecurity Plan (Hawai'i Invasive Species Council, 2016) identifies mosquitoes as high-risk taxa and calls for expanded control of disease-carrying mosquitoes as a priority and objective for the protection of human health, as well as increased education and public awareness of mosquito-borne diseases. The only mosquito-borne diseases that have been reported in Hawai'i to-date are dengue, Zika, and chikungunya, and none of these viruses are endemic to Hawai'i but were introduced by travelers who were exposed outside of the state (DOH 2022a, 2022b, 2022c). Dengue, Zika, and chikungunya are transmitted by the day-biting yellow fever mosquito and Asian tiger mosquito and are not transmitted by the southern house mosquito, which is the target species of the proposed action (DOH 2022d).

Diseases transmitted to humans by the southern house mosquito include West Nile virus, St. Louis encephalitis, and lymphatic filariasis (University of Florida 2019). Of these, West Nile virus is the most widespread mosquito-transmitted disease in the continental US but has not yet been detected in Hawai'i; neither has St. Louis encephalitis nor lymphatic filariasis (CDC 2022b, 2022c, DOH 2022e). Hawai'i's status as a travel destination, however, puts it at a high-risk for the introduction of mosquito-transmitted diseases; this, combined with the wide distribution of southern house mosquitoes on all Hawai'i's main islands, indicates that the state is at particular

high risk for the introduction of West Nile virus. For these reasons, health and wildlife agencies in Hawai‘i are actively working to prevent the introduction and spread of West Nile virus to the state (DOH 2022e). West Nile virus causes symptoms for about 1 in 5 people infected, and about 1 in 150 infected people develop severe symptoms that can be fatal (CDC 2022b). The CDC's guidance document, *West Nile Virus in the United States: Guidelines for Surveillance, Prevention, and Control,* emphasizes the importance of implementing proactive measures that maintain vector populations at low levels to minimize the risk of transmission to humans (CDC 2013).

Human populations that utilize the public portions of the project area and that may be subject to health and safety effects of mosquito-transmitted diseases include recreationists in parks and preserves, cultural practitioners, and land management staff. The portion of the project area that is private land is remote and undeveloped and therefore is not expected to incur much human use. There is no evidence that the release of incompatible male mosquitoes on Kaua‘i would have human health impacts. Existing efforts to manage mosquito populations within the project area are implemented by state agencies and conservation groups who are primarily focused on monitoring and mitigating mosquito-related risks to wildlife and habitat. Mosquito monitoring plots and traps are currently implemented by KFBRP in the Alaka‘i Wilderness Preserve, and ungulate management activities (i.e., exclusion fences, hunting, and trapping) that reduce mosquito larval habitat are currently implemented by DOFAW and TNC throughout the project area (see Appendix E).

4.5.2 Potential Impacts from No-Action Alternative

Under the no-action alternative, existing public health and safety concerns associated with mosquito-transmitted diseases would remain as described under the affected environment, and the state of Hawai‘i would remain at high-risk for the introduction and spread of new diseases (e.g., West Nile virus) that are not already present in Hawai‘i but, if introduced, could be transmitted by the widespread southern house mosquito. Although existing ungulate management strategies that limit the amount of available mosquito breeding habitats would continue to be implemented, these strategies have not been effective in substantially suppressing or eliminating non-native mosquito populations, as evidenced by their recent expansion into higher elevation habitat. Continued implementation of existing management strategies would therefore have a negligible effect on public health and safety concerns associated with mosquito-transmitted diseases.

4.5.3 Potential Impacts from Proposed Action

The proposed action aims to reduce populations of southern house mosquitoes in the project area. This action could benefit recreationists, cultural practitioners, and land management staff who utilize the project area by reducing abundance of southern house mosquitoes, which is a nuisance species. There would likely be a short-term increase in the number of male mosquitoes in localized release areas after each release event, but the release of *Wolbachia*-infected incompatible male mosquitoes would have no adverse effects on public health and safety as male mosquitoes do not bite and therefore, cannot transmit diseases through biting. A reduction in southern house mosquito numbers will have no effect on populations of other nuisance mosquito species.

The magnitude of future public health and safety benefits from the proposed action would depend on the success of IIT treatments at reducing mosquito populations, which cannot be known until post-release monitoring is conducted. However, results of previous field-based trials of IIT (see Section 2.4) indicate that the treatments can be highly effective at reducing mosquito populations (up to 95% reductions). The level of mosquito population declines achieved by the proposed action would have a commensurate and beneficial effect on public health and safety by reducing the likelihood that human arboviruses could be spread by southern house mosquitoes.

Given the short lifespan of mosquitoes, the beneficial effects on public health and safety from declining mosquito populations could be realized relatively quickly after incompatible male mosquito releases begin (e.g., within months). Success of the proposed release of IIT mosquitoes would be determined through post-release monitoring. Short and potentitially long-term public health benefits would be expected should the releases be effective.

Public perceptions surrounding mosquitoes and mosquito-borne diseases may lead to public concerns about the proposed action's effect on health and safety, which would warrant the need for project-specific public education and outreach. Members of the public may, for example, be unaware of the differences between mosquito species and sexes, leading them to believe that the release of mosquitoes could put them at an increased risk of being bitten. To facilitate better public understanding of the proposed action's potential benefits to public health and safety, DLNR, USFWS, and project partners would provide support for education and outreach efforts such as public outreach campaigns, informational flyers at trailheads, or the use of social media to educate the public about the project and associated health and safety benefits (see Table 5). These efforts would be consistent with and would reinforce the state's overarching Interagency Biosecurity Plan, which identifies public education about mosquito-borne diseases and other pest related issues as a critical issue for the state. A public meeting was held for the project on Kaua'i during the public comment period of this EA where the public was provided informational materials and an opportunity to ask questions and voice concerns.

4.5.3.1 PEDESTRIAN RELEASE AND MONITORING

Pedestrian release methods would not result in any additional public health and safety effects beyond what is described in section 4.1.3.1. Monitoring activities (i.e., data collection and analysis) would not directly affect public health and safety but would indirectly affect public health and safety by influencing the success and duration of IIT treatments. Monitoring activities would be implemented with the goal of maximizing the efficacy of IIT treatments, which in turn could support the long-term use of these treatments, thereby increasing the duration and magnitude of associated benefits to public health and safety from declining mosquito populations.

4.5.3.2 HELICOPTER AND FIXED-WING AIRCRAFT AERIAL RELEASE

The use of helicopters for incompatible male mosquito releases is not expected to result in any additional public health and safety effects beyond what is described in section 4.1.3.2. The use of helicopters would follow all FAA rules and guidelines, which would ensure all aviation hazards are properly avoided. As discussed in Sections 4.1.3.2 and 4.1.3.3, wildlife strikes with aircraft may occur and could result in human fatalities or injuries in extreme cases (FAA 2021). Most wildlife strikes, however, do not result in human injury or fatality and the number of damaging

strikes has been decreasing since the 1990's, likely due to the increasing awareness in the aviation community and increased implementation of avoidance and minimization measures to reduce the risks of wildlife strikes at airports. Of the total 232,320 wildlife strikes reported to FAA from 1990-2019, 16 (0.007%) resulted in human fatalities and 251 (0.1%) resulted in human injuries (FAA 2021).

4.5.3.3 DRONE RELEASE

The use of drones for incompatible male mosquito releases is not expected to result in any additional public health and safety effects beyond what is described in section 4.1.3.3. All FAA and DLNR safety-related guidelines for drones would be followed.

4.5.4 Cumulative Impacts

Ongoing mosquito monitoring and ungulate management activities (Appendix E) would continue to occur in the future at current or slightly increased levels. As described under Section 4.5.2, existing ungulate management strategies have not been effective in substantially suppressing or eliminating non-native mosquito populations. These activities would therefore likely continue to have a negligible effect on public health and safety concerns associated with mosquito-transmitted diseases. However, if increased levels of ungulate management are more successful at reducing mosquito populations in the future, this would result in a beneficial effect to public health and safety by reducing the risk of southern house mosquitoes associated diseases being introduced and spread in the project area. None of the other ongoing or reasonably foreseeable activities identified in Appendix E are expected to impact public health and safety. When combined with the effects of the proposed action, the overall cumulative effect on public health and safety would be beneficial.

4.6 Recreation and Wilderness

4.6.1 Affected Environment

Several state-managed recreational areas occur within the project area, including 12,663 acres (21%) of Forest Reserves, 9,940 acres (17%) of Forest Reserve/Wilderness Reserve, 4,261 acres (7%) of Natural Area Reserves, 4,619 acres (8%) of State Wilderness Parks, and 3,438 acres (6%) of State Parks (see Table 1). Recreational uses that occur within each of these designations are summarized in Table 7 and further described below. Uses associated with cultural practitioners (e.g., plant gathering and hunting) are addressed in Section 4.4 of this EA as well as the project's CIA (Appendix B). Aerial helicopter tours are also a common occurrence in the area, with at least 10 or more air tour businesses located on Kaua'i that offer daily tours.

Table 7. Recreational Uses within Project Area

Recreational Area	Recreational Uses	Permit/ Fee Requirements	Management Priorities/Objectives
Hāʻena State Park	Beach use and hiking. Camping not allowed.	Requires advance parking and entry reservation for non-residents.	Cultural, historic, natural and scenic resources, recreational and education opportunities.
Haleleʻa Forest Reserve	Hunting and hiking. Camping not allowed.	Permits required for hunting and commercial uses.	Management of Okolehau Trail, monitoring invasive plants/animals, enhancement of native rare plant resources, maintenance of *Pritchardia* exclosure(s), and management of pig hunting.
Hono O Nā Pali Natural Area Reserve	Hiking, bird watching, hunting, volunteer service trips and guided hikes. Commercial uses allowed with SUP. Camping not allowed.	Permits required for hunting, commercial uses, or groups of 10 or more. Parking fee for non-residents.	Habitat protection, weed control and habitat restoration, rare species monitoring and collecting, education and outreach.
Kōkeʻe State Park	Hiking, camping, hunting, picnicking, wildlife viewing, fishing,	Entrance and parking fees for non-residents. Permit required for camping.	Recreational activities and natural resources.
Kuʻia Natural Area Reserve	Hiking and hunting. Camping not allowed.	Permits required for hunting, commercial uses, or groups of 10 or more. Parking fee for non-residents.	Habitat protection through game management and weed control
Līhuʻe-Kōloa Forest Reserve	Hunting, hiking, horseback riding, fishing, four-wheel driving, and commercial ecotourism. Camping not allowed.	Permits required for hunting and commercial uses.	Maintain the area for multiple uses, including watershed protection, recreation, maintenance of the Keāhua Arboretum, and possible timber and/or biomass plant production.

Recreational Area	Recreational Uses	Permit/ Fee Requirements	Management Priorities/Objectives
Nā Pali Coast State Wilderness Park	Hunting, hiking, camping, boating, wildlife viewing.	Requires advance parking and entry reservation or camping permit.	Outdoor recreation and heritage opportunities.
Nā Pali-Kona Forest Reserve	Hunting, hiking, horseback riding, fishing, biking, camping, picnicking	Permits required for camping, hunting, and commercial uses.	Watershed values, native ecosystems, Threatened, Endangered, and rare species management, resource protection, invasive species control, game management, commercial activity, and public activity.
Nā Pali-Kona Forest Reserve/Alakaʻi Wilderness Preserve	Hiking, camping, hunting	Permits required for camping, hunting, and commercial uses.	Protection of high-quality native ecosystems and rare and endangered endemic plants and animals; outdoor recreation is heavily restricted.
Puʻu Ka Pele Forest Reserve	Hunting, hiking, camping, picnicking, bird watching, fishing, horseback riding, biking	Permits required for camping, hunting, and commercial uses.	Native species conservation, recreational hunting, forestry, and other recreational activities

Sources: DLNR 2018, 2022a, 2022b, 2022c; DOFAW 2009a, 2009b, 2011a, 2013, 2022a, 2022b, 2022c

4.6.1.1 FOREST PRESERVES/WILDERNESS PRESERVE

DOFAW manages forest preserves for multiple uses, including recreational and hunting opportunities, aesthetic benefits, watershed restoration, wildlife habitat protection and management, cultural resources, and fire protection among many other things (DOFAW 2022d). Forest preserves within the project area include Haleleʻa Forest Reserve, Līhuʻe-Kōloa Forest Reserve, Nā Pali-Kona Forest Reserve, and Puʻu Ka Pele Forest Reserve. Recreational uses that occur within these forest reserves include hunting, hiking, camping, picnicking, horseback riding, fishing, bird watching, four-wheel driving, and commercial ecotourism. Hunting and hiking are allowed within all forest preserves in the project area; other uses are only allowed in certain forest preserves as shown in Table 7.

The Alakaʻi Wilderness Preserve is situated within the boundaries of the Nā Pali-Kona Forest Reserve and is managed as a sub-unit of the forest preserve; these two areas collectively make up 33% of the project area. Most of the recreational use in the Nā Pali-Kona Forest Reserve occurs outside of the wilderness area due to a greater number of roads and trails making it more accessible to the public. Recreational use of the wilderness preserve occurs to a lesser degree due

to limited access and more restrictive policies in place to protect its high-quality native habitat and associated rare and endangered endemic species.

4.6.1.2 NATURAL AREA RESERVES

DOFAW manages natural area reserves primarily for the protection of unique native ecosystems, geologic features, and rare and endemic species. Public access and recreational uses are heavily regulated to protect sensitive resources. Commercial recreational uses may be allowed subject to Special Use Permit (SUP) approval (DOFAW 1997).

4.6.1.3 STATE PARKS/WILDERNESS PARKS

Hawai‘i State Parks and Wilderness Preserves are managed for outdoor recreation and heritage opportunities. State Parks are easily accessible and generally include more visitor amenities than at Forest Reserves or Natural Area Reserves (e.g., restrooms, picnic tables, water fountains, trash cans). Visitor use (including both day use and overnight use) is managed through a system of fees and permits.

4.6.1.4 RELEVANT ASPECTS OF VISITOR USE AND EXPERIENCE

Except for air tours, all other land-based recreational uses in the project area tend to be concentrated near established roads, trails, public campsites, day use areas, and other established facilities, all of which are distributed throughout the public portions of the project area. Hiking outside of designated trials is generally discouraged in all recreational use areas due to the potential for natural hazards.

All of the recreational use areas identified within the project’s footprint are within unique native ecosystems that provide visitors with an experience of wild and scenic natural beauty; the levels of remoteness, however, vary throughout the project area, with more accessible areas in Kōke‘e State Park and less accessible areas at higher elevations in the Alaka‘i Wilderness Preserve. Commercial helicopter tour flights and helicopters used by natural resource managers frequently fly over the entire project area daily. Visitors seeking solitude may experience slightly increased noise levels associated with aerial release. To the greatest extent possible, pedestrian releases will occur in areas that are not heavily used by visitors, to reduce the potential for disturbance to visitors.

Given the high-quality habitat conditions in the project area (see Section 4.1.1), bird watching is an activity provided by all recreational use areas. In addition, biting mosquitoes are generally considered a nuisance by visitors. Night-biting species such as the southern house mosquito are primarily a nuisance for overnight campers who are present in the night and early morning hours. Hunters with dogs who camp overnight are also uniquely vulnerable to southern house mosquitoes since they can transmit heartworm (*Dirofilaria immitis*) to dogs. Reducing the abundance of southern house mosquitoes would be a benefit to recreational users of these areas.

4.6.2 Potential Impacts from No-Action Alternative

Under the no-action alternative, recreational uses that occur within the project area would continue as described in the affected envirnment section 4.6.1, subject to future changes resulting

from management actions and the influence of other socioeconomic factors (e.g., tourism industry).

4.6.3 Potential Impacts from Proposed Action

The proposed action would have both beneficial and adverse effects on wilderness and recreation. The project would adversely affect the visitor experience for land-based recreationists (e.g., campers, hikers, hunters) through increased human activity and noise (e.g., from people, vehicles, drones, and aircraft). The sections below discuss how these adverse effects on various user groups would vary by release strategy.

Incompatible male mosquitoes may be released directly or in small biodegradable packages designed to open on contact with the canopy or forest floor. Packages would be composed of weed-free, environmentally friendly material derived from plants. Although many thousands of release packages would be dropped across the project area throughout the duration of the project, the small packages would be spread diffusely, and the biodegradable material would decompose quickly given the typical rainfall patterns in the project area, making the chance of observing multiple packets unlikely. Based on the degradable nature of the delivery packages and diffuse nature of release locations, the impacts on recreationalists and the wilderness would be negligible.

The release of the male mosquitoes would not be expected to cause additional bites or nusiance to recreationalists and users of the wilderness resources. Unlike female mosquitoes that consume blood, male mosquitoes consume nectar and thus, would not be attracted to humans or pets. Localized concentrations of male mosquitoes could be expected to occur in the immediate vicinity (1 to 2 feet) of the release package as the mosquitoes emerge, but the mosquitoes would be expected to disperse within minutes.

The trails, campsites, and landing zones are typically managed by established and ongoing maintenance plans and follow State and USFWS avoidance and minimization measures (Table 5 and 6, Appendix D). Minimal additional vegetation clearing along established trails and LZs would be expected under the proposed action. Any additional trimming of vegetation that would be needed as a result of the proposed action would follow the same State and USFWS avoidance and minimization measures used by the established maintenance crews (Tables 5 and 6 and Appendix D). Based on this, the proposed action would have a minimal effect on the trails, campsites, and LZs.

No changes in public use or access to state-managed recreational areas are anticipated to be required for project operations.

Beneficial effects to land-based recreationists would include reduced female mosquito populations and associated nuisances for overnight users and hunters with dogs, as well as the potential for increased populations of native forest bird species to provide improved bird watching opportunities. This project would not have an impact on the day biting *Aedes* mosquitoes, which also pose a nuisance to visitors.

4.6.3.1 PEDESTRIAN RELEASE AND MONITORING

Pedestrian releases would be implemented by technicians and would involve the use of 4WD trucks and all-terrain vehicles. These activities would result in temporary and localized increases in human activity and noise, which may be noticeable to visitors in the immediate area. These effects would be most noticeable for visitors in more remote areas where visitation and human sources of noise are less common and unexpected. The noise effects of pedestrian releases would be less severe than those associated with aerial releases.

All adverse effects to recreationists from increased human activity and noise would be localized, temporary, and intermittent in nature since releases would be implemented in different locations throughout the project area on a weekly, bi-weekly, or monthly basis. Although adverse effects from pedestrian releases would therefore likely be noticeable to recreationists in the immediate area where releases occur, they are not expected to result in any long-term, meaningful declines to the overall visitor experience, especially when considering the countervailing beneficial effects of mosquito reductions and rebounding native bird populations.

Monitoring activities would have similar adverse effects on the visitor experience for land-based recreationists as described for pedestrian releases (see Section 4.1.3.1) since monitoring would involve the same types of vehicles, a similar number of technicians, and would occur at similar frequency and in the same locations as release sites. Implementation of monitoring, however, would also benefit recreationists by ensuring the maximum effectiveness of the ITT treatments and associated mosquito declines and rebounding native bird populations.

4.6.3.2 HELICOPTER AND FIXED-WING AIRCRAFT AERIAL RELEASE

Helicopter releases would adversely affect the visitor experience for recreationists through increased noise. The noise effects resulting from helicopter releases would be higher than with pedestrian releases. Although pedestrian releases may involve the use of helicopters for access, helicopter releases would take longer, making the duration of noise effects longer. Although the use of helicopters would also increase the overall number of aircraft operating in the project area, commercial air tour agencies are not authorized to fly their helicopters at the low altitudes necessary for release of incompatible male mosquitoes by the project. Tour operators would therefore fly well above the height or altitude necessary for project operations. Helicopter pilots, including those that would be involved in releases, also routinely communicate their locations and altitudes on a shared radio frequency for the purpose of safety. There would be no adverse effects to commercial helicopter air tour flight routes. Helicopter release methods would only be used to the extent necessary to enable access to remote locations and would not be implemented until the release mechanism technology has been fully developed and tested. Prior to aerial releases, DOFAW would notify commercial helicopter operators of program activities and recommended avoidance areas to avoid user conflicts and safety hazards.

4.6.3.3 DRONE RELEASE

Drone releases would adversely affect the visitor experience for recreationists through increased noise, although at significantly lower levels than helicopter use. The sound produced by a consumer-grade battery-powered rotary or fixed-wing drone at ground level is similar to loud highway noise (Schäffer et al. 2021). Most consumer-grade drones are far quieter than

helicopters with some being up to 40 A-weighted decibels (dBA) quieter than a manned helicopter at roughly 328 feet AGL (Airborne Drones 2020). The use of the drones themselves would not create any conflicts with air tours as they would operate below the minimum allowed altitude for helicopters (500 feet AGL [14 CFR Part 91, subpart B, Section 91.119]). The use of drones would not be implemented until the release mechanism technology has been fully developed and tested. Prior to aerial releases, DOFAW would notify commercial helicopter operators of program activities (including drone use) and recommended avoidance areas to avoid user conflicts and safety hazards. All FAA rules and DLNR Best Management Practices for drones would be followed.

4.6.4 Cumulative Impacts

Existing recreational uses in the project area would continue to occur in the future, and there are no reasonably foreseeable changes to the types of use or levels of use that are allowed to occur within the project area (see Appendix E). Ongoing and reasonably foreseeable conservation activities (i.e., ecological research, monitoring, and management) would continue to have both beneficial and adverse effects for recreational users. The project would adversely affect the visitor experience for land-based recreationists (e.g., campers, hikers, hunters) through increased human activity and noise (e.g., from people, vehicles, drones, and aircraft). Adverse effects would result from localized increases in noise and human activity when those activities are implemented in proximity to public spaces. Camping associated with project activities has the potential to have minor and infrequent overlap with public camping reservations at Waiʻalae cabin. Timing and frequency is not yet finalized and may change depending on level of mosquito control and monitoring needed. Estimated use of parking spaces at Kōkeʻe State Park would be restricted to a few spots in low-use areas and would be infrequent (KFBRP). Because of the low use, the impacts to the public are expected to be negligible. The proposed action could cause intermittent, but temporary increases in overall number of aircraft operating in the project area. Commercial air tour agencies, however, are not authorized to fly their aircraft at the low altitudes necessary for release of incompatible male mosquitoes in the project area. Rather, tour operators would fly well above the height or altitude necessary for project operations. Helicopter pilots, including those that would be involved in releases, also routinely communicate their locations and altitudes on a shared radio frequency for safety. There would be no adverse effects to commercial helicopter air tour flight routes expected to occur. There would be the possibility of visual effects for air tours if the air tour helicopter was to be present during mosquito releases. Depending on the occupants of the air tour, this may be perceived as adverse or fascinating.

Beneficial effects to existing and future recreationalists and wilderness users would result from the long-term contribution of the mosquito suppression. The suppression would be expected to improve the wilderness experience of users through the reduction of southern house mosquito bites, increased native avian wildlife and improved pollinator services. The proposed action is not expected to have adverse effects on ongoing or future hunting or resource collection activities within the project area.

4.7 Air Quality, Greenhouse Gas Emissions and Climate Change

The contemporary understanding and agreement among the scientific community is that anthropogenic sources of greenhouse gasses have been the primary cause of global temperature

increases since the mid-20th century (IPCC 2023). Regional effects of climate change are evident in the Hawaiian archipelago, and after a minor lull in the rate of climactic change in the early 2000s, a rapid warming trend appears to have resumed in 2014 (McKenzie et al. 2019). Some climate change models suggest that the mean temperatures in Hawai‘i may increase by 3°–4°C by 2100 (Hayhoe et al. 2018). The effects of climate change have been found to result in increased stress to natural systems through altered temperatures and rainfall patterns (Alexander et al. 2016). Increases in mean temperatures, for example, have facilitated the spread of mosquitoes and avian malaria into habitats where cool temperatures very recently limit mosquito presence and transmission of malaria to highly susceptible endemic forest birds (Atkinson et al. 2014).

4.7.1 Affected Environment

The project area and its lower elevation buffer zones include the highest elevation areas of Kaua‘i, comprised of State Parks, Natural Area Reserves, Wilderness Preserves and some private lands. The project area is relatively removed from many sources of air pollution other than intermittent vehicular travel, aerial tours, and resource management operations. Hawai‘i has an established statewide monitoring network to measure ambient air concentrations of pollutants, which ensures that national air quality standards are met. Monitoring stations are maintained and data are collected by the Air Quality Monitoring Section of the State Laboratories Division; the State maintained 20 air monitoring stations on four islands in 2019. Although Kaua‘i has one monitoring station, it is primarily used to measure the air quality impacts from cruise ships (State of Hawai‘i Annual Air Quality 2019 Data). Air quality in the project area is typically very good, and Kaua‘i meets National Ambient Air Quality Standards (EPA 2021). The National Ambient Air Quality Standards (NAAQS) can determine whether a region is in an air quality attainment or nonattainment area. An area is considered to be in attainment if it meets the federal standard for all criteria pollutants. Subsequently, an area is in nonattainment if it does not meet (or contributes to ambient air quality in a nearby area that does not meet) the standard. When this occurs, states must submit implementation plans to the EPA discussing programs to improve air quality within that region. The project area is currently in an area of attainment for all NAAQS.

4.7.2 Potential Impacts of the No-Action Alternative

Under the no-action alternative, no additional contribution to greenhouse gas emissions would occur beyond what is already occurring in the project area and from future foreseeable actions (Appendix E).

4.7.3 Potential Impacts from Proposed Action

Incompatible male mosquito transport to Kaua‘i from the incompatible male mosquito production facility would utilize exisiting commercial air transport services and would not be expected to increase or otherwise contribute to greenhouse gas emissions. There are several release methods included as part of the proposed action that would produce greenhouse gas emissions. These actions include motor vehicle transport of personnel for release and monitoring activities, helicopter transport of personnel for pedestrian release to remote sites, and helicopter or fixed wing release of incompatible male mosquitoes. Greenhouse gas emissions associated with each of these modes of transport would be intermittent and temporary in nature in the

project area. Releases by fixed wing aircraft, if deployed as an application method has the potential to be the most efficient release option for the project area, resulting in diminished fossil fuel consumption and a sizable, reduced amount of time needed for applications. However, important factors such as incompatible male mosquito viability using this release method are still under development and testing.

Helicopter release would be used when other options such as pedestrian or drone release are not available to meet release needs or these alternate release methods could not be used to access the release sites. The flight time of the helicopter conducting releases would not be expected to exceed three flights during a day. Mosquito release flights would be limited to daytime hours and helicopters or fixed-wing aircraft. The proposed action would initially rely on pedestrian and helicopter or fixed-wing aircraft release, but over time would be expected to pivot to the use of drones as the primary incompatible male mosquito release method based on monitoring. Drones, which are battery powered, do not directly burn fossil fuel and do not generate fuel emissions. Helicopters, however, would still be needed to transport monitoring and support staff to some remote locations that are inaccessible by vehicle, and for occasional incompatible male mosquito release. Effects resulting from this relatively limited number of flights would be negligible compared to ongoing daily commercial (air tour) flights on Kaua‘i, and well below federal reporting requirements for greenhouse gases (25,000 metric tons of CO2 emitted annually, 74 FR 56260).

4.7.4 Cummulative impacts

The project area has ongoing and foreseeable managment actions that produce greenhouse gases. In addition, air tours frequently fly over the area, though their frequency is variable because of weather, FAA regulations, demand, and other factors that may limit or affect flight operations. Although some management actions would result in emissions of criteria pollutants pursuant to the Clean Air Act, the greenhouse gas contributions resulting from the use of helicopters, fixed wing, and other motorized vehicles, would be extremely low and would lead to impacts on air quality and greenhouse gas emissions below nominal levels. Consistent with the interim National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change issued January 9, 2023 (88 FR 1196), the USFWS was guided by the rule of reason in developing this analysis commensurate with the (low) quantity of projected greenhouse gas emissions associated with the proposed action. Conducting an in-depth, quantitative analysis of emissions was not considered proportionate to the insignificant quantity of emissions that the proposed action would be expected to contribute. The additional contribution to the cummulative greenhouse gas emmissions to the existing and foreseeable future projects in the area would be expected to be negligible.

Though climate change and associated adverse impacts have and will continue to affect specific resources on Kaua‘i and within the project area (Alexander et a. 2016, Pauchard et al. 2016), greenhouse gases from helicopter, fixed wing aircraft and motor vehicle emissions associated with the proposed action are not expected to have a measurable effect on global climate change or local climatic conditions. Although, for example, the release of incompatible male mosquitoes would result in some fossil fuel consumption, the associated greenhouse gas emissions would be negligible because of the comparatively limited number of flights anticipated, compared to ongoing daily commercial (air tours) flights on Kaua‘i. Based on the considerations discussed

above, air quality, greenhouse gas emissions, and climate change were dismissed from detailed analysis as an impact topic.

4.8 Environmental Justice

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Executive Order 12898 and supplemental Executive Order 14096 are Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, provides that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations." A minority population exists within an affected area when either the minority population exceeds 50%, or the minority population is meaningfully greater than the minority population of the general population (CEQ 1997).

According to EJScreen, EPA's Environmental Justice Screening and Mapping Tool, census block groups (environmental justice communities) within and around the project area on Kaua'i are comprised of populations where at least 50% of the population is considered a minority. Therefore, environmental justice communities exist in the study area.

4.8.1 Potential impacts from No-Action Alternative

Under the no-action alternative, residents (including environmental justice communities) that use or reside within the project area and its buffer zone would continue to experience a decrease in native bird species and presence of southern house mosquitoes, and ongoing and future activities resulting from management actions and air tour management actions.

4.8.2 Potential impacts from Proposed Alternative

The proposed action involves the use of pedestrians, drones, helicopters, and fixed-wing aircraft to release incompatible mosquitoes for the purpose of suppressing non-native mosquitoes and the spread of avian malaria. The mosquitoes that would be released provide no threat to the public as they would be male mosquitoes, which do not bite and do not transmit disease to humans.

While the suppression of avian malaria should result in a positive overall impact on the project area ecosystem on Kaua'i, mosquito release methods would involve the use of aircraft, which could adversely impact the public who are utilizing public and private lands during project implementation. These potential impacts would mostly be due to the daytime noise or visual disturbance from aircraft. Aerial operations associated with ongoing maintenance and management already occur on state and private lands on Kaua'i. Areas that have high recreational use and are accessible by vehicles would use pedestrian release methods to deploy mosquitoes, which would reduce the potential for noise and visual disturbance from aircraft. Increase in noise and visual impacts would primarily affect only those members of the environmental justice community that are actively utilizing the project area or those residing near the project area that may hear or see the intermittent implementation of the proposed action.

Helicopter use and drone use associated with the proposed release actions would occur during daytime hours and would not occur at night.

The intent and expected outcome of this project is to avoid the extinction of Hawaiian forest birds, which is identified as an important ecological and cultural resource by the Native Hawaiian community. Native Hawaiians identify forest birds as ‘ohana (family), kūpuna (ancestors), and ‘aumākua (familial gods), and their unique habitats are revered as sacred places for the cultural ecological services they provide. The preservation of these species has been identified as a priority by Native Hawaiian community leaders (Paxton et al. 2022). For this reason, the proposed action would have a beneficial impact to the environmental justice community.

4.8.3 Cumulative impacts

Although the release of incompatible male mosquitoes would result in increased human activity and noise (e.g., air, vehicle and pedestrian traffic), the project area is remote, away from residential communities, limited in access and does not incur much human use. Additionally, there is no evidence to suggest the release of incompatible male mosquitoes on Kaua‘i would have impacts to the human health of the environmental justice community. Expected benefits to the environmental justice community from long-term mosquito suppression include improved recreational use through the reduction of southern house mosquito bites, reduced likelihood of mosquito-borne disease transmission, increased native avian wildlife and improved pollinator services. When combined with the effects of the proposed action, the overall cumulative effect on environmental justice communities would be beneficial. Native forest bird populations are a culturally and economically significant element of Kauai’s forests, and their continued survival would enrich and perpetuate the intrinsic value of the natural and cultural landscape. Based on this, the cumulative impacts of the proposed action in addition with known past, ongoing, and future activities are not expected to appreciably increase adverse impacts to environmental justice communities in the project area.

5 CONSISTENCY WITH EXISTING LAND USE, PLANS, AND POLICIES

5.1 National Environmental Policy Act

The NEPA process requires evaluation of federally funded actions including assessing alternatives (e.g., proposed and no-action alternatives). NEPA also requires the disclosure to the public of impacts on the human environment as a result of the alternatives considered. This process is documented in the environmental analysis presented in an EA or EIS. This EA has been prepared in compliance with NEPA, current CEQ (40 CFR 1500-1508) and DOI NEPA Regulations (43 CFR Part 46), and USFWS directive manual 550 FW 1-3 and 505 FW 1-5. Pursuant to NEPA and associated implementing regulations and USFWS policy, this EA presents the analysis of the proposed project and alternatives including the no-action alternative. This EA evaluates impacts anticipated from all alternatives to inform decision makers and the public using an interdisciplinary approach to address all aspects of the human environment

relevant to the potential impacts of the proposed project. The direct, indirect, and cumulative impacts of the proposed project are analyzed and presented within the document.

5.2 Section 106 of the National Historic Preservation Act

Compliance with Section 106 of the National Historic Preservation Act is conducted in consultation with the Hawaiʻi State Historic Preservation Division (SHPD), Native Hawaiian Organizations, and individuals with familial/traditional ties to Kauaʻi and the project area. Pursuant to 36 CFR § 800.2(c)(4), USFWS has authorized DOFAW to initiate and conduct Section 106 consultation with the State Historic Preservation Officer (SHPO) and others but remains legally responsible for all findings and determinations (Appendix G). As part of this procedure, DOFAW will initiate the Section 106 process, identify historic properties and produce an assessment of potential adverse effect (36 CFR §§ 800.3 through 800.5) to the SHPD.

Registered historic properties that occur in the project area range from traditional Native Hawaiian habitation sites to Civilian Conservation Corps-era rustic cabins (Table 8). As outlined in Section 4.4, although most of the project area has not been archaeologically surveyed, habitation and intensive cultivation were concentrated in valleys and along the coast during the pre-contact and early post-contact periods. The high elevation forests that comprise the majority of the project area were not intensively utilized by Native Hawaiians. Many of the activities that took place in the uplands were temporary, ephemeral, and left little to no trace on the archaeological record. Nearly all documented archaeological sites within the project area are located in Kalalau Valley. Two registered historic properties are located in Kōkeʻe State Park within the project area: Camp Sloggett, located southwest of HI 550 and the Civilian Conservation Corps Camp along HI 550.

Table 8. Registered Historic Properties in the Project Area.

Site Name	SIHP Number	Restricted Access
Nā Pali Coast Archaeological District	50-30-02-03200	Yes
Waimea Valley Complex	50-30-06-00035	No
Camp Sloggett, Kōkeʻe	50-30-06-09395	No
Civilian Conservation Corps Camp, Kōkeʻe	50-30-06-09392	No

The potential physical impacts that the proposed project would have on these sites, both archaeologically and culturally, would be no greater than that caused by the current level of use by the public and by DOFAW and its project partners in maintaining the State Parks, Forest Reserves, and Natural Area Reserves within the project area. All activities associated with the project would be located well away from known cultural sites and no ground-disturbing activities would occur. It is therefore anticipated that no cultural and historic sites will be physically impacted by the project. Given that not all of the project area has been archaeologically surveyed, it is possible that previously unrecorded sites could be present in the vicinity of the access routes where project activities would take place. Potential impacts to cultural and historic

sites would be effectively avoided and minimized through the implementation of the measures outlined in Table 5 and Appendix B.

5.3 Endangered Species Act

The Endangered Species Act (ESA) provides broad protection for plants, fish, and wildlife that have been listed as threatened or endangered in the United States or elsewhere and conserves ecosystems on which these species depend (16 United States Code 1531–1544). The USFWS has participated in the development of this EA and provided input on the development of alternatives, impacts to threatened and endangered species, and mitigation measures to minimize species impacts. Formal intra-Service ESA Section 7 consultation would occur once a formal application for funding for the selected alternative is submitted to the USFWS. The proposed action has the potential to stabilize and assist in the recovery of listed and non-listed Hawaiian honeycreeper species. The proposed action would also potentially benefit the recovery of listed native plant species that depend on these avian species for pollination and seed dispersal. Any potential adverse impact on listed native plant and animal species would be avoided and minimized through the measures outlined in Tables 5 and 6 and Appendix D. Take of listed species is therefore not reasonably certain to occur.

5.4 Migratory Bird Treaty Act

The MBTA prohibits the take of migratory birds. A list of birds protected under MBTA regulations is provided in 50 CFR 10.13. Unless permitted by regulations, it is unlawful under the MBTA to pursue, hunt, take, capture, or kill; attempt to take, capture, or kill; possess, offer to or sell, barter, purchase, deliver, or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product. The USFWS does not currently have a comprehensive program under the MBTA to permit the take of migratory birds by otherwise lawful activities. Conservation measures proposed by DLNR to avoid or minimize impacts to MBTA species are included in Appendix D. The proposed action could potentially stabilize populations of six Hawaiian honeycreeper species that are listed under the MBTA. The proposed action may benefit native seabirds (e.g., koa‘e kea, white-tailed tropicbird [*Phaethon lepturus*]) and other impacted native bird species that are included within the MBTA by reducing adverse interactions with southern house mosquitoes. Although the proposed action will potentially adversely impact MBTA species, significant adverse impacts will be avoided and mimimized through the implementation of the measures outlined in Tables 5 and 6 and Appendix D.

5.5 State Regulations

5.5.1 Hawai‘i Coastal Zone Management Program (HRS 205A)

The Hawai‘i Coastal Zone Management (CZM) Program (HRS Chapter 205A) was promulgated in 1977 in response to the Federal Coastal Zone Management Act of 1972. Hawai‘i’s CZM area encompasses the entire state, including all marine waters seaward to the extent of the state’s police power and management authority, including the 12-mile U.S. territorial sea and all archipelagic waters. The purpose of the SMA permit is to ensure that uses, activities, and operations within the SMA are carried out in compliance with the state’s CZM law (HRS 205A).

SMA permits regulate permissible land uses that are already allowed by land use policies, taking into account zoning designations, county general plans, and community plans. Although the project is located within the Special Management Area (SMA), no development or ground disturbance will occur.

5.5.2 Hawai'i Revised Statutes, Chapter 343

The State of Hawai'i EIS law, HRS Chapter 343, was developed "to establish a system of environmental review that would ensure that environmental concerns are given appropriate consideration in decision making along with economic and technical considerations" (HRS 343-1). This chapter requires the development of an EA or EIS that discloses the effects of a proposed action, including the cumulative and overall effects, relative to an established set of 13 significance criteria, as defined in 11 HAR 200-12. HRS 343 also mandates that state agencies consider the potential effects of a proposed action on cultural practices as part of the environmental review process. Act 50 of the Session Laws of Hawai'i (A Bill for an Act Relating to EISs) clarifies that "the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawai'i's culture, and traditional and customary rights" and stresses the need to include consideration of cultural resources, customs, practices, and beliefs as part of the EA and EIS process. As part of the project's approval process, this Final EA has been prepared in accordance with HRS Chapter 343, as required under Revised Ordinances of Honolulu (ROH) Chapter 25.

6 DETERMINATION FOR HRS CHAPTER 343 COMPLIANCE

6.1 Significance Criteria and Analysis

The following is the list of applicable "significant criteria' used by the State of Hawaii, Department of Land and Natural Resources, in accordance with HEPA HAR Chapter 11-200.1, to determine if the proposed action would have a significant effect on the environment:

1. *No irrevocable commitment to loss or destruction of any natural or cultural resource would result.* The project is not expected to irrevocably commit to the loss or destruction of any natural or cultural resources. SOPs would be implemented to avoid or minimize potential impacts to natural or cultural resources.
2. *The proposed action would not curtail the range of beneficial uses of the environment.*
3. *The proposed action would not conflict with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 343, Hawai'i Revised Statutes.* The project would be in conformance with the State's long-term environmental policies and goals expressed under HRS 343.
4. *The proposed action would not substantially affect the economic or social welfare of the community or State.* The project is not anticipated to cause substantial, adverse effects to the economic or social welfare of the community or State.
5. *The proposed action would not affect public health.*

6. *No substantial secondary impacts, such as population changes or effects on public facilities, are expected.* The project is not expected to result in substantial secondary impacts to population or public facilities.
7. *No substantial degradation of environmental quality is expected due to the proposed action.* The project is not anticipated to cause substantial degradation of environmental quality.
8. *No cumulative effect on the environment or commitment to larger actions would be involved. T*he project is not anticipated to have adverse cumulative environmental effects and it is not linked to any larger action.
9. *No rare, threatened, or endangered species or their habitats would be adversely affected.* The project has the potential to reverse the population declines and likely global extinction of two endangered and one threatened Hawaiian honeycreeper species. The recovery of these bird species would potentially benefit the reproduction and recovery of mutualist-dependent listed native plant species. Adverse effects of the proposed action would be effectively mitigated through the implementation of mitigation measures.
10. *The proposed action would not detrimentally affect air or water quality, or ambient noise levels.* The project is not anticipated to result in significant adverse impacts to air or water quality. However, there would be a temporary, short-term adverse impact for recreational users within the accessible areas of the project area due to the intermittent and short-term increase in noise from helicopters and fixed-wing aircraft. These adverse impacts would be minimized to the greatest extent possible by limiting the use of helicopters and fixed-wing aircraft in favor of less intrusive drones within accessible sections of the project area. The impacts of noise from aircraft on native wildlife would be managed through the implementation of the mitigation measures in Tables 5 and 6 and Appendix D.
11. *The proposed action would not detrimentally affect environmentally sensitive areas such as floodplains, tsunami zones, beaches, erosion-prone areas, geologically hazardous lands, estuaries, fresh waters, or coastal waters.* The project is not anticipated to adversely affect environmentally sensitive areas such as floodplains, tsunami zones, beaches, erosion-prone areas, geologically hazardous lands, estuaries, fresh waters, or coastal waters.
12. *The proposed action would not substantially affect scenic vistas and view planes identified in county or state plans or studies.* The project would not adversely impact scenic vistas and view planes.
13. *There would be no requirement for substantial energy consumption.* The project would not require substantial energy consumption.

6.2 Final Determination

Based on a review of the above significance criteria in HRS Chapter 343, and HAR Section 11-200.1-13, it is anticipated that the project would not result in significant adverse effects on the natural or human environment.

7 CONSULTATION

On October 21, 2022, the DLNR and USFWS issued a preparatory notice requesting consultation for the draft EA. The notice, which included a detailed description of proposed project activities and maps of the project area, was emailed to 91 recipients and sent as hard copy letters to 22 individuals or offices. Represented in this request for consultation were at least 33 State or Kaua‘i governmental offices,14 Federal governmental offices representing the USFWS, Department of Defense, U.S. Department of Agriculture and USGS, 49 non-governmental/non-profit organizations that included 14 cultural, 29 environmental, six civic entities, and 11 for profit organizations or companies. A copy of the preparatory notice is included in Appendix H.

8 LITERATURE CITED

Ahumada, J.A., D. Lapointe, and M.D. Samuel. 2004. Modeling the population dynamics of *Culex quinquefasciatus* (Diptera: Culicidae), along an elevational gradient in Hawaii. Journal of Medical Entomology 41: 1157–1170.

AirborneDrones.co (Airborne Drones). 2020. Drone Noise Levels. https://www.airbornedrones.co/drone-noise-levels/. Accessed May 3, 2022.

Alexander, J.M., J.J. Lembrechts, L.A. Cavieres, C. Daehler, S. Haider, C. Kueffer, F. Liu, K. McDougall, A. Milbau, A. Pauchard, L. Rew, and T. Seipel. 2016. Plant invasions into mountains and alpine ecosystems: current status and future challenges. Alpine Botany 126: 89–103.

Aruch, S., C.T. Atkinson, A.F. Savage, and D.A. LaPointe. 2007. Prevalence and distribution of pox-like lesions, avian malaria, and mosquito vectors in Kipahulu Valley, Haleakala National Park, Hawai‘i, USA. Journal of Wildlife Diseases 43: 567–675.

Atkinson, C.T., K. Woods, R. Dusek, L. Sileo, W. Iko. 1995. Wildlife disease and conservation in Hawaii: Pathogenicity of avian malaria (*Plasmodium relictum*) in experimentally infected ‘i‘iwi (*Vestiaria coccinea*). Parasitology 111: S59-S69. Doi: 10.1017/S003118200007582X.

Atkinson, C.T., R. Dusek, K. Woods, W. Iko. 2000. Pathogenicity of avian malaria in experimentally infected Hawai‘i ‘amakihi. Journal of Wildlife Diseases 36: 197–204.

Atkinson, C.T. and D. LaPointe. 2009. Introduced avian diseases, climate change, and the future of Hawaiian honeycreepers. Journal of Avian Medicine and Surgery 23: 53–63.

Atkinson, C.T., K.S. Saili, R.B. Utzurrum, S.I. Jarvi. 2013. Experimental evidence for evolved tolerance to avian malaria in a wild population of low elevation Hawai’i amakihi (*Hemignathus virens*). EcoHealth 10(4): 366–75.

Atkinson, C.T., R.B. Utzurrum, D.A. Lapointe, R.J. Camp, L.H. Crampton, J.T. Foster, T.W. Giambelluca. 2014. Changing climate and the altitudinal range of avian malaria in the Hawaiian Islands – an ongoing conservation crisis on the island of Kaua‘i. Global Change Biology 20: 2426–2436.

Atkinson C.T, W. Watcher-Weatherwax, and D. LaPointe. 2016. Genetic diversity of *Wolbachia* endosymbionts in *Culex quinquefasciatus* from Hawai‘i, Midway Atoll and American Samoa. University of Hawai‘i at Hilo Technical Report HCSU-074.

Atyame, C.M., Duron, O., Tortosa, P., Pasteur, N., Fort, P. and Weill, M., 2011. Multiple *Wolbachia* determinants control the evolution of cytoplasmic incompatibilities in *Culex pipiens* mosquito populations. Molecular Ecology, 20(2), pp.286-298.

Atyame, C.M., J. Cattel, C. Lebon, O. Flores, J.S. Dehecq, M. Weill, L.C. Gouagna, and P. Tortosa. 2015. *Wolbachia*-based population control strategy targeting *Culex*

quinquefasciatus mosquitoes proves efficient under semi-field conditions. PLoS ONE 10: e0119288 https://doi.org/10.1371/journal.pone.0119288

Bache, M. 2022. Email communication between Molly Bache, Program Manager at Save Our Shearwaters and Richard Pender, Ecologist at SWCA Environmental Consultants, Honolulu, Hawai'i in June 2022.

Banko, P.C., K.A. Jaenecke, R.W. Peck, and K.W. Brink. 2019. Increased nesting success of Hawai'i 'elepaio in response to the removal of invasive black rats. Condor 121: 1–12.

Barton, K.E., A. Westerband, R. Ostertag, E. Stacy, K. Winter, D.R. Drake, L.B. Fortini, C.M. Litton, S. Cordell, P. Krushelnycky, K. Kawelo, K. Feliciano, G. Bennet, and T. Knight. 2021. Hawai'i forest review: synthesizing the ecology, evolution, and conservation of a model system. Perspectives in Plant Ecology, Evolution, and Systematics: 52 (2021) 125631

Becker, J. 1995. Factors influencing the distribution of larval mosquitos of the genera *Aedes*, *Culex* and *Toxorhynchites* (Dipt., Culicidae) on Moorea. Journal of Applied Entomology 119: 527-532.

Becker, N., D. Petric, M. Zgomba, C. Boase, M.B. Madon, C. Dahl, and A. Kaiser. 2020. Mosquitoes: Identification, Ecology and Control. Third Edition. Springer Nature, Cham, Switzerland. 570 pp.

Beebe, N.W., D. Pagendam, B.J. Trewin, A. Boomer, M. Bradford, A. Ford, C. Liddington, A. Bondarenco, P.J. De Barro, J. Gilchrist, C. Paton, K.M. Staunton, B. Johnson, A.J. Maynard, G.J. Devine, L.E. Hugo, G. Rasic, H. Cook, P. Massaro, N. Snoad, J.E. Cawford, B.J. White, Z. Xi, and S.A. Ritchie. 2021. Releasing incompatible males drives strong suppression across populations of wild and *Wolbachia*-carrying *Aedes aegypti* in Australia. Proceedings of the National Academy of Sciences of the United States of America 118: https://doi.org/10.1073/pnas.2106828118

Belkin, J.N. 1962. The mosquitoes of the South Pacific (Diptera, Culicidae), 2. Xii+608 pp.

Bennett, G.M., Pantoja, N.A. and O'Grady, P.M. 2012. Diversity and phylogenetic relationships of *Wolbachia* in *Drosophila* and other native Hawaiian insects. Fly 6: 273–283.

Benning, T.L., D. LaPointe, C.T. Atkinson, and P.M. Vitousek. 2002. Interactions of climate change with biological invasions and land use in the Hawaiian Islands: Modeling the fate of endemic birds using a geographic information system. PNAS 99: 14246–14249.

Bouyer, J., N.J. Culbert, A.H. Dicko, M.G. Pacheco, J. Virginio, M.C. Pedrosa, L. Garziera, A.M. Pinto, A. Klaptocz, J. Germann and T. Wallner. 2020. Field performance of sterile male mosquitoes released from an uncrewed aerial vehicle. Science Robotics 5: p.6251.

Camp, R.J., T.K. Pratt, P.M. Gorresen, J.J. Jeffrey, and B.L. Woodworth. 2010. Population trends of forest birds at Hakalau Forest National Wildlife Refuge, Hawai'i. Condor 112: 196–212.

[CDC] Centers for Disease and Control. 2013. West Nile Virus in the United States: Guidelines for Surveillance, Prevention, and Control. Fourth Revision, June 14, 2013. Available at: https://www.cdc.gov/westnile/resources/pdfs/wnvGuidelines.pdf. Accessed January 2023.

[CDC] Centers for Disease and Control. 2022a. Mosquitoes in the United States. https://www.cdc.gov/mosquitoes/about/mosquitoes-in-the-us.html. Accessed 8 August 2022.

[CDC] Centers for Disease and Control. 2022b. West Nile Virus. Available at: https://www.cdc.gov/westnile/index.html. Accessed December 2022.

[CDC] Centers for Disease and Control. 2022c. ArboNET Diseases Map, National Arbovirus Surveillance System. Available at: https://wwwn.cdc.gov/arbonet/Maps/ADB_Diseases_Map/index.html. Accessed December 22, 2022.

Crawford, J.E., D.W. Clarke, V. Criswell. et al. 2020. Efficient production of male *Wolbachia*-infected *Aedes aegypti* mosquitoes enables large-scale suppression of wild populations. Nature Biotechnology. https://doi.org/10.1038/s41587-020-0471-x

[DOH] Department of Health. 2022a. Dengue. Available at: https://health.hawaii.gov/docd/disease_listing/dengue/. Accessed December 22, 2022.

[DOH] Department of Health. 2022b. Chikungunya. Available at: https://health.hawaii.gov/docd/disease_listing/chikungunya/. Accessed December 22, 2022.

[DOH] Department of Health. 2022c. Zika Virus. Available at: https://health.hawaii.gov/docd/disease_listing/zika-virus/. Accessed December 22, 2022.

[DOH] Department of Health. 2022d. Mosquito-Transmitted. Available at: https://health.hawaii.gov/docd/disease-types/mosquito-transmitted/. Accessed December 22, 2022.

[DOH] Department of Health. 2022e. West Nile Virus. Available at: https://health.hawaii.gov/docd/disease_listing/west-nile-virus/. Accessed December 22, 2022.

[DLNR] Department of Land and Natural Resources. 2014. Kōke'e and Waimea Canyon State Parks Master Plan. Prepared by R.M. Towill Corporation and the Division of State Parks, Department of Land and Natural Resources. 585 pp. Available at: https://dlnr.hawaii.gov/dsp/files/2015/03/hsp_Kokee_master_plan_final.pdf

[DLNR] Department of Land and Natural Resources. 2018. Hā'ena State Park Master Plan Final Report. May 2018. Available at: https://dlnr.hawaii.gov/dsp/files/2018/03/Haena-MP-FINAL.pdf. Accessed December 22, 2022.

[DLNR] Department of Land and Natural Resources. 2022a. Koke'e State Park. Available at: https://dlnr.hawaii.gov/dsp/parks/kauai/kokee-state-park/. Accessed December 22, 2022.

[DLNR] Department of Land and Natural Resources. 2022b. Nāpali Coast State Wilderness Park. Available at: https://dlnr.hawaii.gov/dsp/parks/kauai/napali-coast-state-wilderness-park/park-info/. Accessed December 22, 2022.

[DLNR] Department of Land and Natural Resources. 2022c. Welcome to Hawai‘i State Parks. Available at: https://dlnr.hawaii.gov/dsp/. Accessed December 22, 2022.

[DOFAW] Division of Forestry and Wildlife. 1997. Management Policies of the Natural Area Reserves System. May 23. 1997. Available at: https://dlnr.hawaii.gov/ecosystems/files/2013/08/Management-Policies-of-the-Natural-Area-Reserves-System.pdf. Accessed December 22, 2022.

[DOFAW] Division of Forestry and Wildlife. 2009a. Na Pali-Kona Forest Reserve Management Plan. November 2009. Available at: https://dlnr.hawaii.gov/forestry/files/2013/02/NPK_FINAL_small-file.pdf. Accessed December 22, 2022.

[DOFAW] Division of Forestry and Wildlife. 2009b. Pu‘u ka Pele Forest Reserve Management Plan. November 2009. Available at: https://dlnr.hawaii.gov/forestry/files/2013/02/PKP-FINAL_small-file.pdf. Accessed December 22, 2022.

[DOFAW] Division of Forestry and Wildlife. 2011a. Hono O Nā Pali Natural Area Reserve (NAR) Management Plan. November 2011. Available at: https://dlnr.hawaii.gov/ecosystems/files/2013/07/Hono-O-Na-Pali-Management-Plan-2012-.pdf. Accessed December 22, 2022.

[DOFAW] Division of Forestry and Wildlife. 2011b. DOFAW Field Operations Handbook Safety and Health Guidelines. Department of Land and Natural Resources, Division of Forestry and Wildlife. Honolulu, Hawai‘i.

[DOFAW] Division of Forestry and Wildlife. 2013. Kuia Fact Sheet. Available at: https://dlnr.hawaii.gov/ecosystems/files/2013/08/Kuia-Fact-Sheet.pdf. Accessed December 22, 2022.

[DOFAW] Division of Forestry and Wildlife. 2022a. Halele'a Forest Reserve. Available at: https://dlnr.hawaii.gov/forestry/frs/reserves/kauai/halelea/. Accessed December 22. 2022.

[DOFAW] Division of Forestry and Wildlife. 2022b. Kuia Natural Area Reserve. Available at: https://dlnr.hawaii.gov/ecosystems/nars/kauai-2/kuia-2/. Accessed December 22, 2022.

[DOFAW] Division of Forestry and Wildlife. 2022c. Līhu‘e-Kōloa Forest Reserve. Available at: https://dlnr.hawaii.gov/forestry/frs/reserves/kauai/lihue-koloa/. Accessed December 22, 2022.

[DOFAW] Division of Forestry and Wildlife. 2022d. Forest Reserve System. Available at: https://dlnr.hawaii.gov/forestry/frs/. Accessed December 22, 2022.

Dine, D.L.V., 1904. Mosquitoes in Hawaii. Bulletin of the Hawaii agricultural experimental station 6:30.

Ding, H., H. Yeo, and N. Puniamoorthy. 2020. *Wolbachia* infection in wild mosquitoes (Diptera: Culicidae): implications for transmission modes and host-endosymbiont associations in Singapore. Parasites & Vectors 13: 612. https://doi.org/10.1186/s13071-020-04466-8

EPA. 2021. Current Nonattainment Counties for All Criteria Pollutants. Available at: https://www3.epa.gov/airquality/greenbook/ancl.html.

Evenhuis, N.L. and D.A. Polhemus. 1994. Review of the endemic Hawaiian genus *Sigmatineurum* Parent (*Diptera: Dolichopodidae*). Bishop Museum Occasional Papers Number 37. Bishop Museum Press. Honolulu, Hawai'i. 19 pp.

Federal Aviation Administration (FAA). 2021. Wildlife Strikes to Civil Aircraft in the United States 1990-2019. Federal Aviation Administration, National Wildlife Strike Database, Serial Report Number 26. February 2021. Available at: https://www.faa.gov/airports/airport_safety/wildlife/wildlife_strikes_civil_aircraft_united_states_1990_2021. Accessed January 2023.

Fortini, L.B., A.E. Vorsino, F.A. Amidon, E.H. Paxton, J.D. Jacobi. 2015. Large-scale range collapse of Hawaiian forest birds under climate change and the need for 21st Century conservation options. PLoS ONE 10: e0140389. doi:10.1371/journal.pone.0140389.

Freed, L.A., R.L. Cann, and G.R. Bodner. 2008. Incipient extinction of a major population of the Hawaii akepa owing to introduced species. Evolutionary Ecology Research 10: 931–965.

Gallardo Cruz, K.V., K.L. Paxton, and P.J. Hart. 2021. Temporal changes in songbird vocalizations associated with helicopter noise in Hawai'i's protected natural areas. Landscape Ecology 36:829–843.

Gillespie, R.G. 1992. Distribution and diversity of an endemic lineage of invertebrate predators in the Natural Area Reserves of Hawai'i. Report to the Natural Area Reserves System.

Goff, M. L., and C. van Riper, III. 1980. Distribution of mosquitoes (Diptera: Culicidae) on the east flank of Mauna Loa volcano. Pacific Insects 22: 178–188.

Gomes, Noah. 2016. "Some Traditional Native Hawaiian Bird Hunting Practices on Hawai'i Island." The Hawaiian Journal of History Vol. 50: 33–51.

Gon, S.M. III., A. Allison, R.J. Cannarella, J.D. Jacobi, K.Y. Kaneshiro, M.H. Kido, M. Lane-Kamahele, and S.E. Miller. 2006. A GAP Analysis of Hawaii—Final Report. U.S. Geological Survey, Research Corporation of the University of Hawai'i.

Hayhoe, K., D.J. Wuebbles, D.R. Easterling, D.W. Fahey, S. Doherty, J. Kossin, W. Sweet, R. Vose, and M. Wehner. 2018. Our Changing Climate. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 72–144.

Hilgenboecker, K., P. Hammerstein, P. Schlattmann, A. Telschow, J.H. Werren. 2008. How many species are infected with *Wolbachia*? A statistical analysis of current data. FEMS Microbiology Letters 281: 215–20. doi: 10.1111/j.1574-6968.2008.01110.x.

Hoffmann, A.A., I. Iturbe-Ormaetxe, A.G. Callahan, B.L. Phillips, K. Billington. et al. 2014. Stability of the *w*Mel *Wolbachia* infection following invasion into *Aedes aegypti* populations. PLOS Neglected Tropical Diseases 8: e3115. https://doi.org/10.1371/journal.pntd.0003115

Intergovernmental Panel on Climate Change (IPCC). 2023. Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II, III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Lee H., Core Writing Team, P. Arias (ed.)]. IPCC, Geneva, Switzerland, 85 pp.

Kaushik, M., L. Pejchar, and Crampton L.H. 2018. Potential disruption of seed dispersal in the absence of a native Kauai thrush. PLoS ONE 13: e0191992. https://doi.org/10.1371/journal. pone.0191992

Kittayapong, P., N,-o. Kaeothaisong, S. Ninphanomchai, and W. Limohpasmanee. 2018. RCombined sterile insect technique and incompatible insect technique: sex separation and quality of sterile Aedes aegypti male mosquitoes released in a pilot population suppression trial in Thailand. Parasites & Vectors 11: 73–83. https://doi.org/10.1186/s13071-018-3214-9

Klassen, L., Z. Kambris, P.E., Cook, T. Walker, S.P. Sinkins. 2009. Horizontal gene transfer between *Wolbachia* and the mosquito *Aedes aegypti*. BMC Genomics 10: 33. doi:10.1186/1471-2164-10-33

Kozek, J.W., R.U. Rao. 2007. The discovery of *Wolbachia* in arthropods and nematodes – a historical perspective. Issues in Infectious Diseases 5: 1–14.

Lafferty, K.D., J. McLaughlin, D.S. Gruner, T.A. Bogar, A. Bui, J.N. Childress, M. Espinoza, E.S. Forbes, C.A. Johnston, M. Klope, A. Miller-ter Kuile, M. Lee, K.A. Plummer, D.A. Weber, R.T. Young, and H.S. Young. 2018. Local extinction of the Asian tiger mosquito (*Aedes albopictus*) following rat eradication on Palmyra Atoll. Biology Letters 14: 20170743.

LaPointe, D. 2000. Avian malaria in Hawaii: the distribution, ecology and vector potential of forest-dwelling mosquitoes. Ph.D. thesis, University of Hawai‘i, Honolulu, Hawai‘i.

LaPointe, D.A., M.L. Goff, and C.T. Atkinson. 2005 Comparative susceptibility of introduced forest-dwelling mosquitoes in Hawai‘i to avian malaria, *Plasmodium relictum*. Journal of Parasitology 91: 843-849.

LaPointe, D.A., Hofmeister, E.K., Atkinson, C.T., Porter, R.E. and Dusek, R.J., 2009. Experimental infection of Hawai‘i Amakihi (*Hemignathus virens*) with West Nile virus and competence of a co-occurring vector, *Culex quinquefasciatus*: potential impacts on endemic Hawaiian avifauna. Journal of Wildlife Diseases 45: pp.257-271.

LaPointe, D.A., M.L. Goff, and C.T. Atkinson. 2010. Thermal constraints to the sporogonic development and altitudinal distribution of avian malaria *Plasmodium relictum* in Hawai’i. Journal of Parasitology 96: 318–324.

LaPointe, D.A., C.T. Atkinson, M.D. Samuel. 2012. Ecology and conservation biology of avian malaria. Annals of the New York Academy of Sciences 1249: 211–226.

Laven, H. 1967. Eradication of *Culex pipiens fatigans* through cytoplasmic incompatibility. Nature 216: 383–384.

Lerner, H.R.L., M. Meyer, H.F. James, M. Hofreifer, and R.C. Fleischer. 2011. Multilocus resolution of phylogeny and timescale in the extent adaptive radiation of Hawaiian honeycreepers. Current Biology 21: 1838–1844.

Liao, W., T.O.E. Timm, C. Zhang, C.T. Atkinson, D.A. LaPointe, M.D. Samuel. 2015. Will a warmer and wetter future cause extinction of native Hawaiian forest birds? Global Change Biology 21: 4342–4352.

Loope, L. 2016. Guidance document for rapid ‘ōhi‘a death: Background for the 2017-2019 strategic response plan. College for Tropical Agriculture and Human Resources, University of Hawaii at Mānoa. Honolulu, Hawai‘i.

Mains, J.W., C.L. Brelsfoard, R.I. Rose, S.L. Dobson. 2016. Female adult *Aedes albopictus* suppression by *Wolbachia*-infected male mosquitoes. *S*cientific Reports 6: 33846. https://doi.org/10.1038/srep33846.

Major, M., A. Carpenter. 1999. Archaeological Monitoring Report for Kalalau Valley, Nā Pali Coast State Park, Kaua‘i, *TMK: 5-9-01-02*. Department of Land and Natural Resources, Division of State Parks.

McKenzie M.M., T.W. Giambelluca and H.F. Diaz, 2019. Temperature trends in Hawai‘i: a century of change, 1917–2016. International Journal of Climatology 39:.3987–4001.

McClure, K.M., C. Lawrence, A.M. Kilpatrick. 2018. Land use and larval habitat increase *Aedes albopictus* (Diptera: Culicidae) and *Culex quinquefasciatus* (Diptera: Culicidae) abundance in lowland Hawaii. Journal of Medical Entomology 55:1509–1516.

McClure, K.M., R.C. Fleischer and A.M. Kilpatrick. 2020. The role of native and introduced birds in transmission of avian malaria in Hawaii. Ecology 101: p.e03038.

Moreira, L.A., I. Iturbe-Ormaetxe, J.A. Jeffery, G. Lu, A.T. Pyke, L.M. Hedges, B.C. Rocha, S. Hall-Mendelin, A. Day, M. Riegler, L.E. Hugo, K.N. Johnson, B.H. Kay, E.A. McGraw, A.F. van den Hurk, P.A. Ryan, and S.L. O'Neill. 2009. A *Wolbachia* symbiont in *Aedes aegypti* limits infection with dengue, chikungunya, and *Plasmodium*. Cell 139: 1268–1278.

Mounce, H. L., C. Raisin, D.L. Leonard, H. Wickenden, K.J. Swinnerton, and J.J. Groombridge. 2015. Spatial genetic architecture of the critically-endangered Maui parrotbill (*Pseudonester xanthophyrys*): management considerations for reintroduction strategies. Conservation Genetics 16: 71–84.

Mullen, G., and L. Durden. 2009. Medical and veterinary entomology. Academic Press, London.

[NWCG] National Wildlife Coordinating Group. 2016. Interagency Helicopter Operation Guide: PMS 510. June 2016. Available at: https://gacc.nifc.gov/swcc/dc/nmsdc/documents/Dispatch/Reference/IHOG_2016.pdf

Newman, J.S., E.J. Rickley, T.L. Bland, and K.R. Beattie. 1984. Noise measurement flight test: data/analyses, Hughes 500 D/E helicopter. Federal Aviation Administration, Office of Environmental and Energy. Washington D.C. 178 pp.

O’Connor, L., C. Plichart, A.C. Sang, C.L. Brelsfoard, H.C. Bossin, S.L. Dobson. 2012. Open release of male mosquitoes infected with a *Wolbachia* biopesticide: field performance and infection containment. PLOS Neglected Tropical Diseases 6: e1797. doi:10.1371/journal.pntd.0001797.

Parham, J.E., G.R. Higashi, E.K. Lapp, D.G.K. Kuamo‘o, R.T. Nishimoto, S. Hau, J.M. Fitzsimmons, D.A. Polhemus, and W.S. Devick. 2008. Atlas of Hawaiian Watersheds and their Aquatic Resources, Island of Kaua‘i, Bishop Museum and Division of Aquatic Resources. 614 pp.

Paxton, E.H., R.J. Camp, P.M. Gorresen, L.H. Crampton, D.L. Leonard, and E.A VanderWerf. 2016. Collapsing avian community on a Hawaiian island. Science Advances 2: e1600029.

Paxton, E.H., K.W. Brink, L.H. Crampton, J. Hite, and M. Costantini. 2020. 2018 Kaua‘i forest bird population estimates and trends. Technical Report HCSU-098. Hawai‘i Cooperative Studies Unit, University of Hawai‘i at Hilo. 31 pp.

Paxton, E.H., M. Laut, S. Enomoto, and M. Bogardus. 2022. Hawaiian forest bird conservation strategies for minimizing the risk of extinction: Biological and biocultural considerations. Hawai‘i Cooperative Studies Unit Technical Report HCSU-103. University of Hawai‘i at Hilo, Hawaii, USA. 125 pages. http://hdl.handle.net/10790/5386.

Pauchard, A., A. Milbau, A. Albihn, J. Alexander, T. Burgess, C. Daehler, G. Englund, F. Essl, B. Evengård, G. Greenwood, S. Haider, J. Lenoir, K. McDougall, E. Muths, M. Nuñez, J. Olofsson, L. Pellissier, W. Rabitsch, L. Rew, M. Robertson, N. Sanders, and C. Kueffer. 2016. Non-native and native organisms moving into high elevation and high latitude ecosystems in an era of climate change: new challenges for ecology and conservation. Biological Invasions 18: 345–353.

Steffan, W.A. 1968. Hawaiian *Toxorhynchites* (Diptera: Culicidae). Proceedings of the Hawaiian Entomological Society 20: 141–155.

PBR Hawaii 2018. Haena State Park Master Plan. Prepared by PBR Hawaii and Associates, Inc. for Department of Land and Natural Resources Division of State Parks. 168 pp.

Pender, R.J. 2013. Floral trait evolution and pollination ecology in the Hawaiian lobeliad genus, *Clermontia* (Campanulaceae). PhD Dissertation. University of Hawai‘i at Manoa. 171 pp.

Pinzari, C., R. Peck, T. Zinn, D. Gross, K. Montoya-Aiona, K. Brink, M. Gorresen, and F. Bonaccorso. 2019. Hawaiian hoary bat (*Lasiurus cinereus semotus*) activity, diet, and prey availability at the Waihou Mitigation Area, Maui. Technical Report HCSU-090, Hawai‘i Cooperative Studies Unit, University of Hawai‘i at Hilo.

Popovici, J., L.A. Moreira, A. Poinsignon, I. Iturbe-Ormaetxe, D. McNaughton, and S.L. O’Neill. 2010. Assessing key safety concerns of a *Wolbachia*-based strategy to control dengue transmission by *Aedes* mosquitoes. Memórias do Instituto Oswaldo Cruz 105: 957–964

Pratt, H.D. 2005. The Hawaiian Honeycreepers. Oxford University Press, New York.

Raine, A. 2022. Email communication between Andre Raine, Science Director at Archipelago Research and Conservation and Richard Pender, Ecologist at SWCA Environmental Consultants, Honolulu, Hawai‘i in June 2022.

Rangi Hīroa, T. 1957. Arts and Crafts of Hawaii. Bishop Museum Press, Honolulu, Hawai‘i.

Rebolo-Ifrán, N., M. Graña Grilli, and S.A. Lambertucci. 2019. Drones as a threat to wildlife: YouTube complements science in providing evidence about their effect. Environmental Conservation 46: 205–210.

Reiter, M.E., and D.A. Lapointe. 2009. Larval habitat for the avian malaria vector *Culex quinquefasciatus* (Diptera: Culicidae) in altered mid-elevation mesic-dry forests in Hawai‘i. *Journal of Vector Ecology* 34: 208–16.

Samuel, M.D., P.H. Hobbelen, F. DeCastro, J.A. Ahumada, D.A. LaPointe, C.T. Atkinson, B.L. Woodworth, P.J. Hart and D.C. Duffy. 2011. The dynamics, transmission, and population impacts of avian malaria in native Hawaiian birds: a modeling approach. Ecological Applications 21: 2960–2973.

Samy, A.M., A.H. Elaagip, M.A. Kenawy, C.F.J. Ayres, A.T. Peterson, D.E. Soliman. 2016. Climate Change Influences on the Global Potential Distribution of the Mosquito *Culex quinquefasciatus*, Vector of West Nile Virus and Lymphatic Filariasis. PLoS ONE 11: e0163863. https://doi.org/10.1371/journal.pone.0163863.

Schäffer, B., R. Pieren, K. Heutschi, J.M. Wunderli, and S. Becker. 2021. Drone Noise Emission Characteristics and Noise Effects on Humans—A Systematic Review. International Journal of Environmental Research and Public Health 18: 5940. https://doi.org/10.3390/ijerph18115940

Schmidt, T.L., H.H. Barton, G. Rašić, A.P. Turley, B.L. Montgomery, I. Iturbe-Ormaetxe, P.E. Cook, P.A. Ryan, S.A. Ritchie, A.A Hoffmann, S.L O'Neill, M. Turelli. 2017. Local introduction and heterogeneous spatial spread of dengue-suppressing *Wolbachia* through an urban population of *Aedes aegypti*. PLOS Biology 15: e2001894. https://doi.org/10.1371/journal.pbio.2001894.

Schmitz, P. and D. Rubinoff. 2010a. Ecologically and morphologically remarkable new cosmet moth species of the genus *Hyposmocoma* (Lepidoptera: Cosmopterigidae) endemic to the Hawaiian Islands, with reference to the spectacular diversity of larval cases. Annals of the Entomological Society of America 104: 1–15. Available at: https://academic.oup.com/aesa/article/104/1/1/ 128540.

Schmitz, P. and D. Rubinoff. 2010b. The Hawaiian amphibious caterpillar guild: New species of *Hyposmocoma* (Lepidoptera: Cosmopterigidae) confirm distinct aquatic invasions and complex speciation patterns. Zoological Journal of the Linnean Society 162: 15–42. Available at: https://academic.oup.com/zoolinnean/article/162/1/15/2629192.

Seale, A. 1905. Report of Mr. Alvin Seale of the United States Fish Commission, on the introduction of top-minnows to Hawaii from Galveston, Texas. *The Hawaiian Forester and Agriculturist* 2: 364-367.

State of Hawai'i Annual Survey 2019 Air Quality Data. https://health.hawaii.gov/cab/files/2021/07/aqbook_2019.pdf

Subra, R., 1981. Biology and control of *Culex pipiens quinquefasciatus** Say, 1823 (Diptera, Culicidae) with special reference to Africa. International Journal of Tropical Insect Science 1: 319–338.

Traub, W., H. Gerrish, and R. Reeve. 2023. Cultural Impact Assessment of Using *Wolbachia*-based Incompatible Insect Technique for the Suppression of Southern House Mosquito Populations on Kaua‘i. Prepared for the State of Hawai‘i Department of Land and Natural Resources, Division of Forestry and Wildlife by SWCA Environmental Consultants, Hawai‘i.

University of Florida. 2019. Southern house mosquito (*Culex quinquefasciatus*). Featured Creatures Entomology and Nematology, University of Florida. Available at: https://entnemdept.ufl.edu/creatures/aquatic/southern_house_mosquito.htm. Accessed December 22, 2022.

[USFWS] U.S. Fish and Wildlife Service. 2012. 5-Year Review Picture-wing fly (*Drospholia musaphilia*). https://ecos.fws.gov/docs/tess/species_nonpublish/2404.pdf. Accessed June 5, 2023.

[USFWS] U.S. Fish and Wildlife Service. 2022. Endangered Species online database. https://www.fws.gov/endangered/. Accessed 28 February 2022.

[USFWS] U.S. Fish and Wildlife Service. 2023. U.S. Fish and Wildlife Service Mission. Available at: https://www.fws.gov/about/mission-and-vision#:~:text=The%20mission%20of%20t he%20American%20people/. Accessed September 19, 2023

Vinogradova, E.B. 2000. *Culex pipiens pipiens* mosquitoes: taxonomy, distributions, ecology, physiology, genetics, applied importance, and control. Pensoft, Sofia, Bulgaria. 646 pp.

Warner, R.E., 1968. The role of introduced diseases in the extinction of the endemic Hawaiian avifauna. The Condor 70: 101–120.

Weeks, A.R., K.T. Reynolds, and A.A. Hoffmann. 2002. *Wolbachia* dynamics and host effects: what has (and has not) been demonstrated. *TRENDS in Ecology and Evolution* 17: 257-262.

WeRobotics. 2022. Why did 280,000 Mosquitoes Ride our Drone? To Reduce Zika. https://blog.werobotics.org/2018/04/19/why-did-280000-mosquitoes-ride-on-a-drone-to-reduce-zika/. (Accessed April 19, 2022).

Wichman, F.B. 1998. *Kaua‘i: Ancient Place-Names and Their Stories*. Honolulu: University of Hawai‘i Press.

Woodworth, B.L., C.T. Atkinson, D.A. LaPointe, P.J. Hart, C.S. Spiegel, E.J. Tweed, et al. 2005. Host population persistence in the face of introduced vector-borne diseases: Hawaii amakihi and avian malaria. Proceedings of the National Academy of Sciences 102: 1531–6.

Wu, J.X., Delparte, D.M. and P.J. Hart. 2014. Movement Patterns of a Native and Non-native Frugivore in Hawaii and Implications for Seed Dispersal. Biotropica 46: 175–182. https://doi.org/10.1111/btp.12087.

Yent, M. 2004. Archaeological Assessment: Parking Lot and Trailhead Improvements Kōke‘e State Park & Waimea Canyon State Park Waimea, Kaua‘i (TMK: 1-4-01: por. 2 & por. 13) Department of Land and Natural Resources, Division of State Parks.

Zheng, X., D. Zhang, Y. Li, C. Yang, Y. Wu, X. Liang, Y. Liang, X. Pan, L. Hu, Q. Sun, X. Wang, Y. Wei, J. Zhu, W. Qian, Z. Yan, A.G. Parker, J.R.L. Gilles, K. Bourtzis, J. Bouyer, M. Tang, B. Zheng, J. Yu, J. Liu, J. Zhuang, Z. Hu, M. Zhang, J.-T. Gong, X.-Y. Hong, Z. Zhang, L. Lin, Q. Liu, Z. Hu, Z. Wu, L.A. Baton, A.A. Hoffman, and Z. Xi. 2019. Incompatible and sterile insect techniques combined eliminate mosquitoes. Nature 572: 56–61. https://doi.org/10.1038/s41586-019-1407-9

Ziegler, A. 2002. Hawaiian Natural History, Ecology, and Evolution. University of Hawai‘i Press, Honolulu.

Appendix A:

Issues and Potential Impact Topics

Table A-1. Affected Environment Resources that are Considered Unlikely to be Impacted by the No-Action Alternative and Proposed Action.

Impact Causing Element	Resources Potentially Impacted	Assessment of Likely Impacts During Project
Geological disturbance and soil erosion	Existing roads and trails	Implementation of the project would result in nominal increases in vehicle and pedestrian traffic within existing transport infrastructure. The impacts of this increased traffic on soil erosion within this transport infrastructure will be minimized due to incompatible male mosquito release and monitoring being undertaken in appropriate weather to minimize damage to trails. Soil erosion resulting from vehicle and pedestrian movement is likely to be very localized and negligibly greater than the existing conditions with onging and future use. No additional geological or soil disturbance would be expected across the broader proposed project area.
Presence of *Wolbachia*-infected mosquitos	Southern house mosquito; other non-native mosquito species	If successful, populations of non-native southern house mosquito would be reduced to low levels within the proposed project area. This would result in a net benefit for native flora and fauna within the affected area. The risk of novel strains of *Wolbachia* being transmitted to other non-native mosquito species via hybridization or horizontal gene flow was evaluated but deemed to be of negligible risk.
Surface and ground water	Water quality and quantity	No impacts on water quality are anticipated from the proposed action.

Impact Causing Element	Resources Potentially Impacted	Assessment of Likely Impacts During Project
Disturbance or degradation of aquatic habitats (wetlands, marshes, streams, rivers, fishponds, and anchialine ponds)	Water quality and quantity, aquatic flora and fauna in and on the margins of aquatic habitats	Disturbance of freshwater features is anticipated to be limited to monitoring southern house mosquito populations within these habitats. This monitoring is presently being undertaken within the proposed project area and is expected to have no impacts on water quality, quantity, or the habitat that these features provide for flora and fauna. Pedestrian release of incompatible male mosquitoes would have negligible impacts on aquatic environments because crossing of streams would be limited to designated crossings on the established trails within the projec area.
Coastal features (beaches, estuaries, coastal waters)	Coastal geology and sediments, water quality, coastal flora and fauna habitat, recreational sites (e.g., surfing sites, boating, diving)	It is unlikely that project personnel would access coastal sections of the proposed project area during the project. Similarly, no project equipment would be placed near or within this zone.
Lightscapes	Project area and surrounding line of site locations	No impacts to lightscapes are anticipated to result from the proposed action. All work would be conducted during daylight hours. This issue was considered and dismissed from further analysis.
Land Use	Project area	No impacts to land use are anticipated to result from the proposed action. All current land uses would continue as is under the proposed action. This issue was considered and dismissed from further analysis.
Viewsheds	Natural features visible within line-of-sight	Helicopters, fixed-wing aircraft, and drones would be visible intermittently during from elevated vantage points throughout the proposed project area. However, the visual intrusion of these aircraft would be limited in extent (seconds to minutes) and will have no permanent impact on the viewsheds.

Impact Causing Element	Resources Potentially Impacted	Assessment of Likely Impacts During Project
Soundscapes	Disturbance of the natural acoustic environment from human-generated sounds	Helicopters, fixed-wing aircraft, drones, motor vehicles, and personnel will be present intermittently within the proposed project area. However, the audible presence of project associated aircraft, vehicles, and personnel would occur only intermittently and for short time periods. By minimizing the use of aircraft and vehicles, this increase is unlikely to meaningfully contribute to the overall soundscape beyond existing levels.
Wilderness (including visitor experiences)	Visual and audible disturbance of wilderness experience for humans recreating within proposed project area	See Viewsheds and Soundscapes in this Table and Wilderness section in this appendix.

OTHER POTENTIAL ENVIRONMENTAL IMPACTS

Unintended Release of Female Mosquitoes

Although the inadvertent release of female incompatible mosquitoes (i.e., "female contamination") would negatively impact the project's tool effectiveness to suppress southern house mosquito populations on Kaua'i, this presents no more risk to humans or animals than the mosquitoes that currently occur on the island. Such inadvertent releases of females likewise would not increase the population of mosquitoes on Kaua'i.

Owing to the importance of only releasing male incompatible mosquitoes, sorting out and removing females is vital. In similar IIT programs, sex sorting was accomplished several ways and with varying rates of success. A primary method to separate and remove females uses sieves, or another similar physical separation method, taking advantage of the fact the female pupae are larger than those of males (Kittayapong et al. 2018, Crawford et al. 2020, Zeng et al. 2022). This method alone is estimated to remove >95% of all females, and various additional methods have been used to eliminate the remaining females or render them sterile (e.g., exposure to radiation). The proposed action will employ sorting methods consistent with Crawford et al. 2020. This highly technical process relies on physical separation of pupae followed by imaging and sorting of emerged adults via artificial intelligence (AI) programs that remove any remaining females (Crawford et al. 2020). An iterative process of vetting AI scanned images is then used to further reduce the risk of female presence in any given batch of mosquitoes bound for release. While

Crawford et al. (2020) achieved a low female contamination rate of 1 in 900 million with yellow fever mosquitoes, the proposed action would use southern house mosquitoes, a different species of mosquito. Although the methodology is the same and very precise, the estimated number of females released as part of the proposed action is expected to differ. Following the methods described by Crawford et al. (2020), Beebe et al. (2021) did not detect any released females (or larvae containing control *Wolbachia*) during their project in Australia. Following a different method, Zeng et al. (2022) estimated a female contamination rate of <1% and saw no local establishment of *Wolbachia*-infected mosquitoes in their study site in Hunan, China. The Crawford et al. (2020) sex sorting employed in this project would result in a female contamination rate that is several orders of magnitude smaller than reported in Zeng et al. (2022).

As discussed above, southern house mosquitoes release as part of this project would be transinfected with the wAlb *Wolbachia* strain, while wild mosquitoes in Hawai'i are naturally infected by the wPip *Wolbachia* strain (Atkinson et al. 2016). Should a wAlb female be released, she would be compatible with the released wAlb male mosquitoes and could produce viable offspring. This, however, is detrimental to the project's suppression goals and every effort would be made to reduce or eliminate female contamination of released male mosquitoes. For local establishment of a wAlb population of southern house mosquitoes to occur, females would first need to be released and survive long enough to reproduce (i.e., mate, find a blood meal, and lay eggs). If overflooding rates of released males are correctly calculated, it is possible that a released female could find a compatible male with which to mate. Although southern house mosquitoes are bidirectionally incompatible between wAlb and wPip strains, both pairings of wAlb males and wPip females and pairings of wPip males and wAlb females are incompatible. Should a released female mate with a wild type wPip male, no offspring would therefore be produced. If a released female successfully produces offspring with a released male, all resulting offspring would be infected with the wAlb *Wolbachia* strain. These offspring, however, would need to mate with other wAlb southern house mosquitoes to continue the reproductive cycle, as would all successive generations. Meanwhile, any mating events with wPip wild type mosquitoes would suppress any developing wAlb population. Successful establishment of a wAlb population would therefore be the product of a series of extremely unlikely events. Should local establishment by chance be detected, halting releases of wAlb males will allow the local wild type wPip mosquitoes to reinvade a portion of treatment area and eliminate the wAlb population. Deliberately releasing wild type wPip male mosquitoes could similarly accomplish the same objective.

Horizontal Transfer of *Wolbachia*

As previously discussed, *Wolbachia* (wPipV) is already present in the southern house mosquito and *Wolbachia* (wAlbA and wAlbB) strains are already found in the Asian tiger mosquito (*Aedes albopictus*) in Hawai'i. It is highly improbable that incompatible male mosquitoes, which cannot reproduce and would perish in the environment in under a week after release, are more likely to undergo horizontal transmission of *Wolbachia* than the existing populations of southern house mosquitoes that have been reproducing across the islands for the last 125–200 years. Compounding this improbability, *Wolbachia* is already common among native Hawaiian insects (Bennett et al. 2012).

Wolbachia is an endosymbiotic organism (i.e., it exists within the cells of another organism) that is maternally inherited or is passed down from a mother to her offspring. This process of passing *Wolbachia* from mother to offspring is referred to as "vertical transfer" (Weeks et al. 2002). Alternatively, "horizontal transfer" would be the transmission of *Wolbachia* from one organism to another via a non-maternal route (Ding et al. 2020). The mechanism for such a transfer in *Wolbachia* is not known, would only occur following a series of extremely unlikely events, and would require *Wolbachia* bacteria to live outside of their host cells for a period of time (Ding et al. 2020). In a laboratory setting, maintaining living *Wolbachia* outside of host cells requires precise conditions to preserve these bacteria in a cell-free medium for even short periods of time (Rasgon et al 2006); numerous environmental factors would severely limit the lifespan of *Wolbachia* outside of their host cells (e.g., pH, UV radiation) in a natural setting. This technique is in fact required for the process of creating the incompatible mosquitoes to be used in this project. Tolley et al. (2019) asserted or implied that the ability to preserve *Wolbachia* outside of cells in a laboratory setting (Rasgon et al. 2006) represents evidence that *Wolbachia* can live extracellularly in nature. There is, however, no known evidence or example in the literature of free-living (extracellular) *Wolbachia*. The mechanism for horizontal transmission of *Wolbachia* remains unknown, but the hypotheses for how this has occurred in the past have little relevance to the system in the proposed project. Tolley et al. (2019) has suggested that horizontal transfer in ants could have occurred through social interactions or predation, but again there remains no direct evidence of this and this hypothesis is purely speculative.

Regarding the second point, both the Asian tiger mosquito and the yellow fever mosquito (*A. aegypti*) live in the same environments in many parts of the world, including on Hawai'i Island. While the Asian tiger mosquito is nearly always naturally infected with *Wolbachia* (the same strain that would be used in the proposed project), the yellow fever mosquito is naturally uninfected by *Wolbachia* (Klassen et al. 2009) and there is no evidence of horizontal transfer of the bacteria between these two species. There is likewise no evidence that the strain of *Wolbachia* found in southern house mosquitoes has been transmitted to the Asian tiger mosquito (or any other mosquito), or vice versa, in Hawai'i (or anywhere else) despite co-occurrence for >130 years (Atkinson et al. 2016). There is additionally no evidence of transfer of *Wolbachia* from mosquitoes to other arthropods, including native Hawaiian insects (Bennett et al. 2012). The low rate of horizontal transfer among related species, such as Asian tiger and yellow fever mosquitoes, suggests that the rate of transfer among unrelated arthropods would be lower still.

Horizontal Gene Transfer

While horizontal transfer of *Wolbachia* would involve the non-heritable movement of the *Wolbachia* bacterium between insect species, "horizontal gene transfer" would be the theoretical movement of genetic material (DNA) from the *Wolbachia* bacterium into the genome of the southern house mosquito (Klassen et al. 2009). Horizontal gene transfer is a natural process that has occurred innumerable times throughout evolutionary history. Scientists have found segments of DNA within numerous eukaryotic (e.g., animal) organisms that can be traced back to a prokaryotic (i.e., bacterial) organism, often in parasite-host interactions (Klassen et al. 2009, Dunning Hotopp 2011). This may in fact be an important evolutionary process that is just now being realized. The process of horizontal gene transfer itself, however, is not a concern. More pertinent is whether such a transfer includes transcriptional phenotypic traits that could be acted

on by selective pressures that allows for beneficial traits to be developed. A segment of DNA does not necessarily contain all the required information to be transcribed or read and conferred into new traits or functions of the individual organism. Much of a genome in fact contains sequences of non-coding DNA, often referred to as "junk DNA." The likelihood that such an event could somehow alter the genome of the mosquito in a meaningful way is therefore exceptionally low. Further, the horizontal transfer of genes between *Wolbachia* and a mosquito would by no means constitute the creation of a new species of mosquito.

It has been suggested that Klassen et al. (2009) had purported to show evidence of horizontal gene transfer between *Wolbachia* (wPip) and the yellow fever mosquito. These authors found several sequences of DNA within the typically *Wolbachia*-free yellow fever mosquito's genome that had previously been identified from the *Wolbachia* genome. Klassen et al. (2009) do acknowledge, however, that while the most likely direction of transfer was from the *Wolbachia* to the mosquito, it could not be determined for certain the transfer did not occur in the opposite direction. Importantly, these examples of gene transfer occurred as a result of a natural evolutionary event(s), not as a result of any human-caused process (such as in the proposed project); the timescale required for these transfer events is therefore unknown. Given that the wPip strain of *Wolbachia* has co-evolved with the southern house mosquito for likely millions of years, it is considerably more likely that horizontal gene transfer may have occurred naturally between these species than between the transinfected wAlb and the southern house mosquito.

Lastly, concerns such as horizontal gene transfer are predicated on the establishment of a reproducing population of southern house mosquitoes infected with wAlb strain of *Wolbachia.* The very purpose of the proposed project is to suppress the population of southern house mosquitoes within the project area on Kaua'i, not to augment them. Local establishment of wAlb southern house mosquitoes would work against that goal and extreme care would be taken to avoid that scenario.

REFERENCES CITED

Atkinson C.T, W. Watcher-Weatherwax, and D. LaPointe. 2016. Genetic diversity of *Wolbachia* endosymbionts in *Culex quinquefasciatus* from Hawai'i, Midway Atoll and American Samoa. University of Hawai'i at Hilo Technical Report HCSU-074.

Beebe, N.W., D. Pagendam, B.J. Trewin, A. Boomer, M. Bradford, A. Ford, C. Liddington, A. Bondarenco, P.J. De Barro, J. Gilchrist, C. Paton, K.M. Staunton, B. Johnson, A.J. Maynard, G.J. Devine, L.E. Hugo, G. Rasic, H. Cook, P. Massaro, N. Snoad, J.E. Cawford, B.J. White, Z. Xi, and S.A. Ritchie. 2021. Releasing incompatible males drives strong suppression across populations of wild and *Wolbachia*-carrying *Aedes aegypti* in Australia. Proceedings of the National Academy of Sciences of the United States of America 118: https://doi.org/10.1073/pnas.2106828118

Bellini, R., F. Balestrino, A. Medici, G. Gentile, R. Veronesi, and M. Carrieri. 2013. Mating competitiveness of *Aedes albopictus* radio-sterilized males in large enclosures exposed to natural conditions. *Journal of Medical Entomology* 50: 94–102. Available at https://doi.org/10.1603/ME11058.Environmental Protection Agency (EPA). 2020. "EPA Approves Experimental Use Permit to Test Innovative Biopesticide Tool to Better Protect Public Health". Available at: EPA Approves Experimental Use Permit to Test Innovative Biopesticide Tool to Better Protect Public Health | US EPA. Accessed April 25, 2023.

Bennett, G.M., Pantoja, N.A. and O'Grady, P.M. 2012. Diversity and phylogenetic relationships of *Wolbachia* in *Drosophila* and other native Hawaiian insects. Fly 6: 273–283.

Crawford, J.E., D.W. Clarke, V. Criswell. et al. 2020. Efficient production of male *Wolbachia*-infected *Aedes aegypti* mosquitoes enables large-scale suppression of wild populations. Nature Biotechnology. https://doi.org/10.1038/s41587-020-0471-x

Ding, H., Yeo, H. and Puniamoorthy, N., 2020. *Wolbachia* infection in wild mosquitoes (Diptera: Culicidae): implications for transmission modes and host-endosymbiont associations in Singapore. Parasites & Vectors, 13(1), pp.1–16.

Dunning Hotopp, J.C. 2011. Horizontal gene transfer between bacteria and animals. Trends in Genetics 27: 157–163. DOI: 10.1016/j.tig.2011.01.005

EPA. 2021. Current Nonattainment Counties for All Criteria Pollutants. Available at: https://www3.epa.gov/airquality/greenbook/ancl.html.

Kittayapong, P., N,-o. Kaeothaisong, S. Ninphanomchai, and W. Limohpasmanee. 2018. RCombined sterile insect technique and incompatible insect technique: sex separation and quality of sterile *Aedes aegypti* male mosquitoes released in a pilot population suppression trial in Thailand. Parasites & Vectors 11: 73–83. https://doi.org/10.1186/s13071-018-3214-9

Klassen, L., Z. Kambris, P.E. Cook, T. Walker, and S.P. Sinkins. 2009. Horizontal gene transfer between *Wolbachia* and the mosquito *Aedes aegypti*. BMC Genomics 10: 33. doi:10.1186/1471-2164-10-33

Nakagawa, P.A. 1963. Status of *Toxorhynchites* in Hawai'i. Proceedings of the Hawaiian Entomological Society 18: 291–294.

Paxton, E.H., M. Laut, S. Enomoto, and M. Bogardus. 2022. Hawaiian forest bird conservation strategies for minimizing the risk of extinction: Biological and biocultural considerations. Hawai'i Cooperative Studies Unit Technical Report HCSU-103. University of Hawai'i at Hilo, Hawaii, USA. 125 pages. http://hdl.handle.net/10790/5386.

Rasgon, J.L., C.E. Gamston, X. Ren. 2006. Survival of *Wolbachia pipientis* in cell-free medium. Applied and Environmental Microbiology 72: 6934–6937. doi:10.1128/AEM.01673-06

Steffan, W.A. 1968. Hawaiian T*oxorhynchites* (Diptera: Culicidae). Proceedings of the Hawaiian Entomological Society 20: 141–155

Tolley, S.J.A., P. Nonacs, and P. Sapountzis. 2019. *Wolbachia* horizontal transmission events in ants: What do we knowand what can we learn? Frontiers in Microbiology 10: https://doi.org/10.3389/fmicb.2019.00296h

[USFWS] U.S. Fish and Wildlife Service. 2006. Revised Recovery Plan for Hawaiian Forest Birds. Accessed June 7, 2023

[USFWS] U.S. Fish and Wildlife Service. 2021. Kaua'i Islandwide Recovery Plan. Accessed June 9, 2023

Waltz, E. 2016. GM mosquitoes fire first salvo against Zika virus. Nature Biotechnology 34: 221–222. https://doi.org/10.1038/nbt0316-221.

Weeks, A.R., K.T. Reynolds, and A.A. Hoffmann. 2002. *Wolbachia* dynamics and host effects: what has (and has not) been demonstrated. TRENDS in Ecology and Evolution 17: 257-262.WeRobotics. 2022. Why did 280,000 Mosquitoes Ride our Drone? To Reduce Zika. https://blog.werobotics.org/2018/04/19/why-did-280000-mosquitoes-ride-on-a-drone-to-reduce-zika/. (Accessed April 19, 2022).

Yamada, H., A.G. Parker, C.F. Oliva, F. Balestrino, and J.R.L. Gilles. 2014. X-ray-induced sterility in *Aedes albopictus* (Diptera: Culicidae) and male longevity following irradiation. Journal of Medical Entomology 51(4): 811–816. PMID: 25118413.

Zeng, Q., L. She, H. Yuan, Y. Luo, R. Wang, W. Mao, W. Wang, Y. She, C. Wang, M. Shi, et al. 2022. A standalone incompatible insect technique enables mosquito suppression in the urban subtropics. Communications Biology 5: 1419. https://doi.org/10.1038/s42003-022-04332-6

Appendix B:

Cultural Impact Assessment

Appendix C:

Federal Insecticide, Fungicide, and Rodenticide Act Section 18 Specific Emergency Use Label for Incompatible Insect Technique Application and US Environmental Protection Agency Letter of Authorization

*Wolbachia pipientis w*AlbB in *Culex quinquefasciatus* (DQB Strain)

FIFRA Section 18 Specific Emergency Use Directions.

DQB Males

The wAlbB *Wolbachia* bacterium prevents the development of *Culex quinquefasciatus* mosquito eggs in wild type *Cx. quinq.* females mated with *Cx. quinq.* males with wAlbB

ACTIVE INGREDIENT:

Wolbachia pipientis wAlbB, contained in live adult *Culex quinquefasciatus* males (DQB strain) >0.002% w/w*

* Contains a minimum of 0.7 copies *Wolbachia pipientis* wAlbB per copy of *Cx. quinq.* male mosquito DNA

For Distribution to and use only in the State of Hawaii for use in conservation of Hawaiian native birds.

This specific emergency exemption is effective from April 25, 2023 until April 25, 2024.

EPA File Symbol: 23HI01

Contains live male mosquitoes

[male release container] NET UNIT CONTENTS: *Wolbachia pipientis w*AlbB, contained in 1,000 adult male
Culex quinquefasciatus mosquitoes.
Contains Units of male release containers. Net minimum weight active
ingredient in each container is $1.58x10^{-6}$ oz. (0.045mg).

[male transfer container] NET UNIT CONTENTS: *Wolbachia pipientis*, *w*AlbB, contained in 1,000 adult male
Culex quinquefasciatus mosquitoes.
Contains Units of male transfer containers. Net minimum weight active
ingredient in each container is $1.58x10^{-6}$ oz. (0.045 mg).

[male release containers] must be used within 48 hours of receipt or refilling by applicator. [male transfer containers] must be used (applied to treatment area or used to refill [male release container]) within 24 hours of the filling timestamp.

Manufactured by:
Verily Life Sciences LLC
269 E Grand Ave., South San Francisco, CA 94080
EPA Company No. 92643
Batch Code:
email support: dqb-support@debug.com
EPA Registration No. Unregistered Pesticide
EPA Est. No.: 92643-CA-1
Filling
Timestamp:
Ref: DQB-Label-0.11 (FINAL) 2023-04-11
*Wolbachia pipientis w*AlbB in *Culex quinquefasciatus* (DQB Strain)

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. For use only
by Verily Life Sciences LLC.; persons under direct contract with Verily Life Sciences LLC for the purpose of
application of this pesticide; by Federal, state, tribal, or local government officials and their designated representatives responsible for conservation use of this product.

INSECTS SUPPRESSED:

DQB Males selectively suppress populations of *Cx. quinquefasciatus. (Cx. quinq)* where the wAlbB *Wolbachia pipientis* is incompatible with wild-type *Cx. quinq*, resulting in inviable eggs and reduced hatch rates. If used in accordance with this label to achieve a sufficient excess of DQB males over wild-type males, DQB Males are expected to suppress female *Cx. quinq*. mosquito populations.

RESTRICTIONS

● For Distribution to and use only in the State of Hawaii for the conservation of Hawaiian native birds.
● For outdoor use only.
● [male release container] must be used within 48 hours of receipt or refilling by applicator. [male transfer containers] must be used (applied to treatment area or used to refill [male release container]) within 24 hours of the filling timestamp.
● Do not use mosquito adulticide sprays in the same location as DQB Male releases within 48 hours of DQB Male releases.
● This specific exemption labeling must be in possession of the user at the time of application.

Notification Requirements: Applicators must notify Hawaii Department of Agriculture (HDOA) at least
seven (7) days prior to intended application Notification must include the following information:

● Name of applicator(s)
● Employer's name
● Phone number
● E-mail address (if applicable)
● Location (address, Tax Map Key, or GPS coordinates)
● Estimated amount of mosquitos to be released
● Estimated date of application

Completed Use Reports: Applicators must submit a completed use report to HDOA within sixteen (16)
days of application via email or hardcopy through mail. Completed use reports will be submitted on forms provided by HDOA. Contact HDOA to acquire the necessary forms.
HDOA Contact: Applicators can contact HDOA at hdoa.sec18@hawaii.gov or at 808-973-9415.

APPLICATION RATE

● Releases of male mosquitoes are to be performed at least once per week at a release rate adequate to maintain an overflooding ratio of DQB:Wild type male *Cx. quinq* >10:1 or, in the absence of trapping data, a minimum of 150 males/acre/week. Male mosquitoes are released to
Ref: DQB-Label-0.11 (FINAL) 2023-04-11
*Wolbachia pipientis w*AlbB in *Culex quinquefasciatus* (DQB Strain)
the air and fly away to mate with indigenous females. If multiple containers are used, mosquito releases should be distributed as evenly as possible over the treatment area with release points spaced less than 1 km apart to ensure consistent coverage within the treatment area. To ensure highest possible efficacy adhere to this regimen until the end of the mosquito season (where applicable).
● Application rates are based on the area to be treated: each container (1000 DQB Males) is sufficient to treat 6 acres based on initial treatment rates of 150 males per acre per week. Multiple containers per week are required to achieve minimum treatment rates for most areas.
● For ongoing programs involving multiple releases per week over landscape scale (>500 acres) the applicator may use the nominal container fill (e.g. 1000 males) to compute release rates. For smaller programs the applicator will confirm the number of males in each container by entering the container barcode and batch number at https://count.debugproject.com
● Use trapping data in treatment areas or appropriate proxy locations (as reviewed by the Hawaii Department of Land and Natural Resources) to adjust release rates as required to maintain desired overflooding ratio of DQB:Wild type male *Cx. quinq*. of >10:1 and to compensate for estimated higher levels of *Cx. quinq.* in treatment areas as appropriate.
● Overflooding ratio is determined by comparing the pre- and post-release average male trap counts in treatment areas or by using molecular methods on males sampled from treatment areas (to differentiate wAlbB males from Wild Type see Crawford et al 2020[1] for similar methods). For treatment areas inaccessible for regular trapping the Hawaii Department of Land and Natural Resources may approve appropriate proxies. Contact Verily Life Sciences for more information on how to determine overflooding ratio.

METHOD OF APPLICATION

● Releases may be conducted using [male release containers] and [male transfer containers]

● [male release container] must be used within 48 hours of receipt or refilling by applicator. [male transfer containers] must be used (applied to treatment area or used to refill [male release container]) within 24 hours of the filling timestamp
● If receipt of a shipment of DQB male containers is delayed (by more than 48 hours for [male release containers], or 24 hours for [male transfer containers]) contact Verily Life Sciences.
● Keep container closed until ready to release the DQB males
● Releases may be conducted from on foot (by hand) from the ground or aerially. Male mosquitoes should fly vigorously away from the container after release.
● If males do not fly or appear damaged, contact Verily Life Sciences.
● A single release point treats an area with a radius of about 500m (~200 acres) centered around the release point.
● To cover most areas, multiple releases and containers/week are required. Release points should be <1 km apart and as evenly spaced as feasible to achieve consistent treatment.
● For point releases by hand
○ Transport containers to the predetermined release site
○ Point opening of container away from face and open
○ Gently shake or rotate the container until DQB males have dispersed
● For aerial releases

[1] Crawford, J.E., Clarke, D.W., Criswell, V. et al. (2020). Efficient production of male Wolbachia-infected *Aedes aegypti* mosquitoes enables large-scale suppression of wild populations. Nat Biotechnol 38, 482–492. doi: https://doi.org/10.1038/s41587-020-0471-x

Ref: DQB-Label-0.11 (FINAL) 2023-04-11

*Wolbachia pipientis w*AlbB in *Culex quinquefasciatus* (DQB Strain)

○ Aerial releases are to be performed using Verily aerial mosquito release systems.
○ Aerial releases may be conducted by either helicopter or other aircraft, including UAV, equipped with Verily aerial mosquito release systems.
○ Load aerial release equipment with the desired number of male containers to achieve the desired treatment rate over the treatment area.
○ Plan aerial releases by mapping container release points evenly across the treatment area at sufficient density to achieve the desired treatment rate when considering the overall number males released per week into the treatment area.
○ Aerial releases may be initiated manually by the user or automatically by the release equipment, as the aircraft reaches designated release points along the release routes, accounting for aircraft speed, altitude and any wind.
○ Contact Verily Life Sciences for more information on aerial release planning, and to enable automated releases.
● As an example release planning calculation: A treatment area of 3,000 acres at a target of 150 males/acre per week would require 450,000 males/week, which is 225 containers/week at nominal 1000 DQB male fill. Even distribution requires at least 15 evenly spaced release points, though more (and closer) points will enable more even and consistent treatment (each point can treat ~200 acres based on a 500m treatment radius). At 2 releases per week, each release with this minimum set of points should involve ~15 containers/point/release (225 containers per week/150 release points/2 releases per week) to gain appropriate coverage. Increasing the number of release points by decreasing the spacing between points will enable more even and consistent treatment.
● For maximum efficacy the user should ensure consistent application to all areas to be treated throughout the *Cx. quinq.* mosquito season (if applicable).

USE IN INTEGRATED VECTOR MANAGEMENT PROGRAMS

DQB Males can be used as part of an integrated vector management program. This includes the use of larvicides, adulticides, and source reduction. Any integration of mosquito adulticiding must be timed to minimize negative effects on the DQB Males that are released into the same or nearby treatment areas. Consult the pesticide label of the adulticide to determine the most appropriate timing of release of DQB Males between pesticide treatments.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

STORAGE

Keep container closed until ready to use. Keep in original container unless refilling a male release container from a male transfer container according to instructions provided with the Verily field loading device. Keep male transfer containers cool (35-45°F) prior to use. Store DQB Males out of direct sunlight and at moderate temperatures 45℉ - 95℉ (7℃ - 28℃).

PESTICIDE DISPOSAL

Release all living DQB Males present in male release containers as soon as possible and within 48 hours of receipt by applicator or after refilling from transfer containers. Male transfer containers must be used (released or transferred to release containers) within 24 hours of the filling timestamp. Discard

Ref: DQB-Label-0.11 (FINAL) 2023-04-11

*Wolbachia pipientis w*AlbB in *Culex quinquefasciatus* (DQB Strain)

dead individuals in trash. If not released or if the males are damaged, kill males by freezing or allow them to die by keeping inside closed container for a minimum of 7 days, then discard dead mosquitoes in trash.

CONTAINER HANDLING

Do not reuse this container for any other purpose. Return to point of sale by calling [Support phone number] for instructions on returning the empty container, or for the approved process to dispose of in trash, or in a sanitary landfill.

Instructions for refilling [mosquito release container]:

If refilling manually: inside a containment cage e.g. bugdorm, open the [mosquito transfer container] and empty its contents into an open [mosquito release container], re-sealing both immediately to prevent loss of contents.

If refilling using a Verily field loading device: load clean, empty [mosquito release containers] into the loading device in the locations indicated for "release containers," ensuring they are engaged and sealed in the device. Load the corresponding number of Mosquito transfer containers into the loading device in the locations labeled "transfer containers", ensuring that the Mosquito transfer containers are fully sealed in the loading device. Activate the loading device by engaging the "start" mechanism as indicated. Operate loading device until the mosquitoes are transferred and the loading operation is completed. Visually inspect mosquito release containers to ensure they have been filled. Unload the (filled) mosquito release containers from the loading device, and (empty) mosquito transfer containers. User may optionally confirm the number of DQB males in the mosquito release containers by entering the corresponding transfer container barcode and batch at https://count.debugproject.com. Return empty male transfer container(s) to the manufacturer.

WARRANTY STATEMENT CONDITIONS

The directions for use of this product are believed to be adequate and must be followed carefully. However, it is impossible to eliminate all risks associated with the use of this product. Ineffectiveness or other unintended consequences may result because of such factors as weather conditions, presence of other materials, or the manner of use or application, all of which are beyond the control of Verily Life Sciences. All such risks shall be assumed by the user or buyer.

DISCLAIMER OF WARRANTIES

Verily Life Sciences makes no other warranties, express or implied, of merchantability or of fitness that extend beyond the statements made on this label. No agent of Verily Life Sciences is authorized to make any warranties beyond those contained herein or to modify the warranties contained herein. Verily Life Sciences disclaims any liability whatsoever for damages resulting from the mis-use or mis-handling of this product.

LIMITATIONS OF LIABILITY

The exclusive remedy of the user or buyer for any and all losses, injuries, or damages resulting from the use or handling of this product, whether in contract, warranty, tort, negligence, strict liability or otherwise, shall not exceed the purchase price paid or at Verily Life Sciences' election, the replacement of product.

Ref: DQB-Label-0.11 (FINAL) 2023-04-11

*Wolbachia pipientis w*AlbB in *Culex quinquefasciatus* (DQB Strain)

Not on main label: website https://count.debugproject.com

Ref: DQB-Label-0.11 (FINAL) 2023-04-11

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

Hawaii Department of Agriculture
Pesticides Branch
1428 South King Street
Honolulu, HI 96814

Effective Date: April 25, 2023
Expiration Date: April 25, 2024
Report Due: October 25, 2024
File Symbol: 23HI01

Attn: Esther Reichert and Greg Takeshima

The Environmental Protection Agency hereby issues a specific exemption under the provisions of Section 18 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended, to the Hawaii Department of Agriculture (HDOA) for the use of *Wolbachia pipientis* DQB strain (wAlbB) contained in live adult male *Culex quinquefasciatus* mosquitoes on up to 20,000 acres of State, Federal, and private lands to control mosquitoes (*Cx. quinquefasciatus*). This specific exemption is subject to the conditions set forth in your request dated, October 25, 2022, the label submitted April 11, 2023, as well as the following conditions and restrictions:

1. The HDOA is responsible for ensuring that all provisions of this specific exemption are met. It is responsible for providing information in accordance with 40 CFR 166.32(b). Accordingly, a report summarizing the results of this program must be submitted to EPA headquarters and EPA Region 9 within six months following the expiration date or prior to requesting a subsequent specific exemption for this use. An interim summary report may be submitted, in the later instance. In accordance with 40 CFR 166.32(a) these offices shall also be immediately informed of any adverse effects resulting from the use of this pesticide in connection with this exemption.

2. The unregistered product, DQB Males (*Wolbachia pipientis* (wAlbB) contained in live adult male *Culex quinquefasciatus* mosquitoes, active ingredient <0.3% w/w of adult male mosquitoes), manufactured by Verily Life Sciences, may be applied. All applicable directions for use, restrictions, and precautions on the container label submitted April 11, 2023, must be followed, unless otherwise modified in this authorization document.

3. DQB Males may be released by ground or aerial application at a release rate adequate to maintain an overflooding ratio of >10:1 DQB:Wild-type male *Cx. quinquefasciatus* mosquitoes, or in the absence of trapping data, a minimum of 150 males per acre per week. A maximum of 156 applications may be made per release site per year, based on an anticipated maximum of 3 releases

per week. The total amount of DQB Males to be applied per year to treat conservation lands throughout Hawaii is up to 3,000,000 male mosquitoes per week or 156,000,000 males per year. The maximum amount of *Wolbachia pipientis,* DQB strain, to be applied per year is up to ~1.83g/week or 95g/year.

4. DQB Males is for distribution to and use only in the State of Hawaii by Verily Life Sciences LLC; persons under direct contract with Verily Life Sciences LLC for the purpose of application of this pesticide; by Federal, state, tribal, or local government officials and their designated representatives responsible for conservation use of this product.

5. A maximum of 20,000 acres of State, Federal, and private lands may be treated in the counties of Honolulu, Hawaii, Kauai, Niihau, and Maui in the State of Hawaii.

6. DQB Males is for use only by Verily Life Sciences LLC; persons under direct contract with Verily Life Sciences LLC for the purpose of application of this pesticide; by Federal, state, tribal, or local government officials and their designated representatives responsible for conservation use of this product.

7. Use of DQB Males in public health programs is prohibited.

8. Do not use mosquito adulticide sprays in the same location as DQB male releases within 48 hours of DQB Male releases. If an adulticide treatment is expected to have a residual effect lasting longer than 48 hours, consult the pesticide label of the adulticide to determine the most appropriate timing of release of DQB Males between pesticide treatments.

9. This product is not for uses on food or feed.

10. Six weeks from the start of releases, quarterly monitoring for wAlbB-infected *Cx. quinquefasciatus* eggs or larvae must occur within a 10-km radius of release area. Sampling for egg rafts or larvae will be conducted from a minimum of 10 oviposition traps or larval breeding pool samples at each of at least 2 monitoring sites. A representative sample of at least 93 egg rafts, larvae, or any combination of the two, that are collected from these sites (or all collected egg rafts and/or larvae if fewer than 93 are collected across sites) must be evaluated for wAlbB in *Cx. quinquefasciatus* using PCR assays described as part of the *Wolbachia* infection Quality Control.

If wAlbB-infected *Cx. quinquefasciatus* offspring are detected in any of the samples from a site, then monitoring will be increased to monthly at that site, and monthly monitoring will be initiated no later than 45 days from the date of the confirmed detection of wAlbB-infected *Cx. quinquefasciatus* offspring. Monthly monitoring samples should be collected approximately every 30 days, but monthly samples will be collected no later than 45 days from the previous sample date. If monthly monitoring at a site cannot be conducted within 45 days of the date of detection or the previous sample, then releases at that site will be suspended until monthly monitoring can be conducted. If ≥10% of *Cx. quinquefasciatus* eggs or larvae sampled from a site per visit are confirmed positive for wAlbB in two consecutive visits (with the subsequent visits conducted monthly as defined above), then cessation of releases within 3km of the positive site must occur. Releases may resume if an additional sterilization method is used or once <10% of *Cx.*

quinquefasciatus eggs or larvae are positive for wAlbB during subsequent monthly monitoring. Once no wAlbB-infected *Cx. quinquefasciatus* eggs or larvae are detected at the positive site during monthly monitoring, quarterly monitoring may resume.

11. Any unused, unregistered product must either be returned to the manufacturer or distributor (unopened containers) or disposed of in accordance with the label following the expiration of the emergency exemption.

This is the first year that an emergency exemption has been requested under section 18 for use of DQB Males on Hawaii's conservation lands. The industry partner, Verily Life Sciences, has indicated they intend to work toward registration under section 3 of FIFRA in the future. Therefore, progress toward registration is adequate at this time.

In the event that the HDOA requests this use pattern next year in connection with an emergency exemption, EPA is making a preliminary determination that this use is eligible for the re-certification program (40 CFR 166.20(b)(5)).

Any future correspondence in connection with this exemption should refer to file symbol: 23HI01

If you have any questions with respect to this authorization, please contact Emergency Response Team member, Anna Katrina Briley at (202) 566-1210; briley.anna-katrina@epa.gov or Eric Bohnenblust at (202) 566-2506; bohnenblust.eric@epa.gov, Chief of the Minor Use and Emergency Response Branch.

_____
Ed Messina, Esq., Director
Office of Pesticide Protection
cc: USEPA Region 9- Regional and Tribal Coordinator, Fabiola Estrada

Appendix D:

USFWS Avoidance and Minimization Measures and Biosecurity Protocols

Avoidance, Minimization, and Conservation Measures for Listed Plants in the Pacific Islands

Project activities may affect listed plant species by causing physical damage to plant parts (roots, stems, flowers, fruits, seeds, etc.) as well as impacts to other life requisite features of their habitat that may result in reduction of germination, growth, and/or reproduction. Cutting and removal of vegetation surrounding listed plants could potentially alter microsite conditions (e.g., light, moisture, temperature), thereby damaging or destroying the listed plants and increasing the risk of invasion by non-native plants, which can result in higher incidence or intensity of fire. Activities such as grazing, use of construction equipment and vehicles, and increased human traffic (i.e., trails, visitation, monitoring), can cause ground disturbance, erosion, and/or soil compaction, which decrease absorption of water and nutrients and damage plant root systems and may result in reduced growth and increased mortality of listed plants. Soil disturbance or removal may negatively impact the soil seed bank of listed plant species if such species are present or historically occurred in the project area.

In order to avoid or minimize potential adverse effects to listed plants that may occur on the proposed project site, we recommend minimizing disturbance outside of existing developed or otherwise modified areas. When disturbance outside existing developed or modified sites is proposed, a botanical survey for listed plant species should be conducted within the project action area, defined as the area where direct and indirect effects are likely to occur. Surveys should be conducted by a knowledgeable botanist with documented experience in identifying native Hawaiian and Pacific Islands plants, including listed plant species. Botanical surveys should optimally be conducted during the wettest part of the year (typically October to April) when plants and identifying features are more likely to be visible, especially in drier areas. If surveys are conducted outside of the wet season, the USFWS may assume plant presence.

The boundary of the area occupied by listed plants should be marked with flagging by the surveyor. To avoid or minimize potential adverse effects to listed plants, we recommend adherence to buffer distances for the activities described in Table C-1 below.

If listed plants are found to occur in a project area, the avoidance buffers are recommended to reduce direct and indirect impacts to listed plants from project activities. However, where project activities will occur within the recommended buffer distances, additional consultation is required. The impacts to plants of concern within the buffer area may be reduced by placing temporary fencing or other barriers at the boundary of the disturbance, as far from the affected plants as practicable.

The above guidelines apply to areas outside of designated critical habitat. If project activities occur within designated critical habitat unit boundaries, additional consultation is required.

All activities, including site surveys, risk introducing non-native species into project areas. Specific attention is necessary to ensure that all equipment, personnel, and supplies are properly checked and are free of contamination (weed seeds, organic matter, or other contaminants) before entering project areas. Quarantines or management activities occurring on specific priority invasive species proximal to project areas need to be considered and adequately addressed. This information can be acquired by contacting local experts such as those on local invasive species

committees (Kauai: https://www.kauaiisc.org/; Oahu: https://www.oahuisc.org/; Maui Nui: https://mauiinvasive.org/; and Hawaii: https://www.biisc.org/).

Table D-1. Recommended Buffer Distances to Minimize and Avoid Potential Adverse Impacts to Listed Plants from Management Activities

Action		Buffer Distance (feet (meters)) - Keep Project Activity This Far Away from Listed Plant	
		Grasses/Herbs/Shrubs and Terrestrial Orchids	Trees and Arboreal Orchids
Walking, hiking, surveys		3 feet (1 m)	3 feet (1 m)
Cutting and removing vegetation by hand or hand tools (e.g., weeding)		3 feet (1 m)	3 feet (1 m)
Mechanical removal of individual plants or woody vegetation (e.g., chainsaw, weed eater)		Greater of 3 feet (1 m) or height of removed vegetation	Greater of 3 feet (1 m) or height of removed vegetation
Removal of vegetation with heavy equipment (e.g., bulldozer, tractor, "bush hog")		2x width equipment + height of vegetation	820 feet (250 m)
Use of approved herbicides (following label)	Ground-based spray application; hand application (no wand applicator; spot treatment)	10 feet (3 m)	Crown diameter
	Ground-based spray application; manual pump with wand, backpack	50 feet (15 m)	Crown diameter
	Ground-based spray application; vehicle-mounted tank sprayer	50 feet (15 m)	Crown diameter
	Aerial spray (ball applicator)	250 feet (76 m)	250 feet (76 m)
	Aerial application – herbicide ballistic technology (individual plant treatment)	100 feet (30 m)	Crown diameter
	Aerial spray (boom)	Further consultation required	Further consultation required
Use of insecticides (pollinators, seed dispersers)		Further consultation required	Further consultation required
Ground/soil disturbance/outplanting/fencing (hand tools, e.g., shovel, `ō`ō; small mechanized tools, e.g., auger)		20 feet (6 m)	2x crown diameter
Ground/soil disturbance (heavy equipment)		328 feet (100 m)	820 feet (250 m)
Surface hardening/soil compaction	Trails (e.g., human, ungulates)	20 feet (6 m)	2x crown diameter
	Roads/utility corridors, buildings/structures	328 ft (100 m)	820 feet (250 m)
Prescribed burns		Further consultation required	Further consultation required
Farming/ranching/silviculture		820 feet (250 m)	820 feet (250 m)

Definitions (Wagner et al. 1999)

Crown: The leafy top of a tree.

Herb: A plant, either annual, biennial, or perennial, with the non-woody stems dying back to the ground at the end of the growing season.

Shrub: A perennial woody plant with usually several to numerous primary stems arising from or relatively near the ground.

Tree: A woody perennial that usually has a single trunk.

Avoidance and Minimization Measures for Animal Species

Endangered ʻōpeʻapeʻa (Hawaiian hoary bat, *Lasiurus cinereus semotus*): The Hawaiian hoary bat roosts in woody vegetation across all islands and will leave their young unattended in trees and shrubs when they forage. If trees or shrubs 15 feet or taller are cleared during the pupping season, June 1 through September 15, there is a risk that young bats could inadvertently be harmed or killed, since they are too young to fly or move away from disturbance. Hawaiian hoary bats forage for insects from as low as 3 feet to higher than 500 feet above the ground and can become entangled in barbed wire used for fencing.

To avoid and minimize impacts to the endangered Hawaiian hoary bat we recommend you incorporate the following applicable measures into your project description:

- Do not disturb, remove, or trim woody plants greater than 15 feet tall during the bat birthing and pup rearing season (June 1 through September 15).

Endangered ʻuaʻu (Hawaiian petrel, *Pterodroma sandwichensis*), Threatened ʻaʻo, (Newell's shearwater, *Puffinus newelli*), and Endangered Hawaiʻi Distinct Population Segment of the ʻakēʻakē (band-rumped storm-petrel, *Hydrobates castro*):
Hawaiian seabirds may traverse the project area at night during the breeding, nesting and fledging seasons (March 1 to December 15). Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and after circling the lights they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the project area between September 15 and December 15, in their first flights from their mountain nests to the sea, are particularly vulnerable to light attraction.

To avoid and minimize potential project impacts to seabirds we recommend you incorporate the following measures into your project description:

- Fully shield all outdoor lights so the bulb can only be seen from below.

Threatened nēnē (Hawaiian goose, *Branta (Nesochen) sandvicensis*): Nēnē are found on the islands of Hawaiʻi, Maui, Molokaʻi, and Kauaʻi. They are observed in a variety of habitats, but prefer open areas, such as pastures, golf courses, wetlands, natural grasslands and shrublands, and lava flows. Threats to the species include introduced mammalian and avian predators, wind facilities, and vehicle strikes.

To avoid and minimize potential project impacts to nēnē we recommend you incorporate the following measures into your project description:

- Do not approach, feed, or disturb nēnē.
- If nēnē are observed loafing or foraging within the project area during the breeding season (September through April), have a biologist familiar with nēnē nesting behavior survey for nests in and around the project area prior to the resumption of any work. Repeat surveys after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest).
- Cease all work immediately and contact the Service for further guidance if a nest is discovered within a radius of 150 feet of proposed project, or a previously undiscovered nest is found within the 150-foot radius after work begins.
- In areas where nēnē are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.

Endangered koloa maoli, (Hawaiian duck, *Anas wyvilliana):*
Hawaiian ducks are known to utilize montane streams on Kaua‘i for nesting.
To avoid and minimize potential project impacts to the Hawaiian duck we recommend you incorporate the following applicable measures into your project description.
• In areas where ducks are known to be present, post and implement reduced speed limits, and inform project personnel and contractors about the presence of endangered species on-site.
• If water resources are located within or adjacent to the project site, incorporate applicable best management practices regarding work in aquatic environments into the project design (see enclosure).
• Have a biological monitor that is familiar with the species’ biology conduct nest surveys where appropriate habitat occurs within the vicinity of the proposed project site prior to project initiation. Repeat surveys again within 3 days of project initiation and after any subsequent delay of work of 3 or more days (during which the birds may attempt to nest). If a nest or active brood is found:

o Contact the Service within 48 hours for further guidance.
o Establish and maintain a 100-foot buffer around all active nests and/or broods until the chicks/ducklings have fledged. Do not conduct potentially disruptive activities or habitat alteration within this buffer.

Endangered Hawaiian forest birds (puaiohi, *Myadestes palmeri*; ‘akikiki, *Oreomystis bairdi*; akeke‘e, *Loxops caeruleirostris*; and threatened ‘i‘iwi, *Drepanis coccinea:*
Hawaiian forest birds’ current ranges are predominately restricted to montane forests above 3,500 feet in elevation due to habitat loss and threats at lower elevations. Hawaiian forest bird habitat has been lost due to development, agriculture, grazing, wildfire, and spread of invasive habitat-altering species. Forest birds are also affected by mosquito-borne diseases. Mosquitoes are not native to Hawai‘i; their occurrence increases in areas where ungulate presence results in small pools of standing water. Actions such as road construction and development increase human access and result in increased wildfire and invasive species threats. Grazing results in

reductions in woody vegetation and increased grass cover, which reduces forest habitat quality and results in increased wildfire risk on the landscape.

Avoid conducting activities within forest bird habitat that:

- Promote the spread or survival of invasive species.
- Increase mosquito populations or stagnant water habitat.
- Increase wildfire threat to montane forest habitats.
- Remove tree cover during the peak breeding season between January 1 and June 30.

Endangered picture-wing flies (*Drosophila musaphilia*):
Picture-wing flies live in montane forest habitat and are restricted to single islands. Larvae of each species are dependent on a single or a few related plant species. The flies are threatened by destruction of habitat from non-native ungulates and invasive weeds, and also directly threatened by a variety of introduced invertebrates, including yellow jackets, crane flies, and several ant species.

- Avoid clearing forest vegetation within 200 feet of a site potentially occupied by endangered *Drosophila*.

Aquatic invertebrates in Hawai'i: Newcomb's snail (*Erinna newcombi*);
Newcomb's snail is restricted to fast-flowing freshwater streams on Kaua'i, where it feeds on vegetation growing on submerged rocks. Threats to the species include reduced stream flow from drought, water diversion projects, or other natural and human causes; predation by introduced snails, flies, and aquatic species; and small population dynamics.

MIGRATORY BIRD TREATY ACT

NATIONWIDE STANDARD CONSERVATION MEASURES

Listed below are effective measures that should be employed at all project development sites nationwide with the goal of reducing impacts to birds and their habitats. These measures are grouped into three categories: General, Habitat Protection, and Stressor Management. These measures may be updated through time. We recommend checking the Conservation Measures website regularly for the most up-to-date list.

1. GENERAL MEASURES

a. Educate all employees, contractors, and/or site visitors of relevant rules and regulations that protect wildlife. See the Service webpage on Regulations and Policies for more information on regulations that protect migratory birds.

b. Prior to removal of an inactive nest, ensure that the nest is not protected under the Endangered Species Act (ESA) or the Bald and Golden Eagle Protection Act (BGEPA). Nests protected under ESA or BGEPA cannot be removed without a valid permit.
    i. See the Service Nest Destruction Policy
c. Do not collect birds (live or dead) or their parts (e.g., feathers) or nests without a valid permit. Please visit the Service permits page for more information on permits and permit applications.
d. Provide enclosed solid waste receptacles at all project areas. Non-hazardous solid waste (trash) would be collected and deposited in the on-site receptacles. Solid waste would be collected and disposed of by a local waste disposal contractor. For more information about solid waste and how to properly dispose of it, see the EPA Non-Hazardous Waste website.
e. Report any incidental take of a migratory bird, to the local Service Office of Law Enforcement.
f. Consult and follow applicable Service industry guidance.

2. HABITAT PROTECTION

g. Minimize project creep by clearly delineating and maintaining project boundaries (including staging areas).
h. Consult all local, State, and Federal regulations for the development of an appropriate buffer distance between development site and any wetland or waterway. For more information on wetland protection regulations see the Clean Water Act sections 401 and 404.
i. Maximize use of disturbed land for all project activities (i.e., siting, lay-down areas, and construction).
j. Implement standard soil erosion and dust control measures. For example:
    i. Establish vegetation cover to stabilize soil
    ii. Use erosion blankets to prevent soil loss
    iii. Water bare soil to prevent wind erosion and dust issues

3. STRESSOR MANAGEMENT

3.1 STRESSOR: VEGETATION REMOVAL

Conservation Goal: Avoid direct take of adults, chicks, or eggs.

Conservation Measure 1: Schedule all vegetation removal, trimming, and grading of vegetated areas outside of the peak bird breeding season to the maximum extent practicable. Use available resources, such as internet-based tools (e.g., the FWS's Information, Planning and Conservation system and Avian Knowledge Network) to identify peak breeding months for local bird species; or,

contact local Service Migratory Bird Program Office for breeding bird information.

Conservation Measure 2: When project activities cannot occur outside the bird nesting season, conduct surveys prior to scheduled activity to determine if active nests are present within the area of impact and buffer any nesting locations found during surveys.

1) Generally, the surveys should be conducted no more than five days prior to scheduled activity.
2) Timing and dimensions of the area to be surveyed vary and will depend on the nature of the project, location, and expected level of vegetation disturbance.
3) If active nests or breeding behavior (e.g., courtship, nest building, territorial defense, etc.) are detected during these surveys, no vegetation removal activities should be conducted until nestlings have fledged or the nest fails or breeding behaviors are no longer observed. If the activity must occur, establish a buffer zone around the nest and no activities will occur within that zone until nestlings have fledged and left the nest area. The dimension of the buffer zone will depend on the proposed activity, habitat type, and species present and should be coordinated with the local or regional Service office.
4) When establishing a buffer zone, construct a barrier (e.g., plastic fencing) to protect the area. If the fence is knocked down or destroyed, work will suspend wholly, or in part, until the fence is satisfactorily repaired.
5) When establishing a buffer zone, a qualified biologist will be present onsite to serve as a biological monitor during vegetation clearing and grading activities to ensure no take of migratory birds occurs. Prior to vegetation clearing, the monitor will ensure that the limits of construction have been properly staked and are readily identifiable. Any associated project activities that are inconsistent with the applicable conservation measures, and activities that may result in the take of migratory birds will be immediately halted and reported to the appropriate Service office within 24 hours.
6) If establishing a buffer zone is not feasible, contact the Service for guidance to minimize impacts to migratory birds associated with the proposed project or removal of an active nest. Active nests may only be removed if you receive a permit from your local Migratory Bird Permit Office. A permit may authorize active nest removal by a qualified biologist with bird handling experience or by a permitted bird rehabilitator.

Conservation Measure 3: Prepare a vegetation maintenance plan that outlines vegetation maintenance activities and schedules so that direct bird impacts do not occur.

3.2 STRESSOR: INVASIVE SPECIES INTRODUCTION

Conservation Goal: Prevent the introduction of invasive plants.
Conservation Measure 1: Prepare a weed abatement plan that outlines the areas where weed abatement is required and the schedule and method of activities to ensure bird impacts are avoided.

Conservation Measure 2: For temporary and permanent habitat restoration/enhancement, use only native and local (when possible) seed and plant stock.

Conservation Measure 3: Consider creating vehicle wash stations prior to entering sensitive habitat areas to prevent accidental introduction of non-native plants.

Conservation Measure 4: Remove invasive/exotic species that pose an attractive nuisance to migratory birds.

3.3 STRESSOR: ARTIFICIAL LIGHTING

Conservation Goal: Prevent increase in lighting of native habitats during the bird breeding season.

Conservation Measure 1: To the maximum extent practicable, limit construction activities to the time between dawn and dusk to avoid the illumination of adjacent habitat areas.

Conservation Measure 2: If construction activity time restrictions are not possible, use down shielding or directional lighting to avoid light trespass into bird habitat (i.e., use a 'Cobra' style light rather than an omnidirectional light system to direct light down to the roadbed). To the maximum extent practicable, while allowing for public safety, low intensity energy saving lighting (e.g. low pressure sodium lamps) will be used.

Conservation Measure 3: Minimize illumination of lighting on associated construction or operation structures by using motion sensors or heat sensors.

Conservation Measure 5: Bright white light, such as metal halide, halogen, fluorescent, mercury vapor and incandescent lamps should *not* be used.

3.4 STRESSOR: HUMAN DISTURBANCE

Conservation Goal: Minimize prolonged human presence near nesting birds during construction and maintenance actions.

Conservation Measure 1: Restrict unauthorized access to natural areas adjacent to the project site by erecting a barrier and/or avoidance buffers (e.g., gate, fence, wall) to minimize foot traffic and off-road vehicle uses.

3.5 STRESSOR: COLLISION

Conservation Goal: Minimize collision risk with project infrastructure and vehicles.
Conservation Measure 1: Minimize collision risk with project infrastructure (e.g., temporary and permanent) by increasing visibility through appropriate marking and design features (e.g., lighting, wire marking, etc.).

Conservation Measure 2: On bridge crossing areas with adjacent riparian, beach, estuary, or other bird habitat, use fencing or metal bridge poles (Sebastian Poles) that extend to the height of the tallest vehicles that will use the structure.

Conservation Measure 3: Install wildlife friendly culverts so rodents and small mammals can travel under any new roadways instead of over them. This may help reduce raptor deaths associated with being struck while tracking prey or scavenging road kill on the roadway.

Conservation Measure 4: Remove road-kill carcasses regularly to prevent scavenging and bird congregations along roadways.

Conservation Measure 5: Avoid planting "desirable" fruited or preferred nesting vegetation in medians or Rights of Way.

Conservation Measure 6: Eliminate use of steady burning lights on tall structures (e.g., >200 ft).

3.6 STRESSOR: ENTRAPMENT

Conservation Goal: Prevent birds from becoming trapped in project structures or perching and nesting in project areas that may endanger them.

Conservation Measure 1: Minimize entrapment and entanglement hazards through project design measures that may include:

1. Installing anti-perching devices on facilities/equipment where birds may commonly nest or perch
2. Covering or enclosing all potential nesting surfaces on the structure with mesh netting, chicken wire fencing, or other suitable exclusion material prior to the nesting season to prevent birds from establishing new nests. The netting, fencing, or other material must have no opening or mesh size greater than 19 mm and must be maintained until the structure is removed.
3. Cap pipes and cover/seal all small dark spaces where birds may enter and become trapped.

Conservation Measure 2: Use the appropriate deterrents to prevent birds from nesting on structures where they cause conflicts, may endanger themselves, or create a human health and safety hazard.

1. During the time that the birds are trying to build or occupy their nests (generally , between April and August, depending on the geographic location), potential nesting surfaces should be monitored at least once every three days for any nesting activity, especially where bird use of structures is likely to cause take. It is permissible to remove non-active nests (without birds or eggs), partially completed nests, or new nests as they are built (prior to occupation). If birds have started to build any nests, the nests shall be removed before they are completed. Water shall not be used to remove the nests if nests are located within 50 feet of any surface waters.
2. If an active nest becomes established (i.e., there are eggs or young in the nest), all work that could result in abandonment or destruction of the nest shall be avoided until the young have fledged or the nest is unoccupied. Construction activities that may displace birds after they have laid their eggs and before the young have fledged should not be permitted. If the project continues into the following spring, this cycle shall be repeated. When work on the structure is complete, all netting shall be removed and properly disposed of.

3.7 STRESSOR: NOISE

Conservation Goal: Prevent the increase in noise above ambient levels during the nesting bird breeding season.

Conservation Measure 1: Minimize an increase in noise above ambient levels during project construction by installing temporary structural barriers such as sand bags

Conservation Measure 2: Avoid permanent additions to ambient noise levels from the proposed project by using baffle boxes or sound walls.

3.8 STRESSOR: FIRE

Conservation Goal: Minimize fire potential from project-related activities.

Conservation Measure 1: Reduce fire hazards from vehicles and human activities (e.g., use spark arrestors on power equipment, avoid driving vehicles off road).

Conservation Measure 2: Consider fire potential when developing vegetation management plans by planting temporary impact areas with a palate of low-growing, sparse, fire resistant native species that meet with the approval of the County Fire Department and local FWS.

Invasive Species Biosecurity Protocols

Project activities may introduce or spread invasive species, causing negative ecological consequences to new areas or islands, resulting in potential impacts to fish, wildlife, and their habitat. For example, seeds of invasive plant species (e.g., *Chromolaena odorata*, *Senecio madagascariensis* or *Miconia calvescens*) can be inadvertently transported on equipment from a previous work site to a new site where the species are not present. Equipment used in an area infected with a pathogen or insect pest that can have ecological consequences (e.g., rapid ‘ōhi‘a death [*Ceratocystis* spp.], black twig borer [*Xylosandrus compactus*], or naio thrips [*Klambothrips myopori*]), if not properly decontaminated, can likewise serve as a vector to introduce the pathogen into a new area. Vehicles must also be properly inspected and cleaned to ensure vertebrate or invertebrate pests do not stowaway and spread to other areas. These are just a few examples of how even well-intended project activities may inadvertently introduce or spread invasive species.

To avoid and minimize the potential impacts of invasive species to fish, wildlife, and their habitats, we recommend incorporating general biosecurity protocols into project planning (see protocols below). The proposed project also occurs in a geographic area and/or involves activities that risk spreading the fungi that cause rapid ‘ōhi‘a death (ROD). For these reasons, the biosecurity protocol for ROD is also provided below.

The following biosecurity protocol is recommended to be incorporated into planning for the project to avoid or minimize transportation of invasive species with potential to impact fish, wildlife, and their habitat. Cleaning, treatment, and inspection activities are the responsibility of the equipment or vehicle owner and operator. However, it is ultimately the responsibility of the action agency to ensure that all project materials, vehicles, machinery, equipment, and personnel are free of invasive species before entry into a project site. Please refer to the resources listed below for current removal/treatment recommendations that may be relevant to the project.

1. Cleaning and treatment:

   Project applicants should assume that all project materials (i.e., construction materials, or aggregate such as dirt, sand, gravel, etc.), vehicles, machinery, and equipment contain dirt and mud, debris, plant seeds, and other potential vectors of invasive species, and therefore require thorough cleaning. Treatment for specific pests, for example, trapping and poison baiting for rodents, or baiting and fumigation for insects, should be considered when applicable. For effective cleaning we offer the following recommendations prior to entry into a project site:

   a. Project materials, vehicles, machinery, and equipment must be pressure washed thoroughly (preferably with hot water) in a designated cleaning area. Project materials, vehicles, machinery, and equipment should be visibly free of mud and dirt (excluding aggregate), seeds, plant debris, insects, spiders, frogs (including frog eggs), other vertebrate species (e.g., rodents, mongoose, feral cats, reptiles, etc.), and rubbish. Areas of particular concern include bumpers, grills, hood compartments, wheel wells, undercarriage, cabs, and truck beds. Truck beds with accumulated material are prime sites for hitchhiking invasive species.

b. The interior and exterior of vehicles, machinery, and equipment must be free of rubbish and food, which can attract pests (i.e., rodents and insects). The interiors of vehicles and the cabs of machinery should be vacuumed clean particularly for any plant material or seeds.

2. Inspection:

   a. Following cleaning and/or treatment, project materials, vehicles, machinery, and equipment must be visually inspected by its user and found to be free of mud and dirt (excluding aggregate), debris, and invasive species prior to entry into a project site. For example, careful visual inspection of a vehicle's tires and undercarriage is recommended for any remaining mud that could contain invasive plant seeds.

   b. Any project materials, vehicles, machinery, or equipment found to contain invasive species (e.g., plant seeds, invertebrates, rodents, cats, reptiles, etc.) must not enter the project site until those invasive species are properly removed/treated.

3. For all project site personnel:

   a. Prior to entry into the project site, visually inspect and clean all clothes, boots or other footwear, backpack, radio harness, tools and other personal gear and equipment for insects, seeds, soil, plant parts, or other debris. We recommend the use of a cleaning brush with sturdy bristles. Seeds found on clothing, footwear, backpacks, etc., should be placed in a secure bag or similar container and discarded in the trash rather than being dropped to ground at the project site or elsewhere.

4. Additional considerations:

   a. Avoid unnecessary exposure to invasive species at a particular site (to the extent practical) to reduce contamination and spread. For example, if the project involves people or equipment moving between multiple locations, plan and organize timelines so that work is completed in native habitat prior to working in a disturbed location to reduce the likelihood of introducing a pest into the native habitat.

   b. Maintain good communication about invasive species risks between project managers and personnel working on the project site (e.g., conduct briefings and training about invasive species). Ensure prevention measures are communicated to the entire project team. Also consider adding language regarding biosecurity into contracts or permitting mechanisms to provide clarity to all involved in the project.

Species-Specific Biosecurity Protocols

Rapid ʻŌhiʻa Death

ROD is caused by a fungal pathogen (*Ceratocystis* spp.) that attacks and kills ʻōhiʻa trees. ʻŌhiʻa is endemic to the Hawaiian Islands and is the most abundant native tree species, making up approximately 80% of Hawaiʻi's remaining native forests.

For more information about ROD including its current distribution, ROD science updates, and the latest on ROD protocols, please visit www.rapidohiadeath.org.

To reduce the risk of spreading ROD, the following best management practices and decontamination protocol are recommended:

Best Management Practices for ROD

1. Never transport any part of an ʻōhiʻa tree between different areas of an island or to a different island.
2. Do not use equipment from ROD-infected islands on another island unless it is very specialized equipment and follows the decontamination protocol described below.
3. Avoid wounding ʻōhiʻa trees and roots with mowers, chainsaws, weed eaters, and other tools. If an ʻōhiʻa receives a minor injury like a small broken branch, give the injury a clean, pruning-type cut (close to the main part of the trunk or branch) to promote healing, and then spray the entire wounded area with a pruning seal.
4. Always report suspect ROD ʻōhiʻa trees observed within your project area. ROD is a wilt disease that cuts off the supply of water and nutrients to the tree. The primary symptom to look for is an entire canopy or a large branch with dying leaves or red discolored leaves. Please record the global positioning system (GPS) coordinates and location and take a picture of the tree if possible. Please report suspected ROD ʻōhiʻa trees on Kauaʻi to KISC: 808-821-1490 (kisc@hawaii.edu).

ROD Decontamination Protocol

1. Clothes, footwear, backpacks, and other personal equipment
    a. Before leaving the project site, remove as much mud and other contaminants as possible. Use of a brush with soap and water to clean gear is preferred. Footwear, backpacks, and other gear must be sanitized by spraying with a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution.
2. Vehicles, machinery, and other equipment
    a. Vehicles, machinery, and other equipment must be thoroughly hosed down with water (pressure washing preferred) and visibly free of mud and debris, then sprayed with a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution. Use of a "pump-pot" sprayer is recommended for the solution and a hot water wash is

preferred. Be sure to thoroughly clean the undercarriage, truck bed, bumpers, and wheel wells.

b. If non-decontaminated personnel or items enter a vehicle, then the inside of the vehicle (i.e., floor mats, etc.) must be subsequently decontaminated by removing mud and other contaminants and sprayed with a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution.

3. Cutting tools

   a. All cutting tools, including machetes, chainsaws, and loppers, must be sanitized to remove visible mud and other contaminants. Tools must be sanitized using a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution. One minute after sanitizing, an oil-based lubricant may be applied to chainsaw chains or other metallic parts to prevent corrosion.

NOTE: When using a 10% bleach solution, surfaces should be cleaned with a minimum contact time of 30 seconds. Bleach must be mixed daily and used within 24 hours, as once mixed it degrades. Bleach will not work to disinfect surfaces that have high levels of organic matter such as sawdust or soil. Because bleach is corrosive to metal, a water rinse after proper sanitization is recommended to avoid corrosion.

REFERENCES CITED

Wagner, W.L., S. Sohmer, and D.R. Herbst. 1999. Manual of the Flowering Plants of Hawaii, revised edition. Honolulu, Hawaii. University of Hawaii and Bishop Museum Press.

Appendix E:

Present and Reasonably Foreseeable Future Management Actions within the Proposed Project Area

Table E-1. Present and Reasonably Foreseeable Future Management Actions within the Project Area

Activity		Present Activities				Future Activities
Hunting	Reserve	Hunting Unit	Dates	Game Type/Method	Hunter Trips (July 2021 – June 2022)	No special hunts are planned within the project area in the foreseeable future.
	Pu'u Ka Pele, Nā Pali-Kona Forest Reserve	B	Year round; Friday, Saturday, Sunday, Monday and state holidays	Pig; all methods[6]	407	
			May through August; Friday, Saturday, Sunday, Monday	Goat; all methods		
			September through October, Friday, Saturday, Sunday, Monday	Deer; all methods		
	Kōke'e State Park	D	December through May; Saturday, Sunday, and state holidays	Pig; archery, dog, and knife	197	
			June through August; Saturday, Sunday, and state holidays	Deer and pig; archery		

[6] All methods: rifle, shotgun, muzzleloader, archery, dogs, and knife.

Activity	Present Activities				Future Activities
	Nā Pali-Kona, Alakaʻi Wilderness Preserve	E1	Year round; Friday, Saturday, Sunday, Monday, and state holidays	Pig, goat, and deer; all methods	254
		E2	Year round; Daily	Pig, goat, and deer; all methods	296
	Kōkeʻe, Nā Pali-Kona, Kuʻia Natural Area Reserve	H	December through July; Friday, Saturday, Sunday, Monday, and state holidays	Pig, goat, and deer; all methods	1,182
			August through November; Friday, Saturday, Sunday, Monday, and state holidays	Pig, goat, deer; all methods except dogs	
	Nā Pali Coast Wilderness Preserve, Hono Nā Pali Natural Area Reserve	G	Year round; daily	Goat and pig; archery	< 50
	Haleleʻa Forest Reserve, Līhuʻe-Kona Forest Reserve	C	August through November; Friday, Saturday, Sunday, Monday, and state holidays	Goat and pig; all methods	810

Activity		Present Activities	Future Activities
Traps and Bait Stations	Organization	Current Trapping Operations	
	DOFAW (including DOFAW Natural Area Reserves System)	Pacific Rim Conservation has a trap line along the Alaka‘i Boardwalk within Alaka‘i Wilderness Preserve. Tomahawk traps and A24s in Kuia and Hono o Nā Pali Natural Area Reserves (NARs).	No current plans for DOFAW to add additional traps. More traps could be added to Mōhihi management unit if additional fences are constructed.
	State Parks	Kōke‘e State Park, Nā Pali Coast Wilderness Park, Wailua River State Park.	No changes.
	KFBRP	One plot of 125 A24 rat traps in Nā Pali Kona Forest Reserve and one plot of 200 A24s in Alaka‘i Wilderness Preserve. These plots are checked every 4 months.	Current plan to increase size, number, and density of A24 trap grids.
	TNC	Pig traps, cat traps, and mosquito traps in the Alaka‘i Wilderness Preserve. Access various sites within Alaka‘i Wilderness Preserve every other week to check snares, fences, traps, etc.	No changes.
Animal traps	Organization	Current Trapping Operations	
	DOFAW – Natural Area Reserves System	Staff manage snares in NARs. Snares have been removed from units that are ungulate free.	Hunting and deployment of snares is planned within recently completed and future fence units.
	TNC	Network of snares in the Alaka‘i Wilderness Preserve for ungulate removal. Sites are accessed every other week to check snares, fences, traps, etc. Snares are removed from units that are ungulate free.	
	Organization	Current Trapping Operations	

Activity		Present Activities		Future Activities
Fences and Fence Supply Caches	DOFAW – Forestry and TNC	The fenced units on the Alakaʻi Plateau include: East Alakaʻi (1,972 acres), Halehaha-Halepaʻakai (1,352 acres), Koaie (1,064 acres), and Drinking Glass (877 acres). Drinking Glass and Halehaha-Halepaʻakai are entirely within Alakaʻi Wilderness Preserve. The East Alakaʻi and Koaie units are partially state-owned and partially private land (Wainiha Wilderness Preserve). Approximately 5,000 forest reserve acres are fenced in total.		Discussions regarding enlarging the Mōhihi exclosure (in the Alakaʻi Wilderness Preserve) are ongoing. This fence would encompass the headwaters of the Kawaikoi and Waikoali streams (2,000 acres).
	DOFAW – Natural Area Reserves System	Hono O Nā Pali Boundary fence (approximately 3.3 miles) with additional strategic fences (approximately 1.4 miles combined). Kuʻia NAR has several smaller fences (approximately 4.2 miles, enclosing 131.7 acres in total).		No changes.
Camping	Agency Department	Reserves	Usage	An additional $10 processing fee will be charged for camping within Forest Reserves.
	DOFAW	Na Pali Kona Forest Reserve (5 campgrounds: Waialae Cabin, Waikoali, Kawaikoi, Sugi Grove, Lonomea)	2022: 2,475 people over 1,366 nights, 870 permits. So far in 2023: 1,464 people over 772 nights, 478 permits.	
	State Parks	Nā Pali Coast State Wilderness Park Polihale State Park Kōkeʻe State Park	All three sites are accessed daily by the public and campers. Nā Pali Coast State Wilderness Park allows 60 campers per night during summer and 30 campers per night during winter.	
Collecting	Agency Department	Action	Usage	No changes.

Activity		Present Activities		Future Activities
	DOFAW	Collection of foliage for arrangements and lei	2022: 25 in Nā Pali Kona Forest Reserve. None in Puʻu Ka Pele Forest Reserve. So far in 2023: 18 personal collection permits for Nā Pali Kona Forest Reserve. None in Puʻu Ka Pele Forest Reserve.	
	State Parks		Kōkeʻe State Park and Nā Pali Coast Wilderness Park have current collection permits. Access is the same as for the public.	
Commercial Harvest	Agency Department	Harvest Activity	Activity	No changes.
	DOFAW	Hazardous trees that cross or have the potential to fall on or cross access roads.	2022: Two salvage harvests on Camp 10 road. So far in 2023: None.	

Activity		Present Activities		Future Activities
Access	Agency Department	Reserve	Trail or Road	No changes.
	DOFAW Nā Ala Hele	Nā Pali-Kona Forest Reserve	Awaʻawapuhi Trail, Nuʻalolo Cliff Trail, Nuʻalolo Trail, Miloliʻi Trail, Mākaha Ridge Road, Kauhao Ridge Road, Pihea Trail, Alakaʻi Swamp Trail, Kawaikōī Stream Trail, Mōhihi-Camp 10 Road, Poʻomau Canyon Vista Trail, Mōhihi-Waiʻalae Trail, Kohua Ridge Trail, Puʻu Ki-Waiʻalae Trail, Koaie Canyon Trail.	
		Puʻu Ka Pele Forest Reserve	Puʻu Ki-Waiʻalae Trail.	
		Alakaʻi Wilderness Preserve	Pihea Trail, Alakaʻi Swamp Trail, Kawaikōī Stream Trail, Mōhihi-Camp 10 Road, Poʻomau Canyon Vista Trail, Mōhihi-Waiʻalae Trail, Kohua Ridge Trail, Puʻu Ki-Waiʻalae Trail.	
		Kuʻia NAR	Awaʻawapuhi Trail, Nuʻalolo Cliff Trail, Nuʻalolo Trail.	

Activity		Present Activities		Future Activities
	State Parks	Kōkeʻe State Park	Official trails: Poʻomau Canyon Vista Trail, Kaluapuhi Trail, Halemanu-Kōkeʻe Trail, Kumuwela Trail, Berry Flats-Water Tank Trail. Unofficial trails: Kālepa Ridge-Airplane Trail, Honopū Trail. Kōkeʻe Resource Conservation Program (KRCP) does periodic trail maintenance.	
Administrative Trails	Organization	Location and Use		
	DOFAW/TNC	Alakaʻi Wilderness Preserve: Located within fenced units. TNC accesses sites within preserve every other week to check snares, fences, traps, etc.		No changes.
	KFBRP	Alakaʻi Wilderness Preserve: KFBRP uses the unofficial trails weekly from February through July, and about once a month for the rest of the year.		
Trails Tool Caches	Organization	Location		
	State Parks	Nā Pali Coast State Wilderness Park (Kalalau Trail).		No changes.

Activity		Present Activities	Future Activities
Research Shelters	Organization	Present Use of Shelters	
	KFBRP	Two forest bird research shelters in Nā Pali-Kona Forest Reserve and one in the Alaka‘i Wilderness Preserve. Used daily from February through June and monthly the rest of the year by crews of two to six people per shelter.	A new research shelter may be built in the future near Mōhihi Bog; however, this is dependent on the installation of a fence around the perimeter of the Mōhihi watershed. The installation of the shelter will increase camping and mosquito monitoring within this area.
	Organization	Existing Monitoring Activities within Project Area	

Activity		Present Activities	Future Activities
Monitoring Transects and Research Plots	KFBRP	Hawaiʻi Forest Bird Surveys: Monitor transects every 5 years with a crew of two people for 4 months within Kuʻia NAR, Nā Pali-Kona Forest Reserve, and Alakaʻi Wilderness Preserve. Transects will be monitored again in 2023. Two forest bird monitoring plots in Nā Pali-Kona Forest Reserve, and one in Alakaʻi Wilderness Preserve. Plots are surveyed daily between February and June and monthly the rest of the year by crews of two to six people per plot. Three mosquito monitoring plots of 16 traps each (one in Kuʻia NAR, one in Kōkeʻe State Park, and one in Nā Pali Kona Forest Reserve). Monitored every 6 weeks. Larval transects (1–2 kilometers long) on two to three streams in Nā Pali Kona Forest Reserve and two to three streams in Alakaʻi Wilderness Preserve.	Additional monitoring associated with mosquito release.
	TNC	Fourteen vegetation and ungulate monitoring transects within Alakaʻi Wilderness Preserve. Monitoring is undertaken once per year (older transects in ungulate-free units are monitored less frequently).	
Stream and Rainfall/Weather Monitoring Stations	Organization	Existing Monitoring Activities within Project Area	
	KFBRP	One weather monitoring station in Nā Pali Kona Forest Reserve and one in Alakaʻi Wilderness Preserve.	Planning to add a network of 12 stream sensors.
	USGS	Kawaikōī Stream: Nā Pali-Kona Forest Reserve Waiʻalae Stream: Nā Pali-Kona Forest Reserve Waiʻaleʻale Stream: Private lands (Alexander & Baldwin, Brue Baukol Capital Partners) Hanakāpīʻai Stream: Hono O Nā Pali NAR (per DOFAW).	No changes.
	State Parks	Hanakāpīʻai Valley (Nā Pali Coast State Park) and Kōkeʻe State Park.	No changes.

Activity		Present Activities	Future Activities
Research Shelters	Organization	Present Use of Shelters	
	KFBRP	Two forest bird research shelters in Nā Pali-Kona Forest Reserve, and one in the Alakaʻi Wilderness Preserve. Used daily from February through June and monthly the rest of the year by crews of two to six people per shelter.	A new research shelter may be built in the future near Mōhihi Bog; however, this is dependent on the installation of a fence around the perimeter of the Mōhihi watershed. The installation of the shelter will increase camping and mosquito monitoring within this area.
Helicopter Operations	Organization	Current Operations	
	DOFAW (including Natural Area Reserves System, Kauaʻi Invasive Species Committee)	DOFAW – Forestry: One trip every other month on average (approximately 5 hours flying time per month). DOFAW – NARS: Locations throughout the NARs (approximately 5 hours flying time per month).	No changes.
	State Parks	Operations conducted monthly in Kōkeʻe State Park, Nā Pali Coast State Park, Waimea Canyon State Park, Hāʻena State Park.	No changes.
	USGS	USGS flies into their stream and rain gauges quarterly (located in Nā Pali Kona Forest Reserve, private land, Hono o Nā Pali NAR)	No changes.
	TNC	Operations conducted in Alakaʻi Wilderness Preserve (approximately 4 hours flying time/month).	No changes.

Activity		Present Activities	Future Activities
	KFBRP	Alaka‘i Wilderness Preserve: Weekly flights from March through June. Nā Pali Kona Forest Reserve: Flights all year. Flight times average 5.75 hours per month from March to June and 3.25 hours per month for the rest of the year.	Mosquito monitoring will likely increase the number of helicopter flights.
	KRCP (including Kaua‘i Invasive Species Committee)	Alaka‘i Wilderness Preserve: minimum of seven camping trips or fence checks per year. Hono o Nā Pali NAR: Between zero and six operational trips per year. Līhu‘e-Koloa Forest Reserve and Nā Pali Coast State Park: Occasional operations. Total of approximately 26 flight hours in 2022.	No changes.
Landing Zones	Reserve Name	Number of Landing Zones	
	Halele‘a Forest Reserve	2	No changes planned. Project will only utilize existing landing zones. No new landing zones will be created.
	Hono O Nā Pali Natural Area Reserve	6	
	Kōke‘e State Park	2	
	Līhu‘e-Kōloa Forest Reserve	1	
	Nā Pali Coast State Wilderness Park	3	
	Nā Pali-Kona Forest Reserve	8	
	Nā Pali-Kona Forest Reserve/Alaka‘i Wilderness Preserve	38	
	Outside Reserves	4	
	Wainiha Preserve (TNC)	30	
	Total	94	
	DOFAW Partners	State Parks partners	No changes.

Activity	Present Activities	Future Activities
DOFAW/partner activities, management stewardship	KFBRP KRCP: invasive species control TNC: watershed management in Alaka‘i Wilderness Preserve	KRCP Hui o Laka – Kōke‘e Museum Friends of the Kalalau Trail Kaua‘i Invasive Species Committee Pacific Islands Fish and Wildlife Office

Appendix F:

Threatened and Endangered Species and Critical Habitats in the Project Area

Table F-1. Federal Threatened and Endangered Species that would be Considered Unlikely to be Impacted by the No-Action Alternative and Proposed Action.

Species	Threat Status	Justification for not Including within Impacts Analysis
Newcomb's snail (*Erinna newcombi*) (aquatic invertebrate)	Threatened (Federal and state)	Pedestrian activities would be limited to established trails and stream crossings Incompatible mosquitos are unlikely to interact with Newcomb's snails.
Hawaiian monk seal (*Monachus schauinslandi*)	Endangered (Federal and state)	Aerial and pedestrian dispersal of incompatible male mosquitos unlikely to occur near lowland coastal habitats and nearshore coastal waters. Other project activities are unlikely to occur within lowland coastal environments. Interaction between the listed marine species and mosquitos are likely to be minimal to non-existent.
Green sea turtle (*Chelonia mydas*)	Threatened (Federal and state)	
Hawksbill sea turtle (*Eretmochelys imbricata*)	Endangered (Federal and state)	
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered (Federal and state)	
Loggerhead sea turtle (*Caretta caretta*)	Threatened (Federal and state)	
Olive ridley sea turtle (*Lepidochelys olivacea*)	Threatened (Federal and state)	
Humpback whale (*Megaptera novaeangliae*) and five other endangered baleen whale species	Endangered (Federal and state)	
Sperm whale (*Physeter macrocephalus*)	Endangered (Federal and state)	
False killer whale (*Pseudorca crassidens*)	Endangered (Federal and state)	

Table F-2. Federally Listed Threatened and Endangered Plant Species Recorded within the Project Area

Scientific Name[7]	Common Name	USFWS Threat Status
Adenophorus periens	pendent kihi fern	Endangered
Alectryon macrococcus var. *macrococcus*	Mahoe	Endangered
Asplenium dielpallidum	no common name	Endangered
Astelia waialealae	pa'iniu	Endangered
Bonamia menziesii	no common name	Endangered
Brighamia insignis	'ōlulu	Endangered
Canavalia napaliensis	'āwikiwiki	Endangered
Cyanea recta	Hāhā	Endangered
Cyanea rivularis	Hāhā	Endangered
Cyrtandra kealiae subsp. kealiae	ha'iwale	Endangered
Cyrtandra paliku	ha'iwale	Endangered
Dryopteris glabra var. pusilla	Hohiu	Endangered
Dubautia latifolia	Koholāpehu	Endangered
Dubautia pauciflorula	na'ena'e	Endangered
Dubautia waialealae	na'ena'e	Endangered
Euphorbia halemanui	'akoko	Endangered
Euphorbia remyi var. kauaiensis	'akoko	Endangered
Euphorbia remyi var. remyi	'akoko	Endangered
Exocarpus luteolus	Heau	Endangered
Geniostoma helleri	Kāmakahala	Endangered
Geranium kauaiense	Nohoanu	Endangered
Hibiscadelphus distans	Kaua'i hau kuahiwi	Endangered
Hibiscus clayi	Clay's hibiscus	Endangered
Ischaemum byrone	Hilo ischaemum	Endangered
Isodendrion longifolium	Aupaka	Threatened
Joinvillea ascendens subsp. ascendens	'ohe	Endangered

[7] Records within this table are from the DLNR rare plants database.

Scientific Name[7]	Common Name	USFWS Threat Status
Keysseria helenae	Mt. Wai‘ale‘ale island-daisy	Endangered
Lobelia niihauensis	Ni‘ihau lobelia	Endangered
Lysimachia daphnoides	lehua makanoe	Endangered
Lysimachia pendens	no common name	Endangered
Melicope degeneri	Alani	Endangered
Melicope haupuensis	Alani	Endangered
Melicope pallida	Alani	Endangered
Melicope paniculata	Alani	Endangered
Melicope puberula	Alani	Endangered
Melicope rostrata	Alani	Endangered
Myrsine fosbergii	Kōlea	Endangered
Myrsine knudsenii	Kōlea	Endangered
Myrsine linearifolia	Kōlea	Endangered
Myrsine mezii	Kōlea	Endangered
Nothocestrum latifolium	‘aiea	Endangered
Nothocestrum peltatum	‘aiea	Endangered
Peucedanum sandwicense	Makou	Threatened
Phyllostegia helleri	Mt. Kāhili phyllostegia	Endangered
Phyllostegia renovans	red-leaf phyllostegia	Endangered
Pittosporum napaliense	hō‘awa	Endangered
Platanthera holochila	Hawai‘i bog orchid	Endangered
Poa mannii	Mann’s bluegrass	Endangered
Poa sandvicensis	Hawaiian bluegrass	Endangered
Poa siphonoglossa	no common name	Endangered
Polyscias racemosa	no common name	Endangered
Pritchardia viscosa	loulu	Endangered
Psychotria grandiflora	Kōpiko	Endangered
Psychotria hobdyi	Kōpiko	Endangered
Pteralyxia kauaiensis	Kaulu	Endangered
Ranunculus mauiensis	Makou	Endangered

Scientific Name[7]	Common Name	USFWS Threat Status
Remya kauaiensis	Kaua‘i remya	Endangered
Schiedea helleri	no common name	Endangered
Schiedea lychnoides	Kuawawaenohu	Endangered
Schiedea membranacea	no common name	Endangered
Schiedea spergulina	no common name	Endangered
Schiedea viscosa	no common name	Endangered
Sesbania tomentosa	‘ohai	Endangered
Solanum sandwicense	pōpolo ‘aiakeakua	Endangered
Spermolepis hawaiiensis	no common name	Endangered
Stenogyne kealiae	Keal’s stenogyne	Endangered
Wilkesia hobdyi	dwarf iliau	Endangered
Xylosma crenatum	no common name	Endangered

Table F-3. Federally Listed Threatened and Endangered Animal Species in the Project Area

Scientific Name	Common Name	USFWS Threat Status
Myadestes palmeri	Puaiohi, Small Kaua‘i Thrush	Endangered
Oreomystis bairdi	‘Akikiki	Endangered
Loxops careuleirostris	Akeke‘e	Endangered
Drepanis coccinea	‘I‘iwi	Threatened
Branta sandvicensis	Nēnē, Hawaiian Goose	Threatened
Anas wyvilliana	Koloa maoli, Hawaiian Duck	Endangered
Lasiurus cinereus semotus	‘Ōpe‘ape‘a, Hawaiian Hoary Bat	Endangered
Hydrobates castro	‘Akē‘akē, Band-rumped Storm-petrel	Endangered
Erinna newcombi	Newcomb‘s Snail	Endangered
Drosophila musaphilia	Hawaiian Picture-wing Fly	Endangered

Table F-4. Federally Designated Critical Habitats and Associated Species in the Project Area

Critical Habitat Unit	Species
Kaua'i Lowland Wet Ecosystem Unit 1	*Charpentiera densiflora, Cyanea eleeleensis, Cyanea kolekoleensis, Cyanea kuhihewa, Cyrtandra oenobarba Dubautia imbricata* ssp. *imbricata, Euphorbia remyi* var. *kauaiensis, Euphorbia remyi* var. *remyi, Labordia helleri, Melicope paniculata, Melicope puberula, Phyllostegia renovans, Platydesma rostrata, Polyscias bisattenuata, Polyscias flynnii, Stenogyne kealiae*
Kaua'i Lowland Wet Ecosystem Unit 2	*Charpentiera densiflora, Cyanea eleeleensis, Cyanea kolekoleensis, Cyanea kuhihewa, Cyrtandra oenobarba, Dubautia imbricata* ssp. i*mbricata, Euphorbia remyi* var. *kauaiensis, Euphorbia remyi* var. *remyi, Labordia helleri, Melicope paniculata, Melicope puberula, Phyllostegia renovans, Platydesma rostrata, Polyscias bisattenuata, Polyscias flynnii, Stenogyne kealiae*
Kaua'i Lowland Wet Ecosystem Unit 3	*Charpentiera densiflora, Cyanea eleeleensis, Cyanea kolekoleensis, Cyanea kuhihewa, Cyrtandra oenobarba, Dubautia imbricata* ssp. *imbricata, Euphorbia remyi* var. *kauaiensis, Euphorbia remyi* var. *remyi, Labordia helleri, Melicope paniculata, Melicope puberula, Phyllostegia renovans, Platydesma rostrata, Polyscias bisattenuata, Polyscias flynnii, Stenogyne kealia*e
Kaua'i Lowland Wet Ecosystem Unit 4	*Charpentiera densiflora, Cyanea eleeleensis, Cyanea kolekoleensis, Cyanea kuhihewa, Cyrtandra oenobarba, Dubautia imbricata* ssp. *imbricata*, *Euphorbia remyi* var. *kauaiensis, Euphorbia remyi* var. *remyi, Labordia helleri, Melicope paniculata, Melicope puberula, Phyllostegia renovans, Platydesma rostrata, Polyscias bisattenuata, Polyscias flynnii, Stenogyne kealiae*

Kaua'i Lowland Wet Ecosystem Unit 5	*Charpentiera densiflora, Cyanea eleeleensis, Cyanea kolekoleensis, Cyanea kuhihewa, Cyrtandra oenobarba, Dubautia imbricata* ssp. *imbricata, Euphorbia remyi* var. *kauaiensis, Euphorbia remyi* var. *remyi, Labordia helleri, Melicope paniculata, Melicope puberula, Phyllostegia renovans, Platydesma rostrata, Polyscias bisattenuata, Polyscias flynnii, Stenogyne kealiae*
Kaua'i Lowland Mesic Ecosystem Unit 1	*Canavalia napaliensis, Charpentiera densiflora, Doryopteris angelica, Dubautia kenwoodii, Euphorbia eleanoriae, Euphorbia remyi* var. *remyi, Labordia helleri, Pittosporum napaliense, Platydesma rostrata, Polyscias bisattenuata, Psychotria hobdyi*
Kaua'i Lowland Mesic Ecosystem Unit 2	*Canavalia napaliensis, Charpentiera densiflora, Doryopteris angelica, Dubautia kenwoodii, Euphorbia eleanoriae, Euphorbia remyi* var. *remyi, Labordia helleri, Pittosporum napaliense, Platydesma rostrata, Polyscias bisattenuata, Psychotria hobdyi*
Kaua'i Lowland Mesic Ecosystem Unit 3	*Canavalia napaliensis, Charpentiera densiflora, Doryopteris angelica, Dubautia kenwoodii, Euphorbia eleanoriae, Euphorbia remyi* var. *remyi, Labordia helleri, Pittosporum napaliense, Platydesma rostrata, Polyscias bisattenuata, Psychotria hobdyi*
Kaua'i Lowland Mesic Ecosystem Unit 4	*Canavalia napaliensis, Charpentiera densiflora, Doryopteris angelica, Dubautia kenwoodii, Euphorbia eleanoriae, Euphorbia remyi* var. *remyi, Labordia helleri, Pittosporum napaliense, Platydesma rostrata, Polyscias bisattenuata, Psychotria hobdyi*
Kaua'i Montane Mesic Ecosystem Unit 1	*Asplenium dielmannii, Drosophila sharpi, Euphorbia remyi* var. *remyi, Labordia helleri, Loxops caeruleirostris, Melicope knudsenii, Myrsine knudsenii, Myrsine mezii, Oreomystis bairdi, Platydesma rostrata, Polyscias flynnii, Psychotria grandiflora, Stenogyne kealiae*

Kauaʻi Montane Mesic Ecosystem Unit 2	*Astelia waialealae, Drosophila sharpi, Dryopteris crinalis* var. *podosorus, Dubautia kalalauensis, Dubautia waialealae, Euphorbia remyi var. remyi, Geranium kauaiense, Keysseria erici, Keysseria helenae, Labordia helleri, Labordia pumila, Loxops caeruleirostris, Lysimachia daphnoides, Melicope degeneri, Melicope puberula, Myrsine mezii, Oreomystis bairdi, Phyllostegia renovans, Platydesma rostrata, Polyscias flynnii, Psychotria grandiflora*
Kauaʻi Montane Mesic Ecosystem Unit 3	*Canavalia napaliensis, Charpentiera densiflora, Doryopteris angelica, Dubautia kenwoodii, Euphorbia eleanoriae, Euphorbia remyi* var. *remyi, Labordia helleri*
Kauaʻi Montane Wet Ecosystem Unit 1	*Astelia waialealae, Drosophila sharpi, Dryopteris crinalis* var. *podosorus, Dubautia kalalauensis, Dubautia waialealae, Euphorbia remyi* var. *remyi, Geranium kauaiense, Keysseria erici, Keysseria helenae, Labordia helleri, Labordia pumila, Loxops caeruleirostris, Lysimachia daphnoides, Melicope degeneri, Melicope puberula, Myrsine mezii, Oreomystis bairdi, Phyllostegia renovans, Platydesma rostrata, Polyscias flynnii, Psychotria grandiflora*
Kauaʻi Montane Wet Ecosystem Unit 2	*Astelia waialealae, Drosophila sharpi, Dryopteris crinalis* var. *podosorus, Dubautia kalalauensis, Dubautia waialealae, Euphorbia remyi* var. *remyi, Geranium kauaiense, Keysseria erici, Keysseria helenae, Labordia helleri, Labordia pumila, Loxops caeruleirostris, Lysimachia daphnoides, Melicope degeneri, Melicope puberula, Myrsine mezii, Oreomystis bairdi, Phyllostegia renovans, Platydesma rostrata, Polyscias flynnii, Psychotria grandiflora*
Kauaʻi Wet Cliff Ecosystem Unit 2	*Cyanea dolichopoda, Cyrtandra oenobarba, Cyrtandra paliku, Dubautia plantaginea ssp. magnifolia*
Kauaʻi Dry Cliff Ecosystem Unit 2	*Euphorbia eleanoriae, Lysimachia scopulensis, Schiedea attenuata, Stenogyne kealiae*
Newcomb's Snail Unit 1 Kalalau Stream	*Erinna newcombi*
Newcomb's Snail Unit 1 Hanakapiʻai Stream	*Erinna newcombi*
Newcomb's Snail Unit 1 Hanakoa Stream	*Erinna newcombi*
Kauaʻi Unit 1 Kōkeʻe	*Drosophila musaphilia*

Kaua'i Plants Unit 11	*Adenophorus periens, Alectryon macrococcus, Asplenium dielpallidum, Schiedea viscoa, Bonamia menziesii, Brighamia insignis, Centaurium sebaeoides, Euphorbia halemanui, Ctenitis squamigera, Cyanea recta, Cyanea remyi, Cyperus trachysanthos, Cyrtandra cyaneoides, Cyrtandra limahuliensis, Cyanea rivularis, Delissia kauaiensis, Dubautia latifolia, Euphorbia haeleeleana, Exocarpos luteolus, Flueggea neowawraea, Gouania meyenii, Kadua cookiana, Kadua st. johnii, Hesperomannia lydgatei, Hibiscadelphus woodii, Hibiscus waimeae ssp. hannerae, Isodendrion laurifolium, Isodendrion longifolium, Kokia kauaiensis, Labordia lydgatei, Lipochaeta fauriei, Lipochaeta micrantha, Lobelia niihauensis, Melicope haupuensis, Melicope knudsenii, Melicope pallida, Polyscias racemosum, Myrsine linearifolia, Nothocestrum peltatum, Peucedanum sandwicense, Phyllostegia knudsenii, Phyllostegia waimeae, Plantago princeps, Platanthera holochila, Poa mannii, Poa sandvicensis, Pteralyxia kauaiensis, Remya kauaiensis, Remya montgomeryi, Schiedea apokremnos, Schiedea helleri, Schiedea kauaiensis, Schiedea membranacea, Schiedea spergulina* var. *spergulina, Schiedea stellarioides, Solanum sandwicense, Spermolepis hawaiiensis, Stenogyne campanulata, Wilkesia hobdyi, Xylosma crenatum, Zanthoxylum hawaiiense*
Kaua'i Plants Unit 10	*Adenophorus periens, Bonamia menziesii, Cyanea asarifolia, Cyanea remyi, Cyanea undulata, Cyrtandra limahuliensis, Dubautia pauciflorula, Exocarpos luteolus, Hesperomannia lydgatei, Isodendrion longifolium, Labordia lydgatei, Labordia tinifolia* var.*wahiawaensis, Lysimachia filifolia, Myrsine linearifolia, Huperzia nutans, Plantago princeps, Pteralyxia kauaiensis, Viola helenae, Viola kauaiensis* var. *wahiawaensis.*

Appendix G:

Federal Authorization for National Historical Preservation Act Section 106 Consultation

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:
2023-0004317-01

June 2, 2023

Mr. Alan Downer, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
601 Kamokila Blvd., Suite 555
Kapolei, HI 96707

Subject: Authorization of Hawai'i Division of Forestry and Wildlife to Initiate and Conduct NHPA Section 106 Consultations for the Use of *Wolbachia*-based Incompatible Insect Technique for the Suppression of Southern House Mosquito Populations on Kaua'i Project

Dear Mr. Downer:

The U.S. Fish and Wildlife Service (Service) in partnership with the Hawai'i Division of Forestry and Wildlife (DOFAW) is developing an environmemtal assessment to analyze the release of Wolbachia-based incompatible male southern house mosquitoes in the Kōke'e and Alaka'i Wilderness areas to reduce avian disease and prevent extinction of threatened and endangered forest bird species on Kaua'i. The Service's need is to consider the provision of appropriated funds for invasive mosquito control in furtherance of the conservation and recovery of federally threatened and endangered species. The Service is therefore the Federal Agency responsible for compliance with Section 106 consultation requirements for this project under the National Historic Preservation Act, as amended (16 U.S.C. 470(f)).

Pursuant to 36 CFR § 800.2(c)(4), the Service will authorize DOFAW to initiate and conduct Section 106 consultation with the State Historic Preservation Officer (SHPO) and others but remains legally responsible for all findings and determinations. This letter serves to notify the Hawaii SHPO of this authorization.

As part of this process, DOFAW will initiate the Section 106 process, identify historic properties and an assessment of adverse effect (36 CFR §§ 800.3 through 800.5) to the SHPO. DOFAW will seek to secure concurrence or disagreement with the finding from the SHPO in writing.

PACIFIC REGION 1
IDAHO, OREGON*, WASHINGTON,
AMERICAN SAMOA, GUAM, HAWAII, NORTHERN MARIANA ISLANDS
*PARTIAL

Mr. Alan Downer 2

To ensure that the Service agrees with DOFAW, the parties have decided to work together during consultation by following the terms below:

1. Prior to distributing any correspondence, DOFAW will provide the Service an opportunity to review documents to ensure all regulatory requirements are satisfied.
2. Prior to issuing a finding of effect, the Service be given an opportunity to review and concur.
3. DOFAW will provide the Service with all responses and correspondence received from consulting parties.

Additionally, the DOFAW will notify the Service whenever:

1. The SHPO believes that the criteria for adverse effect pursuant to 36 CFR § 800.5 applies to the project.
2. There is a disagreement between DOFAW and SHPO about the area of potential effects, identification, and evaluation of historic properties, and/or the assessment of effects.
3. There is an objection from a consulting party or the public regarding its involvement in the review process established by 36 CFR Part 800, findings and determinations, or implementation of agreed- upon resolution.
4. There is the potential for foreclosure or anticipatory demolition as defined under 36 CFR § 800.9(b) and (c).

Please contact Michelle Clark at (808) 457-7276 or by email at michelle_clark @fws.gov if you have any questions on this matter.

Sincerely,

MICHELLE BOGARDUS

Digitally signed by MICHELLE BOGARDUS
Date: 2023.06.01 21:28:23 -10'00'

Michelle Bogardus,
Deputy Field Supervisor - Geographic Operations

cc: David Smith, DOFAW
Lainie Berry, DOFAW
Sherri Mann, DOFAW

Appendix H:

Federal and State Preparatory Notice for Draft Environmental Assessment

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai'i 96850

State of Hawai'i
DEPARTMENT OF LAND AND
NATURAL RESOURCES
Division of Forestry and Wildlife
1151 Punchbowl Street, Room 325
Honolulu, Hawai'i 96813

In Reply Refer To:
2023-0004317

October 21, 2022

Subject: Preparatory Notice for draft Environmental Assessment for the proposed "Use of Wolbachia-based Incompatible Insect Technique for the suppression of Southern House Mosquito (*Culex quinquefasciatus*) populations in the Kōke'e and Alaka'i areas of Kaua'i"

Dear Reader:

This letter serves for the Hawai'i Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW) and the U.S. Fish and Wildlife Service (Service), collectively referred to herein as the "Resource Agencies", to provide notice and solicit initial comments and recommendations for the proposed "Use of Wolbachia-based Incompatible Insect Technique for the suppression of Southern House Mosquito (*Culex quinquefasciatus*) populations in the Kōke'e and Alaka'i areas of Kaua'i".

The State of Hawai'i DLNR proposes employing Incompatible Insect Technique (IIT) to reduce mosquito populations within approximately 59,204 acres (23,959 hectares) of forest reserves, state parks, and private lands in the Kōke'e and Alaka'i areas of Kaua'i to suppress mosquitoes known to vector diseases to native forest birds in critical higher-elevation native forest habitat. The proposed project is a joint project of the Resource Agencies; and in order to comply with each agencies' obligations under the National Environmental Policy Act (NEPA) and Hawai'i Revised Statutes (HRS) Chapter 343, DOFAW and the Service are preparing an environmental assessment (EA) to address the release of male mosquitoes with incompatible *Wolbachia* in the Kōke'e and Alaka'i areas shown in Figures 1 and 2 below.

The IIT approach is also being evaluated for implementation by the National Park Service (NPS) and DLNR to control species in forest bird critical habitat on the island of Maui. The EA entitled "Suppression of non-native mosquito populations to address the impacts of avian malaria on threatened and endangered forest birds on East Maui" will satisfy NEPA and HRS Chapter 343 compliance. Any public comments submitted to NPS for the East Maui EA will be independent from any comments submitted to DLNR regarding the Kauai IIT mosquito EA identified in this pre-notification letter.

The native forest birds of Kaua'i face several threats to their survival. Already, 10 of the 16 native honeycreepers of Kauai have gone extinct, and 3 of the remaining 6 species are endangered or threatened. One native thrush (puaiohi) and one native flycatcher (Kauai elepaio) also still occur within intact areas of native forest in higher elevation areas of the island. Although several factors contribute to the continuing decline in native bird populations, the main

threats to Hawaiian forest birds are avian malaria (*Plasmodium relictum*) and avian pox (*Avipoxvirus* spp.); diseases principally spread by the non-native southern house mosquito (*Culex quinquefasciatus*). Despite the danger that these diseases pose to native forest birds, there has not, until recently, been a viable method to control mosquito populations within natural areas in Hawai'i.

The IIT has been successfully implemented in over ten countries throughout the world to control mosquitoes that carry human diseases, including four cities in the United States. The technique uses lab-raised male mosquitoes which carry a select strain of *Wolbachia*, a bacterium that naturally occurs in up to 70% of insects. When male mosquitoes, which do not bite or transmit diseases, with this select strain of *Wolbachia* are released into a target habitat and mate with wild female mosquitoes that either contain different strains of *Wolbachia* or no strains, the eggs fail to develop due to the cytoplasmic incompatibility of the *Wolbachia* strains of the male and female mosquitoes. The mosquito species targeted for control in this process are also a vector of human diseases, such as West Nile Virus and lymphatic filariasis, and can transmit heartworm to pets. The development of IIT for mosquito-borne diseases that affect humans presents a unique opportunity to use the technique to control mosquitoes that spread avian diseases to native forest bird species in Hawai'i. This approach does not employ genetic engineering and does not involve or result in either mosquitoes or bacteria being genetically modified organisms.

The DLNR proposes to employ IIT to reduce mosquito populations within the Kōke'e and Alaka'i areas of Kaua'i (figures 1 and 2 below). This effort is consistent with the agency's statutory missions and responsibilities. The project would involve mass-rearing and releasing of male mosquitoes that carry a strain of *Wolbachia* that is incompatible with existing wild female mosquitoes in the area. The male mosquitoes would be released from the ground, along established roads and trails. Additionally, release mechanisms are currently being developed which could enable the use of helicopters or drones to release mosquitoes from the air. Only existing routes of travel will be used, and no new roads, trails, helicopter or drone landing zones will be constructed to support this effort.

The release of incompatible male mosquitoes would take place within 59,204 acres (23,959 hectares) of northwestern Kaua'i. This area includes portions of the Kōke'e State Park, Hono o Nā Pali Natural Area Reserve, Ku'ia Natural Area Reserve, Nā Pali Coast State Wilderness Park, Nā Pali-Kona Forest Reserve, the Alaka'i Wilderness Preserve, as well as privately owned lands. The Kōke'e State Park, Nā Pali-Kona Forest Reserve, and the Alaka'i Wilderness Preserve overlap with the extant native forest habitat, including critical habitat for 'akeke'e (*Loxops caeruleirostris*) and 'akikiki (*Oreomystis bairdi*), on the island. Extensive pre- and post-release monitoring would be implemented to determine the impacts of releasing the incompatible male mosquitoes on the local mosquito population.

It is anticipated that the Service will provide federal funding for the implementation of this action through congressionally allocated funds for the conservation and recovery of federally threatened and endangered species and/or the control of invasive species, including but not limited to potential funding through Recovery Challenge grants, Section 6 funds, State Wildlife Grants, funds awarded via the Pacific Island Fish and Wildlife Office or the Science Applications program, or other similar funding programs. The Service's purpose and need for the project is to provide aid for the implementation of activities that would contribute to the recovery and conservation of several federally listed species, including the 'akeke'e, 'akikiki, puaiohi

(*Myadestes palmeri*), and ʻiʻiwi (*Drepanis coccinea*), as well as other avian species showing concerning declines in population and range.

Transmitted for your review and comment is information on the above-referenced project. Please see enclosed maps of the project area and submit any comments to Cynthia King at cynthia.b.king@hawaii.gov by the internal deadline of October 24, 2022 to November 22, 2022. If no response is received by the indicated due date, we will assume your agency has no comments at this time. Should you have any questions about this request, please contact Cynthia King at cynthia.b.king@hawaii.gov. General information regarding the project can also be found on the www.birdsnotmosquitoes.org website. Information on the HEPA process can be found at https://planning.hawaii.gov/erp/

Sincerely,

Earl Campbell, Ph.D.
Field Supervisor
Pacific Islands Fish and Wildlife Office
U.S. Fish and Wildlife Service

David G. Smith
Forestry and Wildlife Administrator
Division of Forestry and Wildlife
State of Hawaii Department of Land and Natural Resources

enclosures

2023-0004317 4

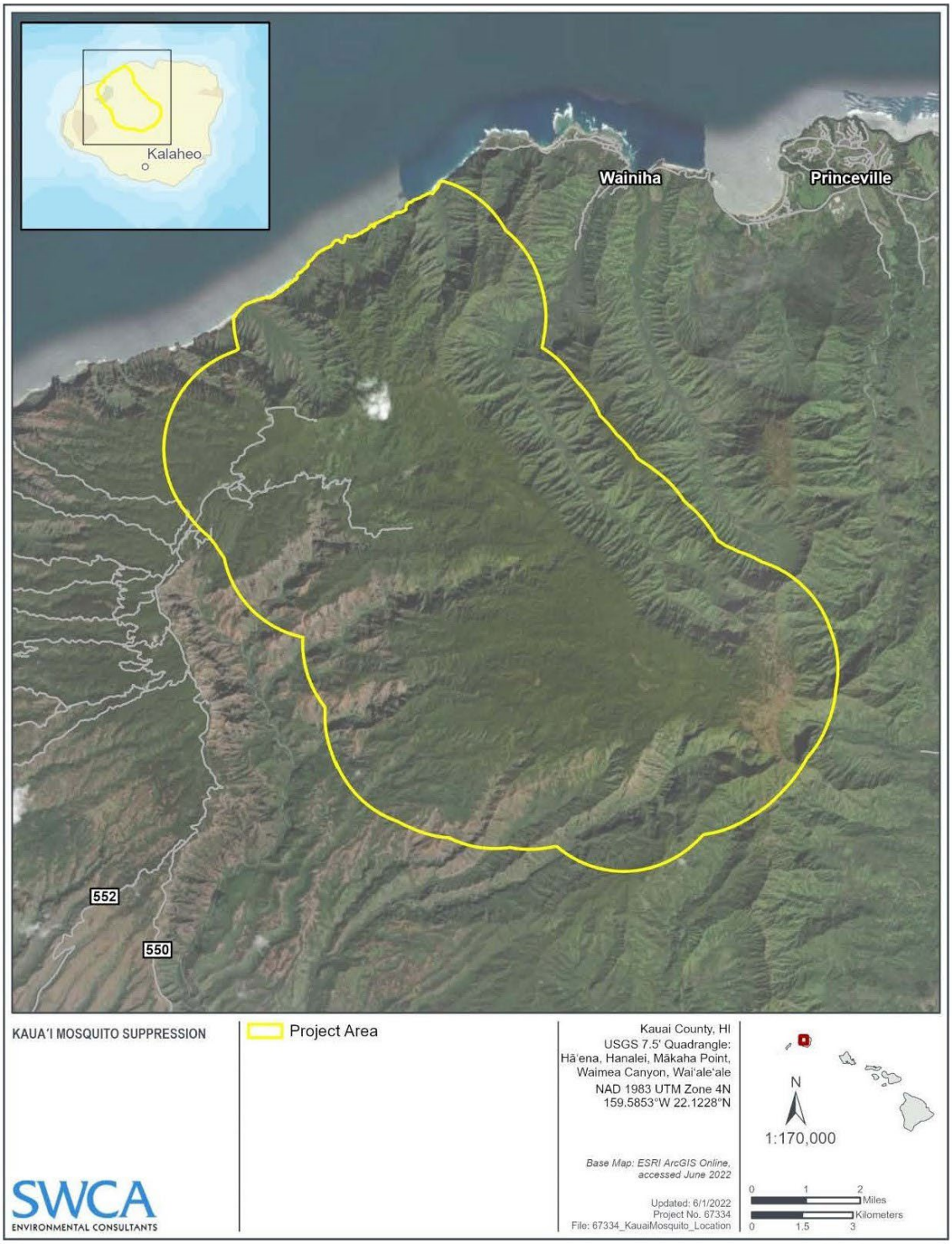

Figure 1. Boundaries of the project area.

2023-0004317 5

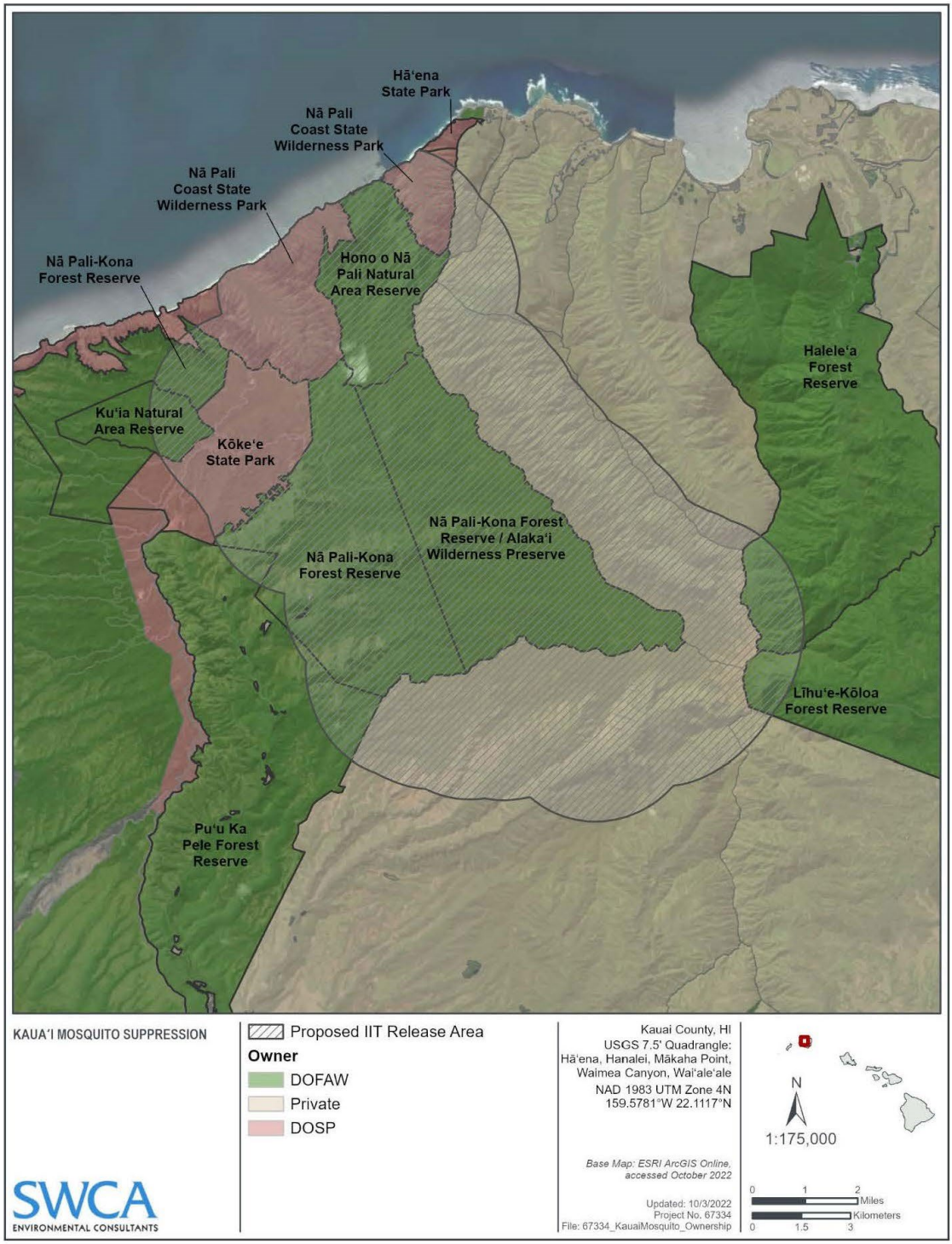

Figure 2. State Parks, Forest Reserves, Natural Area Reserves and private lands within and overlapping the project area.

Table H1. List of offices and/or people contacted with Federal and State preparatory notice of Draft Environmental Assessment.

Office or Entity Contacted	Contact Name	Title	Island
ʻAha Mālama, Corp.	ʻĀnela Jackson	President	
Alexander & Baldwin Properties, Inc.	Sean O'Keefe		Kauai
Alexander and Baldwin	Chad Brue		
American Bird Conservancy	Steve Holmer		—
Association of Hawaiian Civic Clubs	Mr. Hailama Farden	President	
Board of Land and Natural Resources, Kauai member	Karen Ono		Kauai
Cattlemen's Association	Nicole Galase		
Center for Biological Diversity	Amy Atwood	Legal Director	—
Council for Native Hawaiian Advancement	Mr. Joseph Kūhiō Lewis	CEO	
Department of Hawaiian Homelands	Andrew Choy		Oahu
Department of Hawaiian Homelands, Kaua`i Office	Erna Kamabayashi		Kaua'i
Department of Interior, Office of Native Hawaiian Relations	Lisa C. Oshiro-Saganuma		Oahu
Department of Land and Natural Resources - CWRM			
Department of Land and Natural Resources - DAR	Brian Neilson		
Department of Land and Natural Resources - Engineering Division			
Department of Land and Natural Resources - Land Division	Russell Tsuji		
Department of Transportation	Jade Butay		Oahu
Earthjustice	David L. Henkin		Oahu
Garden Island Resource, Conservation, and Development Inc.	Gilbert P. Kea		Kauai
Grove Farm	Casey Watabu		Kauai
Hālau Ka Lei Mokihana O Leināʻala	Leināʻala Jardin	Kuma Hula	

Office or Entity Contacted	Contact Name	Title	Island
Halau member	Sally Jo Manea		
Hanalei Watershed Hui	Makaala Kaaumoana		Kauai
Hanalei Watershed Hui; Kauai Wildlife Coalition; Hui Hoʻomalu i ka ʻāina	Makaʻala Kaʻaumoana		
Hanapepe salt pans	Malia Nobrega-Olivera		
Hawaii Audubon Society	John Harrison		Oahu
Hawaii Cattleman's Association	Nicole Galase		Hawaii
Hawaii Conservation Alliance	Emma Anders		Oahu
Hawaii State Government	Dee Morikawa	Representative	
Hawaii State Government	James Kunane Tokioka	Representative	
Hawaii State Government	Mayor of Kauai		
Hawaii State Government	Nadine K. Nakamura	Representative	
Hawaii State Government	Ronald D. Kouchi	Senator	
Hoʻokipa Network	Puanani Rogers		
Homestead Community Development Corporation	Robin Danner		
Hui Huliau Inc.	Adrian Nakea Silva	Chairman	
Hui o Laka - Kokeʻe Natural History Museum	Chris Faye		
Imua Hawaii	Dreanalee Kalili	Treasurer	
"KAHEA			
The Hawaiian-Environmental Alliance"	Miwa Tamanaha		Oahu
Kamehameha Schools	Mililani Browning		
Kamehameha Schools	Namaka Whitehead		Hawaii
Kamehameha Schools - Community Relations and Communications Group, Government Relations	Piilani Hanohano	Coordinator, Government Relations	
Kanu o ka ʻĀina Learning ʻOhana	Taffi Wise	Executive Director	
Kaua`i Aha Moku			
Kauai Albatross Network; Kauai Wildlife Coalition	Hob Osterlund		
Kauai Chamber of Commerce	Mark Perriello	Director	
Kauaʻi County Council			

Office or Entity Contacted	Contact Name	Title	Island
Kauaʻi Cultural Center	Leilani Darryl		
Kauai Historic Preservation Review Commission			
Kauaʻi Historical Society	Randy Wichman	Interim President	
Kauaʻi Museum			
Kawaileo Law A Limited Liability Law Company	Naʻunanikinau Kamaliʻi		
Ke Kula Niʻihau o Kekaha			
Kekaha Hawaiian Homestead Association	Liberta Hussey-Albao		
Makaweli Poi Mill	John Aʻana		
Malama Anahola	Sherri Cummings	President	
Malama Huleiʻa			
Na Koa Ikaika Ka Lahui Hawaii	Mililani Trask	Convenor	
Nā Kuleana o Kānaka ʻŌiwi	Donna Kaliko Santos		
Na Pali Coast ʻOhana	Sabra Kauka		
National Park Service, Pacific Island Support Office	Melia Lane-Kamahele		Oahu
National Tropical Botanical Gardens	Charles R. Wichman, Jr.		Kauai
NAVFAC Pacific	Norma Creps		Oahu
Niʻihauan Ranch	Mary Sue Matter		
NTBG, Kokeʻe lessees	Chipper & Hauʻoli Wichman		
Office of Conservation and Coastal Lands	Michael Cain		Oahu
Office of Hawaiian Affairs	Dan Ahuna		
Office of Hawaiian Affairs	Sylvia M. Hussey Ed.D.	CEO	
Office of Hawaiian Affairs	Kuulei Stockman	CEO	Oahu
Office of Planning, State of Hawaii	Mary Alice Evans	Director	Oahu
Office of the CEO, The Nature Conservancy	Mark Tercek		—
Office of the Chairperson, Hawaii Department of Agriculture	Phyllis Shimabukuro-Geiser		Oahu
Office of the Coordinator, Kauai Watershed Alliance, The Nature Conservancy, Kauai Program	Melissa Fisher		Kauai

Office or Entity Contacted	Contact Name	Title	Island
"Office of the Director			
US Forest Service, Institute of Pacific Islands Forestry, Pacific Southwest Research Station"	Susan Cordell		Hawaii
Office of the Director, Department of Hawaiian Homelands	William Aila, Jr.		Oahu
Office of the Director, Kauai Chamber of Commerce	Mark Perriello		Kauai
Office of the Director, Kauai County Council	Luke Evslin		Kauai
Office of the Director, National Fish and Wildlife Foundation	Amanda Bassow		—
Office of the Executive Director, Conservation Council for Hawaii	Les welsh		Oahu
Office of the Governor, State of Hawaii, Executive Chambers, State Capital	David Ige	The Honorable	Oahu
Office of the Mayor, Kauai County	Derek Kawakami	The Honorable	Kauai
Office of the President and CEO, National Audubon Society	David Yarnold		—
Office of the Program Manager, Garden Isle Resource, Conservation and Development Council			Kauai
Office of the Representative	Ed Case	Representative	Oahu
Office of the Representative	Kai Kahele	Representative	Oahu
Office of the Representative, Hawaii State Capital	Chris Todd	Representative	Oahu
Office of the Representative, Hawaii State Capital	Joy A. Sue Buenaventura	Representative	Oahu
Office of the Representative, Hawaii State Capital	Mark M. Nakashima	Representative	Oahu
Office of the Representative, Hawaii State Capital	Richard H.K. Onishi	Representative	Oahu
Office of the Senator	Brian Schatz	Senator	Oahu
Office of the Senator	Mazie Hirono	Senator	Oahu
Office of the Senator, Hawaii State Capital	Kaialii Kahele	Senator	Oahu

Office or Entity Contacted	Contact Name	Title	Island
Office of the Senator, Hawaii State Capital	Lorraine R. Inouye	Senator	Oahu
Office of the Senator, Hawaii State Capital	Russel E. Ruderman	Senator	Oahu
OHA, Community Outreach Coordinator, Kaua`i	Kaliko Santos		
Pacific Islands Refuges and Monuments Office			
US Fish and Wildlife Service			
	Ricardo Lopez		Oahu
Pacific Missile Range Facility	Jessi Hallman Behnke		
Pacific Rim Conservation	Eric VanderWerf	Dr.	Oahu
Pacific Rim Conservation	Lindsay Young	Dr.	
Robinson family			
San Diego Zoo, Conservation Program	Ron Swaisgood		—
Senior Vice President, Conservation Policy National Audubon Society	Sarah Greenberger		—
Sierra Club, Hawaii Chapter	Robert D. Harrix, Esq.		Oahu
State Historic Preservation Division			
Kakuhihewa Building	Alan Downer		Oahu
Supervising Deputy Attorney General			
Land and Transportation Division	Julie China		Oahu
The Nature Conservancy of Hawaii	Ulalia Woodside	Executive Director	Oahu
The Nature Conservancy of Hawaii, Cultural Practitioner, BLNR, etc.	Sam ‘Ohu Gon		
The Wildlife Society, Hawaii Chapter	Caroline Thow		Oahu
U.S. Geological Survey, Pacific Islands Ecosystem Research Center	Bob Reed	Director	Hawaii
USDA - Natural Resources Conservation Service	Jennifer Higashino		Oahu

Appendix I:

Responses to Substantive Public Comments on Environmental Assessment

RESPONSES TO SUBSTANTIVE PUBLIC COMMENTS RECEIVED ON THE ENVIRONMENTAL ASSESSMENT

The total number of public comments received during the public review period for the Kaua‘i mosquito suppression Environmental Assessment (EA) was 887, of which 209 (23.6%) were considered “Substantive”. Thirty-nine (39) individual “Concerns” were identified from the substantive comments, which are listed in the “Comment Response Narrative” below with a brief summary of the concern itself; following each concern in the narrative is the detailed agency response. Each comment could include a single concern or multiple concerns. All public comments received are listed in the table (starting on page I-27) that immediately follows the comment response narratives, below. This table lists each public comment, with corresponding agency response indicated in the table column titled “Responses.” For substantive comments, the Responses column refers the reader to the corresponding Concern(s) identified by number in the Comment Response Narrative. Readers can therefore use the Responses column in the table to identify which concerns a given comment raises and where to find the relevant agency responses to these concerns in the Comment Response Narrative.

Comment Response Narrative

CONCERN 1: Commentors were concerned that the level of analysis presented in the Environmental Assessment (EA) was insufficient, and that an Environmental Impact Statement (EIS) should be prepared. Additionally, commentors were concerned about multiple EAs being completed for different locations within the state.

> **Response:** Both the Environmental Assessment (EA) and Environmental Impact Statement (EIS) processes involve rigorous analysis of potential environmental and cultural impacts of proposed agency actions as required by federal National Environmental Protection Act (NEPA) and the Hawaii Environmental Protection Act (HEPA) and Hawai‘i Revised Statutes (HRS) Chapter 343 regulations as applicable. An agency must prepare an EA for a proposed action that is not likely to have significant effects or when the significance of the effects is unknown. The USFWS and DLNR considered potential effects of the proposed action and determined that it was not likely to have significant effects on the human environment including cultural resources. Therefore, an EA was prepared. The Finding of No Significant Impact (FONSI) affirms this and an EIS is not required.
>
> A separate EA was prepared to analyze the potential impacts of the implementation of an Incompatible Insect Technique (IIT) program for control of the southern house mosquito on East Maui using resources made available by the National Park Service (NPS). Use of NPS funds were limited to implantation and analysis of IIT on NPS and adjacent lands. It was not until separate funding was obtained from Hawai‘i state general funds that the Chapter 343 process was initiated to analyze the potential impacts of implementation of a IIT program on Kaua‘i.

CONCERN 2: Commentors were concerned that potential impacts to public health and safety, from increased risk of mosquito abundance and disease transmission, were not sufficiently addressed.

> **Response:** Only incompatible male mosquitoes would be released via the proposed action. Male mosquitoes do not bite humans or animals and do not transmit diseases, and therefore pose no risk to human health. Only female mosquitoes bite humans or animals. The project employs a highly technical sorting methodology originally developed to sort *Aedes aegypti* as described by Crawford et al. (2020), which achieved a low female contamination rate of 1 in 900 million. This proposed action would use *Culex quinquefasciatus*, a different species of mosquito, and while the methodology is very precise the estimated number of females released is expected to differ. Regardless, if a female mosquito is released, a bite from it would pose no greater risk to humans or wildlife than the wild

female mosquitoes currently present in the environment on Kaua‘i.

The *Wolbachia* bacteria used to generate the incompatible male mosquitoes is already present in Hawai‘i in the Asian tiger mosquito (*Aedes albopictus*). *Wolbachia* cannot live within vertebrate cells and cannot be transferred to humans even through the bite of a mosquito that carries it (Popovici et al. 2010). Residents of Hawai‘i are commonly bitten by the Asian tiger mosquito, which is distributed statewide and has remained one of the most abundant mosquitoes at lower elevations since its introduction in 1896. Residents of Hawai‘i are also commonly bitten by the southern house mosquito (*Culex quinquefasciatus*), the target species in the proposed action, which was introduced to Hawai‘i in 1826 and occupies both lower elevation and upper elevation habitats across the state. The southern house mosquito is also already naturally infected with *Wolbachia*. Humans in Hawai‘i therefore are regularly bitten by mosquitoes carrying *Wolbachia*, including the strain that would be used in the proposed action (wAlb). No adverse effects have ever been reported in humans, nor is there a biological mechanism allowing adverse effects to occur (CDC 2022a).

As stated above, the southern house mosquito and the *Wolbachia* bacteria are already present in Hawai‘i. No new organisms would therefore be introduced to Hawai‘i by the proposed action. Further, there is no indication that the released mosquitoes would be any better at transmitting disease to humans or wildlife that those already present (Popovici et al. 2010). The southern house mosquito does not transmit any human diseases in Hawai‘i. In contrast, the southern house mosquito is already a remarkably efficient vector of the avian malaria parasite, with an estimated 85–97% of southern house mosquitoes being susceptible to infection and transmission (LaPointe et al. 2005). Increasing the vector competence (ability to transmit disease) of the southern house mosquito is therefore highly unlikely and ecologically insignificant when compared to the known risk of allowing these mosquitoes to proliferate on the landscape. Planning and development of IIT for forest bird conservation remains supported by state, federal, and private conservation organizations that have legal or administrative management responsibilities towards the recovery of endangered forest birds on Kaua‘i.

The Incompatible Insect Technique using *Wolbachia* is an approach that was researched, developed, and first used over 50 years ago for the express purpose of protecting human public health (Laven 1967). Over the following half-century, the approach has continued to be studied, patented, and applied specifically for the benefit of improving public health outcomes for humans where mosquito-borne diseases are a threat.

CONCERN 3: Commentors were concerned that previous attempts to introduce biological control mechanisms in Hawai‘i have had unforeseen and adverse impacts (e.g., mongoose introduction to control rats) in the state and that this will occur with the proposed mosquito releases.

Response: No new organisms would be introduced to Hawai‘i by the proposed action. The southern house mosquito (*Culex quinquefasciatus*) and the *Wolbachia* bacteria are already present in the state. The *Wolbachia* bacteria used to generate incompatible male mosquitoes occurs in Hawai‘i in the Asian tiger mosquito (*Aedes albopictus*), introduced to Hawai‘i in 1896. The southern house mosquito has been widely established in Hawai‘i since its introduction in 1826 and already naturally carries a strain of *Wolbachia* bacteria. (See also response to Concern 10)

Researchers and resource managers possess long-term data that aptly demonstrate that the worst-case scenario for native wildlife is currently well underway (Pratt et al. 2009; Paxton et al. 2022). The southern house mosquito continues to vector the parasite responsible for avian malaria to native honeycreepers, driving these irreplaceable biocultural resources to extinction. The proposed project aims to control populations of the southern house mosquito in forest habitat, where male and female mosquitoes are already present and causing widespread mortality to endangered forest birds. If released, incompatible male mosquitoes are expected to survive for approximately one week before

mating and then dying. If releases of incompatible male mosquitoes are halted, there will be no lasting effect on the environment.

The history of biological control in Hawai'i is complicated, with success stories largely overshadowed by misinformation. The same lack of regulations and biosecurity measures that allowed the southern house mosquito to first be introduced to Hawai'i in 1826 also enabled private plantation owners on Hawai'i Island to import the Small Indian Mongoose (*Urva auropunctata*) from Jamaica in 1883 with no official review or oversight. Many other regrettable and ill-planned species introductions were completed prior to the Kingdom of Hawai'i publishing the first "Laws of the Hawaiian Islands" in 1890, which sought to regulate pest species introductions and spread. It was not until the 1960's when the now State of Hawai'i began to comply with federal laws, including the and Endangered Species Act (1973), and established State laws (HRS 150A and HRS 343) to ensure any new species introductions of plants or animals were carefully studied and reviewed. The proposed management action is subject to each of these State and Federal laws, regulations, and requisite review.

CONCERN 4: Commentors were concerned that the introduced mosquitoes would be "genetically modified," "bioengineered," or be considered an unsafe "pesticide."

Response: The incompatible male mosquitoes are not genetically modified organisms (GMO). The U.S. Environmental Protection Agency (EPA) does not regulate this approach as a GMO or a genetically engineered product. According to the (EPA), a genetically modified organism is "a plant, animal, or microorganism that has had its genetic material (DNA) changed using technology that generally involves the specific modification of DNA, including the incorporation of specific DNA from one organism to another. Scientists often refer to this process as genetic engineering." (e.g, Gatew and Mengistu 2019).

The proposed mosquito suppression technique does not modify any or part of the genome of either mosquitoes or the *Wolbachia* bacteria. Furthermore, incompatible male mosquitoes are incapable of successfully reproducing with wild females and therefore cannot pass on their genes to successive generations. The proposed action differs from gene drive approaches because if releases are stopped, the population of mosquitoes already present in the forest within the proposed project area will gradually return to pre-release levels.

The EPA has reviewed the use of incompatible male mosquitoes with *Wolbachia* as a biopesticide. The agency defines biopesticides as "naturally occurring substances that control pests (biochemical pesticides), microorganisms that control pests (microbial pesticides), and pesticidal substances produced by plants containing added genetic material (plant-incorporated protectants) or PIPs." Many biopesticides registered by the EPA can be used in and around lands cultivated for certified organic food production if ingredients also meet U.S. Department of Agriculture standards.

The U.S. Department of the Interior Strategy for Preventing the Extinction of Hawaiian Forest Birds (USDOI 2022) acknowledges "technology for this approach is not available for near-term implementation," and is not part of the proposed action under evaluation in this environmental assessment.

CONCERN 5: Commenters were concerned there is risk of damage to ecosystems and environment in general.

Response: No new organisms would be introduced to Hawai'i by the proposed action. The southern house mosquito (*Culex quinquefasciatus*) and the *Wolbachia* bacteria are already present in Hawai'i. The *Wolbachia* bacteria used to generate incompatible male mosquitoes occurs in Hawai'i in the Asian tiger mosquito (*Aedes albopictus*), which has been in Hawai'i since 1896. The southern house

mosquito is widely established in Hawai'i, since its introduction in 1826, and already naturally carries a strain of *Wolbachia* bacteria. There is a substantial body of data and peer-reviewed publications that demonstrate the use of incompatible insect technique is safe, targeted, and results in no adverse effects to humans or the environment (Laven 1967; Moreira et al. 2009; Atyame et al. 2011; Atayme et al. 2015; Kittayapong et al. 2019; Zheng et al. 2019;
Crawford et al. 2020; Beebe et al. 2021).

Researchers and resource managers additionally possess long-term data that demonstrate the worst-case scenario for native wildlife is currently underway (Pratt et al. 2009; Paxton et al. 2022). The southern house mosquito transmits the parasite responsible for avian malaria to native honeycreepers, driving these irreplaceable biocultural resources to extinction. The proposed project aims to control the southern house mosquito in forest habitat, where male and female mosquitoes are otherwise present and causing widespread mortality to endangered forest birds. If released, incompatible male mosquitoes are expected to survive for approximately one week. If releases of incompatible male mosquitoes are stopped, there will be no lasting effect on the environment.

CONCERN 6: Commentors were concerned that the proposed action may be inefficient, ineffective, and costly.

Response: There is no single solution to the extinction crisis endangered Hawaiian forest birds currently face. However, the release of incompatible male mosquitoes with *Wolbachia* is the most promising new approach that resource managers can implement in the near-term to control the primary threat to native forest birds in remote natural areas.

The proposed Incompatible Insect Technique (IIT) mosquito suppression project was identified as a priority for Hawai'i at local and international planning meetings in 2016 and 2017. Over the last six years, federal and state agencies and non-governmental organizations (NGOs) have participated in exhaustive research, development, and planning, and have initiated permitting and environmental compliance. The program would be part of a suite of management actions that are currently in place, or are being considered, designed to protect native forest birds from extinction. These include conservation breeding of forest birds, potential translocations of birds to Hawai'i Island, and future mosquito suppression techniques (USDOI, 2022). These tools, however, are not permanent solutions either. Should a more long-lasting technique be developed and refined to the point where it could be applied to the landscape, it could be considered in the future, with appropriate environmental compliance. It is also possible that future mosquito suppression techniques will benefit from the procedures developed for the proposed action.

Regular and consistent releases of incompatible male mosquitoes can be used to maintain population suppression of wild mosquitoes at a landscape-scale over long periods. It is common for management projects to require repeated actions to maintain the success of the project. For example, fencing to keep out problematic mammals (e.g., rats, pigs, and deer) from sensitive habitats requires regular maintenance. Similarly, controlling weeds or invasive insects usually requires repeated visits to affected sites, sometimes for many decades after an infestation is discovered (e.g., Chimera et al. 2000, Neville et al. 2019).

Conservation and resource management in Hawai'i can be costly. Programs that aim to preserve Hawai'i's watershed forests, protect near-shore beaches and reefs, stabilize and recover endangered species, control destructive invasive species, and support commercial and recreational fishing and hunting programs all require significant recurring state and federal funding. Sometimes funds are used to study and develop new management tools and approaches, while other funds are directed towards specific on-the-ground actions. The mission of the U.S. Fish and Wildlife Service (USFWS) is to work with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people through Federal programs relating to migratory birds,

endangered species, interjurisdictional fish and marine mammals, and inland sport fisheries. Likewise, the Hawaiʻi Department of Land and Natural Resources (DLNR) is charged with the task of enhancing, protecting, conserving and managing Hawaiʻi's unique and limited natural, cultural and historic resources that are held in public trust for current and future generations of the people of Hawaiʻi nei, and its visitors, in partnership with others from the public and private sectors.

The DLNR has not only the legal mandate, but the kuleana (privilege and responsibility) to protect biocultural resources. Hawaiʻi's unique biodiversity is deeply interlaced with Hawaiian culture. Both USFWS and DLNR stewardship aim to perpetuate the unique and continuing connections between Hawaiian culture and this sacred and evolving land. Honeycreepers such as the ʻakikiki and ʻakekeʻe are ʻaumakua (familial guardians or ancestors), and their endurance in the native forest is an embodiment of Hawaiian culture.

The Rapid ʻŌhiʻa Death project is an example of another program that requires ongoing and extensive federal and state funding to preserve ʻōhiʻa (*Metrosideros polymorpha*), a species that is the backbone of the native forest and a significant biocultural resource.

CONCERN 7: Commentors were concerned that the entire range of alternatives was not fully assessed, including alternatives that are "safer" and more "natural."

Response: As is discussed in the EA, habitat protection, habitat restoration, conservation breeding, and control of predators such as small mammals are expected to continue in and around the project area. While these ongoing efforts contribute to the long-term restoration of suitable habitat throughout endangered forest bird critical habitat, these efforts alone will not prevent the extinction of forest bird species in Hawaiʻi. Recent analysis of long-term survey data for seven of the eight native forest bird species on Kauaʻi found that six species had significantly declined in abundance over the past 25 years within the uppermost elevations of their available habitat on the island (Paxton et al. 2016). This decline is concurrent with increases in the prevalence of mosquitoes and avian malaria in forest bird habitat on Kauaʻi (Atkinson et al. 2014). The two rarest avian species, ʻakikiki and ʻakekeʻe, have undergone dramatic declines in recent years and are at risk of imminent extinction (Paxton et al. 2022). Best scientific information indicates that landscape-scale mosquito control as described in this EA is needed to prevent extinction of these species in the wild. Additionally, as is noted above, there is a substantial body of data and peer-reviewed publications that demonstrate the use of incompatible insect technique is safe, targeted, and results in no adverse effects to humans or the environment (Laven 1967; Moreira et al. 2009; Atyame et al. 2011; Atayme et al. 2015; Kittayapong et al. 2019; Zheng et al. 2019; Crawford et al. 2020; Beebe et al. 2021).

Loss of suitable habitat has been extensive in the Hawaiian Islands and is an important threat to forest birds generally. However, introduced mosquitoes are also a threat because forest birds on Kauaʻi are highly susceptible to mosquito-borne diseases and are not expected to persist in areas where mosquitoes are present. Restoration of suitable habitat through reforestation of areas in which mosquitoes are present is therefore not expected to be an effective alternative strategy to prevent the extinction of those species. Restoration of suitable habitat in high elevation areas where mosquitoes are not present, or not expected to be present as global temperatures rise, is an important part of recovery efforts. Habitat restoration, however, does not constitute an effective alternative to mosquito control at this time because, 1) the acreage of potential suitable habitat at those high elevations is vanishingly small, and 2) restoration of suitable habitat in those areas requires decades of time and cannot be completed before the projected extinction timeline of the affected species.

As previously mentioned in Concern 6, the proposed action would be part of a suite of management actions designed for the preservation of native forest birds, many of which have already been implemented. The US Fish and Wildlife Service (USFWS) developed recovery plans for several taxa of endangered Hawaiian forest birds, including the remaining populations of ʻakikiki and ʻakekeʻe on

Kaua'i (USFWS 2006, USFWS 2021). These plans prioritize measures such as conservation breeding and restoration of degraded habitat through invasive species control (introduced feral ungulates, non-native plants and rats) as well as implementation of techniques to control mosquitoes at a landscape scale. Over 3,900 acres of critical habitat for 'akikiki and 'akeke'e have been fenced to exclude feral ungulates (pigs, goats and black-tailed deer) by the Kaua'i Watershed Alliance (KWA). The KWA continues to remove habitat degrading invasive plants (Himalayan ginger, Australian tree fern and strawberry guava) from these fenced areas. The Kaua'i Forest Bird Recovery Project conducts rat control using Goodnature A24 traps in core forest bird breeding habitat. From 2016 to 2018 eggs of the 'akikiki were collected to start a conservation breeding population. Over 40 'akikiki are currently in captivity at the San Diego Zoo Alliance conservation breeding facilities on Maui and Hawai'i Island. Other alternatives such as translocation of birds to other islands with high elevation habitat are being considered (Paxton et al. 2022, USDOI 2022).

Although a range of options were considered, there are few tools available to achieve landscape level mosquito control in natural areas. While this project is the first proposed use of incompatible male mosquitoes with *Wolbachia* for conservation purposes, and the first time the approach would be used in Hawai'i, there is a substantial body of data that demonstrates the Incompatible Insect Technique (IIT) approach is safe, targeted, and results in no adverse effects to humans or the environment (e.g., Laven 1967; Moreira et al. 2009; Atayme et al. 2015; Kittayapong et al. 2019; Zheng et al. 2019; Crawford et al. 2020; Beebe et al. 2021). The potential benefits of IIT in the management of human diseases and their insect vectors have led to a growing body of research on the utility of *Wolbachia* for population control in mosquito-borne diseases. Additional alternatives were considered but dismissed and are described in Appendix A of the environmental assessment.

CONCERN 8: Commentors were concerned about the potential for biopesticide drift associated with the project.

Response: For the reasons discussed in the EA and in response to comments above, disbursal of Incompatible male mosquitoes outside of the project area will have no adverse impacts on public health or the environment. This assessment is shared by the EPA. In addition, released incompatible male *Culex* mosquitoes would have no pesticidal action outside of the project area due to insufficient numbers drifting outside of the project area into areas where they would be overwhelmed by the large density of wild *Culex* mosquitoes in these lower elevations. The ratio of incompatible males to wild females would not be enough to suppress or have an effect on mosquito populations outside of the project area.

Pesticide drift is the movement of pesticide dust or droplets through the air at the time of application or soon after, to any site other than the area intended. This term has been historically associated with the use of chemical pesticides due to potential negative effects on people's health and the environment, and damage to nearby crops or infrastructure (www.epa.gov/reducing-pesticide-drift/introduction-pesticide-drift).

"Biopesticides" are derived from natural organic sources such as animals, plants, bacteria, and certain minerals. The *Wolbachia*-based incompatible male *Culex* mosquito in this EA is classified as a biopesticide by the EPA. The EPA encourages the use of biopesticides over chemical pesticides for several reasons, but mainly because they are usually inherently less toxic than conventional pesticides and generally affect only the target pest and closely related organisms, in contrast to broad spectrum, conventional pesticides.

A Federal Insecticide Fungicide Rodenticide Act (FIFRA) Section 18 application was submitted by the Hawai'i Department of Agriculture to the EPA, in collaboration with the USFWS and DLNR, to request an emergency exemption from Section 3 pesticide registration, given the imminent extinction risks to threatened and endangered forest bird species. The EPA conducted a rigorous review to

ensure that the Incompatible Insect Technique biopesticide will not adversely affect public health or the environment. The Section 18 process results in temporary product registration and a label that identifies appropriate product use, application rates, restrictions, safety, and quality control requirements. On April 25, 2023, the EPA approved the Section 18 and issued Specific Emergency Use Directions for use of *Wolbachia pipientis* wAlbB in *Culex quinquefasciatus* (DQB Strain) (Appendix C of the EA: Federal Insecticide, Fungicide, and Rodenticide Act Section 18 Specific Emergency Use Label for Incompatible Insect Technique Application and U.S. EPA Letter of Authorization).

CONCERN 9: Commentors were concerned that there has been insufficient study of the proposed action, that more studies should be completed, and that the proposed action has not been considered carefully.

Response: Since 2016, Federal and State agencies and NGOs initiated development, planning and environmental compliance needed to assess the efficacy and safety of the proposed mosquito abatement program. While this program is the first proposed use of incompatible male mosquitoes with *Wolbachia* for conservation there is a substantial body of data that demonstrate the approach is safe, targeted, and results in no adverse effects to humans or the environment (Laven 1967; Moreira et al. 2009; Atyame et al. 2011; Atayme et al. 2015; Kittayapong et al. 2019; Zheng et al. 2019; Crawford et al. 2020; Beebe et al. 2021). On April 25, 2023, the EPA approved the Section 18 and issued Specific Emergency Use Directions for use of *Wolbachia pipientis* wAlbB in *Culex quinquefasciatus* (DQB Strain) (Appendix C of the EA: Federal Insecticide, Fungicide, and Rodenticide Act Section 18 Specific Emergency Use Label for Incompatible Insect Technique Application and U.S. EPA Letter of Authorization). Public outreach related to the use of incompatible male mosquitoes began in 2018, and the effects of the Incompatible Insect Technique program were appropriately and extensively analyzed in this EA.

The southern house mosquito has been present in Hawai'i for nearly 200 years and already naturally carries the *Wolbachia* bacteria within its cells. This species of mosquito has invaded native forest habitat, which is the last refuge for critically endangered forest birds, and also occupies suburban and urban areas - even taking advantage of breeding indoors in air conditioner condensation/drip pans/drain pans in high rise buildings. As a result, residents of Hawai'i have been interacting with and bitten by the southern house mosquito (carrying *Wolbachia*) for generations.

The proposed mosquito suppression project using incompatible male mosquitoes was identified as a priority for Hawai'i at local and international planning meetings in 2016 and 2017. Over the following six years, Federal and State agencies and NGOs have participated in exhaustive research, development and planning to facilitate project implementation, and initiated permitting and environmental compliance. Outreach related to the use of incompatible male mosquitoes has been ongoing since 2018, and the use of this approach has been recommended by both executive and legislative branch leadership across the state.

In 2017, the Hawai'i Invasive Species Council adopted Resolution 17-2, supporting research and evaluation of landscape-scale control technologies for mosquitoes, and encouraging researchers to review and evaluate approaches that could potentially benefit both native wildlife and human health in Hawai'i. In 2019, House Resolution (HR) 297 passed the Hawai'i State House and directed the "[Department of Agriculture] to review the *Aedes aegypti* mosquito with *Wolbachia* bacteria, including *Aedes aegypti* mosquitoes originating from Hawai'i stock that could be imported for landscape scale mosquito control, and render a determination to place it on the appropriate animal import list." The resolution required the Departments of Health (DOH), Agriculture (DOA), and Land and Natural Resources (DLNR) to collaborate on a report to the Legislature with recommendations for appropriate vector control programs. In 2021, House Resolution (HR) 95 subsequently passed the Hawai'i State House urging DLNR, DOA, DOH and the University of Hawai'i to implement a

mosquito control program using *Wolbachia* to reduce mosquito population levels throughout the state. In 2022, the Hawai‘i Board of Agriculture voted to approve the administrative rule change and issuance of an import permit that would allow implementation of the proposed project. On September 7, 2022, the Kaua‘i County Council passed Resolution No. 2022-31 “Resolution Urging Federal, State, and County Elected Officials to Support the Funding and Implementation of the Use of Mosquito Birth Control to Bring Kaua‘i's Native Forest Birds Back From Near Extinction and Towards Abundance.” On May 12, 2023, the Kaua‘i County Council passed Resolution 2023-43, “Resolution Urging Federal, State, and County Elected Officials to Support Funding and Implementation of Mosquito Birth Control Measures to Mitigate the Rapid Decline of Native Bird Species.”

The period during which these resolutions were introduced and approved, highlights the timeline over which this approach has been under public review and subject to public comment.

CONCERN 10: Commentors were concerned that the *Wolbachia* bacteria in the mosquitoes to be released is “foreign” or would be “introduced” to an environment in Hawai‘i where it currently does not occur.

Response: The proposed action will not involve introducing any new or foreign organisms to Hawai‘i (see response to Concern 3). Any releases of organisms of this kind are rightfully scrutinized, well studied, and regulated. The incompatible male mosquitoes reared in the lab would be derived from mosquitoes initially collected in Hawai‘i. These are the same species of mosquito, the southern house mosquito (*Culex quinquefasciatus*), that are present in Hawai‘i and responsible for spreading avian malaria. Similarly, the strain of *Wolbachia* in the released male mosquitoes is also present in Hawai‘i in the bodies of another mosquito common in the state, the Asian tiger mosquito (*Aedes albopictus*).

The southern house mosquitoes that exist in Hawai‘i today carry a strain of *Wolbachia* called wPip. The Asian tiger mosquito carries a different strain of *Wolbachia* called wAlb. To create the incompatible southern house mosquitoes, scientists would create a laboratory line of Hawai‘i mosquitoes with the wAlb *Wolbachia* strain. This is done through a multi-step process involving rearing mosquitoes in the lab and removing the wPip *Wolbachia* from their bodies with common antibiotics. The wAlb strain of *Wolbachia* is injected into the eggs of the *Wolbachia*-free mosquitoes. The resulting mosquitoes are southern house mosquitoes with a stable infection of wAlb *Wolbachia*, which naturally occurs in Hawaii. These are reared for several generations and carefully tested. All this work is done in controlled laboratory conditions.

The success of the suppression program is predicated on only releasing incompatible male southern house mosquitoes. As *Wolbachia* is maternally inherited, no local establishment of wAlb southern house mosquitoes is expected or is likely to occur (see response to Concern 12 for more on the issues of female contamination and local establishment). However, as no organisms (mosquito or *Wolbachia*) used in this proposed project are novel to Hawai‘i, local establishment would not constitute introduction of any foreign species.

CONCERN 11: Commentors were concerned that the proposed project would be an “experiment” that has not been implemented prior.

Response: This is neither an experiment nor a novel technique. The proposed action is an application of an established method for controlling insect populations. The Incompatible Insect Technique (IIT) has been used for decades to control mosquitoes that are a human health concern in at least 15 countries including, but not limited to, New Caledonia, Fiji, Vanuatu, French Polynesia, Australia, Indonesia, Singapore, Malaysia, Vietnam, Sri Lanka, India, China, Brazil, Columbia, and Mexico and the United States (New York, Kentucky, Florida, Texas, Puerto Rico and California). All data and

peer-reviewed studies published to date indicate that IIT is a safe and effective method to reduce mosquito populations and disease transmission. The proposed action is also not the first time IIT has been used to suppress populations of the southern house mosquito. Stand-alone field releases of incompatible southern house mosquitoes were completed in China in 2022, led by Michigan State University researcher Dr. Zhiyong Xi. The project released over five million incompatible males, and preliminary results indicated very strong suppression in the field (publication in prep; pers. comm., Z. Xi).

The only novel aspect of the proposed action is that it has not previously been employed in Hawai‘i nor has it been used for wildlife conservation. As such, protocols are being developed for its use in Kaua‘i’s native forest and other local conditions. While there is ample evidence to indicate this approach is effective for reducing mosquito populations, it remains to be seen to what extent southern house mosquito populations will be suppressed.

CONCERN 12: Commentors were concerned that female mosquitoes would be released that could ultimately breed and perpetuate or increase rather than suppress the mosquito population, possibly resulting in a “super mosquito.”

Response: Several commentors correctly identified that the release of females (i.e., “female contamination”) would negatively impact the ability of the proposed action to suppress mosquito populations. Potentially released females, however, present no more risk to humans or animals than the wild mosquitoes that currently occur on Kaua‘i, nor would releases of females increase the population of mosquitoes on Kaua‘i.

Given the importance of only releasing male mosquitoes, sorting out females is a vital part of the process. In previous Incompatible Insect (IIT) programs similar to the proposed action, sex sorting was accomplished in several ways, with varying rates of success. One of the primary methods used to separate and eliminate females uses sieves, or another similar physical separation method, taking advantage of the fact the female pupae are larger than male pupae. This method alone is estimated to remove >95% of all females, and various additional methods have been used to eliminate remaining females or render them sterile (e.g., exposure to radiation). Employing this and other available sorting methods, Crawford et al. (2020) estimated that the risk of releasing a female is 1 out of 900 million released *Aedes aegypti* mosquitoes. The proposed action would use *Culex quinquefasciatus*, a different species of mosquito, and while the methodology is very precise the estimated number of females released is expected to differ.

This highly technical process uses physical separation of pupae, followed by imaging and sorting of emerged adults via artificial intelligence (AI) programs to remove remaining females. Following this, an iterative process of vetting AI scanned images is used to further reduce the risk of females being present in any given batch of incompatible mosquitoes bound for release. Following the methods described by Crawford et al. (2020), Beebe et al. (2021) did not detect any released females (or larvae containing control *Wolbachia*) throughout the life of their project in Australia. Using a different method, Zeng et al. (2022) estimated a female contamination rate of <1% and saw no local establishment of *Wolbachia*-infected mosquitoes in their study site. The Crawford et al. (2020) sex sorting would result in a female contamination rate that is several orders of magnitude smaller than reported in Zeng et al. (2022).

The released southern house mosquitoes would be transinfected with the wAlb *Wolbachia* strain and the wild mosquitoes in Hawai‘i currently are naturally infected by the wPip *Wolbachia* strain (see response to Concern 10 for more explanation). Should a wAlb female be released, she would be compatible with the released wAlb male mosquitoes and could produce viable offspring. As such, every effort would be made to reduce or eliminate female contamination in released male mosquitoes. For local establishment of a wAlb population of southern house mosquitoes to form, females would

first need to be released and survive long enough to reproduce (mate, find a blood meal, and lay eggs). If overflooding rates of released males are correctly calculated, it is possible that a released female could find a compatible male with which to mate. Scientists have confirmed bidirectional incompatibility between the wAlb and wPip southern house mosquitoes. This means that pairings of wAlb males and wPip females are incompatible, as are pairings of wPip males and wAlb females. Should a released female mate with a wild type wPip male, no offspring would be produced. If a released female successfully produces offspring with a released male, all those offspring would be infected with the wAlb *Wolbachia* strain. These offspring would then need to mate with other wAlb southern house mosquitoes to continue the reproductive cycle, as would all successive generations. Meanwhile, any mating events with wPip wild type mosquitoes would suppress any developing wAlb population. Successful establishment of a wAlb population would thus be the product of a series of extremely unlikely events. Should local establishment be detected, halting releases of wAlb males would allow the wild type wPip mosquitoes to reinvade a portion of treatment area and eliminate the wAlb population. Deliberately releasing wild type wPip male mosquitoes could similarly accomplish the same objective.

Attempting to establish a population of mosquitoes with a *Wolbachia* strain other than that which is already present in an environment is an extremely challenging and resource intensive exercise. In contrast to the releases proposed in this EA, other IIT programs are specifically designed with the goal of replacing a population of mosquitoes with others infected with a different *Wolbachia* that has been shown to reduce the transmission of disease. In that type of program both males and females are released. Examining the success of those programs gives some insight into the number of females that may need to be released to successfully establish a population. For example, Hoffman et al. (2011) released between 5,000 and 11,000 females per week (assuming a 1:1 sex ratio). Even at that rate, it took multiple releases over several months to increase the *Wolbachia* frequency in the mosquito population above 50% (indicating they had replaced half the population). Hoffman et al. (2011) also continued to document suppression of their *Wolbachia* mosquitoes through ingress of females from outside the release area. The methods expected to be employed for sorting out females in the proposed action are similar to those used by Crawford et al. (2020), which achieved a low female contamination rate of 1 in 900 million mosquitoes released. The proposed action, however, would use *Culex quinquefasciatus*, a different species of mosquito than used by Crawford et al. (2020). While the methodology is very precise the estimated number of females released is expected to differ as a result. Regardless, based on the results on Crawford et al. (2020) very few females are expected to be released; too few to result in local establishment.

CONCERN 13: Commentors were concerned that there is a risk that the release of *Wolbachia*-infected mosquitoes could increase, rather than diminish, disease transmission within the ecosystem and to humans (e.g., malaria, dengue fever, yellow fever, Zika virus, and West Nile Virus).

Response: There is no indication that the released incompatible male mosquitoes will increase disease transmission in humans or wildlife. The general trend seen in the peer-reviewed literature is that *Wolbachia* infection leads to lower rates of disease transmission including that of dengue, chikungunya, Zika, West Nile Virus, and malaria (e.g., Moreira et al. 2009, Hussain et al. 2012, Dutra et al. 2016). The ability of *Wolbachia* to suppress disease transmission is the basis for several applications of the Incompatible Insect Technique. Prime examples are projects aimed at replacing populations of the yellow fever mosquito (*Aedes aegypti*), which is naturally *Wolbachia*-free, with those infected with *Wolbachia*, thereby reducing the spread of dengue and other diseases (e.g., Eliminate Dengue [https://www.fhi360.org/projects/eliminate-dengue]).

As several commentors mentioned, there are a few select studies that show the opposite pattern, i.e., increased disease transmission in *Wolbachia*-infected mosquitoes. However, there are significant differences between the proposed action and the methods employed by these studies and the study

systems involved. In all the studies highlighted by commentors, the *Wolbachia* infection involved was either natural or achieved by inoculating adult mosquitoes, resulting in transient (unstable) infections (Zele et al. 2013, Dodson et al. 2014, Hughes et al. 2014). As Dodson et al. (2014) stated, "It should be noted that these experiments were performed with mosquitoes transiently infected in the somatic tissues with *Wolbachia*, rather than a stable maternally inherited infection. It remains to be seen whether a stable wAlbB infection will enhance WNV [West Nile Virus] in a similar way." The released mosquitoes in the proposed action would inherit their *Wolbachia* maternally and the infection would be stable and concentrated in sex cells. It should be noted that local transmission of West Nile Virus, chikungunya, Zika, and malaria (any other form besides avian) has not been documented in Hawai'i.

Over 200 species of *Plasmodium*, the malaria parasite, have been identified and each species is host specific, meaning it can only infect certain kinds of animals. Further, most *Plasmodium* species are spread by specific mosquito species or a closely related group of species. Hughes et al. (2014) reviewed the effects of *Wolbachia* infection on transmission of various malaria parasite species. These authors showed that while most *Wolbachia* infections led to a reduction in malaria transmission, some *Wolbachia* infections led to an increase in transmission of rat malaria (*Plasmodium berghei* and *P. yoelli*; limited to Africa), chicken malaria (*P. gallinaceum*; not present in Hawai'i), and one case of avian malaria (*P. relictum*). As noted in the response to Concern 2, the southern house mosquito is already a highly efficient vector of the avian malaria parasite, with 85–97% of mosquitoes being susceptible to infection and transmission (LaPointe et al. 2005) and it is improbable that susceptibility could increase beyond what is currently seen in the wild. Notably, Hughes et al. (2014) also showed that *Wolbachia* infection consistently led to a decrease in transmission of human malaria (*P. falciparum*). Regardless, neither the species of mosquito that carries human malaria, nor human malaria itself, are present in Hawai'i and human infection is therefore not possible.

Another important difference between the studies that found increases in disease transmission in *Wolbachia*-infected mosquitoes and the proposed action is that these studies compared *Wolbachia*-uninfected and *Wolbachia*-infected mosquitoes. Zele et al. (2013) found an increase in avian malaria infection between *Wolbachia*-uninfected southern house mosquitoes versus *Wolbachia*-infected southern house mosquitoes. In Hawai'i, nearly 100% of southern house mosquitoes are naturally infected with *Wolbachia* (Atkinson et al. 2016) as would be the released incompatible males. A comparison with Zele et al. (2013) is therefore inappropriate.

CONCERN 14: Commentors were concerned that transinfected *Wolbachia* will make its way into other mosquito or other insect species non-maternally, i.e., via "horizontal transfer."

Response: *Wolbachia* (wPipV) is already present in the southern house mosquito (C*ulex quinquefasciatus*) in Hawai'i, and *Wolbachia* (wAlbA and wAlbB) strains are already found in the Asian tiger mosquito (*Aedes albopictus)* in Hawai'i. These mosquito species have been in Hawai'i since 1826 and 1896, respectively. It is highly improbable that incompatible male mosquitoes, which cannot reproduce, are more likely to undergo horizontal transmission of *Wolbachia* than the existing populations of mosquitoes that have been reproducing on the landscape for the last 125–200 years. Further, *Wolbachia* is common among native Hawaiian insects (Bennett et al. 2012).

Wolbachia is an endosymbiotic organism (living within the cells of another organism) that is maternally inherited or passed down from a mother to her offspring; this is also referred to as "vertical transfer". "Horizontal transfer" in this case would be the transmission of *Wolbachia* from one organism to another, non-maternally. The mechanism for horizontal transfer in *Wolbachia* is not known, but it could only occur following a series of extremely unlikely events and would require the *Wolbachia* bacterium to live outside of their host cells for some period of time. In a laboratory setting,

keeping *Wolbachia* alive outside of host cells requires specific conditions to preserve them in a cell-free medium for even short periods (Rasgon et al 2006). These specific laboratory conditions are required in the process of creating the incompatible mosquitoes in the proposed action. However, some have asserted or implied that the ability to preserve *Wolbachia* outside of cells in a laboratory setting (Rasgon et al. 2006) represents evidence that *Wolbachia* can live extracellularly in the wild (Tolley et al. 2019). But there has yet to be any evidence of free-living *Wolbachia* in the wild and there are numerous environmental factors that would severely limit the lifespan of *Wolbachia* outside of their host cells (e.g., pH, UV radiation). The mechanism for horizontal transmission of *Wolbachia* remains unknown, but hypotheses regarding how this may have occurred in the past have little relevance to the system in the proposed action. Tolley et al. (2019) suggested that horizontal transfer in ants could have occurred through social interactions or predation, but there remains no direct evidence of this.

There is good evidence that, over millions of years, horizontal transfer of *Wolbachia* has occurred numerous times (Tolley et al. 2019, Ding et al. 2020). However, *Wolbachia* shows a high degree of host endemism (only lives within one host species or closely related species) especially the strains involved here, wPip and wAlb (Ding et al. 2020). This high rate of endemism itself is evidence of the rarity of horizontal transfer. Just as several commentors suggested, Loreto and Wallau (2016) theorized that horizontal transfer between mosquito species (or other insects) may cause some unknown impacts in an Incompatible Insect Technique program. O'Neill (2016) directly addresses the concerns of Loreto and Wallau (2016) and makes several relevant points regarding horizontal transfer including, 1) horizontal transfer is very rare in nature (e.g., Hamm et al. 2014), and 2) natural experiments indicate a low rate of horizontal transfer including in closely related sympatric (living in the same place) mosquitoes. To the second point, both the Asian tiger mosquito (*Aedes albopictus*) and the yellow fever mosquito (*Aedes aegypti*) live in the same environments in many parts of the world, including on Hawai'i Island. The Asian tiger mosquito is nearly always infected with *Wolbachia* naturally (the same strain that would be used in the proposed action), while the yellow fever mosquito is naturally uninfected by *Wolbachia,* and yet there has never been evidence of horizontal transfer of *Wolbachia* between these species. There also is no evidence that the strain of *Wolbachia* found in southern house mosquitoes has been transmitted to the Asian tiger mosquito (or any other mosquito), or vice versa, in Hawai'i (or anywhere else) despite co-occurrence for the past >130 years (Atkinson et al. 2016). Further, there is no evidence of transfer of any mosquito *Wolbachia* to other arthropods, including native Hawaiian insects. The low rate of horizontal transfer among related species, such as *A. albopictus* and *A. aegypti*, would suggest that the rate of transfer among unrelated arthropods would be even lower.

CONCERN 15: Commentors were concerned that horizontal gene transfer may occur within the transinfected mosquitoes and unknown evolutionary events may occur as a result.

Response: Commentors listed concerns regarding horizontal gene transfer between the *Wolbachia* endosymbiont and the mosquito. To clarify, this is different from the concerns of horizontal *Wolbachia* transfer involving non-heritable movement of the *Wolbachia* organism between insect species (see response to Concern 14). Horizontal gene transfer in this context would be the theoretical movement of genetic material (DNA) from *Wolbachia* into the southern house mosquito genome. Horizontal gene transfer is a natural process that has occurred innumerable times throughout evolutionary history. Scientists have found segments of DNA within numerous eukaryotic (e.g., animal) organisms that can be traced back to a prokaryotic (i.e., bacteria) organism, often in parasite-host interactions. This may in fact be an important evolutionary process that is just now being realized. However, the process of horizontal gene transfer itself is not a concern. Rather, if such a transfer includes transcriptional phenotypic traits that could be influenced by selective pressures that allow for beneficial traits to be developed. A segment of DNA does not necessarily contain all the

required information to be transcribed (read) and conferred into new traits or functions. Much of a genome in fact contains sequences of non-coding DNA, often referred to as “junk DNA.” The likelihood that such an event could somehow alter the genome of the mosquito in a meaningful way is therefore exceptionally low. Further, horizontal transfer of genes between *Wolbachia* and a mosquito is unlikely to constitute the creation of a new species of mosquito as some commentors suggested.

Some commentors singled out a study by Klassen et al. (2009) that purported to show evidence of horizontal gene transfer between *Wolbachia* (wPip) and the yellow fever mosquito (*Aedes aegypti*). These authors found several sequences of DNA within the genome of the yellow fever mosquito (which is typically *Wolbachia*-free) that had previously been identified from the *Wolbachia* genome. Klassen et al. (2009) do acknowledge, however, that while the most likely direction of transfer was from the *Wolbachia* to the mosquito, it cannot be determined for certain the transfer did not occur in the opposite direction. Most importantly, these examples of gene transfer occurred as a result of a natural evolutionary event(s), not as a result of any human-caused process, such as in the proposed action; the timescale required for these transfer events is therefore unknown. Further, given that the wPip strain of *Wolbachia* has co-evolved with the southern house mosquito for likely millions of years, it is considerably more likely that horizontal gene transfer may have naturally occurred between these species than between the transinfected wAlb and the southern house mosquito. Finally, given that only non-reproductive males are planned for release, genetic change over an evolutionary time scale is prevented.

Concerns such as horizontal gene transfer are predicated on establishment of a reproducing population of southern house mosquitoes infected with wAlb strain of *Wolbachia.* The purpose of the proposed action, however, is to suppress the population of southern house mosquitoes within the project area on Kaua‘i. Local establishment of wAlb southern house mosquitoes would work against that goal, for the reasons discussed in comment response 12 would be extremely unlikely, and extreme care would be taken to avoid that scenario. For more information, please see response to Concern 12.

CONCERN 16: Commentors were concerned that the proposed action would be “tested” on Native Hawaiians, which would constitute an environmental justice concern.

Response: With respect to environmental justice, there is no evidence that the release of incompatible male mosquitoes on Kaua‘i will have any human health impacts. Therefore, there would be no disproportionately high and adverse human health impacts to Native Hawaiians that would result in environmental justice concerns. Please refer to Section 4.8 of the EA for the full analysis of environmental justice.

As discussed in Concern 11, this is neither an experiment nor a novel technique. With respect to environmental justice, there are substantial data that demonstrate the approach is safe, targeted, and results in no adverse effects to human health or the environment ((Laven 1967; Moreira et al. 2009; Atyame et al. 2011; Atayme et al. 2015; Kittayapong et al. 2019; Zheng et al. 2019; Crawford et al. 2020; Beebe et al. 2021). The proposed action is an application of an established method for controlling insect populations. The Incompatible Insect Technique (IIT) has been used for decades in at least 15 countries and elsewhere in the United States. The IIT method is a highly effective and safe technique with a strong record of peer-reviewed studies and successful applications around the world. The southern house mosquito has been present in Hawai‘i for nearly 200 years and already naturally carries the *Wolbachia* bacteria within its cells. This species of mosquito has invaded native forest habitat, which is the last refuge for critically endangered forest birds, and also occupies suburban and urban areas. As a result, residents of Hawai‘i have been interacting with and bitten by the southern house mosquito (carrying *Wolbachia*) for generations. Therefore, there would be no disproportionately high and adverse human health impacts to Native Hawaiians that would result in

environmental justice concerns.

DLNR prepared a Cultural Impact Assessment (CIA)(See appendix B of the Final Draft EA) as part of compliance with the Hawai'i Environmental Policy Act (HEPA). Based on the research and ethnographic data within the CIA report, it was found that it would be unlikely that the proposed action would adversely impact traditional or customary practices.

The CIA also found that native birds could be considered a cultural resource as they are entwined in both Hawaiian culture and tradition across the islands. The history of the birds in Hawai'i is one of tremendous adaptive radiation due to geographic isolation resulting in numerous species of birds found nowhere else on earth (Pratt et al. 2009). The use of helicopters and drones under the proposed action could temporarily disturb native forest birds, but over the long term there would be substantial benefits by minimizing the spread of avian malaria and pox and reducing bird mortality. Any minimal impacts to ethnographic resources and traditional cultural practices would likely be temporary at any given location, though releases would likely occur over the long term. Reduction of avian malaria as proposed would conserve numerous rare birds important to Native Hawaiian culture providing a beneficial impact, outweighing the adverse impacts.

CONCERN 17: During the public comment period, commenters submitted additional literature for review.

Response: The USFWS and DLNR reviewed all literature that was submitted during the public comment period on the EA and incorporated relevant information into the EA or comment responses as necessary.

CONCERN 18: Commenters were concerned that initiating a mosquito control program would impact or disrupt pollination by mosquitoes.

Response: While it is possible that mosquitoes can serve as generalist pollinators to some flowering plants, they are not known to provide essential pollination services to any native plant species or plants of agricultural importance in Hawai'i. This is due to the fact that mosquitoes, including the southern house mosquito, have only been in Hawai'i for less than 200 years and have not evolved with these plants. Additionally, the southern house mosquito has only dispersed into higher elevation habitat in the last several decades. In contrast, Hawai'i has a remarkable diversity of native arthropod and bird pollinators that have evolved over millions of years to provide pollination services to native flowering plants in Hawai'i. This project will have no negative impacts on native arthropod pollinators. Furthermore, the project could potentially significantly benefit native forest birds and increase their numbers, which may therefore increase overall pollination services in Hawaiian forests.

CONCERN 19: Commenters expressed concern about risks to native wildlife, particularly native bats and birds.

Response: Native insects, fish, birds and bats in Hawai'i do not rely on mosquitoes as an essential component of their diets. While opportunistic predation of mosquitoes occurs, mosquitoes are just one of many native and non-native prey items consumed by native insectivores (Pinzari et al. 2019). As such, the control of southern house mosquitoes is not expected to significantly adversely impact any native wildlife as a result of changes to the existing food web. Hawai'i's native fauna evolved over millions of years as constituents in a diverse community assemblage. In contrast, mosquitoes are a comparatively recent introduction that were established on Hawai'i less than 200 years ago. There are additionally no data suggesting that consumption of transinfected mosquitoes would present a risk to native wildlife. Native taxa such as damselflies and bats have been consuming multiple mosquito species containing *Wolbachia* (including *Aedes albopictus* and *Culex quinquefasciatus*) since the

insects were first introduced, with no adverse effects. *Wolbachia* cannot live in vertebrates and thus cannot affect bats or birds (Popovici et al. 2010). See the response to Concern 14 for examination of "horizontal transfer" of *Wolbachia.*

CONCERN 20: One commentor suggested that funding for the proposed actions should instead go directly to captive rearing and releases of the affected bird species.

Response: DLNR and USFWS already receive annual federal and state funding to protect, monitor, and conduct research on endangered forest birds in the wild. Using this funding, the agencies have documented steep declines in honeycreeper species such as ʻakikiki, ʻakekeʻe, kiwikiu and ʻākohekohe over the past 20 years. These declines correspond with mosquitoes encroaching into high elevation forest habitat where they were not previously found and an increase in the prevalence of avian malaria in birds in these areas. The data collected suggests that avian malaria (transmitted by non-native mosquitoes) is the predominant threat to honeycreepers, and the expanding range of the southern house mosquito is causing honeycreeper population declines. Landscape-scale mosquito control as described in this Environmental Assessment is the best way to provide safe habitat for these endangered honeycreeper species.

DLNR and USFWS also receive annual federal funding for conservation breeding of endangered honeycreepers at two facilities in Hawaiʻi. In 2022 the agencies received funding under the Bipartisan Infrastructure Act to construct additional aviaries to house endangered honeycreepers at facilities on Maui. The agencies also received funding from the United States Fish and Wildlife Service Recovery Implementation Fund to collect ʻakikiki and kiwikiu from the wild and house them in captivity until mosquito control can be implemented on Maui and Kauaʻi. DLNR and USFWS have sufficient funding for collection from the wild and conservation breeding and diverting funding from the proposed project is therefore not necessary. In order to release birds in the future, safe habitat in which mosquito populations are suppressed is critical. The intended beneficial outcome of the proposed project is necessary to release these birds in the future and to protect other honeycreeper species that are not currently threatened with imminent extinction, but which will likely become extinct in the future if mosquito control is not implemented.

CONCERN 21: One commentor wants to see what happens on Maui (success, failure, negative impacts) before this project proceeds on Kauaʻi.

Response: While waiting for results of the Maui Incompatible Insect Technique (IIT) trials would give important insight into the resources and logistics required to implement an IIT program, there is already sufficient evidence to demonstrate the IIT method is a highly effective and safe technique with a strong record of peer-reviewed studies and successful applications around the world. There is a need to enact mosquito control in forest bird critical habitat across the state. Given the results of ample research to date, the DLNR and USFWS propose that this effective method to be employed on Kauaʻi as soon as all environmental compliance and permitting is complete, as it is likely to suppress southern house mosquito populations and will have no significant adverse effects to the environment.

CONCERN 22: One commentor wanted to know why other avian species, such as nēnē, are not being affected similarly from mosquitoes.

Response: Although avian malaria parasites can be found in any bird species, passerine birds (i.e., "perching birds" such as the Hawaiian honeycreepers) are most commonly affected by avian malaria (Valkiūnas, 2005). Hawaiian honeycreepers are unique in their high susceptibility to avian malaria; a single bite from an infected mosquito can kill a honeycreeper. Effects of avian malaria on other bird

species worldwide are generally undetectable or “sub-lethal,” meaning infection may reduce breeding success or immune response, for example, but does not result in mortality (LaPointe et al. 2012).

Hawaiian honeycreepers are a unique sub-family of birds, whereas other Hawaiian birds such as ‘alalā (Hawaiian Crow), nēnē (Hawaiian Goose), ‘io (Hawaiian Hawk), pueo (Hawaiian Owl), and ae‘o (Hawaiian Stilt) have continental relatives in the same genus. This higher degree of genetic divergence from their continental ancestors demonstrates that honeycreepers have been in Hawai‘i longer than other Hawaiian birds and likely lost their resistance to avian malaria. By contrast, other native Hawaiian birds were likely more recent arrivals and have retained their baseline resistance to avian malaria. There is evidence that some honeycreeper species such as the ‘amakihi are adapting a resistance to avian malaria (Atkinson et al. 2013). For other honeycreeper species, however, avian malaria infection is far too lethal, and they have become extinct before acquiring resistance to the disease.

State and federal biologists remain concerned about the potential for other mosquito-vectored diseases like West Nile Virus becoming established in Hawai‘i, which could have devastating consequences for many native bird species.

CONCERN 23: A commentor expressed concern that there were no biosecurity protocols for the released mosquitoes mentioned and that the pathogen screenings are unknown.

Response: The DLNR, USFWS and partners participating in this project are complying with all State and Federal requirements relating to biosecurity and the movement of invasive species. In addition, the mosquito rearing for this project is in compliance with the requirements out of the EPA, as well as Center for Disease Control (CDC) guidance. A higher level of biosafety and biosecurity standards are set for all laboratories that hold and maintain species that can vector diseases. The diet or blood supply that the mosquitoes in the lab are provided is sourced from companies that also adhere to strict Food and Drug Administration (FDA) and CDC guidance in providing pathogen-free animal blood for laboratory use. In addition to manufacturer screening, secondary panel testing occurs at the laboratory to verify that the diet is free of any diseases. Access to the lab is restricted to authorized personnel. Once packaged at the lab, the incompatible male mosquitoes are securely shipped and are not exposed to any potential pathogens. Upon arrival in the state, the shipment is inspected by a Hawai‘i Department of Agriculture official per the HDOA mosquito import permit conditions.

The incompatible male mosquitoes reared in the lab were originally collected in Hawai‘i (see response to Concern 10). These are the same species of mosquito, the southern house mosquito (*Culex quinquefasciatus*), that are present in Hawai‘i and responsible for spreading avian malaria. Similarly, the strain of *Wolbachia* in the released male mosquitoes is also present in Hawai‘i in the bodies of another mosquito common in the state, the Asian tiger mosquito (*Aedes albopictus*). Although the project would release incompatible male *Culex* mosquitoes, it would monitor for any release of females on the landscape. The methods expected to be employed for sorting out females in the proposed action are similar to those used by Crawford et al. (2020), which achieved a low female contamination rate of 1 in 900 million mosquitoes released. The proposed action, however, would use *Culex quinquefasciatus*, a different species of mosquito than used by Crawford et al. (2020). While the methodology is very precise the estimated number of females released is expected to differ as a result. (See response for Concern 12). These pose no risk to the humans, wildlife, or the ecosystem and females are likewise sexually incompatible with wild males. It is not expected that such a low number of females would result in local establishment. Nevertheless, monitoring would be conducted and if any lab-reared females were detected, releases of incompatible male mosquitoes could be halted in the area detected, allowing the population to revert to the wild type.

The project would be conducting pre and post release monitoring to assess changes in southern house mosquito populations and would integrate data to inform project planning and future releases.

Technical monitoring plans are being developed and as release plans are fleshed out, monitoring protocols would be put in place.

Invasive species biosecurity protocols are provided in Appendix D to help the project avoid or minimize the inadvertent transportation or spread of other invasive species that could potentially impact plants, fish, wildlife, and their habitat within the project area. These protocols and other existing biosecurity standard operating procedures and best practices would be followed by trained and experienced project personnel.

CONCERN 24: A commenter suggested that mosquito fish should be considered as a tool to control populations of southern house mosquitoes.

Response: The dispersal of mosquito fish into aquatic habitat can be an effective tool to reduce mosquito populations under certain conditions. Mosquito fish predate the larval stage of mosquitoes and have been used historically in Hawai'i as a part of an integrated pest management strategy for mosquito vector control in urban and suburban areas. To be effective, the fish must be introduced, or disperse, to available habitat where mosquitoes are breeding. In natural areas, such as those included in the proposed project area, southern house mosquitoes often breed in ephemeral larval habitat (standing water on roadsides, tree cavities, pig wallows and intermittent streams). The lack of waterway connectivity throughout core forest bird habitat would limit the mosquito fish's ability to control mosquitoes in all areas where endangered forest birds exist. Locating and distributing mosquito fish to such larval habitat is not logistically possible. Furthermore, mosquito fish are generalist predators, which means they do not target mosquitoes exclusively and are documented to have significant adverse impacts on native invertebrate fauna. In lowland waterways, mosquito fish consume native arthropods (such as the endangered *Megalagrion* species damselflies and anchialine pond shrimps *Vetericaris chaceorum* and *Procaris hawaiana*) and crustaceans causing major declines of native biota in waterways and pools where they are present. This suggested alternative has been included in Section 3.3 ("Alternatives Considered but Dismissed from Detailed Analysis") of the final draft of EA.

CONCERN 25: A commenter suggested that the DLNR and USFWS should consider the successful mosquito control approach used in Tetiaroa, Tahiti.

Response: Both the DLNR and USFWS have considered this approach. The same Incompatible Insect Technique approach using *Wolbachia* bacteria proposed in this environmental assessment, has been used in the successful suppression of an isolated mosquito population (*Aedes polynesiensis*) on the private atoll of Tetiaroa, North of Tahiti in French Polynesia. The program was initiated with the goal of reducing populations of mosquitoes that transmit diseases such as dengue fever, and chikungunya and Zika viruses to Tetiaroa residents and visitors. The release of incompatible male mosquitoes in Tetiaroa is ongoing and has resulted in 90% reductions of mosquitoes on specific islands within the atoll (https://www.tetiaroasociety.org/programs/research/mosquito-population-control, https://www.tetiaroasociety.org/sites/default/files/research-docs/ILM-Tetiaroa-pilot-project-2017.pdf)

CONCERN 26: Commentors were concerned about funding sources for the proposed action, potential conflicts of interest of agency staff and board members, and the role of special interests.

Response: All of the federal and state funds allocated to this project have traceable sources (state or federal appropriations). Potential financial aid from federal sources include, without limitation, Recovery Challenge grants, Section 6 funds, State Wildlife Grants, Bipartisan Infrastructure Law, Inflation Reduction Act fund, Stewardship grants, Migratory Bird Conservation Act grants, Recovery

Challenge grants, America the Beautiful Challenge grants, funds awarded via the Pacific Island Fish and Wildlife Office or the Science Applications Program, and other similar funding programs. State funding comes from State general funds. The American Bird Conservancy and The Nature Conservancy are also providing funding for the project.

In regards to concerns about conflicts of interest andspecial interests: The mission of the U.S. Fish and Wildlife Service (USFWS) is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people through federal programs relating to migratory birds, endangered species, interjurisdictional fish and marine mammals, and inland sport fisheries. Likewise, the Hawai'i Department of Land and Natural Resources (DLNR) is charged with the task of enhancing, protecting, conserving and managing Hawai'i's unique and limited natural, cultural and historic resources that are held in public trust for current and future generations of the people of Hawai'i nei, and its visitors, in partnership with others from the public and private sectors. USFWS and DLNR staff and designated representatives are fulfilling their official duties and responsibilities to their respective agencies by serving on boards and committees such as the State Board of Agriculture and related subcommittees. Their role on these boards and committees, including in partnerships such as Birds Not Mosquitoes Committee, is to provide technical expertise and represent agency leadership and policy positions. DLNR and USFWS staff working on this project are not receiving renumeration beyond their current salaries. Furthermore, many of the state and federal employees involved in this project are simultaneously working on a multitude of other projects and tasks related to their respective missions.

CONCERN 27: Commentors raised a concern that informed consent is required and was not obtained from the public to undertake this Incompatible Insect Technique (IIT) project.

Response: The proposed action analyzed in this EA is neither an experiment nor a novel technique being tested on the residents of Hawai'i. In making decisions on their respective proposed actions, the DLNR and USFWS each adhered to applicable laws, including NEPA and HEPA. NEPA and HEPA each require the agencies to inform the public about a proposed action and to seek information from the public about a proposed action and alternatives thereto. Substantive information obtained through public participation and from other sources is considered by agency officials in making decisions on proposed actions. Decision-makers strive to make well informed decisions utilizing best available information. As a rule, decisionmakers are not legally required to obtain the prior consent of individuals or entities who may disagree with an agency decision, or who may otherwise be affected by an agency decision. In this matter, the public was informed about the proposed action and was afforded an opportunity to comment. Substantive information available to decision-makers was considered and a final determination was made.

CONCERN 28: A commentor was concerned that *Wolbachia* Incompatible Insect Technique (IIT) trials conducted in Florida and Texas were the cause of recent human malaria detections in those states.

Response: Mosquitoes used in *Wolbachia* based IIT field trials in Florida and Texas are from the genus *Aedes*, a genus of mosquito that are not capable of spreading human malaria. Those projects also involved only releases of male mosquitoes, which do not take blood meals and thus are not capable of spreading disease. It is therefore not possible that human malaria was spread by the *Wolbachia* based incompatible male *Aedes aegypti* mosquito programs in Florida and Texas.

Malaria is a mosquito-borne disease caused by *Plasmodium* species protozoans that can cause illness in animals. Malaria in humans is caused by five *Plasmodium* species: *Plasmodium falciparum, P.*

vivax, P. malariae, P. ovale and P. knowlesi (Sato 2021). The mosquito genus *Anopheles* is one of about forty genera of mosquitoes and is the only ones that can transmit malaria between humans (Harbach 2004, Godfray 2013). Field trials of the *Wolbachia* based incompatible insect technique programs were conducted in Florida (Mains et al 2019) and Texas (CDC 2022b). These projects released incompatible male *Aedes aegypti* mosquitoes to suppress wild *Aedes aegypti* populations. *Aedes aegypti* mosquitoes do not spread human malaria. In addition, the releases involved only male *Aedes aegypti* mosquitoes, which do not take blood meals and thus do not vector disease. Only female mosquitoes take a blood meal and are capable of spreading the disease.

Human malaria is not endemic in the United States. The Center for Disease Control (CDC) reports that an average of 2,000 malaria cases are reported in the U.S. each year. These cases are a result of travelers acquiring the disease from abroad and returning to the U.S. These imported cases can lead to disease transmission when exposed to wild mosquito populations known to transmit human malaria. Recently, the CDC has been collaborating with two U.S. state health departments with ongoing investigations of locally acquired mosquito-transmitted *Plasmodium vivax*, a human malaria. According to the CDC, there is no evidence to suggest that the cases in Florida and Texas are related (CDC 2023). Human malaria in these states is being spread by mosquitoes of the genus *Anopheles*. Florida has recorded over 10 species of *Anopholes* mosquitoes in the state, all capable of spreading human malaria (Riles 2020).

CONCERN 29: A commenter was concerned that information being provided by Dr. Lorrin Pang, a resident of Maui, is not being considered.

Response: All concerns and/or alternatives that have been proposed to DLNR and USFWS from residents relating to this environmental assessment are being seriously considered. Regarding comments by Dr. Lorrin Pang, USFWS staff has taken the additional step of meeting with Dr. Pang given his position within the community. DLNR and USFWS staff and leadership are fully cognizant of the information, literature and relevant information provided by Dr. Pang and have carefully considered the validity and legitimacy of the information provided in the formal decision-making process. Please note that Dr. Pang's participation in this process is that of a private citizen and does not reflect the position of the Hawaiʻi Department of Health. The Hawaiʻi Department of Health is a member of the Birds, Not Mosquitoes partnership, and supports the planning for use of Incompatible Insect Technique (IIT) for control of the southern house mosquito.

CONCERN 30: Commentors were concerned about the potential impacts to tourism from conducting a *Wolbachia*-based control program in Hawaiʻi.

Response: It is not anticipated that tourism would be impacted negatively from conducting a *Wolbachia*-based control program in Hawaiʻi. Incompatible male mosquitoes released in the project area will have no significant impacts on public health or the environment (see Concern 2 Response). While it is possible some individuals could avoid visiting Hawaiʻi due to negative impressions about mosquito management operations occurring within the state, it is not expected to be a widely adopted position. *Wolbachia*-based incompatible male mosquitoes utilized in an Incompatible Insect Technique (IIT) program for the control of mosquitoes are regarded as a safe, environmentally friendly, non-chemical, targeted approach (See Concern 2 Response). The application of a *Wolbachia*-based biopesticide is approved for use in 20 states in the U.S. and field programs have occurred in some states with similar climates and tourism appeal (California, Florida, Texas) as to Hawaiʻi (CDC 2017).

The project implementation area and its lower elevation buffer zones include the highest elevation areas of Kauaʻi comprised of State Parks, Natural Area Reserves, Wilderness Preserves and some private lands. These areas tend to be more remote and away from most visitor experiences, especially those

from out-of-state. It is possible that the project could affect the visitor experience for land-based recreationists (e.g., campers, hikers, hunters) through increased human activity and noise (e.g., from people, vehicles, drones, and aircraft). However, there is already ongoing management occurring in these areas as well as the presence of commercial air tours. Additionally, no changes in public use or access to state-managed recreational areas are anticipated to be required for project operations. Beneficial effects to land-based recreationists could include reduced abundance of biting mosquitoes that are a nuisance for overnight users and hunters with dogs, as well as the potential for increased populations of native forest bird species to provide improved bird watching opportunities.

CONCERN 31: Commenters expressed concern that the State of Hawai'i has established a "secret" mosquito lab without public knowledge.

Response: In 2014, DLNR established an insectary facility in Kailua on O'ahu to house applied research projects and support the conservation and management of rare invertebrate species. The benefits of applied research projects are two-fold; in the process of gathering important ecological information on a rare, native species, DLNR propagates large numbers of individuals that can then be systematically released to enhance naturally occurring populations or seed new populations. The insectary is not customized to a particular taxonomic group, but instead provides an indoor laboratory environment and associated outdoor space where projects can be initiated on an array of rare species. Projects range from basic biological and ecological studies to the development of specific captive rearing, propagation and reintroduction techniques. Initial targets for conservation breeding included an endangered damselfly species, which is aquatic and predatory in the larval stage. Two mosquito species (*Aedes albopictus* and *Culex quinquefasciatus*) have been raised intermittently since 2014 as a dietary component for the damselflies.

In 2022, DLNR proposed to renovate one of the existing insectary spaces to support implementation of an Incompatible Insect Technique (IIT) mosquito control project in Hawai'i. USFWS funds ($94,456) and State of Hawaii Capitol Improvement Project (CIP) funds ($100,000) are allocated from the FY2022 budget for the renovation including: "Construction and equipment for installation of biocontainment enclosure with anteroom, temperature cabinets and shelving; equipment and appurtenances, and all project related costs." No state or federal funds have been spent on the renovation to date.

In the interim, DLNR staff have been working to relocate the insectary facility to a base yard in Pearl City, HI. The base yard is located on the leeward side of the island of Oahu, at an elevation of approximately 820 feet (250 meters). In advance of the move, DLNR staff conducted outreach presentations to the Aiea Neighborhood Board, Pearl City Neighborhood Board, and the Pearl City Lions Club. Presentations included specifics of plans to complete groundwork, relocate the facilities, and explained how the invertebrate labs will support DLNR objectives to stabilize and recover populations of rare and endangered species. Half of each presentation focused on DLNR's involvement in the Birds Not Mosquitoes partnership and clearly described the facility's proposed use for rearing of incompatible male mosquitoes with *Wolbachia*.

CONCERN 32: One commentor expressed concern that the use of glyphosate is causing mosquitoes to be more susceptive to malaria infection.

Response: This project does not use glyphosate. Glyphosate, also known as Roundup®, is an herbicide that can be used to treat habitat modifying invasive species in urban, suburban and natural areas. Glyphosate has also not historically been commonly used in the project area where endangered forest birds also occur. The herbicide is primarily used at lower elevations to treat grassy areas. The main herbicides used in forest bird habitat areas are Garlon/Triclopyr or Polaris/ Imazapyr. Monitoring of malaria in mosquitoes shows increased prevalence since the 1990s through 2020.

These data come from Kawaikoi Stream, Mohihi Stream, Camp 10 road, Koaie Stream; mostly areas where glyphosate is not generally applied.

CONCERN 33: One commentor expressed concern that predictive modelling is speculative and questioned whether such modeling should be used for guiding decisions.

Response: Ecology is the study of the relationships of organisms to their ecosystem and each other. Like all branches of the sciences, ecologists use data collected in the field to understand these relationships. The individual data point is not necessarily used in the Sciences to generalize about the relationships of organisms to their ecosystems, to each other, or to human interactions. Rather, it is the general trends associated with data sets that are assessed and to inform management of the organism, their ecology, and the ecosystems in which they are studied. Data that are used to inform these trends are analyzed to a degree to ensure that the efficacy of an approach or method to be employed in conservation actions is not speculative. The statistical, predictive modelling techniques used give an indication of confidence in the trend, and thus the ability to simulate them in real-world, hands-on management and for project utility. The trends and recommendations are evaluated by experts in the field, and compared to peer reviewed literature, to ensure scientific integrity, applicability, and quality.

CONCERN 34: Commenters suggest the proposed action cannot be allowed to move forward while a similar project proposed for East Maui is being litigated in court.

Response: The lawsuit relating to the implementation of an Incompatible Insect Technique program on East Maui is a separate matter and does not affect the proposed action described in this EA.

CONCERN 35: A commenter was concerned that the fluorescent marker Rhodamine B would be used on the incompatible male mosquitoes released on Kauaʻi.

Response: There are no plans to use Rhodamine B to mark incompatible male mosquitoes released on Kauaʻi for the purpose of this Incompatible Insect Technique project. Rhodamine B is an organic chloride salt that is commonly used to dye cloth, paper, paint and other products (https://www.rsc.org/suppdata/ra/c4/c4ra14184a/c4ra14184a1.pdf). It can also be used to mark insects and other animals for research and ecological studies (e.g., Papillon et al. 2002, Schellhorn et al. 2004).

CONCERN 36: A commenter was concerned that the use of antibiotics on mosquitoes in the laboratory would contribute to antibiotic resistance in humans or the environment in Hawaiʻi.

Response: The limited use of tetracycline in a laboratory environment poses no risk to increased antibiotic resistance in humans or the environment in Hawaiʻi. Tetracyclene is an antibiotic that is commonly used in humans to treat bacterial infections (Nelson and Levy 2011). In the context of this project, Tetracyclene will be used in the laboratory environment to remove naturally occurring *Wolbachia* bacteria from southern house mosquitoes collected from Hawaiʻi, prior to giving them the incompatible *Wolbachia* bacteria. Southern house mosquitoes in Hawaiʻi naturally carry the wPip *Wolbachia* strain. In order to be given the incompatible strain of *Wolbachia* (wAlb) necessary for an Incompatible Insect Techique program, mosquitoes originating from Hawaiʻi first need to be cleared of the wPip *Wolbachia*. Tetracyclene will only be utilized during this specific step of the laboratory process. PCR testing will then be completed to confirm that the wPip strain is absent from the eggs of those individuals. No antibiotics will be used on subsquent generations of mosquitoes produced or maintained in the laboratory, nor will they be used directly on the mosquitoes proposed for release on Kauaʻi.

CONCERN 37: A commentor requested a list of the 14 countries and 4 states in the United States in which the proposed action was noted as being used in the EA.

> **Response:** The Incompatible Insect Technique has been used for decades to control mosquitoes that are a human health concern in over 15 countries including, but not limited to, New Caledonia, Fiji, Vanuatu, French Polynesia, Australia, Indonesia, Singapore, Malaysia, Vietnam, Sri Lanka, India, China, Brazil, Columbia, Mexico, and the United States (New York, Kentucky, Florida, Texas, Puerto Rico and California). This information is included in the final EA.

CONCERN 38: A commentor suggested looking into the immunity of other native birds and developing a vaccine that could be administered to at-risk forest birds.

> **Response:** At present there is no vaccine available for avian malaria. DLNR and FWS will evaluate all available tools, including the use of a vaccine if one becomes available and would consider the most efficient methods for deployment. Researchers are investigating the causes of malaria resistance in 'amakihi. This project is in progress and results are not yet available. This suggested alternative has been included in Section 3.3 ("Alternatives Considered but Dismissed from Detailed Analysis") of the final draft of EA.

CONCERN 39: A commentor was concerned about field crews' ability to adequately monitor the response of mosquitoes and birds to this intervention if field crews are not allowed to move along new-to-them routes, such as pig trails.

> **Response**: Monitoring of birds is beyond the scope of this EA. Based on mosquito dispersal and survivorship modeling completed by USFWS and USGS researchers, USFWS and DLNR are confident that accurate and efficient mosquito monitoring can be conducted across the proposed project area using existing public and management trails to evaluate the efficacy of the control program. Monitoring the response of forests bird to mosquito suppression via the Incompatible Insect Technique (IIT) mosquito control is outside the scope of the proposed action of this EA.

References

Atkinson C.T., K.S. Saili, R.B. Utzurrum, S.I. Jarvi. 2013. Experimental evidence for evolved tolerance to avian malaria in a wild population of low elevation Hawai'i 'Amakihi (*Hemignathus virens*). Ecohealth 10: 366-75. https://doi: 10.1007/s10393-013-0899-2.

Atkinson, C.T., R.B. Utzurrum, D.A. Lapointe, R.J. Camp, L.H. Crampton, J.T. Foster, T.W. Giambelluca. 2014. Changing climate and the altitudinal range of avian malaria in the Hawaiian Islands – an ongoing conservation crisis on the island of Kaua'i. Global Change Biology 20: 2426–2436.

Atkinson C.T, W. Watcher-Weatherwax, and D. LaPointe. 2016. Genetic diversity of *Wolbachia* endosymbionts in *Culex quinquefasciatus* from Hawai'i, Midway Atoll and American Samoa. University of Hawai'i at Hilo Technical Report HCSU-074.

Atyame, C.M., J. Cattel, C. Lebon, O. Flores, J.S. Dehecq, M. Weill, L.C. Gouagna, and P. Tortosa. 2015. *Wolbachia*-based population control strategy targeting *Culex quinquefasciatus* mosquitoes proves efficient under semi-field conditions. PLoS ONE 10: e0119288 https://doi.org/10.1371/journal.pone.0119288.

Atyame, C.M., N. Pasteur, E. Dumas, P. Tortosa, M.L. Tantely, N. Pocquet, S. Licciardi, A. Bheecarry, B. Zumbo, M. Weill, and O. Duron. 2011. Cytoplasmic incompatibility as a means of controlling *Culex pipiens quinquefasciatus* mosquito in the islands of the south-western Indian Ocean. PLoS Neglected Tropical Diseases 5: e1440.

Beebe, N.W., D. Pagendam, B.J. Trewin, A. Boomer, M. Bradford, A. Ford, C. Liddington, A. Bondarenco, P.J. De Barro, J. Gilchrist, C. Paton, K.M. Staunton, B. Johnson, A.J. Maynard, G.J. Devine, L.E. Hugo, G. Rasic, H. Cook, P. Massaro, N. Snoad, J.E. Cawford, B.J. White, Z. Xi, and S.A. Ritchie. 2021. Releasing incompatible males drives strong suppression across populations of wild and *Wolbachia*-carrying *Aedes aegypti* in Australia. Proceedings of the National Academy of Sciences of the United States of America 118: https://doi.org/10.1073/pnas.2106828118

Bennett, G.M., Pantoja, N.A. and O'Grady, P.M. 2012. Diversity and phylogenetic relationships of *Wolbachia* in Drosophila and other native Hawaiian insects. Fly 6: 273-283.

Center for Disease Control (CDC). 2017. EPA Registers the *Wolbachia* Zap Line in Live Male Asian Tiger Mosquitoes. Released November 17, 2017. https://www.epa.gov/pesticides/epa-registers-*wolbachia*-zap-strain-live-male-asian-tiger-mosquitoes

Center for Disease Control (CDC). 2022a. Mosquitoes with *Wolbachia* for Reducing Numbers of *Aedes aegypti* Mosquitoes. Last reviewed July 25, 2022. https://www.cdc.gov/mosquitoes/mosquito-control/community/emerging-methods/*wolbachia*.html

Center for Disease Control (CDC). 2022b. Introduction to Pesticide Drift. Last updated October 31, 2022. https://www.epa.gov/reducing-pesticide-drift/introduction-pesticide-drift

Center for Disease Control (CDC). 2023. Locally Acquired Cases of Malaria in Florida and Texas. Last reviewed July 24, 2023. https://www.cdc.gov/malaria/new_info/2023/malaria_florida.html

Chimera, C.G., A.C. Medeiros, L.L. Loope, and R.H. Hobdy. 2000. Status of management and control efforts for the invasive alien tree *Miconia calvescens* DC. (Melastomataceae) in Hana, East Maui'. Pacific Cooperative Studies Unit Technical Report #128. Pacific Cooperative Studies Unit, University of Hawaii. https://scholarspace.manoa.hawaii.edu/handle/10125/7122.

Crawford, J.E., D.W. Clarke, V. Criswell, M. Desnoyer, D. Cornel, B. Deegan, K. Gong, K.C. Hopkins, P. Howell, J.S. Hyde, J. Livni, C. Behling, R. Benza, W. Chen, K.L. Dobson, C. Eldershaw, D. Greeley, Y. Han, B. Hughes, E. Kakani, J. Karbowski, A. Kitchell, E. Lee, T. Lin, J. Liu, M. Lozano, W. MacDonald, J.W. Mains, M. Metlitz, S.N. Mitchell, D. Moore, J.R. Ohm, K. Parkes, A. Porshnikoff, C. Robuck, M. Sheridan, R. Sobecki, P. Smith, J. Stevenson, J. Sullivan, B. Wasson, A.M. Weakley, M. Wilhelm, J. Won, A. Yasunaga, W.C. Chan, J. Holeman, N. Snoad, L. Upson, T. Zha, S.L. Dobson, F.S. Mulligan, P. Massaro, and B.J. White. 2020. Efficient production of male *Wolbachia*-infected *Aedes aegypti* mosquitoes enables large-scale suppression of wild populations. Nature Biotechnology 38: 482-492.

Ding, H., H. Yeo, and N. Puniamoorthy. 2020. *Wolbachia* infection in wild mosquitoes (Diptera: Culcidae): Implications for transmission modes and host-endosymbiont associations in Singapore. Parasites & Vectors 13: 612.

Dodson, B.L., G.L. Hughes, O. Paul, A.C. Matacchiero, L.D. Kramer, J. L. Rasgon. 2014. *Wolbachia* Enhances West Nile Virus (WNV) infection in the mosquito *Culex tarsalis*. PLoS Neglected Tropical Diseases 8: e2965.

Dutra, H.L.C., M.N. Rocha, F.B.S. Dias, S.B. Mansur, E.P. Caragata, and L.A. Moreira. 2016. *Wolbachia* clocks currently circulating Zika virus isolates in Brazilian *Aedes aegypti* mosquitoes. Cell Host & Microbe 19: 771–774.

Gatew, H., and K. Mengistu. 2019. Genetically modified foods (GMOs); a review of genetic engineering. Journal of Life Science and Biomedicine 9: 157-163

Godfray, H.C.J. 2013. Mosquito ecology and control of malaria. Journal of Animal Ecology 82: 15-25. doi: 10.1111/1365-2656.12003

Hamm, C.A., D.J. Beguyn, A. Vo, C.C.R. Smith, P. Saelao, A.O. Shaver, J. Jaenike, and M. Turelli. 2014. *Wolbachia* do not live by reproductive manipulation alone: infection polymorphism in Drosophila suzukii and D. subpulchrella. Molecular Ecology 23: 4871–4885.

Harbach, R.E. 2004. The classification of genus Anopheles (Diptera: Culicidae): a working hypothesis of phylogenetic relationships. Bulletin of Entomological Research 94: 537–553

Hoffmann, A.A., B.L. Montgomery, J. Popovici, I. Iturbe-Ormaetxe, P.H. Johnson, F. Muzzi, M. Greenfield, M. Durkan, Y.S. Leong, Y. Dong, H. Cook, J. Axford, A.G. Callahan, N. Kenny, C. Omodei, E.A. McGraw, P.A. Ryan, S.A. Ritchie, M. Turelli, and S.L. O'Neill. 2011. Successful establishment of *Wolbachia* in *Aedes* populations to suppress dengue transmission. Nature 476: 454–457

Hughes, G.L., A. Rivero, J.L. Rasgon. 2014. *Wolbachia* can enhance Plasmodium infection in mosquitoes: Implications for malaria control? PLoS Pathogens 10: e1004182.

Hussain, M., G. Lu, S. Torres, J.H. Edmonds, B.H. Kay, A.A. Khromykh, S. Asgari. 2012. Effect of *Wolbachia* on replication of West Nile Virus in a mosquito cell line and adult mosquitoes. Journal of Virology 87: 851–858.

Kittayapong, P., S. Ninphanomchai, W. Limohpasmanee, C. Chansang, U. Chansang, P. Mongkalangoon. 2019. Combined sterile insect technique and incompatible insect technique: The first proof-of-concept to suppress *Aedes aegypti* vector populations in semi-rural settings in Thailand. PLoS Neglected Tropical Disease 13: e0007771.

Klassen, L., Z. Kambris, P.E. Cook, T. Walker, and S.P. Sinkins. 2009. Horizontal gene transfer between *Wolbachia* and the mosquito *Aedes aegypti*. BMC Genomics 10: 33.

LaPointe, D.A., M.L. Goff, and C.T. Atkinson. 2005 Comparative susceptibility of introduced forest-dwelling mosquitoes in Hawai'i to avian malaria, *Plasmodium relictum*. Journal of Parasitology 91: 843-849.

Lapointe, D. A., C.T. Atkinson, M.D. Samuel. 2012. Ecology and conservation biology of avian malaria. Annals of the New York Academy of Sciences 1249: 211–226. https://doi.org/10.1111/j.1749-6632.2011.06431.x

Laven, H. 1967. Eradication of *Culex pipiens fatigans* through cytoplasmic incompatibility. Nature 216: 383-384.

Loreto, E.L.S. and G.L. Wallau. 2016. Risks of *Wolbachia* mosquito control. Science 351: 1273.

Mains, J. W., Kelly, P. H., Dobson, K. L., Petrie, W. D., & Dobson, S. L. 2019. Localized Control of *Aedes aegypti* (Diptera: Culicidae) in Miami, FL, via Inundative Releases of *Wolbachia*-Infected Male Mosquitoes. Journal of Medical Entomology 56: 1296–1303. https://doi.org/10.1093/jme/tjz051

Moreira LA, I. Iturbe-Ormaetxe I, J.A. Jeffery, G.J. Lu, A.T. Pyke, L.M. Hedges, B.C. Rocha, S. Hall-Mendelin, A. Day, M. Riegler, L.E. Hugo, K.N. Johnson, B.H. Kay, E.A. Mcgraw, A.F. Van Den Hurk, P.A. Ryan, S.L. O'Neill. 2009. A *Wolbachia* Symbiont in *Aedes aegypti* limits infection with dengue, chikungunya, and plasmodium. Cell 139: 1268–1278.

Nelson, M.L., and S.B. Levy. 2011. The history of tetracyclines. *Annals of the New York Academy of Sciences* 1241: 17-32. https://doi.org/10.1111/j.1749-6632.2011.06354.x

Neville, R., J.Y. Fujikawa and M. Halabisky. 2019. Eradication programmes complicated by long-lived seed banks: lessons learnt from 15 years of miconia control on O'ahu Island, Hawai'i. In: Veitch, C.R., M.N. Clout, A.R. Martin, J.C. Russell and C.J. West (eds.). Island invasives: scaling up to meet the challenge. Occasional Paper of the Species Survival Commission 62: 430–434. IUCN, Gland, Switzerland

O'Neill, S.L., 2016. *Wolbachia* mosquito control: Tested. Science 352: 526-526.

Papillon, Y., B. Ludovic, and A. Butet. 2002. Rhodamine B as a collective marker for studying the movements of small mammals. Acta Theriologica 47: 491-497

Paxton, E.H., R.J. Camp, P.M. Gorresen, L.H. Crampton, D.L. Leonard, and E.A VanderWerf. 2016. Collapsing avian community on a Hawaiian island. Science Advances 2: e1600029.

Paxton, E.H., M. Laut, S. Enomoto, and M. Bogardus. 2022. Hawaiian forest bird conservation strategies for minimizing the risk of extinction: Biological and biocultural considerations. Hawai'i Cooperative Studies Unit Technical Report HCSU-103. University of Hawai'i at Hilo, Hawaii, USA. 125 pages. http://hdl.handle.net/10790/5386.

Paxton, E. H., R. J. Camp, P. M. Gorresen, L. H. Crampton, D. L. Leonard, and E. A. Vanderwerf. 2016. Collapsing avian community on a Hawaiian island. Science Advances 2: e1600029.

Pinzari, C.A., Peck, R.W., Zinn, T.L., Gross, D., Montoya-Aiona, K., Brinck, K.W., Gorresen, M., & Bonaccorso, F.J. 2019. Hawaiian Hoary Bat (Lasiurus cinereus semotus) Activity, Diet and Prey Availability at the Waihou Mitigation Area, Maui. U.S. Geological Survey date release. https://doi.org/10.5066/P9U0KRMY.

Popovici, J., L.A. Moreira, A. Poinsignon, I.Iturbe-Ormaetxe, D. McNaughton, S.L. O'Neill. 2010. Assessing key safety concerns of a *Wolbachia*-based strategy to control dengue transmission by *Aedes* mosquitoes. Memórias do Instituto Oswaldo Cruz, Rio de Janeiro 105: 957–964.

Pratt, T.K., C.T. Atkinson, P.C. Banko, J.D. Jacobi, and B.L. Woodworth. 2009. Conservation Biology of Hawaiian Forest Birds. Yale University Press, New Haven, Connecticut. 707 pp.

Rasgon, J.L., C.E. Gamston, and X. Ren. 2006. Survival of *Wolbachia* pipientis in cell-free medium. Applied and Environmental Microbiology 72: 6934–6937.

Riles M.T., C.R. Connelly. 2020. An Update of the Mosquito Records of Florida Counties, USA. Journal of the American Mosquito Control Association 36: 107–111. doi: https://doi.org/10.2987/20-6923.1

Sato S. 2021. Plasmodium-a brief introduction to the parasites causing human malaria and their basic biology. Journal of physiological anthropology 40: 1. https://doi.org/10.1186/s40101-020-00251-9

Schellhorn, N., G. Siekmann, C. Paull, G. Furness, and G. Baker. 2004. The use of dyes to mark populations of beneficial insects in the field. International Journal of Pest Management 50: 153-159. DOI: 10.1080/09670870410001731862

Tolley, S.J.A., P. Nonacs, and P. Sapountzis. 2019. *Wolbachia* horizontal transmission events in ants: What do we know and what can we learn? Frontiers in Microbiology 10: 296.

U.S. Department of the Interior (USDOI). 2022. U.S. Department of the Interior Strategy for Preventing the Extinction of Hawaiian Forest Birds. https://www.fws.gov/media/doi-strategy-preventing-extinction-hawaiian-forest-birds-508.

U.S. Fish and Wildlife Service (USFWS). 2006. Revised recovery plan for Hawaiian forest birds. USFWS Region 1, Portland, OR, 622 pp.

U.S. Fish and Wildlife Service (USFWS). 2021. Kaua'i Island-wide Recovery Plan. USFWS Region 1, Portland, OR.

Valkiūnas, G. 2005.Avian Malaria Parasites and Other Haemosporidia. CRC Press. New York.

Zéle, F., A. Nicot, A. Berthomieu, M. Weill, O. Duron, and A. Rivero. 2013. *Wolbachia* increases susceptibility to Plasmodium infection in a natural system. Proceedings of the Royal Society 281: 20132837.

Zeng, Q., L. She, H. Yuan, Y. Luo, R. Wang, W. Mao, W. Wang, Y. She, C. Wang, M. Shi, T. Cao, R. Gan, Y. Li, J. Zhou, W. Qian, S. Hu, Y. Wang, X. Zheng, K. Li, L. Bai, X. Pan, and Z. Xi. 2022. A standalone incompatible insect technique enables mosquito suppression in the urban subtropics. Communications Biology 5: 1419.

Zheng, X., D. Zhang, Y. Li, C. Yang, Y. Wu, X. Liang, Y. Liang, X. Pan, L. Hu, Q. Sun, X. Wang, Y. Wei, J. Zhu, W. Qian, Z. Yan, A.G. Parker, J.R.L. Gilles, K. Bourtzis, J. Bouyer, M. Tang, B. Zheng, J. Yu, J. Liu, J. Zhuang, Z. Hu, M. Zhang, J.-T. Gong, X.-Y. Hong, Z. Zhang, L. Lin, Q. Liu, Z. Hu, Z. Wu, L.A. Baton, A.A. Hoffman, and Z. Xi. 2019. Incompatible and sterile insect techniques combined eliminate mosquitoes. Nature 572: 56–61. https://doi.org/10.1038/s41586-019-1407-9

Entry Date	Comment	Responses
6/23/2023 20:52	I think an extremely cautious approach should be taken here to consider if this is all being done to try and save a species whose time may already be too late or has run its course. Around 150 Species all around the world go extinct everyday and 99% of everything that has ever been around on earth has gone extinct. What's the successful track record in introducing new species to combat one thing but affecting many others. You folks already know! It's not been good. What poses more of a threat, rats, cats? Why aren't other avian species being affected similarly from mosquitos? Nene geese are thriving.	Concerns: 3, 22
6/26/2023 8:28	I think this is a very good idea. My concern is that this bacteria could spread to other insect species, the ones that are critical for pollination like bees. Bees are under severe strain worldwide and a cross contamination to them would be disastrous. The resort in Tahiti, The Brando, has eliminated all mosquitoes from the entire Tetiaroa Atoll that they inhabit. Maybe officials from Hawai'i should consult with their organization and find out what they did to achieve this.	Concerns: 14, 25
6/26/2023 13:13	Please allow science to prevail and allow the proposed IIT mosquito eradication methods to begin as soon as possible. We do not have the benefit if time in our side when it comes to saving nearly extinct species. These birds are in a precarious position already and any unforeseen natural disaster could expedite their disappearance if our islands take a direct hit and nesting and foraging sites are damaged.	Thank you for your comment
6/26/2023 14:41	Aloha, My husband and I completely support the biological control of the growing threat of mosquitoes due to climate change that is threatening Hawai'i's native bird population. Control of mosquitos by this method is safer and more effective than spraying pesticides, has been well studied, tested and safely used in other parts of the world. In addition to causing the extinction of our native bird species, mosquitoes also pose a threat to humans by carrying and spreading such diseases as Zika virus, dengue fever, malaria and other mosquito borne diseases, many of which can be fatal to humans. Mahalo, Permanent, full time Maui residents.	Thank you for your comment
6/26/2023 15:33	Aloha, Please allow science to prevail and allow the proposed IIT mosquito eradication methods to begin as soon as possible. We do not have the benefit if time in our side when it comes to saving nearly extinct species. These birds are in a precarious position already and any unforeseen natural disaster could expedite their disappearance if our islands take a direct hit and nesting and foraging sites are damaged. Please do not allow for non-scientific fear-mongering to sidetrack science and progress in the name of species preservation.	Thank you for your comment
6/27/2023 7:53	I am in support of the this plan. We humans introduced these mosquitoes to the Hawaiian island, and we humans should do everything in our power tool remove them. Hawaii has already lost too many bird species to these mosquitoes, and we shouldn't lose any more.	Thank you for your comment
6/27/2023 12:19	I am very much in favor of this proposal, as the endemic birds are vital to our ecosystem and culture here in Hawaii. As long as the release of these sterile male mosquitoes do no additional harm to our already decimated environment, I believe this a good idea to protect those birds that we have left for our sense of enjoyment, for purposes of culture, for pollination of our food, and to keep the web of life as intact as possible. Mahalo.	Thank you for your comment

Entry Date	Comment	Responses
6/27/2023 21:01	AloHa! Stop the MADDNESS! It is extremely dangerous project!!! Do not let the money buy your hearts and souls… Do not let Kauai be infected with this mosquito HORROR! STOP this project in the name of anything sacred in your heart! Don't let Kauai and its residents suffer …. PLEASE!	Concern: 26
6/28/2023 6:50	Why this rush on releasing untested mosquito experiments? Why Hawaii? Why are we again test subjects? Maui already started without the consent of the people that live there! I say stop! Did we ask for this mosquitoes to be brought to Hawaii? Or is someone getting paid to use Hawaii as a testing ground? Is our government really caring about us that live here? Is it really all about saving birds? Spending all that money? That money could be better used on low income housing!	Concern: 26, 27
6/28/2023 13:02	I am writing to express my STRONG SUPPORT for this proposed mosquito suppression project. This is our best and perhaps only chance to save species like the 'akikiki from extinction.	Thank you for your comment
6/30/2023 15:16	As a Hawai'i resident, I am writing to express my strong support for the proposed suppression of invasive mosquito population project on Kaua'i. As indicated in the EA, this project would not result in the introduction of any new species to the island; would only release male mosquitoes; Wolbachia cannot be transferred between animal species,	Thank you for your comment
7/1/2023 17:00	Aloha hou e DLNR. I have previously offered comment and input on the approval for Wolbachia to be released on Maui to protect those Maui endemic avian species in peril. I am now doing the same for our Kauaʻi manu. Without this, even more will be lost. It is probably too little too late for the ʻAkikiki, which cannot be described with any other word than devastating. We Kānaka have a saying "I ola ʻoe, i ola mākou nei," when you live, we all live. Without these manu, we collectively as a people lose part of our identity. We cannot afford to lose more, and approving these methods for mosquito prevention are again a step in the right direction, but a step that should have happened decades ago. Please, please approve these measures to help save our manu, it is the least we can do. Mahalo	Thank you for your comment
7/1/2023 18:21	We must move forward with mosquito control, it's already too late for too many!	Thank you for your comment
7/1/2023 19:19	Let's protect native Hawaiian birds throughout forest reserves, state parks, and private lands in the Kōkeʻe and Alakaʻi areas of Kauaʻi. I agree with the project to suppress mosquitoes known to transmit diseases to native forest birds. Let's keep Hawaii native and beautiful	Thank you for your comment
7/2/2023 3:02	Fighting invasive born illness is a key part to the survival of these birds!	Thank you for your comment

Entry Date	Comment	Responses
7/2/2023 5:46	Aloha mai kākou, I am a Kanaka Maoli wildlife biologist, ethno-ornithologist, and cultural practitioner, and I would like to testify in strong favor of IIT & the release of incompatible Wolbachia mosquitoes on Kaua‘i (and across the islands). The imminent extinction of our forest birds is an emergency, and I encourage DLNR and USFWS to act quickly in hopes of saving ‘Akikiki & ‘Akeke‘e, the former who could potentially go extinct this year. Mahalo for your time.	Thank you for your comment
7/2/2023 6:41	Please support Hawaii’s forest birds! In my short time (25) years living on Maui I saw the diversity of flora and fauna disappear one by one… please listen to conservation organizations and follow the science to help save Hawaii’s special birds	Thank you for your comment
7/2/2023 9:02	Aloha, I am writing in full support of IIT efforts on Kaua'i. Native Hawaiian honeycreepers are incredibly important to Native Hawaiian culture and the ecology of Hawai‘i. If action is not taken to suppress mosquitoes and avian malaria in forest bird habitat as soon as possible, we will lose these birds to extinction forever. Wolbachia IIT is currently the only hope we have. Given the imminent risk of extinction for multiple species, we must move forward as swiftly as possible with the actions described in this EA. Mahalo for your work and for the opportunity to provide testimony.	Thank you for your comment
7/3/2023 10:19	Dear Hawaii DLNR-DOFAW Members, I SUPPORT the DRAFT ENVIRONMENTAL ASSESSMENT AND ANTICIPATED FINDING OF NO SIGNIFICANT IMPACT FOR ENVIRONMENTAL ASSESSMENT FOR USE OF WOLBACHIA-BASED INCOMPATIBLE INSECT TECHNIQUE FOR THE SUPPRESSION OF NONNATIVE SOUTHERN HOUSE MOSQUITO POPULATIONS ON KAUA'I. I think we can all agree that the situation facing Kauai's native forest birds is dire, and that we must do something, safe and effective, as soon as possible in order to save those birds that remain for future generations. The proposed Incompatible Insect Technique (IIT) has been successfully used globally for over 50 years. In each case, scientists have researched and analyzed the results and found that the method has no significant negative health or environmental impacts. An Environmental Assessment (EA) for use of the IIT method to control avian malaria on Maui was performed and approved by accredited experts and elected officials of The National Park Service and Hawaii DLNR-DOFAW. As is the case for every other known use of this technique, the draft Kaua'i EA for the IIT method has now similarly found that there will be no negative impacts to the health, environment, plants, animals, or people of Hawaii. This technique is the only hope left to save several species of the birds in the short time remaining before extinction. Given these facts, and the desperate plight of the birds, I SUPPORT the DRAFT ENVIRONMENTAL ASSESSMENT AND ANTICIPATED FINDING OF NO SIGNIFICANT IMPACT FOR ENVIRONMENTAL ASSESSMENT FOR USE OF WOLBACHIA-BASED INCOMPATIBLE INSECT TECHNIQUE FOR THE SUPPRESSION OF NONNATIVE SOUTHERN HOUSE MOSQUITO POPULATIONS ON KAUA'I. Please act quickly, the birds do not have much time. Mahalo nui for your consideration,	Thank you for your comment

Entry Date	Comment	Responses
7/3/2023 10:31	I’m OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/3/2023 11:12	I support the use of IIT to reduce the invasive mosquito population. Avian malaria and pox have been completely destroying the native Hawaiian honeycreeper population, with so few species and individuals remaining it is our duty to protect these species to the best of our ability.	Thank you for your comment
7/3/2023 11:27	Aloha, I previously worked for the Kaua'i Forest Bird Recovery Project and I am now studying 'akikiki and 'akeke'e in graduate school at UCLA pursuing my PhD. I've spent 5 years working with these endangered species, specifically trying to identify suitable habitat for them on islands with a larger elevational range. However, I have always hoped that the Alaka'i could remain the home of these unique and imperiled birds. The IIT technique is our last hope for saving our native forest bird species and our native forests in general which are the headwaters of the most important watershed on the island. This technique has been proven to be safe, will only harm a non-native pest and is being developed responsibly with the residents of Kaua'i in mind. I have the full support of this plan and I hope it gets brought through to fruition. Thank you for your time and consideration.	Thank you for your comment
7/3/2023 11:44	Mosquito suppression has been proven to be an effective form of disease suppression in other systems and is essential for the conservation of numerous native forest bird species. Further, there is no evidence that IIT is in any way dangerous or that there is significant risk of producing off-target negative consequences. Mosquitoes are not native to Hawai'i and should be eradicated to the best of our ability.	Thank you for your comment
7/3/2023 11:52	As a Kaua‘i resident and conservation biologist by education and trade, I fully support the Department of Land and Natural Resources (DLNR) and U.S. Fish and Wildlife Service (USFWS) proposal to use the Incompatible Insect Technique to reduce mosquito populations within forest reserves, state parks, and private lands in the Kōke‘e and Alaka‘i areas of Kaua‘i. The science is clear that if we do not take immediate action, our forest bird populations will dwindle and many will go extinct. The proposed technique is thoroughly researched and a safe tool to help us achieve positive conservation outcomes. Not only from a environmental perspective, but also from a cultural perspective, the people of Kaua‘i and Hawai‘i want to see this crisis met with combative action.	Thank you for your comment
7/3/2023 12:06	Aloha, I am submitting testimony in strong support of mosquito suppression on Kaua‘i. Hawai‘i's native Honeycreepers are foundational to the culture, forests, and ecosystems of Hawai’i. We have already lost a great deal of these forest bird species due to avian diseases transmitted by non-native mosquitoes. Every time we lose a bird species we lose an ecosystem service, a valuable part of our community, a beautiful native creature, a unique creation of an incredible number of years of evolution, and a piece of Hawaiian culture. Right this moment the’akikiki is going extinct in the wild. Two native birds on Maui are predicted to also go extinct within the next few years if nothing is done immediately. These birds provide essential ecosystem services and without action or delayed action, these species have no chance of survival. The incompatible insect technique or mosquito birth control provides us with a last glimmer of hope and opportunity to save the last remaining Honeycreepers from extinction. This method has been used successfully worldwide for vector control for human diseases and gives us a powerful tool to address the main cause for the decline of our Honeycreepers. It is solely the fault of human beings for the declines and extinctions of our native birds. Introducing predators, plants, and disease to these islands has been a death sentence to our native species. If we continue to let native species go extinct, we risk the collapse of our entire ecosystem. We have the tools to make this situation better and as a professional who grew up in Hawai‘i, and has worked in Hawai‘i's native forests for over 6 years now, I have seen firsthand the type of dire situation we are in. Please do your part to protect Hawai‘i's native bird species, its ecosystems, and its culture and support IIT and other mosquito control techniques.	Thank you for your comment

Entry Date	Comment	Responses
7/3/2023 15:49	I support the use of the IIT technique to reduce mosquito populations on Kaua'i and other islands. I understand that similar methods have been used successfully for more than 10 year and that the state has worked with the federal government and with The Nature Conservancy to ensure that the method will be safe and effective here in Hawaii. I also think that harms associated with horizontal transfer are overstated, and if they eventually do occur we will find scientific solutions to overcome them. These birds are critically endangered and I believe that scientifically based methods such as these give them their best chance at survival.	Thank you for your comment
7/3/2023 20:10	Absolutely no mosquito release anywhere on our islands.	Thank you for your comment
7/4/2023 2:44	Hello, I am writing my comment in support of the Kauai Mosquito suppression project outlined in the Environmental Assessment (EA). The timing of the Wolbachia bacterium into the mosquito population is critical as many of the species affected, including but not limited to I'iwi akeke‘e and ‘akikiki, are already in huge declines. As a passionate birder, it breaks my heart to see the word EXTINCTION. Not only are these birds important to the ecosystem in which they exist, but they also have a strong cultural important to the native peoples of Kauai. If nothing is done, avian malaria will continue to spread and wipe out Kauai's native bird population until they are all gone. The island of Kauai is already overgrown and overtaken by so many invasive species that we need to hold on to the natives we have. I would hate to think that future generations will be walking in Kauai’s forest only to hear the calls of non-native species and look in books to see what birds used to exist on the island. Although I am not from Hawaii, I am very passionate about the protection of Hawaii's vulnerable bird population. I am fortunate enough to have been able to see a handful of the species affected first hand and would hate to never be able to see them again. I know many others feel the same way. This is a real solution that will save species and prevent extinction. We must act to prevent the loss of Kauai’s native bird population and be the voices that will save them. Thank you for your time	Thank you for your comment
7/4/2023 4:34	Another reason why I’m OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health!	Concern: 1
7/4/2023 18:20	IIT method sounds like it may be a feasible way to decrease the mosquito population without the use of chemical pesticides. One area of concern is the possible mosquito population replacement with wolbachia infected mosquitoes. This can occur when female wolbachia infected mosquitoes inadvertently get released into the population and breed. What steps will be done to mitigate and monitor this? How good are the facilities that breed the mosquitoes at sorting out male from female, as this is notoriously difficult? Are all the mosquitoes going to be irradiated to sterilize any females that may get through the sorting process? If the local mosquito population is replaced with wolbachia infected mosquitos, what hazards do that pose to bird/human population?	Thank you for your comment
7/4/2023 22:08	I’m OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/4/2023 22:16	Your campaign is FOR THE BIRDS !!!	Thank you for your comment
7/4/2023 23:58	Completely opposed to this. If this non sense goes thru the authorities need to take full accountability. But no, please do not go ahead with this.	Thank you for your comment

Entry Date	Comment	Responses
7/5/2023 8:35	I support the use of the Wolbachia-based Incompatible Insect Technique for the suppression of non-native southern house mosquito populations on Kaua‘i.	Thank you for your comment
7/5/2023 8:45	I think it is critically important that we move forward with IIT based mosquito control on Kaua'i. We are losing the forest birds on the Alaka'i at unprecedented rates right now.	Thank you for your comment
7/5/2023 9:05	I think what they’re trying to do is awesome and it’s really our only way of mostly getting rid of avian malaria . I’m only 12 years old and I love native plants and birds so seeing that some of these birds may go extinct real soon is really hurtful to me. I personally would love to see the ‘Akikiki and the ‘Akeke‘e before they go extinct so I’m hoping that this will happen to save them. Good job to DLNR and USFWS make it happen.	Thank you for your comment
7/5/2023 9:08	Kaua'i's native forest birds are experiencing massive decline due to mosquito-borne diseases, which can and should be suppressed by use of IIT. This is a no-brainer. The released male mosquitoes will pose no threat to humans or other Hawaiian flora and fauna. This technique is the last hope.	Thank you for your comment
7/5/2023 10:13	I support this!	Thank you for your comment
7/5/2023 17:21	This technique for the suppression of mosquitoes is the long-awaited, very first step in saving our native forest birds. The people of Hawai'i will be very happy when they realize mosquitoes are fewer and birds are more.	Thank you for your comment
7/5/2023 18:06	I am commenting on the Mosquito Suppression Environmental Assessment - July 2023. I am a conservation biologist on Maui and have been working with these forest birds for the last 15 years. Although I am on Maui, we are facing the same issues here. I have also worked with these bids on Kaua'i and have seen the changes over the years there in terms of mosquito presence and the lack of birds. Anecdotally, I remember being at camp without mosquitoes- now they are there. I remember when akikiki and akeke'e were not listed on the endangered species act- now they are facing extinction. I even went over to Kaua'i earlier this year as a last chance to see these birds in the wild.	Thank you for your comment
7/6/2023 7:58	Hi! I'm writing in support of mosquito suppression via Wolbachia. I am hoping something will be done to save the remaining honeycreepers!	Thank you for your comment
7/6/2023 8:41	Aloha. I am writing to voice my support of the mosquito control efforts described in the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua‘i." This is a vital step towards ensuring the conservation of Hawai'i's unique native wildlife, including two endemic bird species found only on Kauai and at risk of extinction in the next year to five years due to avian malaria: the 'akikiki and akeke'e. Incompatible Insect Technique is a method of mosquito control which has been used for decades all across the world and uses naturally occurring bacteria already found in Hawai‘i, and does not require the application of chemical pesticides or genetic modification. It is a tested, well researched, and safe technique to control mosquitoes and prevent further extinctions due to avian malaria. As an ornithologist, I was given the incredible opportunity last year to observe the remaining two individual 'akikiki in Halepa'akai for days on end as they foraged and moved about the forest. It breaks my heart that these birds witnessed their species decline to the point of vanishing almost entirely, leaving behind just a father and son with no hope of continuing their lineage in the forest from which they hatched. It is essential we control Southern house mosquitoes in these forests, so that 'akikiki and other highly susceptible honeycreepers can thrive in their forests of origin. The loss of native birds is not just biological, but cultural as well. I dream of a mosquito free Hawai‘i where native Hawaiians can enjoy the beautiful native birds their ancestors had close relationships with. Without mosquito control, we will lose these jewels of	Thank you for your comment

Entry Date	Comment	Responses
	(***Continued***) the forest forever. Hawai'i has already lost all but 17 of the over 59 honeycreepers that once inhabited its verdant forests. Please support this action so we can prevent the addition of Kauai's unique forest birds to the list of species lost forever due to invasive species and disease. Mahalo.	
7/6/2023 9:39	Aloha, The Hawai`i Audubon Society strongly supports urgent efforts by USFWS and DLNR to save the native Hawaiian honeycreepers from imminent extinction. We endorse that the use of the naturally-occurring Wolbachia bacteria as mosquito birth control is a safe way to efficiently reduce/suppress mosquito populations in Hawai‘i. Mahalo!	Thank you for your comment
7/6/2023 11:52	I’m writing in strong support of the draft Environmental Assessment for mosquito suppression on Kaua‘i. I have seen firsthand the decimating decline in native forest bird populations on the island. I had the privilege of hiking the Mohihi trail in November and saw for different ‘akikiki when there were about 24 known individuals in the wild. A few weeks ago, I visited Mohihi with three other Representatives and the Kaua‘i Forest Bird Recovery Project. With the population down to six known individuals, we understandable saw zero ‘akikiki. And while hiking out, we found a dying ‘amakihi on the trail. As we waited for the Kaua‘i Forest Bird Recovery Project folks to try and save its life, we found a dead ‘apapane just feet from it. The folks from the Kaua‘i Forest Bird Recovery Project all shared stories of dead birds hanging from bushes as they are literally falling dead from the sky due to avian malaria. And so our high-elevation forests are almost entirely silent compared to the relative abundance I remember as a child. While our forest bird population on Kaua‘i is rapidly dwindling, silent forests aren’t our inevitable future. Mosquito control has the potential to bring our forests back to abundance. But time is critical – as every month or delay will make brining some of thes species back from the brink much harder. I believe that the Environmental Assessment was thorough and address all potential impacts, and I’m hopeful that the mosquito suppressant methods can begin as soon as possible.	Thank you for your comment
7/6/2023 14:39	I am in strong support of releasing incompatible mosquitoes on Kaua'i. We need to save these incredibly special birds!	Thank you for your comment
7/6/2023 15:01	I am strongly in support of this mosquito suppression technique on Kaua‘i for the protection of Hawaiian honeycreepers. I am a conservationist who posts educational material online social media, and I can say that I have witnessed strong public support for mosquito suppression among my online following of over 30,000 people. This technique of mosquito suppression seems safe and we should be moving expeditiously to implement it in order to prevent further catastrophic extinctions on Kaua‘i.	Thank you for your comment
7/6/2023 16:46	I oppose the releasing of biological weapons in Hawaii. Whoever reads this I implore you to think of the danger they are considering releasing with these mosquitos and the harm could definitely befall us all. I pray you have a heart and choose wisely to not allow this to happen.	Thank you for your comment
7/6/2023 19:11	Absolutely necessary to save native birds. Don’t let the science deniers stop this very important effort.	Thank you for your comment
7/7/2023 4:21	The introduction of Wolbachia treated mosquitoes is critical to the survival of Hawaiian birds from the spread of avian malaria. Even if there was an environmental risk it would be better than losing the native birds of Hawaii. Since there is no risk delaying its use only kills more native birds.	Thank you for your comment

Entry Date	Comment	Responses
7/7/2023 9:31	As an avian biologist who has seen the devastating effects of mosquitoes on the environment in Hawai'i, I am in strong support of the Proposed Action alternative described in the Wolbachia-based Suppression of Mosquitoes on Kauai Environmental Assessment (EA). Given that this alternative does not appear to have any significant negative impacts, an Environmental Impact Statement is not needed for this project. Due to the grave consequences that the No Action alternative would have for many of our threatened and endangered native species, swift implementation of the Proposed Action is needed. This is a well described project with valid data and methods and is especially crucial on Kauai where many of the native forest birds are in dire condition. Implementation and monitoring will be important as well as a thorough communication plan with the public- ensuring that they understand the positive impacts this technique could provide, that no harm will come to them, native wildlife, or to water or cultural resources, and that cultural practitioners and hunters will still be allowed access to the affected areas. Again, I am in support of the Proposed Action and the EA as it is written. Mahalo for the opportunity to comment on this important EA.	Thank you for your comment
7/7/2023 14:52	This project is well designed, well-vetted and should be implemented as soon as possible.	Thank you for your comment
7/7/2023 17:06	I OPPOSE this	Thank you for your comment
7/7/2023 23:50	I am in favor of using the incompatible male Wolbachia in the Kōke‘e and Alaka‘i Wilderness areas, to mitigate the terrible toll that this species of mosquito transmitting avian diseases to our native Hawaiian birds. There are so few species left, and they are struggling for survival despite conservation efforts. Please support the implementation of programs to control and if possible, eliminate this species of mosquito on Kaua'i.	Thank you for your comment
7/8/2023 8:18	I was born and raised on Big Island and the damage brought on to native bird populations through mosquitos has not gone unnoticed. Hopefully we can see some of these remedies being implemented there one day as well.	Thank you for your comment
7/9/2023 8:43	To whom it may concern, I totally support the proposed method of Mosquito Suppression. To me the fact that mosquitos will only be breeding with other mosquitos makes the impacts of the Incompatible Insect Technique seem very safe.	Thank you for your comment
7/9/2023 18:22	I'm a Kaua'i resident and filmmaker who has recently had the opportunity to partner with Kauai Forest Birds Recovery Project on a short film examining the cultural impact of species extinction. Before this project, I honestly hadn't even realized birds were considered pollinators. But through my involvement with KFBRP, and the many interviews I've conducted with experts in the fields of Hawaiian conservation and culture, I've learned so much about the necessity of Hawaii's native birds in keeping both the ecosystem and culture intact.	Thank you for your comment
7/10/2023 6:48	I have visited Kauai and was shocked at the deadly impacts of introduced mosquito populations on native songbirds. The situation will only get worse as temperatures rise. I fully support controlling the mosquitoes in this manner (not using insecticides, which are non-discriminating in their lethal and sublethal impacts). Hawaii's unique avifauna deserves every effort to protect and restore populations of the birds. Thank you.	Thank you for your comment
7/10/2023 8:10	I think it would be wonderful to do this so that future generations might also enjoy the native birds that live nowhere else than here on Kauai.	Thank you for your comment
7/10/2023 9:06	I fully support the Kauai Mosquito Suppression program.	Thank you for your comment

Entry Date	Comment	Responses
7/10/2023 18:51	Aloha. This project is being challenged in environmental court to seek a ruling to require an Environmental Impact Statement. No further actions should be taken to release biopesticide mosquitoes while the need for further study of the risks is actively being litigated. NBC News has identified the fact that a similar project of mosquito release occurred two to three years ago in Texas and Florida. And both states have now reported their first malaria cases in twenty years, according to WTRF News. Could it really be a coincidence? https://www.wtrf.com/health-2/are-genetically-modified-mosquitoes-from-a-bill-gates-backed-program-causing-a-u-s-malaria-outbreak/ There is no evidence that the release of mosquitos in Hawaii will be harmless, either.The Bill and Melinda Gates Foundation funded the company Oxitec "to rid the world of malaria". It would seem their science was faulty. https://www.gatesfoundation.org/about/committed-grants/2020/09/inv019029 While the mosquitos being released in Hawaii are not genetically modified, they are infected with a Wolbachia virus. And the release is moving forward without proper studies. Wolbachia bacteria can be transmitted horizontally to parasites in our system that can then play a major role in giving people elephantitis, heartworm, and River Blindness. Approving these actions puts Hawaii people at risk for serious diseases. Those responsible will be held accountable. Please, cease and desist	Concerns: 1, 2, 9, 14, 28, 34
7/10/2023 20:09	We need to save our 'ōiwi species. There is no Hawai'i without our native species and kānaka 'ōiwi.	Thank you for your comment
7/10/2023 20:20	Please consider the past when considering the future. Have we not learned our lessons from "good ideas gone wrong"? It is so unfortunate what is happening to these birds, but this does not seems to be the answer. Please reread your "draft" Environmental Assessment. We have no idea the impact to this island in the future. If it goes wrong, pushing it through because "we have to do something now", will be a ridiculous statement. Please do not do this. Thank you for your time in reading this.	Thank you for your comment
7/10/2023 23:13	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/11/2023 15:50	I live on Maui where the Mosquito Suppression has just been made known to us here in Hana. We here on Maui are now trying to make sense of this insanity as they have already released some "Wolbachia" mosquitos without our knowledge. Here there has been no EIS but we are demanding it via the court system. We the people remain hopeful.	Concern: 1
7/11/2023 17:00	As a conservation biologist working on Kauai for the last couple years, in addition to working in endangered bird conservation across the world, I fully support the measures to introduce IIT to the ecosystems of Kauai. These measures have become the only option available to preserve Hawaii's native birds from human-caused extinction. If IIT introduction measures do not succeed, other species will be lost forever. The opposing voices to these measures are not founded in fact and seek only to spread misinformation and false paranoia. We have not only the ability but the responsibility to proceed with IIT and save these beautiful, vital stewards of Hawaii.	Thank you for your comment
7/11/2023 17:00	Without our birds we will loose an important species integral to watershed protection. Birds are valuable pollinators. We should be using CRISPR not this expensive method.	Concerns: 6

Entry Date	Comment	Responses
7/11/2023 17:04	I believe that we are at a point with the downfall in native honeycreepers on the islands of Kauai and Maui specifically that we need to act now! The Wobachia mosquito introduction is a proven result to suppression of mosquitoes. The honeycreepers of the Hawaiian islands are very special to the forest ecosystem, and to the native Hawaiian culture. We've lost many honeycreeper species in the past, and with the ability to use these mosquitos we would hope will lead to positive outcomes to help these birds. The Akikiki is already on extinctions doorstep, and many more honeycreepers from the islands are right behind.	Thank you for your comment
7/11/2023 17:56	We need an intervention fast to save our forest birds from extinction! This Wolbachia project is well thought out and I trust all the scientists working on it. Please approve the EA.	Thank you for your comment
7/12/2023 2:51	Hawaii is experiencing an epidemic of avian malaria today, and it is having a devastating impact on our native forest birds. At least two bird species on Kauai, the ‘Akeke‘e and ‘Akikiki and two on Maui, the Maui Kiwikiu and Akohekohe, are expected to be extinct in as little as one to two years unless more is done to control the epidemic. All proven means must be used if we expect to be successful in saving these and other native birds from extinction.	Thank you for your comment
7/12/2023 10:53	This sounds like a great idea. It's important to consider all avenues to prevent species from becoming extinct.	Thank you for your comment
7/12/2023 22:59	The proposed mosquito suppression does not introduce anything that is not already here, all mosquitos are male which don't bite. The manu are near extinction and this is the best possible chance with lowest possible chance of negative impact. This has to happen as soon as humanly possible. We lose the birds, we start to lose our native forest. Lose the native forest, lose the water.	Thank you for your comment
7/13/2023 2:52	I am against releasing genetically modified mosquitos on Kauai or any of the Hawaiian islands.	Concern: 4
7/13/2023 18:23	I’m OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/14/2023 3:00	I highly believe that the mosquitoes of Kaua'i are major problems to many species of native Hawai'i birds. These birds, being heavily specialized and found no where else on Earth are true gems of the world. Yet they are declining, due to these invasive malaria-carrying insects. Let us not forget the many species we mourn across America, the Carolina parakeet, the passenger pigeon and the Kaua'i o'o, who's voice recordings inspire thousands to take action. If we do not take action immediately, we will lose these beautiful creatures. The forests of Hawai'i will have lost their voices, subjecting the archipelago to the eerie loss of birdsong. We need to take action. We need to eliminate the mosquitoes and bring back environmental balance to the islands. We have lost too many already, we cannot lose anymore. For the sake of the indigenous and tourists alike, who admire the honeycreepers unique songs and behaviors, and for the sake of the birds themselves, being subject to horrid and unnatural disease. Take action, for they do not have voices, so we must be their voice.	Thank you for your comment
7/14/2023 3:49	Mosquitos are terrible. Birds are good. 100% support your effort.	Thank you for your comment

Entry Date	Comment	Responses
7/14/2023 4:54	I strongly support immediate implementation of the DLNR/USFWS proposal to use the Incompatible Insect Technique (IIT) to reduce the mosquito populations in 59,204 acres of forest reserves, state parks, and private lands in the Kōke‘e and Alaka‘i areas of Kaua‘i. I visited some more accessible parts of these areas in 1990 and saw abundant and beautiful native forest birds of several species. It is a great tragedy that the areas that I visited are now mostly devoid of native forest birds due to the climate change induced spread of invasive mosquitos carrying avian malaria and that several species are rapidly approaching extinction. This plan gives the best hope for reversing this terrible trend, preventing additional extinctions, and restoring the amazing and beautiful natural heritage of Kauai. Potential negative impacts have been carefully studied and found to be non-existent or minimal; they are greatly outweighed by the likely positive impacts on ecosystem health and the economic benefits of bird watching focussed tourism. Please implement the Kauai mosquito suppression plan now!	Thank you for your comment
7/14/2023 13:14	I’m OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/14/2023 22:24	It is critical to release mosquito control to save our last endangered honeycreepers. I urge you to move forward with the releasing of mosquito control ASAP to save our birds from extinction. Extinction is forever. Mahalo nui loa.	Thank you for your comment
7/15/2023 16:21	I strongly urge the passage of the proposed project to help support the longevity of the Akikiki. This project will not only help the survival of the Honeycreepers but also benefit our public health. As landowners in KAUA’I we would also welcome the opportunity to allow the agencies access to the land for use with this project. Thank you for your concern and actions.	Thank you for your comment
7/15/2023 16:23	I’m OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, “Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.” This project is an experiment on Hawaii’s people, wildlife, and ‘āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven’t been considered. Conflicts of interest haven’t been addressed.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	(***Continued***) There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	
7/16/2023 4:35	I am a concerned resident of Kauai and care deeply about my neighbors and my stewardship of this special treasure called Kauai. Aloha Aina! There has been 50 years of scientific based evidence to justify this program. As long as there are attorneys, seemingly logical arguments can be made for even scientifically uninformed causes. Science is not something that is 100% and nothing will be accomplished waiting for it to be. These well intentioned people have been misled. They have the right to make their opinions heard, but not at the expense of damaging our island. Because of the extremely dire situation, any further delay is the same as doing nothing. Our bird species have been on Kauai far longer than any of us. Human activity has given them a death sentence. Delays like this are nothing more than a few selfish people trying to impose their uninformed wishes.	Thank you for your comment
7/16/2023 11:08	Please please do not destroy our greater economic system on this sacred island. No one can scientifically evaluate the consequences of this. It will inevitably cause huge problems.	Thank you for your comment
7/16/2023 11:15	Releasing genetically modified mosquitos is not worth the risk. Do not play God with your land, animals, and people. What happens if the mosquitos reproduce more than expected? What happens if it is discovered they cause problems? Here's a suggestion: learn how to balance a budget like any reasonable adult before doing crazy risky experiments like this which could destroy your state (and the lives of your constituents who you are sworn to serve.) usdebtclock.org	concerns: 4, 11, 12
7/16/2023 12:01	It's not clear what the objections to this obviously very thoroughly researched plan could be, given that the only alternative seems to be no action. I think we can't afford to not try this as soon as possible given the assured terrible consequences of doing nothing. Of course, we'd all like to stand behind the maxim "don't mess with Mother Nature," but we already have so many times over we need to try to mitigate the damage using other natural interventions.	Thank you for your comment
7/16/2023 13:42	I am writing to voice my strong support for the proposed mosquito suppression plan. This plan is the only way to save several native birds from certain extinction and has no apparent downsides. Having seen 'akeke'e and 'akikiki in the wild myself, I dearly hope that they are not doomed to extinction because of any misguided opposition to this plan.	Thank you for your comment
7/16/2023 15:27	Aloha. I am submitting this testimony in SUPPORT of the Draft EA: Kaua'i Mosquito Suppression. It is well documented the challenges these birds face with the rapid spread of mosquitoes into their once pristine habitats. The time is now several species have shown decline rates at 75-98% annually. These birds are not only unique to the islands they are a part of the cultural history. The work that would be undertaken by this proposal would give these species a fighting chance into the future and allow for their songs and stories to continue for future generations to enjoy. Hawai'i is the extinction capital of the world. The islands must have robust conservation management actions to protect what species are remaining to ease this trend. Having worked on Kaua'i with these species directly it is heartbreaking to see the declines of these charismatic birds that I and others cherish. Often just the sound of these birds calling or singing within the forest can clear a wary mind, and unfortunately much of the forest has gone silent in recent years. The value of these and other interactions with the birds is simply priceless. There is simply no more time left, we must pull together and act now to save these species from extinction. Mahalo nui, Roy L Morris	Thank you for your comment

Entry Date	Comment	Responses
7/16/2023 16:16	I don't understand how do we know that these mosquitoes are implanted how do we know that where they come from is it just someone's say so or is somebody see somebody create them in the lab with that intention to harm the animal kingdom and the human Kingdom. Sometimes human beings get too involved in nature and just mess up the whole process. I don't want her animals to be killed because someone thinks they made a new pesticide or a new concoction that was going to change the world we are just like a little tick on her back. One of these days she's going to shake us all off when are we going to wake up and be in love with nature and stop fighting inside and outside	Thank you for your comment
7/16/2023 17:51	As tempting as it may be for some scientists and some environmentalists…and as lucrative as it may be for others. This is not proven science, the risks are far too high, outweighing the potential "benefits". Please pause and allow/do a larger campaign for public awareness. People do not know about this. Let's see if the ones that are more educated on the topic actually want it.	Thank you for your comment
7/16/2023 18:16	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/16/2023 22:17	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project seems like a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females,	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable (***Continued***) of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	
7/16/2023 22:31	Do no do this. The agenda behind this appears to be evil or at best misguided. We demand a stop to this.	Thank you for your comment
7/17/2023 2:31	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	(***Continued)*** There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	
7/17/2023 4:40	We all love and want to protect the honeycreepers. However historically releasing a non native species to combat another non native species has been disastrous for generations to come. I beg for an appropriate solution with true concern for impact to the people and bird populations that does not involve releasing another non native species in Hawaii: please stop introducing new species . Please do not introduce modified misquitos to our islands. I feel deep in my opu that this is a wrong route to take. Please .	Concerns: 3, 7, 10
7/17/2023 8:00	My husband and I are opposed to the release of the Wolbachia bacteria mosquitos. As a native Hawaiian I am disgusted to see Hawaii once again being used and abused due to ignorance and money. We and our community are opposed to this release. The fact that this agency is even considering this experiment on Hawaii shows your arrogance and stupidity. Run these experiments on someone elses home not ours. If there was even the smallest chance that Department of Land and "Natural" resources could hurt our people through this process, the process should not be considered. The real question is why would you consider this experiment? You cannot be this naive. The potential consequences on our people (the people of Hawaii), are not worth this experiment. Anyone in this department who goes through with this experiment, will be held accountable. The people of Hawaii have a right to know (which individuals) are bringing lab infected insects into Hawaii.	Concerns: 2, 11, 16, 26
7/17/2023 9:13	I strongly support the use of IIT mosquito suppression to protect the endemic forest birds of Kauai.	Thank you for your comment
7/17/2023 9:50	I support IIT! Our manu po'e need this to survive for many wa.	Thank you for your comment
7/17/2023 10:47	I think we would have learned that bringing in other species of any kind is not wise! What are the studies on this?? All just experiments, really don't think we should take the chance! The mongoose went terribly wrong. Thank goodness they weren't introduced to Kauai. We try so hard to keep non native species out!! Why would we introduce a non native mosquito?? Man made mosquitoes at that! Until further studies are done I do NOT think it is wise to Kauai be an experiment! NO I DO NOT THINK WE SHOULD BRING EXPERIMENTAL MOSQUITOES TO KAUAI!	Concerns: 3, 9, 10, 11
7/17/2023 12:16	I support this proven method for mosquito control in Hawaii.	Thank you for your comment
7/17/2023 17:29	Honeycreepers are a unique group of forest birds found only in Hawai'i, which once had more than 50 species. Today, only 17 species remain, some with fewer than 500 individuals left. Without swift action, several species of honeycreepers will become extinct in the next ten years.	Thank you for your comment

Entry Date	Comment	Responses
7/17/2023 17:35	As a PhD research biochemist from UCB and an OMD for 50 years, founder and professor of TCM College of Hawaii for 25 years, I am strongly opposed to releasing the wolbachia-infected mosquitoes in Kauai and any where on our lands of Hawaii and the earth. Joining Dr. Lorrin Pang, I have studied its failure in Brazil and Indonesia and our own states of Kentucky and similarly in Florida and Texas. 6 cases of human malaria just announced in Florida, after 20 years of being malaria free. This experiment in Hawaii has never been done before and is unconstitutional and an international crime against the Nuremberg Trial to experiment on people without their consent. The diseases attributed to this bacteria along with the horizontal vectors it will move to are deadly like encephalitis, elephantitis, river blindness, West Nile virus, avian malaria, and Lymphoma. Why are we bringing this down on our children, elders and people. Dr. Lorrin Pang warns that it may literally speed up the extinction of these birds and of our people of Hawaii. He has Alternatives that are not deadly to human beings. I have been working in Thailand for 8 years. In this Clinic they had to spray every year to prevent the mosquito population on the premises of the International Resort I worked in. Right now we don't have these problems, but I guarantee that we will have severe problems and repercussions releasing these Wolbachia bacterial mosquitoes into the ecosystem by the billions for 20 years no less. When there are such faulty narratives and excuses I have been taught to follow the money. It has been funded by The Bill and Melinda Gates Foundation all over the world and in our country. Their mission is eugenics, to diminish our population to a faulty Narrative of human caused climate catastrophe. Climate changes are due to the precession of the Earth's axis in a different direction. I've traced another Alphabet fund to George Soros for mosquito reproduction, to be transferred to our own precious Islands. These Frankenstein mosquitoes need to stop being made and released and experimented on the people of Hawaii. We need to stop tampering with God's precious creation.	Concerns: 2, 7, 11, 12, 14, 19, 26, 27, 28
7/17/2023 19:41	Suppress mosquitos!	Thank you for your comment
7/17/2023 20:14	Aloha, I am writing in strong support of the Kauai Mosquito Suppression project. Mosquito suppression and eventual eradication can save our native birds from extinction and improve the quality of life for everyone in Hawaii- residents and visitors alike. Similar releases in other regions have already been done and this is a safe and effective treatment. Please, please support this program.	Thank you for your comment
7/17/2023 21:16	I support Wolbachia IIT in Kauauai. I am from Waianae, Oahu. Me ke aloha	Thank you for your comment
7/17/2023 21:19	Aloha my name is and I support Walbochi IIT on Kaua’i. I am in the Hawai’i conservation community and urge you too push forward in the release of Walbachia. This is our time to take action to save our natives! Mahalo	Thank you for your comment
7/18/2023 3:55	There is simply not enough known about how this introduction of these specimens will effect the environment or even if they will actually function as planned.	Concern: 10
7/18/2023 6:51	There was once a time when you could easily observe native forest birds at Kōke’e State Park. Now, it’s hard to find an ‘apapane let alone an i‘iwi or ‘anianiau. They are disappearing before our eyes. Please consider a FONSI for the Kaua‘i Mosquito Suppression Environmental Assessment. The forest birds have NO more time to wait before disease takes them all.	Thank you for your comment

Entry Date	Comment	Responses
7/18/2023 8:11	I am writing in support of the Kaua’i Mosquito Suppression plan to save the Kaua’i forest birds from extinctions. This is one of our absolute last chances to save some of these birds. We must not delay any longer!	Thank you for your comment
7/18/2023 8:13	I am writing in support of the plan for Kaua’i Mosquito Suppression. We must not let misinformation being spread delay this. There isn’t much time left for the Kaua’i Forest Birds.	Thank you for your comment
7/18/2023 8:36	I understand wanting to protect native bird life. But this "solution" is so over the top misguided that it defies all logic. It also is typical of the meddling that humans have done into the workings of nature that have backfired spectacularly.	Thank you for your comment
7/18/2023 8:40	I support Wolbachia ITT on Kaua'i to Save Hawaiian Forest Birds. This implementation is crucial to save Kaua'i's forest birds.	Thank you for your comment
7/18/2023 8:51	I am in support of the project to use the incompatible insect technique to manage mosquitoes on Kauai. This critical action is necessary to protect forest birds in Hawaii. Humans have messed up our planet so much that this is the least we can do.	Thank you for your comment
7/18/2023 9:36	Aloha. I support Wolbachia IIT on Kaua‘i to save Hawaiian forest birds. Thank you for using the best available scientific information and active community engagement to accurately demonstrate the need to relieve the plight of Kaua‘i's native forest birds. Mahalo	Thank you for your comment
7/18/2023 10:04	Good morning, I’d like to submit my support for this project, wolbachia IIT is imperative for the future of Hawaiian forest birds on Kauai. I’m happy to see this project move forward after years of planning and hard work.	Thank you for your comment
7/18/2023 10:18	Aloha kakou, We have been watching the decline of our native manu, the Hawaiian Honeycreepers for a long time. 'Akikiki and 'Akeke'e of Kaua'i are next on the chopping block due to avian malaria and anthropogenic global warming. We finally have a tool that has a chance to make a substantial difference in conserving these unique and irreplaceable species. It is our kuleana to try. I fully support the environmental assessment of no significant impact and the application of wolbachia mosquitoes as a form of invasive mosquito control. Please hurry and stay the course, do not get harried by these naysayers and fearmongers, the manu do not have much longer without this conservation tool. Mahalo	Thank you for your comment
7/18/2023 10:48	I fully support the proposed alternative to use the IIT in Hawaii as outlined in the EA for Kauái Mosquito Suppression. This proposed action (Alternative 2) has a strong probability of decreasing the spread of avian disease among Hawaiian honeycreepers. Thus, aiding the recovery of our remaining endemic, endangered, Kauái forest birds. The proposed action of using the IIT, based on prior National and International introductions, will not harm humans,economics, or habitat on the Island of Kauái.	Thank you for your comment
7/18/2023 10:51	I am totally against this! The insanity of releasing millions of Mosquitos on any of the HI islands is a poorly thought out plan that will have devastating long term effects.	Concern: 9

Entry Date	Comment	Responses
7/18/2023 10:55	Please STOP this INSANE EXPERIMENT,,, Haven't we seen enough harm with the EXPERIMENTAL vaccine and all the injuries about it!	Concern: 11
7/18/2023 11:50	I am opposed to the release of the mosquitos. There is not enough data to back up the claims of success. This could easily turn into a situation like releasing the mongoose. That plan sounded great too until it wasn't and that situation has still not been corrected. There is also the chance that this release negatively impacts humans through an increase in a disease carrying vector and then those who supported this action would have legal impacts. This study does not address human impacts, the potential impact to tourism if the news spreads info that mosquitoes have been released in mass quantity, and no discussion of how the winds may blow the released pests to other areas outside the project area. What if the mating of these "incompatible" mosquitoes creates a "super mosquito" that causes more damage?	Concerns: 2, 3, 8, 9, 12, 13, 30
7/18/2023 12:40	I support Wolbachia IIT to save Hawaiian forest birds because without the use of this tool, Hawaiian forest birds will continue to go extinct. Hawaii has had the highest rate of forest bird extinction of any location in the world. This tragedy has been directly caused by the introduction of mosquitoes to Hawaii in the 1800s. Without steps being taken to alleviate this extinction crisis, Hawaii runs the risk of having NO native forest birds in our forests within the next century. Steps need to be taken NOW, instead of waiting longer and longer until more species disappear. A single bite by an infected mosquito can kill an ‘i‘iwi (and critically endangered forest bird species).	Thank you for your comment
7/18/2023 12:57	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever.	Thank you for your comment
7/18/2023 12:58	You are putting these islands AND the birds you want to save at a huge risk of death and disease with this experiment. Dr. Pang was asked for his professional opinion from the Hawaiian Health Department, which was DO NOT DO THIS EXPERIMENT! He is being ignored.	Concerns: 2, 5, 11, 19, 29
7/18/2023 13:25	Releasing GMO mosquitoes is an experiment, and for the first time in 20 years we now have malaria in states where they were previously released! It is called being vaccinated without informed consent to be bitten by these franken mozis. This is a crime against humanity and nature	Concerns: 4, 27, 28
7/18/2023 14:45	I would like to express my support for the proposed action (repeatedly releasing incompatible male mosquitoes to reduce the reproductive potential of wild mosquitoes) to protect the populations of endangered Hawaiian forest birds (particularly the Akikiki since there are less than 10 left in the wild). It is critical to do everything possible to protect the native Hawaiian birds.	Thank you for your comment
7/18/2023 16:33	I STRONGLY SUPPORT, the proposed use of the Wolbachia Incompatible Insect Technique to prevent the extinction of the endangered Hawaiian honeycreepers living on the islands of Kaua‘i.	Thank you for your comment

Entry Date	Comment	Responses
7/18/2023 17:13	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO and strains of the Wolbachia bacteria is already present in Hawaii. Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for the use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. This technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever	Thank you for your comment
7/18/2023 18:34	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever.	Thank you for your comment
7/18/2023 18:35	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever.	Thank you for your comment

Entry Date	Comment	Responses
7/18/2023 18:37	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever.	Thank you for your comment
7/18/2023 18:37	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever.	Thank you for your comment
7/18/2023 20:17	Aloha to whom it may concern, I'm from Pupukea Oahu, and I am in support of Wolbachia IIT on Kaua'i. Mahalo	Thank you for your comment
7/19/2023 3:30	I fully support the use of the IIT to reduce mosquito populations on all of the islands, but especially Kaua'i. Please act swiftly to save our remaining forest bird species!	Thank you for your comment
7/19/2023 7:54	It is sad that we have to send testimony to get action to save endangered birds and suppress mosquitos. The fact that people with no scientific background can derail projects meant to preserve Hawaiian biodiversity is infuriating. It is the same with the feral cat (toxoplasmosis) lobby that prevents landscape scale cat control. Please allow this control measure to pass, these birds may be extinct within a year, birds that have been here for millions of years, coevolved with plants that are also in danger of disappearing. What legacy are we leaving our children and what example are we showing? previous generations have kicked the can and we have the dubious title of "the endangered species capital of the world". Control the mosquitos, cats, and other invasive species by any means necessary as long as there is evidence that the benefits outweigh the risks.	Thank you for your comment

Entry Date	Comment	Responses
7/19/2023 8:47	Good morning~ I am writing to express my support for the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds. IIT is the only feasible option for safely and successfully suppressing mosquito populations in Hawaii. Furthermore, IIT is not GMO. Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. If we do not use this proven technology in a timely manner, we will be witnessing imminent extinction of several species of native Hawaiian birds and the community will surely question why we chose to defer decision making to a small group of uneducated individuals whose claims are completely unfounded. Hawaii's leading experts in avian biology and conservation, from state, federal, and non-profit organizations support the use of Wolbachia IIT to save Hawaiian forest birds. As an outreach and volunteer program specialist with one of the largest conservation organizations in the state, I can testify that literally hundreds of kama'aina volunteers that join us in restoring Hawaii's native forests have repeatedly expressed support for the use of Wolbachia IIT to safely and successfully suppress mosquito populations. Please listen to our plea and move quickly to approve the use of Wolbachia Incompatible Insect Technique to save Hawaiian forest birds, before it is too late!	Thank you for your comment
7/19/2023 9:06	Please save our Forest Birds by implementing use of this Wolbachia Technology. I have hiked the Alakai Swamp Trail and I love seeing & hearing the Forest Birds. They are part of our heritage. The proposal doesn't harm the environment. It has succeeded in other areas. So, I'm hoping that you will approve this proposal.	Thank you for your comment
7/19/2023 9:25	I am for the suppression of mosquitos on the island of Kauai. I believe that the suppression of the mosquitos will aid in keeping the native birds around. The native birds are so important culturally and ecologically to this island. There aren't many left so we need to protect what is still there.	Thank you for your comment
7/19/2023 10:21	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. As a Native Hawaiian, I feel it is especially imperative that we make this stand to protect our sacred species. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever.	Thank you for your comment
7/19/2023 12:00	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1

Entry Date	Comment	Responses
7/19/2023 12:30	This letter is in OPPOSITION to the proposed mosquito release. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes, and its degree of efficacy in remote forest landscapes is unknown." This project experiments on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, or private landowners? The DLNR has an appalling history when it comes to accountability the latest case in point is the devastation that went unaccounted for at Pohakuloa. The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." We demand an Environmental Impact Statement. Stop the insanity	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/19/2023 12:32	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/19/2023 12:33	I am strongly OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachiastand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	(**, *Continued***) There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement. Love, Light, Laughter & Abundance	
7/19/2023 12:39	Dear Leaders. I totally and unequivocally oppose the release of mosquitos unless there is a way to insure that there will be no repercussions ecologically. There are almost always repercussions, so don't know how you can release them in good faith unless somebody somewhere is getting paid.	Thank you for your comment
7/19/2023 12:46	Aloha. How many times are folks doing this kind of thing going to get it Badly Wrong before they learn? Nature, the Aina, has a balance. We humans, in our arrogance, create imbalance, then to fix it we take dangerous steps, this time a human experiment, and create MORE IMBALANCE. This one could be the WORST ever. STOP THIS NOW! Have you people lost your minds completely? Let Nature create balance as she always done. No one, NO ONE knows for sure what will happen with this release, NO ONE! If our mistakes have created an imbalance for some beautiful birds, we should pray for forgiveness and let Nature recreate balance. NOT MAKE IT WORSE WITH SOME DAM FOOL EXPERIMENT THAT WOULD NEVER HAPPEN IN NATURE. Get a grip. Let the Aina take care of the Aina! No one, NO ONE knows for sure what will happen with releasing BILLONS of these Arrogant human creations into our environment, on all Islands, on into the future. NO ONE. Again, STOP THIS NOW !!! Use some common sense, Please ! Mahalo	Concerns: 3, 11, 10
7/19/2023 12:53	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health	Concern: 1
7/19/2023 13:25	I am very concerned that releasing billions of mosquitos will create a huge environmental disaster which we will never recover from. This has been tried in Florida and Texas and now both States are having mosquito born outbreaks of malaria.	Concern: 28
7/19/2023 13:44	This movement is something that is very important to me and I believe Kaua'i Mosquito Suppression is necessary for many reasons.	Thank you for your comment
7/19/2023 14:08	Please do NOT release any mosquitos in the Hawaiian Islands.	Thank you for your comment

Entry Date	Comment	Responses
7/19/2023 14:10	Why do we need to do these tests here? Ua Mau Keia O Kaaina Ika Pono! Let the life of the land be perpetuated in righteousness. I the areas where the mosquitos have been released, they have had Malaria cases. The mosquitos have been released on Maui and someone from Kailua has come down with encephalitis. What if it was caused by the release of the test mosquitos? I don't like anything I see Bill Gates name attached to, because he is pure evil.	Concerns: 2, 11, 26, 28
7/19/2023 14:26	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/19/2023 14:40	Do not under any circumstances allow this highly risky Kauai Mosquito Suppression program to continue. There has been no legitimate environmental impact study done; and therefore, the program should be stopped immediately.	Concern: 1,
7/19/2023 14:51	I used to be an intern for Kaua'i Forest Bird Recovery Project in 2015 and was amazed at the forests and birds that made it home. There were over 20 pairs of 'Akikiki at the time and we were doing the first egg collections. I was amazed at how carefree the 'Akikiki were and how close they came to me when they were foraging. They came even closer than some urban birds. These birds have cultural importance in Hawaiian history and to lose these birds would be to lose a living part of the culture. The metaphors that referred to the o'o as being the most dominant of the ohi'a flowers was portrayed by ali'i wearing yellow feathers in their garments. These metaphors lose their meaning as the species disappear. Please pass this bill so we do not lose anymore of our species and the culture.	Thank you for your comment
7/19/2023 15:27	I'm OPPOSED to this "Wolbachcia-based Suppression of Mosquitoes on Kaua'i" Environmenal Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complte a detailed, full scope Encironmental Impact Statement (EIS) documenting the impacts to our native birds, environment and public health.	Concern: 1
7/19/2023 15:56	Dear Sirs, I implore you to say NO to this mosquito release. Please say NO to our beautiful islands becoming an experiment in modifying bugs to save birds. The fact that it has not been tested (we are the test) should raise the alarm! our history in Hawaii with modifying the environment have all but failed. Texas and Florida allowed similar experiments - albeit less dangerous potentially. These two states now have Malaria cases. First in over 20 years, shortly after release the modified mosquitoes. Please consider those who come after us...our children, our grandchildren, our friends. There is no amount of money we would consider enough to destroy our delicate ecosystem here on the islands. We the people are saying NO> please hear our plea.	Concerns: 3, 11, 26, 28
7/19/2023 16:02	In response to the above, I am opposed to this this Modified mosquito release program. We respectfully request, and demand that the state of Hawaii and it's partnership with agency birds, not mosquitoes do a complete detailed full scope environmental impact statement (eis) documenting the potential impacts to our birds ,environment and public health and safety. As a long time resident of Hawaii I am concerned for the health of my family and myself neighbors in the community in general as this experiment may go awry and cause irreversible environmental and health damage. Thank you for considering my comments and please reconsider any release of genetically modified mosquitoes.	Concerns, 1, 2, 4, 5, 11, 19

Entry Date	Comment	Responses
7/19/2023 17:24	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. Please stop trying to "fix" problems with solutions that have unknown consequences. Listen to the people, stop this from happening.	Concern: 1
7/19/2023 17:24	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/19/2023 19:38	Please stop using us as guinea pigs and letting go those bioweapon mosquitos.People are already injured and died from the experimental bioweapon injection.I know if things go wrong like we all get sick from the bites you guys will deny ,lie and laugh behind our backs like the bio injection.People need to be in jail or death penalty what they did to people in hawaii by forcing the death prick.If the people who agree to let them stupid GMO mosquitos go,they should let thousands in there house to let it go.Let hundreds of thousands go in the people that agree and governors house too since he dont care.Start with that because if thats ok than it should be ok.Let atleast 1000 per day in there house then jack it up to 5000 a day.Should be fine if nothing goes wrong,I'm alright with that.	Concerns: 4, 11
7/19/2023 19:57	Do NOT do this. Vote NO. No experimental needed here. Sent from my iPad	Concern: 11
7/19/2023 20:00	Vote NO on releasing experimental mosquitoes anywhere in the state. Thank you	Concern: 11
7/19/2023 20:02	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kauai" Environmental Assessment. I demand that the State of Hawaii and its Muti-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'aina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. Who will take responsibility if something goes wrong - the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There is currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kauai". I demand an Environmental Impact Statement	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
7/19/2023 21:11	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. For complete sample testimony click here	Concern: 1
7/19/2023 21:56	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health	Concern: 1
7/19/2023 22:41	I am opposed to the release of these mosquitos for the reason that no actual study has been done to determine the full impact on all aspects of the island environment combined with the fact that no actual determination has been made that this method will even be effective. Further, that it may even create a greater danger to the environment and may actually have the reverse effect. In the past, I have taken notice that DLNR's actions run contrary to the desire of the people. Such was the case back in 1996 when I moved to the Big Island on the Hamakua coast where they allowed burning and spraying of fusilade and round up to erradicate sugar cane stumps to support the new mono crop of Eucalyptus coming in. How irresponsible is that? The health impacts were enormous and quite predictable to say the least. I do not consider the DLNR to have anything to do with responsible land management. That it is only in place to allow for negotiations with capitalist ventures which produce some kind of economic interest to the island. Responsibility is the least of its concerns as was demonstrated by the actions stated above. It takes an enormous effort from the community to counter these types of actions. Until it can demonstrate absolute responsible land management that is in line with community interests, I don't feel DLNR should even exist.	Concerns: 1, 5, 6, 9, 26
7/19/2023 23:09	We come forward and strongly request that the mosquito release is immediately canceled. There's not enough information or studies to know exactly what this mosquito invasion will do to birds, humans, other animals on the islands of Hawaii. As a bird enthusiast and volunteer for many types of birds throughout the world, We highly recommend focusing on the birds themselves and Not introducing an invasive species to wipe out more birds. The female count of Mosquitoes being released Have not been studied either. They can be far more fertile and far more devastating than the current mosquitoes. How could our sensitive ecosystem handle anymore Man-made and man invented circus tricks? The current plan is not only foolish and very dangerous...but it's also an unreachable and unrealistic plan. Let's focus on the birds themselves. All of this funding should be used to capture what birds we can and multiply them in captivity then to be released in the wild, like many other places in the world that has been successful. Please do not allow the release of monster mosquitoes! You are making our islands into toxic paradise.	Concerns: 2, 6, 9, 10, 12, 19, 20
7/20/2023 1:05	I am OPPOSED to the release of these bioengineered "mosquitos". Leave Hawai'i alone. Leave the birds alone. and Leave our Earth alone!	Thank you for your comment
7/20/2023 4:06	No genetically modified mosquitos should be released ever...	Concern: 4

Entry Date	Comment	Responses
7/20/2023 6:13	Aloha, I am the 4th generation of my family living here, me on the Big Island. My great grandfather was one, of the first two people, to settle in Kalaheo, Kauai. There are now six generations of my family living in Hawaii state now. We all love our native forest birds and we need you to swiftly help protect the few remaining ones. These birds have a place in Hawaiian history and culture. Many endemic forest birds are listed and endangered or critically endangered. The US Endangered Species Act mandates government to save them….. so please do so. Time is running out very quickly. Extinction is forever. Thank you	Thank you for your comment
7/20/2023 6:31	I AM OPPOSED to this horrible idea for a multitude of reasons. DO NOT MESS WITH HAWAII. This is DISRESPECTFUL to the people and islands and history. STOP MUTATING!!!!!! You are going to kill us and the land with your stupidity!!! STOP	Thank you for your comment
7/20/2023 7:42	I am writing to express my strong support for use of the Wolbachia incompatibility technique to control mosquitoes on Kauai. I have worked directly with Hawaiian forest birds for more than 30 years and I have seen first-hand the decline in many of our endemic forest bird species. This is an extinction crisis happening right now, right in front of us. Diseases carried by mosquitoes are the most serious threat to Hawaiian forest birds, and several species of Hawaiian honeycreepers will go extinct in the next few years unless mosquitoes can be controlled at a meaningful scale. The Wolbachia technique currently offers the best method of achieving mosquito control. The Wolbachia technique is safe and should be implemented as quickly as possible. I urge the State of Hawaii to not be influenced by mis-information spread by a few people who do not understand understand the technique or the urgency of the situation. Similar mosquito releases are needed on other islands.	Thank you for your comment
7/20/2023 7:43	I think it is extremely important that the Incompatible Insect Technique (IIT) be used on Kaua'i. 'Akikiki are now down to 5 known wild individuals and with the 'Akeke'e going through a free fall decline I believe this may be the only way to save them. Other honeycreeper species endemic to Kaua'i ('Anianiau and Kaua'i 'Amakihi) are also experiencing declines in population because of avian malaria and since they have more time than 'Akikiki and 'Akeke'e do, IIT could help their populations stabilize or increase before they become endangered. I was glad to read that once approved, IIT will be implemented as soon as possible. While 'Akikiki breed well in captivity, there is yet to be a successful breeding of 'Akeke'e in captivity, so reducing mosquito populations quickly might be the only way for 'Akeke'e to survive. We have lost so much of the biodiversity of Hawai'i due to introduced (**., *Continued***) mosquitoes, and if we don't take action we risk losing the endemic Hawaiian Honeycreepers forever. As a 13 year old, it breaks my heart that so many species still alive a few decades ago are now extinct, so I will never get to experience their beauty. We cannot let this happen to the remaining forest birds. IIT does not contain genetically modified organisms (GMOs), and is completely natural. It will not harm humans or the environment. Every creature has the right to survive and thrive. Extinction is forever, and we cannot lose 'Akikiki and 'Akeke'e. IIT must be implemented as fast as possible to ensure the survival of our precious forest birds.	Thank you for your comment

Entry Date	Comment	Responses
7/20/2023 7:46	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement. Thank you	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/20/2023 7:47	I am OPPOSED to the "Wolbachia-based Suppression of Mosquitoes on Kauai" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is an extremely dangerous EXPERIMENT on the land, birds, wildlife, and people of the Hawaiian Islands. The lab-infected biopesticide mosquitoes come with many risks, including but not limited to: 1) horizontal transmission of the introduced bacteria strain, 2) increased pathogen infection in mosquitoes, 3) irreversible evolutionary events, 4) population replacement, 5) accidental release of lab-reared females, 6) creation of lab-strain females in the wild, 7) horizontal gene transfer, 8) Biopesticide wind drift, 9) and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document all of these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is UNKNOWN." This project is an experiment on Hawaii's people, wildlife, and our 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	(**, *Continued***) There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." My family and I demand an Environmental Impact Statement and we will hold you and others that support this dangerous act accountable for your acoutions.	
7/20/2023 8:15	I am writing in support of the draft EA for mosquito suppression on Kauai. In just a few years, the chorus of the forest is almost non-existent. We need to do what we can to save the birds that remain. Thank you.	Thank you for your comment
7/20/2023 8:38	I am very much in favor of the injected mosquito release. It works and will help keep people safe	Thank you for your comment
7/20/2023 9:01	STOP any intentions to introduce mosquitos or any biological agent onto the environment. This is insanity! Thank you	Thank you for your comment
7/20/2023 10:18	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/20/2023 11:25	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	(**, *Continued***) Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	
7/20/2023 11:42	Aloha Kaua'i Mosquito Suppression, I am concerned about the open air release of the Wolbachia mosquitoes as I think that we do not have enough data to address the unexpected consequences. There is no way to recall a life form. We have seen far to many introductions of species that have negative effect on our native species. I feel that for decades, literally tons of restricted use pesticides are used with no concern for our rare, endangered bird species and their critical habitat. I believe that if Wolbachia mosquitoes are released, it will open the door for the release of gene edited mosquitos. This type of tinkering with our ecosystem is unwise and dangerous. It is truly experimental and in my opinion we should pursue other means of mosquito control such as baits or localized methods. A release of a species without the ability to control it is too risky. While we all care for our treasured birds and are bothered by mosquitoes in general, I think these releases are unsafe. Interrupting the circle of life may have a negative effect on species that feed on mosquitoes. I think that we must be very cautious before releasing any unknown into the environment. We do not yet have proof that this method with the goal of controlling Avian Bird flu is safe in the larger sense. Proceeding without regard to the pre-cautionary principle is unsafe and irresponsible. Thank you for allowing me to testify	Concerns: 3, 4, 7, 9, 10, 19,
7/20/2023 12:01	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/20/2023 12:11	This project must be stopped . It is hazardous to all living creatures great and small. We must protect our beautiful islands from those who wish to destroy the balance of nature. Please do not allow this to happen.	Thank you for your comment
7/20/2023 12:13	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/20/2023 15:35	Whomever it is that would even introduce such a project into our Hawaii environment obviously has NO regard for the quality of human, animal and bird life here. I trust that enough people in our state will take a stand on this issue, to ensure a future of sound consideration based on long term research and studies, and the real effects on human and animal life, LONG BEFORE submitting to such a radical, and potentially destructive form of "prevention" in the name of "protection" against any disease..or whatever the rational may appear to be. To all those empowered to serve the people, on the committee that is considering passing legislation supposedly designed to " protect" our health, I urge you to take a stand for our natural immunity, and for the precious lives of WE the People of HAwaii, and the animals and birds that are an innate part of our cultural heritage. Above all please remember our State Motto, which should be a constant reminder of the Heart of our Constitution, and relationship to all life forms..which includes all of US, the Aina, and all	Concerns: 2, 9, 10, 19

Entry Date	Comment	Responses
	(***Continued***) natural life: " THE LIFE OF THE LAND IS PERPETUATED IN RIGHTEOUSNESS aka Right Use..ness!! The passing of a law that releases such an alien form of "God knows what!" into our environment is a perfect example of WRONG use..ness! Mahalo Nui Loa and Malama Pono, Sincerely, Molokai Wahine	
7/20/2023 16:14	Kaua'i Environmental Assessment First I want to have you look at what happened in Florida after mosquitoes were released. Now after many years they have malaria. I do not think that is a coincidence. I realize it may be but why take a chance. So I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Aouthern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/20/2023 16:29	Manu have no time left. Our local conservation community has worked long and hard on the research regarding this project. That being said, I strongly support birds not mosquitos. This is our best attempt at salvaging what's left of the native Hawaiian bird population. If we do nothing they will be wiped out eventually. It's not a matter of if but when. How long can the Manu hold? How long can people turn a blind eye on the utter destruction of the native bird population? Please move forward with this project.	Thank you for your comment

Entry Date	Comment	Responses
7/20/2023 17:12	Please do not do this!!! I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
7/20/2023 17:46	20 July 2023. Dear Officials of Department of Land and Natural Resources (DLNR - DOFAW) and US Fish and Wildlife. Aloha! We oppose "Wolbachia-based IIT - the draft Environmental Assessment (dEA). Please do not allow this proposed dEA to be Accepted. Please DO NOT allow IIT Wolbachia bacteria to be released on Kaua`i. This would be the first wide-spread conservation use of IIT Wolbachia bacteria. Deny the dEA of IIT Wolbachia bacteria. We do not want regulatory approval ! ! ! We demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a federal Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This proposed project: A dangerous experiment on `Āina, birds, wildlife, and people of Kaua`i & Hawai`i Nei. The lab-infected biopesticide mosquitoes come with countless risks, including horizontal transmission of the introduced wolbachia IIT bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. The U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown. This project is an experiment on Hawaii's people, wildlife, and `āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Responsibility - Who / Agencey will be held accountable if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed federal EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. A hearing is scheduled tomorrow, in First Circuit Court: 21 July 2023 on O`ahu Circuit Court (seeking a ruling to require an EIS for these mosquito releases on Maui & Kaua,`i this proposed project cannot be allowed to move forward. DEFINELY there is NEED for further study We do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "draft Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique (ITT) for the suppression of nonnative southern house mosquito populations on Kaua'i." MAHALO PLENTY ! Sincerely With ALOHA	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
7/20/2023 18:00	Kaua'i Environmental Assessment I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/20/2023 19:15	Messing with the Intelligence of Nature and its Natural Laws, has always turned out bad for the environment. The Side Effects always surface making greater problems. Please do not release tampered mosquitos onto Kauai, you are playing a dangerous battle with Nature. You will personally suffer.	Concern: 3
7/20/2023 19:27	The release of genetically-modified mosquitos poses significance health risk. Look at what has already happened with Texas and Florida with new malaria cases because of the mosquitos they released. Please prevent the spread of any more diseases or the introduction of any more risks to the population with untested mosquitos: Genetically-modified mosquitoes are suspected of causing US malaria cases in Florida and TexasBarry O'Keefe: https://www.2ndsmartestguyintheworld.com/p/horror-show-update-are-genetically Dr. Lorrin Pang and Hawaii Unites' Tina Lia talk about biopesticide mosquitoes: https://rumble.com/v2nd9dc-ep.-74-maui-mosquito-agenda-continues-with-dr.-lorrin-pang-tina-lia-barry-o.html Thank you	Concerns: 2, 4, 28

Entry Date	Comment	Responses
7/20/2023 21:45	Please push forward with the incompatible insect technique as a way to control for mosquitos. It seems there is much to gain from doing so, and relatively little risk involved. This is a last chance for these birds.	Thank you for your comment
7/20/2023 22:03	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/20/2023 22:07	I met an elepaio once when hiking above my farm on the Big Island. Such an awesome experience, and one I hope my children and grandchildren will get to have too. As the summers get warmer the mosquitos go higher up the mountain. I totally support this Mosquito Control Project, and it must happen soon.	Thank you for your comment
7/21/2023 6:57	I fully support the mosquito bio control, Wolbachia. Our Manu are suffering from human mistakes, let us remedy it!	Thank you for your comment
7/21/2023 7:02	Aloha, I am writing as an individual to express my strong support for the draft EA for IIT mosquito suppression program on Kaua'i. I am a resident of Hana, Maui, so I don't know how much weight should be given to those off-island. But we all care about the native manu and want to see them protected on all islands. Because this technique is also being implemented in East Maui, I have looked into this method, listened to those who are opposed to it and tried to understand their reasons for concern, and also sought answers from the proponents of the project. At this time I feel that this is a very safe method of mosquito control that has very little risk, compared to the known risk of extinction to our native	Thank you for your comment

Entry Date	Comment	Responses
	(***Continued***) honeycreepers and the impact that would have on the overall native rainforest ecosystem that would result, should the implementation of this project be unnecessarily delayed. I believe that the EA has thoroughly considered and adequately answered the questions that have been raised, and I support a finding of no significant impact through the use of this IIT for mosquito suppression. Mahalo	
7/21/2023 7:56	I personally am very concerned about the negative implications of the mosquito release. I am also aware of the dwindling bird populations. This is a dilemma for sure. I am opposed to the Kauai release at this point, and would hope that decision makers would be patient and wait until Maui’s release can be determined as a success or failure, and negative impacts can be evaluated carefully and with full transparency to the public. Thank you for hearing my testimony.	Concern: 21
7/21/2023 8:01	Aloha, as a citizen of Kauai, I am currently opposed to the mosquitoes release. I would hope that restraint will be showed, and the Maui results will be studied carefully well before mosquitos are released on kauai. I do understand the urgency and efforts to stave off death of more native birds from AM, but I’m very concerned about the possible negative effects. Thank you	Concern: 21
7/21/2023 8:12	It is very unfortunate that conspiracy theorists such as Hawaii Unites are delaying this essential effort to save our native birds. The ‘akikiki is about to go extinct in the wild. The mosquito releases should have happened yesterday!!! Please please this has to happens to save our birds.	Thank you for your comment
7/21/2023 9:15	We need to do something now to save our forest birds. We know that doing nothing will cause extinction. They are going to be functionally extinct regardless. Let’s do something to help the birds have a future. Release the sterile mosquitos.	Thank you for your comment
7/21/2023 9:36	I am writing in support of Kaua‘i Mosquito Suppression. This project will help to protect the manu on Kaua‘i whose populations are declining at an alarming rate. Please support our endangered endemic and indigenous wildlife.	Thank you for your comment
7/21/2023 9:54	Please allow the the release of male mosquitoes with incompatible Wolbachia in the Kōke‘e and Alaka‘i Wilderness areas! We must act now to save our endangered manu before they are lost forever. If you don’t act, they will certainly go extinct. Only you have the power to stop that. Let this be your legacy. Do not let the quackery from conspiracy theorists be the demise of these beautiful species found nowhere else in the world. Thank you	Thank you for your comment
7/21/2023 10:14	Please take decisive action to curb the mosquito population and protect native birds!	Thank you for your comment

Entry Date	Comment	Responses
7/21/2023 10:23	Our natural environment was created by divine design. The unique ecosystem of the Hawaiian islands can not sustain its natural beauty if the intricacies of her natural habitat continue being stripped away. Todays society is so driven by instant gratification that we are no longer taking the time to truly asses the long term damages of our decisions. The loss of these birds due to the mosquito population is much more than the loss of a bird. It’s the loss of native plants, which shape the environment. If the environment changes, then the climate changes. If the climate changes the entire landscape of the location will change. We can’t continue to strip our islands of their endemic life. That life is the literally the root of the beauty that is Hawai’i. It’s time to take these issues seriously. Stop the short-term greed, and start paying attention to the importance of investing in sustainability.	Thank you for your comment
7/21/2023 10:33	I support the draft Environmental Assessment for Kaua’i Mosquito Suppression! Our forest birds are heading towards extinction and this must stop now. Immediate intervention must happen now to decrease the mosquito population.	Thank you for your comment
7/21/2023 10:34	The release of these male mosquitoes are absolutely needed for the survival of endangered species!	Thank you for your comment
7/21/2023 10:46	The Kaua’i mosquito suppression plan is not just beneficial but ESSENTIAL. The extinction of many species cannot be undone but it can be prevented for the species that remain through systemic extermination of mosquitos. The native birds are crucial to the survival of many already threatened native plants by pollinating and seed dispersal; many having evolved specialized beaks specifically for this purpose. The success of this project would therefore not only help to protect native birds but also native flora in turn. The long term benefits don’t just help the birds and plants, but residents and visitors as well. No one likes mosquitos, pure and simple. They can spread other diseases to humans and animals besides just the native bird species. As humans were responsible for the introduction of mosquitos to the islands it is only right that we take responsibility for the consequences of this and take the steps to right the wrong; whether we as individuals were directly responsible or not. Save and preserve our native species.	Thank you for your comment
7/21/2023 10:51	I strongly support IIT efforts on Kaua‘i to protect our declining native bird populationsfrom deadly diseases. This well researched, tried, science based approach will give managers and all stakeholders a fighting chance to keep these birds on the landscape and part of our natural world.	Thank you for your comment
7/21/2023 11:14	I am writing from Hawaii island in support of these efforts to control mosquito populations by releasing sterile mosquitos. The decimation and extinction of so many Hawaiian forest birds from Avian malaria is a great man-made tragedy, and it is so urgent that we act now to try and save the remaining ones. As avian malaria has become prevalent at higher and higher elevations, the ongoing loss of what little safe habitat remains for these birds has to urgently be reversed before we lose even more species. Please move forward as fast as possible with these releases.	Thank you for your comment
7/21/2023 11:22	I support the proposed project to use the Incompatible Insect Technique (IIT) to reduce mosquito populations in the Kōke‘e and Alaka‘i areas of Kaua‘i. Widespread use of IIT is critical in reducing the spread of avian malaria to critically endangered honeycreeper species like the ‘Akikiki and the ‘Akeke‘e. This pilot project is a huge step forward for conservation in Hawaii and will provide much needed relief to allow bird populations to recover.	Thank you for your comment

Entry Date	Comment	Responses
7/21/2023 11:54	I am OPPOSED to " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. Sincerely,	Concern: 1
7/21/2023 11:57	I support Wolbachia IIT to save Hawaiian forest birds because today, only 17 species of honeycreepers remain in Hawai'i, some with fewer than 500 individuals left. Avian malaria, a disease transmitted by invasive southern house mosquitoes, is driving the extinction of our forest birds. The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds. Without swift action, several species of honeycreepers will become extinct in the next ten years. Wolbachia IIT is safe for humans and the environment. Independent risk analyses indicate that the release of Wolbachia mosquitoes poses negligible risk to humans and the environment. We should try everything we can to maintain if not increase Hawaiian forest bird populations and prevent anymore manu extinctions.	Thank you for your comment
7/21/2023 12:57	I am strongly opposed to the Incompatible Insect Technique Kauai Mosquito Suppression. In my opinion it is an experiment with unknown potential negative consequences to the land and creatures. Once set in motion any negatives can not be undone therefore best to not experience with Mother Nature.	Concerns: 11, 19
7/21/2023 14:00	I support the implementation of the IIT project not only because I think this is one of our last options for truly supporting the health of native Hawaiian forest bird species and what is tied to them (cultural knowledge and pride, ecological services, etc.), but also because it has been shown to not have negative effects in the proposed introduction area.	Thank you for your comment
7/21/2023 14:02	We need to take care of our native birds and species. Mosiquitos are an invasive species that only harm our delicate island ecosystem and an island without them is much better and authentic to Hawaii. Also better for human health, native species health, and health of the island	Thank you for your comment
7/21/2023 14:15	I support the incompatible insert technique. I support saving manu oiwi	Thank you for your comment
7/21/2023 14:43	Let's maintain the splendor and joy of the island	
7/21/2023 14:54	I think it's important to prioritize the native birds of Hawaii not just for their benefit but in order to care for the islands and the people who live on them.	Thank you for your comment
7/21/2023 15:09	Mosquitos are not native to the islands and have had a catastrophic impact on native bird species. I fully support the proposed control method. It has been used safely and effectively for mosquito abatement for years at sites around the world. Without this immediate action, Hawaii will lose it's few remaining species of honey creepers. Some in the next few years and the rest in the next few decades. This is an unacceptable and completely unconscionable loss. For the birds, their forests, and the Hawaiians who have always managed these lands we absolutely must move forward with the proposed abatement plan. There are no documented hazards to humans exposed to these mosquitoes, or to any native insects or animals in previous releases anywhere in the world.	Thank you for your comment

Entry Date	Comment	Responses
7/21/2023 17:32	I support moving forward with (IIT). The native birds were here long before the mosquitoes, and it is our kuleana to make sure they are here for years to come. Native Hawaiian bird species are so important to our ecosystem, and contribute to seed dispersal of our native plants. Hawaii has infamously become known as an epicenter for extinction; if we have the opportunity and the tools (like IIT), it should be our responsibility to change that narrative in support of our native species. After all, we know the benefits of having our native bird species around, but we do not know what consequences may come in a life without them. Land and species are all connected and all rely upon one another to work as a whole.	Thank you for your comment
7/21/2023 17:41	Aloha, as an avid hiker and hawaiian native plant/species enthusiast, I strongly support this IIT project. Hawaii is a special place. Our islands have beautiful species that only exist here. Not anywhere else in the world! Sadly we are the endangered species capital of the world. We need to fight and make ways to help our species survive! We can not afford to lose another native bird. We must save our honeycreepers! If we know there is a way to save and repopulate, why not? These native birds are full of history and give life to our ecosystem. It would be sad to have one less native species, that can no longer thrive/live in the natural enviornment that God specifically designed our beautiful birds to live in. I urge you to please move forward with this project. It will save many of our native birds, and give life to the natural resources our islands have.	Thank you for your comment
7/21/2023 18:19	I strongly support the use of Wolbachia-based Incompatible Insect Technique to reduce the number of invasive mosquitos negatively affecting the native bird populations of Kaua'i. The time to act is now to proctect birds like the 'akikiki and 'akeke'e, the plan laid out is sound and does not seem like it would negatively impact anything other than invasive mosquitos. The faster this can go through, the better.	Thank you for your comment
7/21/2023 18:40	Please help save our native birds from extinction! This may be their only chance at survival!! Hawaii's native birds connects us to our past by being able to experience what our Hawaiian ancestors were able to experience. By going through with this project, it would show how much our state and government actually care about the animals, environment, and people. Our voices must be heard before we never hear an 'akikiki in our forests again. It is our duty to protect the animals that were here long before humans ever settled here.	Thank you for your comment
7/21/2023 19:17	Hawai'i's forest birds are facing an extinction crisis and it is our kuleana to ensure that this crisis never comes to fruition. Only six of 16 native honeycreepers remain with predictions that two more will soon become extinct by 2025 and 2034 respectively. We need to do everything in our power to ensure that no more native birds go extinct. The Incompatible Insect Technique (IIT) needs to be instituted, so that our native birds are protected. please listen to the people working to make this happen in a responsible and thoughtful way. Thank you	Thank you for your comment
7/21/2023 21:04	Protecting what's left of our native species is imperative to the continued health of Hawaii. I am in support.	Thank you for your comment
7/21/2023 21:52	Please protect these incredible birds and the marvelous ecosystems of Hawaii that so many Native Hawaiians rely on! This project aims to limit harmful invasive mosquitos in a way that will have little to no impact on other non-target species; it will benefit the native ecosystems of Hawaii and protect priceless ways of life that have the potential to be lost forever; and suppress a species that is invasive and a nuisance to many people and animal life. Please support this project and thank you for your time and consideration.	Thank you for your comment
7/21/2023 22:02	i support the protection of hawaii's native species	Thank you for your comment

Entry Date	Comment	Responses
7/21/2023 22:13	Department of Land and Natural Resources, Division of Forestry and Wildlife, Attn: Mosquito Control Project, May I strongly urge you to discontinue the build out of the insectary intended to mass produce Wolbachia and genetically modified pgSIT CRISPR technology mosquitoes, aimed for release on our islands. This project may cause the extinction of endangered native birds and could affect public health. The Wolbachia Bacteria can transmit to wild mosquitoes and other insects, which potentially carry disease to both humans and wildlife. Claims that this poses no Human Health Risk is based on science that was discredited by the EPA. The risk outweighs the benefit. May wisdom and sound judgement guide this deeply crucial decision, as once it is made, it is irreversible. Sent With Sincerest Respect.	Concerns: 2, 13, 14, 19, 31
7/21/2023 22:39	aloha, this is insanity... when have any invasive implants to the island EVER helped anything? NEVER!!!!!! and this is NO exception.... this is a disaster & NOT ok..I'm OPPOSED to this Wolbachia-based Suppression of Mosquitoes on Kaua'i and/or anywhere Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. mahalo,	Concerns: 1, 3
7/22/2023 0:20	I support on behalf of myself and many other unheard voices, doing anything and everything possible to protect our native bird population from extinction before it is too late.. just as how it is too late for some of our species that are already lost forever. We should have been dealing with this issue long ago, but it has been brushed off and put on the back burner only until now, so time is of the utmost importance. These birds not only help save our native forests and ecosystems by pollination and seed spreading, but are also a direct representation of our culture and respect for the importance of each and every individual amongst us all.. If we let them go forever, what else are we willing to let go forever? These birds are found no where else in the world, and have survived here long before all of us have. They are our kūpuna, they are our ancestors. If we give up on them, it's like we are giving up on our own ancestors and the people that came before us. Please put this plan into action and treat it with the importance that it deserves. We have a chance to do something, before it is too late. Let's show the world we are capable of creating positive change, and lead by example.	Thank you for your comment
7/22/2023 1:43	Hawaiian endemic birds are so special and very uniquely beautiful. Please let me raise my voice to support protecting the birds.. I hope this can take a very quick action!! Mahalo from Japan	Thank you for your comment
7/22/2023 1:58	It's essential to control the mosquito population using the birth control technique so that mosquitoes cannot transmit avian flu to the rapidly dwindling native Hawaiian bird population. Please authorize this project to give the birds a chance to survive and repopulate. The birds are needed to pollinate the plants. I'm in favour of saving them by any means necessary.	Thank you for your comment
7/22/2023 2:04	I greet you and appeal to you with a request not to build on this mountain, not to destroy it, you must think about the future of your offspring!	Thank you for your comment
7/22/2023 2:11	We can't allow to destroy the nature and sacrifice the future of our children for another building and profit. One step at a time we are destroying our planet and it will be the end of all of us.	Thank you for your comment

Entry Date	Comment	Responses
7/22/2023 4:27	Please take the appropriate steps to protects Hawaii's native songbirds for future generations and to preserve the ecological services they provide. Curbing mosquito populations with the Incompatible Insect Technique (IIT) is essential. The future of Hawaii's native birds are in your hands.	Thank you for your comment
7/22/2023 4:42	I fully support the outlined plan for mosquito suppression. Protecting native bird species, and therefore native plant species, is a critical part of maintaining biodiversity on this planet.	Thank you for your comment
7/22/2023 5:12	The extinction crisis among birds threatens the biodiversity and balance of the whole planet. Please choose this opportunity to protect Hawai'i's native avian pollinators with the IIT before it is too late.	Thank you for your comment
7/22/2023 5:25	As we continue to loose species around the world, it is increasingly important to protect endemic birds of Hawaii. If we loose these birds we loose unique and critical species forever. Beauty and the effect on the ecosystem is only the start of why we should protect these birds.	Thank you for your comment
7/22/2023 5:36	To Whom it May Concern, I would like to express my strong support for the IIT Mosquito Control Project to hopefully ensure the long term survival of Hawai'i's native honeycreepers. With so many native species already lost to extinction, Hawai'i's remaining native birds are an integral part of ecosystem the and we need to do everything in our power to save them. While I am generally not a strong proponent of introducing more non-native creatures into the environment as a conservation measure, it seems that the IIT method is based on sound science and has a decent chance of working. It seems as well that we are in last resort territory with species like the Akikiki down to single digits in the wild and this technique may be the only viable way to save them. As an avid birdwatcher and nature-lover, I've had the great luck and to be able to observe a handful of the (currently) more common native Hawaiian birds. I still hope to one day have the opportunity to catch a glimpse of highly imperiled species like the Akikiki and Puaiohi in the wild, but I'd be just as happy knowing they are still around and that we tried our best to save them while we still had a chance. Thank you for your time.	Thank you for your comment
7/22/2023 6:03	I support the proposed action to eradicate mosquitos from Kauai in the most efficient and effective manner. Mosquitos are not native to the islands and have decimated native bird populations. Mahalo for the time and effort all have put into this EA and I hope this moves forward expeditiously.	Thank you for your comment
7/22/2023 6:27	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	(**Anon, 7/22/2023 6:27, *Continued***) Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven’t been considered. Conflicts of interest haven’t been addressed. There’s currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua’i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the “Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua’i.” I demand an Environmental Impact Statement Stop trying to create a new disaster!!	
7/22/2023 6:42	I am strongly in favor of releasing IIT mosquitos. This will help save our native birds. This is a moral imperative. Doing nothing is not an option.	Thank you for your comment
7/22/2023 6:49	Please do not send more mosquitoes in effort to depopulate the coqui. Please do not send mosquitoes in effort to impact the environment or for any purpose. These mosquitoes are very aggressive in their ability to potentially multiply to an alarming rate and harm the balance of the island, including severe harm to the honey creeper population. Please do not send mosquitoes for any reason.	Concerns: 10, 19
7/22/2023 7:50	I support using the Incompatible Insect Technique to reduce mosquito populations within forest reserves, state parks, and private lands in the Kōke‘e and Alaka‘i areas of Kaua‘i.	Thank you for your comment
7/22/2023 7:53	Preserving Hawaii's native honeycreepers is an activity which DLNR should be pursuing. Too many species have already gone extinct. Please push forward with this critical effort to save these unique species for future generations.	Thank you for your comment

Entry Date	Comment	Responses
7/22/2023 8:05	To Whom it May Concern, I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement. Regards,	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/22/2023 8:11	Hello, We need to do some thing to stop extinction. Please approve the release of wolbachia mosquitos on Kauai. The time for action is now.	Thank you for your comment
7/22/2023 8:21	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1

Entry Date	Comment	Responses
7/22/2023 8:24	This project needs to stop. I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/22/2023 8:24	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/22/2023 8:34	Enough is enough we need to take care of Mother Nature	Thank you for your comment
7/22/2023 8:56	I support using the Incompatible Insect Technique to reduce mosquito populations within forest reserves, state parks, and private lands in the Kōke'e and Alaka'i areas of Kaua'i.	Thank you for your comment
7/22/2023 8:59	I strongly SUPPORT the use of biocontrol for these introduced and harmful mosquitos. I would go as far as supporting the introduction of a GMO control (which this is not). Hawaii is the best place to use this system of control as its lands are far away from any land boarders, that could facilitate the re-introduction of the pest by adjacent lands. If we can eradicate these pests, they would make all our lives better and decrease the ongoing use of chemical pesticides used in their eradication. Please support this project and eventually we would love it to come to the Big Island!	Thank you for your comment

Entry Date	Comment	Responses
7/22/2023 9:10	Aloha mai, My comment is one of unconditional support for IIT, as soon as possible. To lose a species unique to our home, like the ‘akikiki and akeke‘e is a devastation our we cannot allow to come to pass. There is no replacing these birds if they are gone. Far to many native species across Hawai'i have been destroyed by our short-sightedness. It is our kuleana to do everything we can for those that remain. Na'u me ka mahalo, Kekaha, Kaua'i	Thank you for your comment
7/22/2023 9:32	I’m OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, “Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.” This project is an experiment on Hawaii’s people, wildlife, and ‘āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/22/2023 9:39	Aloha kakahiaka, After reading the EA for this project I just wanted to email say I am in support of this project and protecting the ‘Akikiki from extinction using mosquito population suppression. I saw your post on instagram, couldn’t find the link in the bio, so I saw this was an option. Mahalo,	Thank you for your comment
7/22/2023 9:56	No more experimental drugs on islands. No study has been done. We’ve only been given false information. Strongly opposed	Concern: 9
7/22/2023 10:11	I’m OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, “Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.” This project is an experiment on Hawaii’s people, wildlife, and ‘āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	(***Continued***). Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	
7/22/2023 10:14	Save the 'i'iwi!!! Aloha <3	Thank you for your comment
7/22/2023 10:56	Some of the most unique birds on our entire planet are in extreme peril, we've already lost so many, we need to do everything we can to save the remaining. Please consider this for our future generations, if not for ourselves as we will surely lose more species in our lifetime if we do not act.	Thank you for your comment
7/22/2023 11:11	I support this measure to protect these birds and preserve historical and cultural rights these birds have. Mahalo nō.	Thank you for your comment
7/22/2023 11:21	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	(**Anon, 7/22/2023 11:21, *Continued***). Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.	
7/22/2023 11:22	To Whom It May Concern: I am strongly in favor of the release of mosquito to render mosquitos in Hawai`i sterile. We must save our native birds. Please don't listen to malahini with wild notions about the harm it might cause. Mahalo, Papakolea, O`ahu	Thank you for your comment
7/22/2023 11:24	I am in full support of the use of IIT on the Hawaiian Islands to reduce mosquito populations and the transmission of avian malaria. As a conservationist working on the islands, both fighting the coconut rhinoceros beetle invasion and working to restore native dryland forests, I witness the challenges our native ecosystems face against invasive species every day. The plight of the Hawaiian honeycreepers is particularly distressing, and the rapid rate of extinctions in this one of a kind lineage requires a rapid response. IIT offers hope that aid can be rendered to these birds before it is too late. The opportunity to use an insect control technique that involves no toxic chemicals, no introduction of non-native species, and no use of genetic modification is incredibly exciting. As a trained biologist with a Masters degree in Entomology I give my full support in the release of incompatible male southern house mosquitoes and sincerely hope it will give our remaining honeycreeper populations the opportunity to rebound.	Thank you for your comment
7/22/2023 11:33	Injecting mosquitos is violating the Laws (Intelligence) of Nature. Injecting them causes them to undergo mutations that no one can predict, will they carry disease worse than MALARIA and kill more humans or even other vertebrate species? Stay on the safe side...do not altethe mosquiitos. Is so called science of Agriculture negatively impacting the Honeycreepers...and weakening them vs. the mosquitos...or vice versa strengthening the mosquito...or will the injected mosquitos will mutate the mosquitos to be worse or deadly against humans or other species? Be safe leave nature up to nature. Besides is this a profit motive for the few? They put covid through gain of function and we has a pandemic and death. Mahalo,	Concerns: 2, 13, 15, 19, 26,
7/22/2023 11:54	I'm opposed to this "Wolbachia-based Suppression of Mosquitoes on Kauai Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/22/2023 11:55	I am writing in support of the IIT action outlined in this Draft EA, intended to control the mosquito population of Kaua'i to protect the remaining, endangered native bird species. Growing up in Hawai'i I was taught from elementary school on that the native birds of Hawai'i were severely endangered or extinct. For almost 40 years throughout my life I've been hearing this, and for many of those years I assumed things were being done to combat this. While it is clear that there are people in departments such as DOFAW and USFWS Who have dedicated their lives to this work, it's obviously not enough without the proper governmental support. If enough was being done we wouldn't have continued to see the decline and extinction of so many native birds in my lifetime. The continuing decline of our Native species, regularly puts us at the top of the list of endangered species capitals in the US and the World. This is not a title to be proud of. A track record of knowingly allowing the slow extermination of such unique species of birds, found nowhere else,is apathetic and lazy. This string of islands was theirs first,it is incumbent upon us to preserve the integrity of this land and species that evolved here without us. These birds and the plants that rely on them, not only serve to represent the	Thank you for your comment

Entry Date	Comment	Responses
	Hawaiian culture that revered them as part of their landscape and beliefs, but also as an incredible testament to the majesty of nature and the power of evolution. This EA shows that the benefits to the IIT action clearly. Mosquitoes are not just a threat to the birds of Hawai'i, but also the people. I truly believe that supporting this program is the safest, smartest and quickest way to address this problem that has been brewing under our noses for decades. To not support the controlling of the mosquito population and its effects on our native birds is to say that we knew the threat, we found a solution and still did nothing. This program and its impacts potentially have far reaching, positive effects for native birds on other islands and the quality and safety of life for residents of all kinds.	
7/22/2023 12:01	To Whom It May Concern: I am a Hawaiian cultural practitioner of Hula and Chant for the last forty years. I live on the Hawaiian homestead ‘āina of Papakōlea, O‘ahu. I deeply support the cause of Wolbachia IIT on Kaua‘i to save Hawaiian forest birds from extinction. The native birds have been an important part of our culture, the ecosystem, from time immemorial and need to continue to exist not only in our chants and stories but in our forest community. It is our responsibility to do all we can to save our forest birds. Sincerely and with Aloha,	Thank you for your comment
7/22/2023 12:10	I have always loved birds and have learned a lot about the native bird population ever since I moved to Hawai‘i as a teenager. It saddens me to hear of the extinction of so many native avian species and to know that this danger continues to exist for many of our endangered species, like the ‘akikiki. As a current doctoral student at UH, I stand from my peers who research climate change and environment, as well as the many activists, organizers, scientists, and bird enthusiasts that desire to see the government take urgent action against the continued dwindling of our native avian populations. It is encouraging to see the USFWS and DLNR putting resources and taking action to curb one of the most hazardous threats to our birds, which are mosquitos. I hope these efforts will not only continue, but also branch out towards other actions on other islands and places that are experiencing great wildlife diversity losses, especially because all of it is caused by human activity. Mahalo for considering our comments!	Thank you for your comment
7/22/2023 12:17	I support Wolbachia IIT on Kauai to save Hawaiian forests birds because I am know the impound our native bird population. Mosquitos continue to kill off our native birds which are a vital species in forest preservation. Without out our native birds, there are no native forest, without native forest there is less fresh drinking water in our aquifer overtime, therefore threats to human existence on these islands, Mahalo! from Kapa’a, Kaua’i -- Masters of Science Student, Tropical Conservation Biology and Environmental Science, University of Hawai'i at Hilo	Thank you for your comment
7/22/2023 12:37	Hi, I support Wolbachia IIT on Kaua’i to save Hawaiian forest birds because the benefits far outweigh the perceived risks. The birds’ impending extinction and other related consequences of inaction in this case will be irreversible. Please move forward this project. Thank you, Honolulu, Hawai’i	Thank you for your comment

Entry Date	Comment	Responses
7/22/2023 12:53	I Oppose to " Wolbasha- based Suppression of Mosquitos on ALL the Islands of Hawaii , PLEASE Stop this.....	Thank you for your comment
7/22/2023 12:58	Mosquitos are BAD enought with out making them worse... as an experimental .... sounds crazy to me and others ... I'm sure alot of Tourist will not come to the Islands ... Not Good , Think about it...	Concerns: 11, 30
7/22/2023 13:03	I strongly support the initiative control mosquito populations to preserve the endemic forest birds of Kauai. IIT is critical to implement now before the few remaining birds are extinct.	Thank you for your comment
7/22/2023 13:06	Please protect the native birds! They need our help! Mosquitos are not native to Hawaii and this is a natural way to reduce their populations and protect the beauty of Hawaii.	Thank you for your comment
7/22/2023 14:26	I support the use of wolbachia mosquito control on Kauai since it has been used for such purposes in other areas. Our native birds need all the help they can get. Already the Akikiki is pretty much extinct in the wild. I can only hope that captive breeding will help to reestablish them later on. That will not happen unless the mosquitoes are controlled.	Thank you for your comment
7/22/2023 15:07	I am opposed to the Mosquito suppression project to be initiated on Kaua’i. There needs to be a more in depth study(EIS performed) so the environmental impact on wildlife, plants and people can be examined further. This project was initiated in Singapore and was then halted! This is not a good sign and means there is a grave risk to releasing these variants into the Kaua’i atmosphere! I am opposed!	ConcernL: 1
7/22/2023 15:20	Don’t allow experimenting on Hawaiian islands? Kill us people and the rich will come and grab our lands. Protect our people and spend the money on low income housing. No experiments on Hawaii! Listen to Hawaiians not the rich and famous that don’t mean well in the long run.	Concerns: 11
7/22/2023 15:32	I support the proposed action for release of male mosquitoes with incompatible Wolbachia in the Kōke‘e and Alaka‘i Wilderness areas.	Thank you for your comment
7/22/2023 15:33	I strongly support this initiative to control mosquito populations.	Thank you for your comment
7/22/2023 16:39	I cannot believe that anyone would even consider doing this!!!! I absolutely refuse this insanity and demand proper studies be done before anything like this is even considered. NO NO NO to this proposal.	Concern: 9

Entry Date	Comment	Responses
7/22/2023 16:41	I’m OPPOSED to this “ Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. I cannot believe this insanity is being considered. Yours truly, -- "Trust in the Lord with all thine heart and lean not unto thine own understanding. In all thy ways acknowledge Him and He shall direct thy paths" ~ Proverbs 3:5-6	Concern: 1
7/22/2023 17:01	Mahalo nui loa to whoever is reading and considering these public comments. I am a local conservation biologist born-and-raised on O‘ahu and I speak as someone who works to restore our native plants, birds, bats, and insects. I have had the (unfortunately) rare opportunity of meeting the beautiful endangered birds of Kaua‘i that the proposed mosquito suppression project would protect. I have also had the bittersweet opportunity to observe one of our last wild ‘akikiki, a species that may already be extinct in the wild before mosquito suppression actions get approved. The individual bird we saw was foraging alone, and it was heartbreaking to think that her mate, who she had built six nests with this past year and with whom she had always been seen with previously, may have just died due to mosquito-borne avian malaria... The first decision being considered here seems to be whether to take action to save our remaining endangered forest birds or not. I think to not act would be indefensible and foolish given that extinction not only diminishes our archipelago’s natural heritage and unique identity, but also unfairly removes opportunities for our children and grandchildren to get to know these amazing birds. I have faith that even though most people have unfortunately not had the opportunity to meet our native manu because of their rarity, if asked directly, most local citizens would support taking action to save them. The second decision that some concerned citizens may rightly have is “what actions should we take and not take on behalf of our endangered manu?”. I want to highlight that our enemies here are mosquitoes, a group of non-native insect species responsible for killing more humans worldwide and more native Hawaiian birds than any other. Paradoxically, mosquitoes are also somewhat easy to ignore (seen as “normal”) and notoriously difficult to control. However, mosquitoes only arrived in the islands after European contact so before that, both Native Hawaiians and native manu had never experienced a mosquito bite (what a paradise!). While multiple native bird species would be directly saved from extinction by the suppression, and hopefully eventual eradication, of disease-carrying mosquitos, none of our native species would be negatively impacted. For example, I have a PhD in bat conservation and am 100% comfortable in saying that our native ‘ōpe’ape’a would not be negatively impacted by lower mosquito populations or even the complete eradication of mosquitos. Our bats turn out to be quite flexible in what insects they eat and mosquitos make up a negligible part of their diet. Not to mention that our bats and other native predators were happily living here long before mosquitoes arrived. Many of the methods for controlling mosquitos effectively unfortunately involve science that is poorly understood by the general public. The repeated release of male mosquitos made effectively sterile using Wolbochia strains does not involve genetic modification or new species introductions. These Wolbochia strains already exist in wild mosquitoes and do not affect other species. Therefore, this incompatible insect technique (IIT) would not negatively impact other local insect species, much less other wildlife, plants, or humans. If saving our native birds is not enough reason, trialling IIT locally on bird-biting mosquitoes might also lead to better methods for controlling human-biting mosquitos in Hawaii, reducing the risk of mosquito-borne diseases like Dengue fever. Lastly, I want to touch on general opposition towards any actions seen as “messing with nature”. First of all, like it or not, we humans affect nature in a big way because of how many of us there are and our need for resources. We unfortunately cannot avoid having SOME impact on our natural environments. Our choice now is whether we wish to serve as responsible stewards or as negligent ones. As an ecologist and conservationist, I am well aware that humans have a history of ignorance and shortsightedness	Thank you for your comment

Entry Date	Comment	Responses
	concerning how we choose to manage ecosystems. It is our impacts, both purposeful and accidental that drove the majority of our native forest birds extinct already and that threatens our remaining ones. However, we HAVE learned from our mistakes and modern conservation efforts worldwide have proven that, given enough support and funding, species that we humans made endangered CAN be saved from extinction. If we do nothing, we are very likely to lose the majority of our remaining native bird species in the next 100 years, with some species like the ʻakikiki very likely disappearing before the next election cycle. Even if we take other actions, it is going to be impossible to save these birds if we do not get rid of mosquitoes and get rid of them FAST. I hope that our policymakers and those reviewing this EA don't only consider how popular the proposed project is now, but also how popular it might seem in 10, 50, or 100 years, when it may have made the difference in whether or not our children alive then have the luxury of knowing that these unique birds still exist. The inadequacy and slowness of our actions to save our native manu thus far have been bewildering, frustrating, and shameful, but I sincerely hope we can act properly and promptly in these next few critical years. We acted too slow for the poor ʻakikiki. Let us not lose even more.	
7/22/2023 17:10	I am OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health! Thank you!	Concern: 1
7/22/2023 17:14	I am OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and individuals' health.	Concern: 1
7/22/2023 17:31	Thank you to the reviewers of these public comments. I grew up on Oʻahu and have had a love of our native species and ecosystems from a young age. I currently work in renewable energy and know that our existential climate and biodiversity crises are inextricably linked. Man-made climate change is not only threatening the people of the world, but also the other animals and plants that we share our planet with. For example, we have known for decades that greenhouse gas emissions are warming up the planet, and that one of the results would be that mosquitos would be able to spread to previously mosquito-free places. Despite this knowledge, we have been heartbreakingly slow to act on behalf of our native Hawaiian manu. I sincerely hope that this EA gets approved as quickly as possible because while we think about whether to do something, our manu are dropping dead from mosquito-borne diseases. As this EA outlines, several Kauaʻi bird species populations are in precipitous declines. The situation is even more dire than the cited research describes. ʻAkikiki in particular had a massive die off just this year and are likely to be extinct in the wild before the holiday season. My fiancé volunteered with the Kauaʻi Forest Bird Recovery Project in late May. The site he visited deep in the ʻAlakaʻi had had multiple breeding pairs of ʻakikiki at the beginning of the year, but by the time he got there in May, they had all disappeared. We went back to Kauaʻi just last week and were lucky enough to see one of the last FIVE wild ʻakikiki known now. Our friend who works with the species told us that this adorable female had built 6 nests this past breeding season, but we did not see the mate that she built those nests with and with whom she had always been seen with previously. Our hearts sank thinking that he might have just recently died from avian malaria… As also outlined in the EA, the IIT method proposed poses no risks to our native species, who evolved without mosquitos, or to the people of Hawaiʻi. If anything, having less mosquitos is better for people too. I hope that one day, we move from mosquito supression to complete eradication. I believe that we are moving in the right direction towards better stewardship of our native species, but this movement is much too slow. The proposed mosquito control may save the other threatened native birds of Kauaʻi, but it sadly seems too late for the ʻakikiki. Their only hope is that our captive breeding facilities rear a large enough captive flock AND mosquitos are cleared from the forest of Kauaʻi. Only then, could ʻakikiki be returned to the wild and thrive. This would be a true miracle give the inadequate	Thank you for your comment

Entry Date	Comment	Responses
	funding and infrastructure supporting our manu at the moment. I believe that we will eventually become a society that takes proper care of its natural resources, biodiversity, and global climate. However, I fear that we will move slowly towards that ultimate goal, that when we get there, we will look around and find that we have lost so much more than we needed to. Please help us move quicker towards this ultimate goal for our own sakes and for the sake of future generations.	
7/22/2023 17:47	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health	Concern: 1
7/22/2023 19:00	Since the health of Hawaii's people are involved, we demand informed consent. Since our environment is being affected, you should follow the laws, statues, and procedures of providing an Environmental Impact Assessment and statement. There is no emergency that requires you to drop all precautions and safeguards for the people and the aina. It is obvious that you are putting special interests and back room payoffs ahead of your duty to serve the people and health and wellbeing of the state. Did you not take an oath to protect? I implore you to hear the voice of the people, and do what is right in God's eyes.	Concerns: 1, 2, 26, 27
7/22/2023 19:16	Save the birds	Thank you for your comment
7/22/2023 19:28	Mosquito suppression is the duty of the government and is essential to protecting what remains of Kaua'i's biodiversity. We cannot wait to act, we must act now before every native bird is gone	Thank you for your comment
7/22/2023 19:35	Please help the birds	Thank you for your comment
7/22/2023 19:38	Aloha, I oppose the draft Environmental Assessment to release of lab mosquitoes on Kauai. DLNR is receiving funding for public relations to popularize the idea that it will be safe. Also, the funding the project has ties to Soros, which raises suspicion about using the remote islands of Hawaii for experimentation. Who on the highest Federal level, is behind this plan? Does the DLNR know? Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong? Sincerely, Moku o Keawe	Concern: 2, 4, 19, 26
7/22/2023 19:38	I am in huge support of this project, we owe it to the native species of Hawai'i to do what we can to protect them from harmful invasive species. Also these birds are just too damn cute to go extinct 😻	Thank you for your comment

Entry Date	Comment	Responses
7/22/2023 20:42	I support these measures to protect our beautiful and culturally critical birds. We have already lost over half of Kauai's native bird species. 10 out of 16 of these incredible species have died out due to avian malaria, via introduced mosquitos, and by habitat destruction — both of which are caused by humans. It is our responsibility to right these wrongs, and we don't have much time left as birds like the 'i'iwi are dying every day. Please implement this innovative solution as soon as possible!	Thank you for your comment
7/22/2023 21:00	I cannot see more tragedies like this happen without anything done before I am even an adult. All it takes to understand how important it is to protect native species is a couple science classes. I urge you to invest in the Native Hawaiian honeycreepers.	Thank you for your comment
7/22/2023 21:45	Please help save the last remaining birds left in the world!!!!!!!!!! This is our chance to make a change and help to preserve such special beings.	Thank you for your comment
7/22/2023 22:05	I am completely against altering nature like this. You will be unleashing lab-altered (Unnatural) insects out in the wild with an out come unknown because has not been tested. Recently there was something done here on island and now the lilikoi plants are in danger. When nature is in balance, it works. You may want to look deeper in what is causing this or a better natural solution. Again, I am very against this untested lab-altered answer to a problem that does need to be addressed. Mahalo....	Concerns: 7, 9, 11,
7/22/2023 22:12	If there is modern technology proven safe and able to reduce the presence of an invasive, harmful, disease-carrying creature such as the mosquitoes found in Hawaii, then I'm unsure as to why it wouldn't have already been introduced! This technology is safe and effective, and we must act now to save the very few native birds we have left in Hawaii!	Thank you for your comment
7/22/2023 22:37	The IIT has been effective at decreasing mosquito populations without harming beneficial insects populations or other species in many ecosystems all over the world. Especially since mosquitoes are invasive to Hawai'i using this proven technique is a responsible management protocol.	Thank you for your comment
7/22/2023 23:09	https://www.instagram.com/p/Cu9_yKervX3/?igshid=MzRlODBiNWFlZA==	Thank you for your comment
7/22/2023 23:10	https://www.instagram.com/p/Cu9_yKervX3/?igshid=MzRlODBiNWFlZA==	Thank you for your comment
7/23/2023 1:15	Per Stanford, you get malaria when a mosquito infected with parasites bites you and transfers the parasite to you. Malaria spreads when an infected Anopheles mosquito bites a person. This is the only type of mosquito that can spread malaria. The mosquito becomes infected by biting an infected person and drawing blood that contains the parasite. When that mosquito bites another person, that person becomes infected (1). If there is an outbreak of avian malaria, there is something off balance in Kauai's Aina as we do not have malaria here for mosquitos to transmit. To me it sounds like something is out of wack with the parasites that cause malaria. "Study of glyphosate's effects on moth, mosquito species highlights the potential for large-scale ecological impact including on malaria transmission" per Public Health. Quoting a study it found glyphosate (roundup) inhibits the production of melanin, which insects often use as part of their immune defenses against bacteria and parasites (2). "Mosquitoes exposed to glyphosate were less able to control Plasmodium infections they would have otherwise resisted, which hints that glyphosate exposure may make them better vectors for malaria," says co-first author Daniel Smith. "These results raise concerns about the increasing use of glyphosate in regions of the world where malaria is endemic." (3). It's known that glyphosate impacts the honey bees gut microbiota (4). Sounds like this is another case where it is throwing off the ecosystem by altering the health of insects that keep things in balance.	Concerns: 28, 32

Entry Date	Comment	Responses
	) Let's ban Round Up and all glyphosate products. In 2015 The World Health Organization reclassified glyphosate as probably carcinogenic to humans ((International Agenc, 2015) (5) . It's been linked to neurological health, Alzheimer's (6), Parkinson's, cognitive disfunction, autism, depression and other neurological disorders(7). There are many alternatives to using roundup (9)(10)(11). Ten countries (including Mexico) have banned it (8). We are just one very small island. In doing this there is a great chance of slowing and preventing these extinctions, and human disorders/diseases as well. Let us NOT worsen things by altering nature any more by releasing another unnatural remedy out into the wild that's untested with an unknown outcome in these vulnerable yet so precious jungles and aina. Mahalo and much Aloha,, Kilauea Resident (1) https://stanfordhealthcare.org/medical-conditions/primary-care/malaria/causes.html (2)https://publichealth.jhu.edu/2021/ingredient-in-common-weed-killer-impairs-insect-immune-systems-study-suggests (3)https://newatlas.com/biology/insect-immune-system-impaired-glyphosate-malaria-mosquito/ (4) https://pubmed.ncbi.nlm.nih.gov/32723788/ (5) IARC (International Agency for Research on Cancer) (2015). Evaluation of five organophosphate insecticides and herbicides. IARC Monographs 112, World Health Organization, International Agency for Research on Cancer. Lyon: France. Volume112.pdf. [accessed: 3/25/2020] http://www.iarc.fr/en/media-centre/iarcnews/pdf/Monograph. (6) https://news.asu.edu/20220728-new-study-shows-commonly-used-agricultural-herbicide-crosses-bloodbrain-barrier (7) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9101768/ (8) https://www.ehn.org/glyphosate-explained-2656803555/where-is-glyphosate-banned (9) https://www.gardenertofarmer.net/gardening/garden-pest-control/safe-alternatives-to-roundup/ (10) https://www.consumernotice.org/environmental/pesticides/roundup/alternatives/ (11) https://www.lawnandpetal.com/round-up-weed-killer-alternatives/	
7/23/2023 3:12	I support the efforts outlined in the EA to suppress mosquito populations to save the birds	Thank you for your comment
7/23/2023 4:44	I OPPOSE to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. The State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes must complete a detailed Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The biopesticide mosquitoes come with many risks: horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Studies have documented this. The U.S. Dept. of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Claims of no human health risks are based on unsound science discredited by the EPA.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	(**Anon, 7/23/2023 4:44, *Continued***) If something goes wrong it will be too late for any fix, and will the federal government, the State of Hawaii, agency partners, private landowners take responsibility? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I reject the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i" and demand an Environmental Impact Statement.	
7/23/2023 4:44	I'm for this. Avian malaria is pushing our native birds to extinction and has already taken many species. The proposed male cullex mosquitoes will pose no risk to both human and bird life and will only help to aid in mosquito population suppression. They are unable to spread human malaria. They are unable to spread avian malaria as the released males don't bite birds, and they will cause female mosquito infertility. Incompatible wolbachia strains seem like a good control method.	Thank you for your comment
7/23/2023 5:36	Hello, Please consider this message as a vote of support for using IIT to protect native Hawaiian birds. Please protect these beautiful birds on the behalf of us citizens. 8th Grade English, , North Shore Middle School, Student Council Sponsor	Thank you for your comment
7/23/2023 6:18	I oppose this suppression. Introducing disease into the food chain will also affect people, plants and animals and this is simply another bio weapon to our health and well-being. I oppose this project strongly Captain cook Hawaii	Concerns: 2, 5
7/23/2023 6:56	Please do a complete environmental study before releasing an alien pest into Hawaii forests. Best. Albatross News Hilo Hawaii	Concern: 1
7/23/2023 7:28	Dear Wildlife Services, We are happy to hear about the plans to release mosquitoes using the IIT technique. It's an important step towards preserving the natural Hawaiian ecosystem for ourselves and future generations. Sincerely	Thank you for your comment
7/23/2023 8:58	Please - Stop this from happening on ALL OUR HAWAIIAN ISLANDS… There has been NO ENVIRONMENTAL TESTING … I'm on Hawai'i Island…. and a Hawaiian Culture Teacher in many different ways… Please DO NOT RELEASE THESE HORRIBLE MOSQUITOES!!!! WE HAVE SO MUCH TO LOSE IN OUR ENVIRONMENT	Concern: 9

Entry Date	Comment	Responses
7/23/2023 9:01	This is unbelievable! Your documents state that you don't know if this is going to work to save native birds and yet you want to do it for a minimum of 20 years! There are studies that show wolbachia injected mosquitoes can carry west neil virus and other diseases. This can no only harm humans but the birds you want to save! Plus, Dr. Pang, a tropical disease specialist that the Hawaii health department hired for his opinion, said, do not do this and you are ignoring him. Are you insane? Please stop this immediately and do a full EIS before you put a potentially dangers insect that can change the entire eco system forever!!!	Concerns: 1, 2, 6, 13, 19, 29
7/23/2023 9:02	Without mosquito suppression, we will almost certainly lose our many of our manu within the next few years. This is the only tool we have available at the moment and it is scientifically proven to work. Please consider approving this ea and allowing the use of IIT to suppress the invasive mosquitos so that future generations can see these birds in the forests. Science is built on facts, not beliefs.	Thank you for your comment
7/23/2023 9:06	I support Wolbachia IIT to save Hawaiian forest birds because this is our best chance to drastically change their chances of survival. I wish we could have done this years ago already as we have lost so many native birds and continue to lose them at a rapid rate due to avian malaria. A single bite from an infected mosquito can mean death for our birds. Honeycreepers are a unique group of forest birds found only in Hawaii- which once had more than 50 species, but only 17 currently remain. Some of these remaining species have less than 500 individuals left. These birds are incredible and hold such importance to Hawaii and Hawaiian culture. We need to get behind this effort to save what is left of these amazing species. The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds. The time is now. Without swift action, several of these honeycreeper species will become extinct in the next ten years. Don't let it happen.	Thank you for your comment
7/23/2023 9:17	Hello, I am a lifelong Hawaii resident, and I am writing in support of wolbachia ITT to save our native forest birds. I am a recent college graduate from University of Hawaii at Hilo in conservation biology, and I can't believe I am about to experience another extinction of our native bird species in my short lifetime. This is a science based, natural mosquito control method that is our last hope to save these birds that are so important to our ecosystems and culture. The vast majority of Hawaii residents support this and want to save our birds- please allow us a chance to save them and allow us to use Wolbachia ITT. Thank you	Thank you for your comment
7/23/2023 9:25	Aloha and mahalo for taking the time to read this message. I am Kanaka 'Oiwi , residing in Oahu. As a native Hawaiian, it is our kuleana to protect and preserve our 'Āina and its inhabitants . We have already lost so much … our cultural practices, traditions, family, our land … and the least we can do is make sure we don't lose our native bird population either . These honeycreeper birds are endemic to Hawaii . If we have the opportunity to protect them, why shouldn't we ? They need our help . It is because of western contact and the introduction of mosquitoes that our birds have been decimated. Now we are nearly down to 5 'Akikiki left in Kauai . Each native species provide something important to this island we call home . It's our kuleana to Mālama these birds .	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 9:26	Aloha, I am a Honolulu born and raised native Hawaiian bird lover who has been lucky enough to see our native birds on Oahu, Maui, and Hawaii Island. I support Wolbachia IIT to save Hawaiian forest birds because Honeycreepers are a unique group of forest birds found only in Hawai'i, which once had more than 50 species. Today, only 17 species remain, some with fewer than 500 individuals left. Without swift action, several species of honeycreepers will become extinct in the next ten years. Avian malaria, a disease transmitted by invasive southern house mosquitoes, is driving the extinction of our forest birds. A single bite by an infected mosquito can kill an 'i'iwi (and critically endangered forest bird species). As the climate warms, mosquitoes carrying avian malaria are moving upslope into the last refugia for Hawaii's forest birds. The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds. Hawaii is at risk of losing at least four more critically endangered forest bird species to avian malaria in the next decade, and they need all the help and support we can provide. Please implement the Wolbachia ITT to save our cultural heritage. Once the birds are gone, they will never return. I don't want that to happen on my watch. With aloha	Thank you for your comment
7/23/2023 9:41	Use IIT to reduce mosquito populations. I cannot think of a single reason not to initiate this action. Protect Hawaii's native birds and indirectly protect the native forests these birds pollinate. I believe using IIT is completely justified with the extinction crisis on hand, and quite frankly should've been done years ago.	Thank you for your comment
7/23/2023 9:48	Comments related to: DRAFT ENVIRONMENTAL ASSESSMENT FOR USE OF WOLBACHIA-BASED INCOMPATIBLE INSECT TECHNIQUE FOR THE SUPPRESSION OF NONNATIVE SOUTHERN HOUSE MOSQUITO POPULATIONS ON KAUA'I I read the detailed, thorough EA and fully support the proposal. I feel the EA covers the important aspects of the environment (threatened and endangered species, wildlife, vegetation and cultural resources, public health and safety, recreation and wilderness air quality, greenhouse gas emissions and climate change, and environmental justice) and is a vital and natural next step to saving these unique Hawai'i forest birds before it's too late and recovery becomes but a dream. I support implementation of the plan as soon as possible after all regulatory and procedural steps have been taken and approved. Many seem already initiated or approved. I am pleased to see the variety of treated male mosquito dispersal techniques considered. The greater the project area coverage the greater the likelihood of a more rapid decline of mosquitos in the forested areas and safer environment of Hawai'i forest birds. The techniques allow treated male release to areas that would otherwise be less accessible or inaccessible. Aerial treatment is a great tool. Drones are securing their place in wildlife management and this is a perfect application for this relatively new tool. I applaud the preparers for involving the not only the natural environment, but the cultural environment as well. The forest and these native forest birds are integrally tied to the Hawaiian culture. The rebound and recovery of these species on the brink of extinction have great environment and cultural value. Since many of these species are tied to pollination of plants important to Hawaiian culture there is another benefit in perpetuating these plants reliant on these avian species for their propagation and survival. I know and have worked with some of the professionals involved and interviewed and they have the qualifications, knowledge and dedication to make this a successful Action. I agree with several interviewees regarding the need for commitment to follow-up monitoring. Many times I have seen and been involved in plans where post-project monitoring is either too short or not thorough. This project is very important and post-project monitoring and reporting is critical to assessment of Proposed Action results.	Thank you for your comment

Entry Date	Comment	Responses
	I am optimistic this Action will aid in recovery of Hawai'i forest birds and a healthier natural and cultural environment. I wish this program all the success possible and look forward to monitoring updates when data are available. Wildlife Biologist, USFWS (Retired)	
7/23/2023 10:14	I believe this is the only way to save the endemic honeycreepers. Full fledged support is my opinion.	Thank you for your comment
7/23/2023 10:25	Hawaiian honeycreepers are a unique family of birds found nowhere else on the planet. More than half of the endemic birds have gone extinct. We can’t let anymore species vanish, because extinction is forever. There are two species of birds here on Kauai that could be extinct anywhere within 1-5 years: We can’t let that happen! Please, as a concerned citizen, I sincerely insist that the mosquito suppression program become into affect immediately. Without it, avian malaria will continue to cause our incredibly important birds to vanish to the harsh reality of extinction! Please act now! Sincerely, Kapaa, HI 96746	Thank you for your comment
7/23/2023 10:28	I am in full support of the implementation of the incompatible insect technique to reduce mosquito populations on a landscape level on the island of Kauai to reduce the transmission of mosquito borne avian diseases. Despite over 20 years of conservation efforts to address threats such as pigs and habitat loss, we are still witnessing extinctions of our native manu with the akikiki being the latest victim. We finally have a chance to address the problem of mosquitoes and it would be irresponsible to not take advantage of this opportunity for the future of our forests. Anyone who is against the implementation of IIT does not work in the field and is blind to the history of our forests.	Thank you for your comment
7/23/2023 10:32	Fifteen years ago, ‘akikiki, a small, light gray, unassuming bird of the most intact ‘ōhi‘a lehua forests of Kaua‘i, regularly flitted above my head, calling with a high, sweet whispered tchweet. I recognized then that I was privileged to be one of the few people to have such an opportunity, so often and so intimately. It was as if I had been invited into their living room of tall mossy ‘ōhi‘a and quaking lapalapa to witness the daily joy and tumult of their lives. The search for food – clinging, peering, probing, creeping along the trunks and branches of the trees. The occasional dispute with the neighbors – a muted explosion of chip notes and fluttering wings. The raising of young – needy in their infancy and delightfully curious in their adolescence. What should be ordinary, mundane, and uneventful even, part of the Hawaiian forest is something that future generations may never see, and it’s happened too many times already. Mosquitoes carrying and transmitting avian malaria have already forever changed the nature of the forests across the islands, and while it may already be too late for the ‘akikiki, there’s now a science-backed method for controlling mosquitoes that we've never had access to in the past. This could save many species that exist nowhere else on earth and are a part of the fabric and history of the islands. While this technology, and the innovative methods developed to deploy it in challenging locations, could have great benefits for human health in the future, the importance of rolling it out now to save imperiled forest birds is paramount. I am in full support of this project, and having read the EA, there are practical questions yet to be answered about how best to implement this at scale, but there are no major questions remaining about its safety or readiness for immediate use.	Thank you for your comment
7/23/2023 10:35	I support Wolbachia IIT to save Hawaiian forest birds because it is backed by rigorous research and is the only hope we have at the moment to safeguard these species considering climate change. It would be unfortunate if these species are lost because of stupidity. Don't be stupid and get on the right side of history.	Thank you for your comment
7/23/2023 10:35	I support Wolbachia IIT to save Hawaiian forest birds because it is backed by rigorous research and is the only hope we have at the moment to safeguard these species considering climate change. It would be unfortunate if these species are lost because of stupidity. Don't be stupid and get on the right side of history.	Thank you for your comment
7/23/2023 10:38	Those birds are facing extinction, just do whatever is needed to save them. Thank you	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 10:39	Native Hawaiian birds are critical to the health of Hawaiian ecosystems and the cultural preservation of Hawaii. Mosquitoes are not native to this environment and have proved incredibly dangerous to native bird populations. I support this effort to save native birds! Mahalo nui to all the scientists, conservationists and representatives working to make this possible! Me ke aloha,	Thank you for your comment
7/23/2023 10:44	Dear Department of Land and Natural Resources, U.S. Fish and Wildlife Service, and other stakeholders, My name is , a native Hawaiian artist with a strong focus on educating people about native Hawaiian birds. Concurrently, I am pursuing my graduate studies in Plant Pathology at the University of Hawaii at Manoa. I was privileged to work closely with native birds from Kauai at the Keauhou Bird Conservation Center. One experience that left a traumatic impact on me was witnessing the death of an akikiki due to avian malaria over three agonizing days before receiving a diagnosis a week later when it was long dead. The memory of that little gray puff ball sitting under a heat lamp, hoping for its recovery, will forever stay with me. This tragic incident reinforced the critical importance of safeguarding these vulnerable creatures, as if captive birds don't stand a chance, then those flying freely in the wild face even greater peril. I am writing this comment in full support of the Environmental Assessment (EA) and proposed project aimed at suppressing nonnative southern house mosquitoes on Kaua‘i. The comprehensive EA offers a well-founded strategy to reduce the mosquito population and protect the native Hawaiian forest birds. By adhering to environmental regulations and evaluating alternatives, the project ensures responsible and sound decision-making based on scientific evidence and cultural considerations. I see no legal violation as the EA complies with the National Environmental Policy Act and the Hawaii Revised Statutes. This adherence guarantees a thorough evaluation of potential impacts and outlines strategies to mitigate any adverse effects of the mosquito release, ensuring the project's compliance with all relevant Acts and regulations. The discussion of the no-action alternative is commendable as it provides a detailed perspective on the consequences of inaction. Additionally, the inclusion of the alternative actions (Appendix A) provided an exceptional analysis of why those alternatives were dismissed. The discussion of every alternative was fully understandable and reasonable as to why they were not an option for implementation. The Insect Incompatibility Technique has been extensively applied worldwide to control diseases affecting humans, making it a well-studied approach. Given the comprehensive research presented in the EA and IITs widespread use, there is no necessity to request an Environmental Impact Statement for this technique. The EA's thorough examination provides sufficient evidence to support the project's implementation without the need for further impact assessments. In conclusion, I fully support the project to suppress nonnative southern house mosquitoes using IIT on Kaua‘i. The EA is following all rules and regulations and is backed by exemplary scientific studies. I urge all stakeholders to join in its implementation to save the native birds.	Thank you for your comment
7/23/2023 10:44	Our ‘akikiki and other forest birds (especially on Kaua’i) are suffering and on the brink of extinction, as a direct result of climate change caused by human over-consumption and over-development. It is our kuleana/responsibility to take every reasonable action to preserve endangered birds and prevent their extinction. The technique of releasing Wolbachia incompatible mosquitoes has been extensively tested and found to not harm ecosystems or human communities, and it represents our best hope for saving our native forest birds. We must act now and utilize this safe tool that is available to us to try to save our manu from extinction. Mahalo for your consideration.	Thank you for your comment
7/23/2023 10:57	I support this action to save the birds!	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 11:09	| support Wolbachia IT to save Hawaiian forest birds because this is vital to prevent extinction. We do not have the luxury to wait any longer and this needs to be done asap. As a veterinarian here in Honolulu I cannot fathom why this is even being debated at this point. Let’s stop wasting time and act now. Honolulu, HI	Thank you for your comment
7/23/2023 11:12	I support this EA because I refuse to see yet another native species go extinct, especially when the solution could be right in front of us. As a field technician, we put so much time and energy into our job so that we can continue to protect our native manu. The misinformation of wolbachia has lead to some people fearing a scientifically supported solution and delaying the safety of the forests. We as humans have a responsibility to fix the problems we brought to the islands, and I hope the next step forward is in support of wolbachia. For the manu!	Thank you for your comment
7/23/2023 11:16	I would like to offer my support for the Draft Environmental Assessment: Kaua‘i Mosquito Suppression. I have been actively involved in native ecosystem restoration on Hawai‘i Island for over 20 years. I have had the opportunity to work with and witness so many incredible plant and animal species across Hawai‘i. Unfortunately, I have also witnessed extinctions. I understand the depth of the loss. We are witnessing extinctions at an overwhelmingly alarming rate, and each loss is heavily echoed through human, plant, and animal communities across the pae ‘āina. The rapid decline in Hawai‘i’s forest bird populations is more than just unfortunate, it is a tangible loss of ecosystem function and ultimately Hawaiian culture. Releasing incompatible male mosquitoes has the potential to reduce the mosquito population by at least 90%. IIT is not a new technology. It has been successfully implemented within the United States and 13 other countries across the globe. Without action and direct management of southern house mosquitoes, it is likely that the ‘akeke‘e and ‘akikiki would be driven to extinction within the decade, and the ‘i‘iwi is likely to be extirpated on Kaua‘i. The EA is extensive and highlights that ecosystem risks to non-target species are negligible at most. Conversely, a no-action alternative will have monumental and catastrophic negative impacts to the ‘āina. I believe that if the EA were critically read and understood, much of the opposition to the incompatible male mosquito release would be overcome. While I can understand the innate concern many residents have regarding any form of a biological release, the data shows that public and environmental health impacts are not a concern. Again, a no-action alternative poses a multitude of risks. I believe that providing consistent and sound information to the public is a critical component and I truly hope that all those who choose to comment have read through the EA thoroughly. Mahalo for all of the hard work you all have done and continue to do for our manu.	Thank you for your comment
7/23/2023 11:27	I support the proposed release of Wolbachia-altered mosquitos for the use of incompatible insect technique to help save the remaining Hawaiian forest birds from avian malaria.	Thank you for your comment
7/23/2023 11:32	I recently became an amateur bird photographer and I truly truly want to be able to continue photographing these amazing birds into the future. Please continue the mosquito control project so that these birds will continue to exist and fulfill their part of our forest habitats. Sincerely	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 11:37	I support this action. This project is essential for the conservation of Hawaiian heritage by preserving the manu. Over and over, the use of Wolbachia has proven effective and safe for the benefit of public health for humans. Reducing any human infection of dengue, west Nile, and any potential future mosquito vector based disease such as malaria should be more than enough to convince others that this action should be taken. Mosquitoes do not belong in Hawai'i and this action needs to be taken now.	Thank you for your comment
7/23/2023 11:40	To whom it may concern, I'm writing in favor of IIT discovery and execution to save native birds if proven effective and not further destructive. Thank you.	Thank you for your comment
7/23/2023 11:43	A lot of people are against this passing. Those people are uneducated on Hawaii's ecosystem and native well-being. Please do pass this. Native species in Hawai'i need to be taken care of and we can't lose any more natives. I went to school on Maui & O'ahu to learn about Hawaii's ethnobotany, geography, and ecosystems. If we don't do something now non of these birds have a chance. Thank you.	Thank you for your comment
7/23/2023 11:43	I strongly support mosquito suppression on Kauai. This science-backed technique is the only chance these birds have. Please act swiftly, we are running out of time.	Thank you for your comment
7/23/2023 11:53	I support the effort to save our native birds. Please let this project pass! Our entire natural environment depends on each other and if our birds go extinct and can never be heard or seen so will other species. It is a sad thing that I will never hear or see the birds or plants that my tūtū saw, or even that my dad saw. But it breaks my heart to think my children may never see or hear their song.	Thank you for your comment
7/23/2023 11:54	I support the EA	Thank you for your comment
7/23/2023 12:45	Honeycreepers are a unique group of forest birds found only in Hawaii, which once had more than 50 species. Today, only 17 species remain, some with fewer than 500 individuals left. Without swift action, several species of honeycreepers will become extinct in the next ten years. Avian malaria, a disease transmitted by invasive southern house mosquitoes, is driving the extinction of our forest birds. A single bite by an infected mosquito can kill an iwi (and critically endangered forest bird species). As the climate warms, mosquitoes carrying avian malaria are moving upslope into the last refugia for Hawaii's forest birds. The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds.	Thank you for your comment
7/23/2023 12:52	I fully support the implementation of IIT on Kaua'i island to combat avian malaria. As an avian ecologist, I view the loss of Hawaiian biodiversity as an existential threat to global diversity because of the rarity and importance of the endemic honeycreepers. I hope the USFWS and DLNR approve this method to reduce invasive mosquito populations and help rescue this special and irreplaceable resource of native birds	Thank you for your comment
7/23/2023 12:53	I support the decision to use IIT to decimate mosquito populations. Kaua'i native bird populations are too critical to not take action now. This method is fast, effective, and has the added benefit of not using insecticides which may hurt local insect populations.	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 13:14	I support this ea	Thank you for your comment
7/23/2023 13:19	In regards to the whole idea of wolbachia being used to make mosquitoes sterile, I think that we really have nothing to lose, especially when we look at our options. If this design has been tested before and does work, then I really see no problem to it. We are in a dire situation where it's practically now or never. We didn't have the kind of technology to save the Po'ouli, the Kaua'i o'o, and many that went extinct before, but now we have a chance. A chance that seems likely to work, as it has been tested and has worked, is way better than waiting to see the inevitable death of the Akikiki. Even if I haven't personally seen an Akikiki, do you think that I want to hear about the extinction of another bird, when we've lost so much. It's not just about me, as I'm quite sure I'm not the only one with the same thought. I can't even imagine how those that have seen the Akikiki are feeling right now. I really can't imagine even witnessing a species that is now gone from the Earth. At that point, we are literally watching our Earth slowly fall apart due to our own reasons. When I think about it, extinctions are inevitable, but it's just too hard to give up when you have the heart and even the chance to save a species. I also think it's unfortunate how so many people don't give a shit about what's going on in the current day, unless it starts relating to themselves. for example, I didn't really know how to feel about the comments I was reading about the topic of saving birds with the new design. I can understand if some people didn't know the full of it, but the fact that people cared about the mosquitoes being a negative effect to us, like bringing in a disease, brought me to a situation where I really didn't know how to respond. These are lab born mosquitoes, so I'm pretty sure they won't have diseases, but the fact that they choose themselves, a species with a population over 8 billion, compared to a bird species with a population 5 or less, which is completely due to that species with over 8 billion in population. Obviously, that species would be us, humans. But seriously, do you know how crazy that sounds to me? Let me put the fact that species with even a few thousand left are in danger due to less genetic variety, but look at the situation that Hawai'i is in, and has been in for years. When we look at species like the Bornean orangutan, an infamously popular but rare species, being critically endangered with a population of around 14,000. Critically endangered. The Akikiki is critically endangered too, with a population of 5 or less. Where is the extreme attention to Hawaiian birds in general that we should have had years ago? I really don't get it, but that's most likely an answer not for me. I guess it makes sense if you don't know the situation, but even some that know of the situation still go on to their daily lives. Don't get wrong, I do get it. Even with dire situations like these, we can still keep moving, but that's the part that has me on the line here. Do I really want to keep moving into a world likely of more and more extinctions? I don't know about others, but that's a really hard subject on me. I honestly wish I was born earlier so I could be able to really help with this subject. After seeing that I can go on and comment what I think about the current idea in saving the Akikiki and many birds to come, it took me a little bit of time to finally decide that I would comment. I don't know why I would consider it or not, as I know what is the best decision. Over some time, I though that there really is no point to be scared about commenting, so I'm putting all of my thought into it. One thought that really got me was while I'm comfortably laying down on my bed in my room with A.C, trying to come up with what to say, the Akikiki is essentially fighting for it's right to exist in an environment where the average person would be scared in if they were there for too long, or if they got lost. At the end of the day, we are no longer used to a different place if we are there for too long. Everyone wants to go back to their home, a place where they don't have to worry about surviving out in the wild for their own food and such, like any other animal has to do. That's a reality that I can even confess. I'm too used to having things being handed to me almost. I'm not saying that our system of getting things is the best, as a good amount of people have to deal with poverty, but I would say a lot of people would want to live how the world is rather than having to survive on your own. Aside from that, I suppose I haven't talked about the importance as to why we should try to protect our native species. The birds, I would say, especially important to protect right now compared to the plants or even the insects. Insects will raise in population once we have more plants, so that's not too much of a problem. But anyway, the birds here are to serve as health component of the native forests. We have different kinds of birds, all to balance out the ecosystem. We have honeycreepers, which have evolved over millions of years to have their beaks fit into the flowers of the native plants, like the lobeliads. We have thrushes and flycatchers that feed on insects to balance the populations of insects such as moths. We even have or had species unique to crushing eating snails, species that eat the immature seeds of plants, etc. on the big island, the Alala had a big job of dispersing seeds of native plants, like the Ho'awa, though the species has gone extinct in the wild. It has been especially thought to bring it back into the wild due to the native Hawaiian hawk, the 'Io. While all of the birds have a vast ecological significance, they also have a large cultural significance, as a good amount of the honey creepers were harvested for	Thank you for your comment

Entry Date	Comment	Responses
	feathers, but not killed. They were caught using nets, and would get stuck onto the nets due to the sap from the papala tree. The feathers were used to make cloaks and such. Aside from any more cultural information, these birds have evolved for millions of years, specifically to benefit their environment. Essentially, they're a good reason why most of our native plants are dispersed out on (**anon, 7/23/2023 13:19, *Continued***) the islands. It also has to do with insects, but birds also have a significance for it. It's weird to think that it's still possible for a plant to exist now that was pollinated and was essentially grown from a bird species that is now extinct. But the whole idea of species spending literally millions of years to evolve to benefit the island, to benefit us, just go extinct by us. To know that we are capable of wiping out a species, and many more, is rather frightening. While frightening it is, it's unfortunately not new to us, as we've been doing that for years. We've brought species to extinction just for hunting purposes and making money. It always somehow comes back to money, something so simple but so chaotic to how we take our everyday lives. In relation to hunting, taxonomic collections of extinct species of birds here in Hawai'i are kind of sad to see, as most of those birds we really don't know much about. All we really have is what they look like due to specimens, but they were never really researched enough. Aside from that, it's sad to see a lifeless body of what used to be alive. That's why I'm really hoping that doesn't come true to the Akikiki, or the Akeke'e, just to see a lifeless body of what used to be alive. I feel like if we don't do anything to save the birds now, we just won't be able to. Especially for the Akikiki. Never did I ever think I would be alive to know that the Akikiki would be in the same position as the Po,ouli. I seriously never thought about it. I thought that the population was still around 40 or so, but apparently there's only around 5. The thought terrifies me. I guess this is what it feels like to essentially see extinction happen or live through it. It happens just like the snap of a finger, just like that. You take your eyes off of the subject for a second, and it's gone once you look back. Almost like a good dream; how you're enjoying the moment, but once you wake up, you come to the reality that it's gone. That's dream's gone. I don't want the dream of losing the Akikiki to be true. I don't think anybody that knows the situation that we're in wants it to happen, but you really do feel useless when you can't do anything about it. When you can't physically be there to help something that isn't yourself for once, you feel like you've failed even though there's nothing. You can really do about it. At least I'll feel better about myself once I submit this comment. At least I can help in some way, you know? The topic itself really isn't easy to even get yourself to talk about, if I'm going to be really honest. I've been aimlessly thinking about how I want go with what I'm saying, while having the thought of the current situation In my head. The very fact that an akikiki could be dying right now due to avian malaria as I'm creating this message is what scares the hell out of me. The fact that we've put another species in this situation, and the fact that the reality of it is unavoidable. I do tend to think what this works would look like if we never did anything, but thats obviously not reality. Even if we never existed in the first place, extinction will always take place. I've thought that maybe we're supposed to be this way, to cause another extinction crisis. This has happened with plenty of species, before we even existed, but knowing that we can save a species is the difference between if we existed or not. We made the the mistake, but we can't give hope. Any spark of hope is what carries this species on. We are legitimately the only way of saving them, so if we give up, they give up. Even if mosqutioes doesn't work, I'd say it's better that we try than to just see them die right in front of our eyes. Hell, to see the world rot in front of our eyes.	
7/23/2023 13:21	We need to protect our native species, and this will be instrumental in doing so.	Thank you for your comment
7/23/2023 13:25	As a Kanaka ʻŌiwi artist, scientist, and cultural practitioner I support IIT to aid in the recovery of our endemic manu. Mosquitoes are not native to Hawaiʻi and play no vital role in our ecosystems. IIT has been used to help eradicate mosquitoes to mitigate human diseases all over the world and the EA finds no significant effect. This could be our last chance to save birds that exist nowhere else in the world, and is our responsibility as environmental stewards to do whatever is in our power to support our last remaining manu. Mahalo nui no kō ʻoukou lohe ʻana mai iaʻu.	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 13:28	loha, From my perspective the extinction of Hawaii native birds species can be prevented by the proven use of mosquitos by DLNR. Unfortunately there are people who just do not understand the efficacy and safety of the method proposed which will help prevent the transmission of avian malaria. Please trust the experts and start the program to save the i’’wi as they cannot survive continued delays! Mahalo! Kihei	Thank you for your comment
7/23/2023 13:46	Please act NOW to implement the Wolbachia Incompatible Insect Technique on Kaua‘i. Our critically endangered birds will not survive much longer in the face of a warming climate that has allowed introduced mosquitoes to penetrate the highest montane forests on Kaua‘i and thereby threaten every single population of our endemic forest birds with fatal infections of avian malaria. The Wolbachia IIT is NOT genetic modification and it will not even eliminate all mosquitoes, but rather drastically reduce their populations in the target regions. It is a safe and effective technique that will buy our endemic bird populations a bit of precious time as we work to develop an effective vaccine. I spent over twenty years working all across Hawai‘i Nei in support of ecological researchers from across the planet -- I understand the incredible challenges we face as we attempt to conserve our invaluable natural resources and biological diversity for ourselves and for our posterity. Mahalo for all your hard work fighting to conserve our resources and for your leadership on this issue in particular!	Thank you for your comment
7/23/2023 13:48	Save these birds! This is VERY important!	Thank you for your comment
7/23/2023 13:53	I support the project.	Thank you for your comment
7/23/2023 13:56	I strongly support the use of the IIT technique on the island of Kauai. Wolbachia has been studied very well for decades and could be key to the survival of our Hawaiian Honeycreepers. Please listen to the testimony of ecologists and biologists, and not the fearmongering of conspiracy theorists.	Thank you for your comment
7/23/2023 13:59	I support Wolbachia IIT to save Hawaiian forest birds because I believe it is an imperative part of stopping the spread of Avian Malaria, and protecting the avian biodiversity of the Hawaiian islands. Once, more than 50 different species of honeycreepers, a truly unique group of birds, called Hawai'i home. Now just 17 of those species remain, some of which having populations of no more than 500 individuals, and they need need our immediate action to save them from joining their relatives in extinction. When just a single bite from a southern house mosquito can kill a honeycreeper, you know there is no time or room to delay in taking action.	Thank you for your comment
7/23/2023 13:59	I support EA protect the native birds.	Thank you for your comment
7/23/2023 14:13	I support Mosquito Suppression to save our native forest birds.	Thank you for your comment
7/23/2023 14:17	I fully support this assessment and plan, and hope that the Indigenous people of Hawaii are given a voice in this implementation. The time is now. We are in crisis and need to act now. Thank you for your time and effort in this endeavor!	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 14:19	The Draft Environmental Assessment makes it very clear that the any potential risks are far outweighed by the potential benefits of this program.	Thank you for your comment
7/23/2023 14:19	Save our native birds.	Thank you for your comment
7/23/2023 14:22	save the birds!!! don’t let mankind destroy more of creation	Thank you for your comment
7/23/2023 14:25	BIRDS NOT MOSQUITOS	Thank you for your comment
7/23/2023 14:27	I support the protection of our manu ‘ōiwi	Thank you for your comment
7/23/2023 14:29	I support the use of wolbachia in an effort to protect native Hawaiian birds. The mosquitoes are a recent problem for these rare birds and if nothing is done they will be driven to extinction. Time is running out there are so many hurdles to get over. It would be a disaster to not use all the tools in the toolbox. I am a biologist and i live and work to save species in California. I have visited Hawaii many times and my grandmother and great grandmother were both born in Hawaii. I haven't ever seen a Hawaiian Honeycreeper but i feel very strongly that they should be protected from extinction. For future generations including my daughter and future generations of Honeycreepers.	Thank you for your comment
7/23/2023 14:32	Hi, As a huge fan of the endemic birds of Kauai I want to voice my support for the Wolbachia Incompatible Insect Technique to save these forest birds. There are only 17 species of honeycreepers left! Without any action several species are expected to go extinct in the next decade. This is unacceptable when there is a clear way to help! Thank you for hearing me, Birder and nature-lover	Thank you for your comment
7/23/2023 14:39	I am in support of releasing male mosquitoes with incompatible Wolbachia in the Kōke‘e and Alaka‘i Wilderness areas as a way to combat avian malaria	Thank you for your comment
7/23/2023 14:44	I strongly support these measures to help prevent the extinction of our endemic birds.	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 14:45	Dear DLNR team, Thank you for all that you do to protect Hawai'i natural and cultural resources! I know that your work is incredibly challenging and that you must have so many issues competing for attention. I'm writing today in support of your efforts to suppress mosquito populations in Kaua'i. As someone who was born and raised in very urban areas, thanks to the education and knowledge shared by my colleagues and friends, I've come to learn the value of Hawai'i's land and animals, especially our Native Bird population. It broke my heart to learn that only 5 'akikiki are left in the wild on Kaua'i and that their recent demise is largely connected to the spread of mosquitoes and avian malaria. All living beings are incredibly interconnected. Death to one of us means death to all of us, but the reverse is true too. That a lifeline to one gives us all the opportunity to survive. In this case, you have the power to create that lifeline by taking swift action such as the Incompatible Insect Technique to suppress mosquito populations and save our native birds, such as the 'i'iwi and the 'akikiki. It is my hope that you do so, so that our future generations can continue to thrive. With gratitude,	Thank you for your comment
7/23/2023 14:51	It's sad to see the forests that were so beautiful and you would walk and hear native bird calls are now quiet and all you hear is buzzing or maybe one Elepaio in the distance. The 'Akikiki is at the end, the Akeke'e and Puaiohi are close, the Anianiau and Kaua'i Amakihi are getting there, the Elepaio is common now but not in the future, and I'iwi and Apapane are on other islands. I completely support Wolbachia and eliminating mosquitoes for the future of Kaua'i's forests. It's essential to keep these forests pristine with native species and right now this is the only thing to get rid of those f*cking mosquitoes	Thank you for your comment
7/23/2023 14:52	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	There’s currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua’i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the “Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua’i.” I demand an Environmental Impact Statement.	
7/23/2023 14:55	I support this EA	Thank you for your comment
7/23/2023 15:06	I am in full support of the actions and methods proposed for mosquito suppression to protect Kaua'i native forest birds and hope these efforts are successful. Thank you.	Thank you for your comment
7/23/2023 15:08	Hello, I am in strong support of using this technique to suppress mosquito populations on Kauai. We should have done this years ago. Without this technique, we will likely lose the remaining honeycreeper species. Please vote in support of allowing this mosquito control program to proceed. Thank you.	Thank you for your comment
7/23/2023 15:08	I support releasing male mosquitos that will help eradicate avian malaria by means of incompatible Wolbachia. The populations of Native island birds have been on the decline for decades, and too many populations and species are already extinct. It is our duty to protect what species we have left.	Thank you for your comment
7/23/2023 15:10	I very strongly support this effort to suppress the mosquito population. I am in favor of any efforts to protect the native bird population. This is the only option to save some of the most imperilled native species.	Thank you for your comment
7/23/2023 15:19	Aloha. This email exists to inform you of my support for Wolbachia IIT. Without rapid action, what’s left of 17 native forrest bird species are headed down the pathway of continued extinction. Avian malaria is driving current extinction risks, as a single bite from a mosquito can kill an ‘i‘iwi and other bird species. As the temperature increases, mosquitoes are moving up in elevation and infecting birds increasingly. The Incompatible Insect Technique can lesson mosquitos, and save forest birds. Please contact me with any questions or concerns. Mahalo nui, -- Master of Science Student, Tropical Conservation Biology and Environmental Science , University of Hawai‘i at Hilo I acknowledge that I live and work on Kanaka ‘Ōiwi land. I acknowledge the illegal overthrow of the Hawaiian Kingdom and dedicate myself and my work to honoring this land.	Thank you for your comment
7/23/2023 15:22	I am in favor of releasing the mosquitoes. If we lose the native birds, we lose the native plants they pollinate in the mountains. If we lose the native plants in the mountain we lose our water down here. The hawaiian ecosystem is special and fragile, we need to do all we can to protect every aspect of it, not just the ones certain people know or care about.	Thank you for your comment
7/23/2023 15:23	Please do whatever you can to suppress mosquitoes and improve the chances of survival for Kaua‘i’s forest birds. Human disturbances have put the birds in this dire situation, and it is our responsibility to use well informed science to prevent their extinction.	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 15:24	Aloha. I really hope that we can proceed with Wolbachia mosquito releases on Kaua'i and that you realize that the conspiracy theorists of Hawaii Unites claims' are all totally invalid. We need this to save our native birds! This is their last chance to avoid extinction. Please, this needs to pass. Respectfully, Kamuela, HI	Thank you for your comment
7/23/2023 15:30	Aloha, I have read the draft Environmental Assessment for Kaua'i Mosquito Suppression employing the release of male mosquitos with incompatible Wolbachia. (or most of it!) I also read the EA for the Maui project. I hope that this EA is accepted, issued a FONSI and that the next steps of this critically needed project can rapidly proceed. I acknowledged that this is no quick, easy or sure fix to save the most endangered Kaua'i honeycreepers. But the proposed alternatives all amount to the do nothing alternative. I acknowledge that there will be noise from the dispersal methods of fixed wing airplanes and helicopters and probably drones too. The forests and the people using the parks within the project area are already affected by constant airplane and helicopter operations with no purpose but to show magnificent scenery to vacationers. Meanwhile, the treasures of the forest, its voices, its propagators, the miracles of Hawai'i's unique evolution are perishing. Thank you. With Aloha, Kīlauea, HI 96754	Thank you for your comment
7/23/2023 15:37	I am in full support of the draft Environmental Assessment for Kaua'i Mosquito Suppression to save Kaua'i forest birds from extinction.	Thank you for your comment
7/23/2023 15:53	I have been to the forests on Kauai numerous times over the last decade. When I first visited the Alakai in 2011, Akikiki were still a regular sight. Knowing they will be gone from the wild in a matter of months is heartbreaking. We should be taking every possible measure to protect Hawaii's native birds. This is the very last chance.	Thank you for your comment
7/23/2023 16:00	We must do everything in our ability to save Hawaii's forest birds before it's too late. The people that are opposed suck more than the mosquitoes! They should have to lie naked in a mosquito swarm and say they would rather have that than the sight and sound of our beautiful native birds overhead. Birds not mosquitoes! For our keiki and the future! I am 100% in favor of Kauai Mosquito Suppression and hopefully the rest of the state to follow. Mahalo.	Thank you for your comment
7/23/2023 16:03	The implementation of this program is critically urgent. The degree of anthropogenically caused extinction in Hawaii is tragic and we need to do everything we can to save the remaining endemic species from extinction. This program may be our last hope given the rapidly accelerating decreases in the native honeycreeper population.	Thank you for your comment
7/23/2023 16:08	It is vital that the people working to preserve native bird populations on the islands of Hawaii have access to all possible tools. In this case there is no evidence that this method of mosquito management will have any negative impacts on human health. Do not allow uniformed fear mongering control wildlife management. Protect native birds.	Thank you for your comment
7/23/2023 16:10	It would be shameful to lose an endemic species when there are science-backed mitigation strategies available. Hawaii has lost too many endemic species already, and I don't think anyone would be able to look back with any level of pride if we lost another in 2023. Please consider this my full support of moving forward with mosquito control on Kaua'i	Thank you for your comment
7/23/2023 16:14	I support Wolbachia IIT to save Hawaiian forest birds. It is critical we use every science backed resource we have to attempt to save these species. It would be an incredible waste to not use this technology.	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 16:14	I support the use of Wolbachia and any other major ecological interventions to save remaining Hawaiian honeycreepers for many commonly-stated ecological reasons, but also because the extinction of the Hawaiian honeycreepers is a stain on the US' international environmental reputation and a rhetorical weakness as we preach biodiversity conservation to countries in the global tropics. We cannot keep telling Brazil and Indonesia to care for their rainforest birds when we have lost a third of our own.	Thank you for your comment
7/23/2023 16:15	Mosquito suppression is essential for the survival of at least four different native bird species. Hasn't colonialism taken enough from Hawaii? Please help stop this and save our birds <3	Thank you for your comment
7/23/2023 16:23	Hello, I'm writing this email in support of Wolbachia IIT to save Hawaiian birds. Over the past decades, we have observe huge declines in Hawaiian honeycreepers due to mosquitoes. Mosquitoes in Hawaii are recent and unnatural, leading to severe mass extinctions. I support the Environmental Assessment to give Hawaiian birds a chance. Best	Thank you for your comment
7/23/2023 16:28	We have already lost so much in Hawaii. Don't let the 'akikiki go the way of so many other species. History will see what we do. Do right.	Thank you for your comment
7/23/2023 16:33	Please save our indigenous birds by suppressing mosquito and disease prevalence. Thank you.	Thank you for your comment
7/23/2023 16:33	Hawaii's Honeycreepers are on the verge of extinction, with many already extinct from mostly human error and arrogance. IIT has the potential to save what is left. These birds should be protected and saved for many reasons. Not only for the importance of preserving biodiversity but also for the impact they will have on local communities and culture as a whole. Many native birds are celebrated by locals and are a part their history as well as natural history. They also help boost local economies through ecotourism, as many birders want to see them. Birding, mind you is one of if not the fasting growing outdoor hobbies in the country! So yes these birds should be saved and methods like IIT which are backed by sound science should be utilized to protect them!	Thank you for your comment
7/23/2023 16:36	Aloha, I am opposed to the draft Kaua'i EA for the suppression of Mosquitoes using the Incompatible Insect Technique. The EA does not contain sufficient detail for the public to evaluate and fails to provide of risk assessment for bio security of lab rearing, transport, or release of Wolbachia infected mosquitoes. There are many potential secondary impacts to include antibiotic resistance, increase pathogen infection, accidental female escape, and lab reared male mosquitoes (which can be intentionally co opted as a bio weapon by bad actors) can pass pathogens to females thru mating. There is insufficient proof of the actual mosquito population and rate of infection of Plasmodium relictum in proposed area. Most disturbing, is the funding behind Wolbachia research since 2002 and other connected grants thru NIH and human health includes the Bill and Melinda Gates Foundation which openly supports human depopulation and Agenda 2030 which is based on a climate emergency hoax. Furthermore, there seems to be corporate agenda leading in the direction of synthetic biology as a form of mosquito control which no one wants in Hawaii. I'm a very concerned citizen.	Concerns: 9, 12, 13, 26, 36,

Entry Date	Comment	Responses
7/23/2023 16:47	Aloha, I am writing here now to express how important it is that we, as the community of Hawaii , do everything we can to save the remaining native bird species of our homeland. I support incompatible insect technique to save out manu population. These birds are our ohana and our kuleana and this proposed method of protection is a useful way to protect them from extinction. Mahalo nui.	Thank you for your comment
7/23/2023 16:50	The basis of this project seems to be a remarkable solution to limit the mosquito population. Already these wolbachia incompatatble mosquitos are used to tackle other cases such as malaria. I agree that done so correctly, it would not effect the ecosystem to a great extent.	Thank you for your comment
7/23/2023 16:51	Aloha, As a native Hawaiian and conservationist I support this use of IIT to reduce mosquito populations as described in the proposal. This is a necessary and safe measure we must use to prevent the imminent extinction of the 'Akikiki and 'Akeke'e not to mention the other manu whose populations are also declining. It is clear that this release and use of naturally occurring wolbachia will have no negative impacts on humans. People who say otherwise need to educate themselves. We owe it to our native birds to do our very best and use the most effective tools and technology at our disposal to help them survive, which at this time includes IIT. Please do what is right and approve this proposal to prevent the extinction and continued decline of our precious manu. Once they are lost we cannot get them back. So many have been lost to us already.	Thank you for your comment
7/23/2023 16:54	Aloha board members, I am writing to express my support of the Wolbachia program to reduce mosquito populations in Hawai'i. I feel strongly that this program should be implemented as soon as possible because if action isn't taken immediately we risk losing our native forest birds completely. Wolbachia is a scientifically supported solution with proven results. It's not an experiment, it's been safely used with good results in other places like California, Texas, Mexico, and Australia to stop the spread of mosquito-borne diseases that sicken humans. In fact, 15 different countries, including the continental U.S. have used Wolbachia to decrease mosquito populations. It's natural, non-GMO, and safer than pesticides. There is a lot of misinformation floating around but Wolbachia doesn't hurt people, or animals that eat mosquitoes, or change the water supply in any way. Wolbachia is already in the environment—nature healthily coexists with all kinds of bacteria, we even need them in our gut to help digest food. Mosquitoes are not native and do not belong in Hawai'i. Additionally, no native species depend on them for food. They are, in fact, a plague on native wildlife. It is vital we fix this situation because the extinction of multiple species of birds, known only to exist here in Hawai'i, hinges on humans making the right decisions and doing the right things to correct the mistakes we ourselves have caused to this unique and fragile ecosystem we call home. Humans brought mosquitoes to Hawai'i in the 1800s and we have to be the ones to do the work to get rid of them now. We cannot dismiss the immediacy of this crisis. There is no recovery from extinction. Hawaiian honeycreepers are facing challenges and this is an area we can truly help have a positive impact. Do we really want to wake up one morning and hear the news that we have lost the last 'i'iwi? How will we feel if we can only describe them to our youngest family members and know they'll never see one for themselves because they are all gone? How will we feel if we know we missed a chance to save them? Our native birds attract tourism dollars for our economy but more importantly, they are valuable to Hawaiian culture, Hawaiian history, and Hawaiian identity. We should celebrate them because they are precious, inspiring, stunning, and they only exist here in these magnificent islands. They need our help and we will surely regret not meeting these challenges with decisive action if they disappear forever.	Thank you for your comment

Entry Date	Comment	Responses
	One of the most beautiful things about our species is our indefatigable ability to solve complex problems and this comes into no greater light than we fix the problems we ourselves created. By reducing mosquito reproductive rates by implementing the Wolbachia bacteria plan we will see less mosquito larvae squiggling in the puddles. That's a win for birds and a solid win for us! Thank you sincerely for your time	
7/23/2023 16:56	Save the honeycreepers! Implement the incompatible mosquito program now.	Thank you for your comment
7/23/2023 17:08	Aloha, Please find my attached PDF testimony in opposition to the Draft Environmental Assessment for Kaua'i Mosquito Suppression. There are some very serious concerns outlined in this extensive document. Mahalo for your service, . Kamuela, HI Sent with Proton Mail secure email. [TEXT COPIED FROM PDF] Attention: Mosquito Control Project Kaua'i Department of Land and Natural Resources U.S. Fish and Wildlife Service Aloha This testimony is in regards to draft Kaua'i Environmental Assessment (EA) completed in June 2023. I am strongly opposed to the request for Anticipated Finding of No Significant Impact (AFONSI) for the release of lab bred Wolbachia southern house mosquitoes in Kaua'i and all Hawaiian Islands for numerous reasons documented in this extensive testimony. There is insufficient detail for the public to properly evaluate the EA as being safe for the environment. The Kaua'i draft EA requires much more study on secondary impacts with no less than a full scope Environmental Impact Statement (EIS) since mosquitoes are a vector of disease. The Incompatible Insect Technique (IIT) is being promoted in the EA as a mosquito control method to help save endangered birds from avian malaria. Page 9 of the EA states this technique has been successfully implemented in 14 countries and 4 cities in the United States, but fails to list the countries and projects that are connected. The only Wolbachia program that has been implemented worldwide at this scale is the World Mosquito Program funded by The Bill and Melinda Gates Foundation. This is a different method involving Aedes aegypti males and females released into urban areas for population replacement to control Dengue fever, a human disease. The World Mosquito program chart on its website lists difference between the methods used worldwide. The IIT method proposed for Maui and Kaua'i "relies on the continuous production and release of male mosquitoes and is, therefore, more expensive than the World Mosquito Program's method. There is no field evidence that it can reduce the risk of mosquito- borne diseases." https://www.worldmosquitoprogram.org/en/learn/how-our-method-compares The IIT method has never been used for conservation purposes or with the species Culex quinquefasciatus (southern house mosquito) anywhere worldwide. This is an experiment based on several unsound justifications and references. Federal documents admit the outcome is unknown. The public has already voiced numerous concerns about the release of lab bred mosquitoes in response to the Maui EA which is now being challenged in environmental court to seek a ruling to require an Environmental Impact Statement. No further actions should be taken to release biopesticide mosquitoes anywhere Hawai'i while the need for further study of the risks is actively being litigated.	Concerns: 1, 2, 4, 7, 8, 9, 11, 12, 13, 14, 19, 23, 31, 33, 36

Entry Date	Comment	Responses
	Since spring 2022, as a veteran in National Security and Investigations for over 30 years, I have personally studied the science in depth behind the use of Wolbachia for mosquito control. After reviewing thousands of pages of scientific papers, environmental assessments, government documents, videos, interviews, funding, and grants related to Wolbachia; as well as consulting with experts regularly; what stands out from all this research is that Wolbachia bacterium strains are still being discovered and its impacts are yet to be fully understood. Its influence on other life forms; including humans, native birds, arthropods and filarial worms' reproductive cycle and pathogen infection (either to block or promote) is still in process of being vetted. Science is still grasping the mechanisms of Wolbachia as documented on page 32 of Evaluation of Existing EFSA Guidelines for their Adequacy for the Molecular Characterization and Environmental Risk Assessment of Genetically Modified Insects with Synthetically Engineered Gene Drives. "The mechanism of Wolbachia-induced pathogen-blocking is not well understood (Marshall et al., 2019). Yet, this feature, along with the gene drive-like inheritance pattern of Wolbachia, has been harnessed in replacement strategies to limit disease transmission by mosquito populations." http://www.ask-force.org/web/EFSA/EFSA-GMO-Panel-Gene-drive-document-for- consultation-20200129.pdf We are awaiting results of grants researched out of Penn State University thru NIH including WOLBACHIA-INDUCED ENHANCEMENT OF HUMAN ARBOVIRAL PATHOGENS. "A SOBERING REMINDER THAT THE PATHOGEN INHIBITORY EFFECTS RESULTING FROM WOLBACHIA INFECTION IN SOME INSECTS CANNOT AND SHOULD NOT BE GENERALIZED ACROSS VECTOR-PATHOGEN SYSTEMS. UNDERSTANDING THE GENERAL ARE CRITICAL FOR ESTIMATING HOW LIKELY WOLBACHIA-BASED CONTROL STRATEGIES ARE TO FAIL OR MAKE THINGS WORSE, FOR IDENTIFYING POTENTIAL POINTS WHERE WOLBACHIA-BASED CONTROL IS LIKELY TO BREAK DOWN IN THE FIELD, AND FOR PLANNING RISK MITIGATION STRATEGIES IN HE CASE OF UNFORESEEN HARMFUL OUTCOMES. IN THIS RESEARCH, WE WILL INVESTIGATE THE HYPOTHESIS THAT WOLBACHIA-INDUCED MODULATION OF THE MOSQUITO HOLOGENOME CAN LEAD TO INCREASED ARBOVIRUS INFECTION/TRANSMISSION IN SOME VECTOR-PATHOGEN SYSTEMS OF HUMAN IMPORTANCE." https://govtribe.com/award/federal-grant-award/project-grant-r01ai116636 Wolbachia Potential to Increase Pathogen Infection The Southern House Mosquito can transmit Avian Malaria, Avian Pox, Western Equine Encephalitis, West Nile Virus, Canine Heartworm, Lymphatic Filariasis/Elephantiasis, St. Louis Encephalitis and is a potential vector of Zika virus. There are Wolbachia studies that have shown it to increase pathogen infection in some instances "Mosquitoes infected with the bacteria Wolbachia are more likely to become infected with West Nile virus and more likely to transmit the virus to humans, according to a team of researchers." "The results suggest that caution should be used when releasing Wolbachia-infected mosquitoes into nature to control vector-borne diseases of humans." https://www.sciencedaily.com/releases/2014/07/140710141628.htm Wolbachia Enhances West Nile Virus (WNV) Infection in the Mosquito Culex tarsalis https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0002965 Wolbachia Can Enhance Plasmodium Infection in Mosquitoes: Implications for Malaria Control? https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4154766/ Antibiotic Resistance Page 12 of Kauai EA states: "To produce the incompatible male southern house mosquitoes for this project, a laboratory line of Hawai'i mosquitoes was generated with the wAlbB strain of Wolbachia. This was accomplished through a multi-step process that	

Entry Date	Comment	Responses
	involved rearing Hawai'i mosquitoes in the lab and removing the wPip Wolbachia from their bodies with common antibiotics. The wAlbB strain of Wolbachia was then transferred into the eggs of these Wolbachia-free Hawai'i mosquitoes." Use of this method over time with constant releases can lead to antibiotic resistance with unknown effects on the environment and can cancel out effectiveness of treatment for diseases in which Wolbachia is implicated in humans which is highly concerning. The endosymbiont Wolbachia rebounds following antibiotic treatment https://pubmed.ncbi.nlm.nih.gov/32639986/ Previous mosquito control projects in California and Cayman Islands using Genetically Modified (GM) mosquitoes (which also uses antibiotics during lab rearing) have not renewed contracts. "Cayman Island officials were set to renew their contract. But data from the trials indicated serious problems, leading the territory's environmental health minister to tell the Edmonton Journal, the scheme was not getting the results we were looking for. There was further concern that the released mosquitoes could be spreading antibiotic resistance or make mosquito-borne diseases worse by lowering individual immunity." Modified Mosquitoes Fail to Beat Malaria https://www.pressreader.com/canada/edmonton-journal/20181126/281951723871847 "British biotechnology company Oxitec is withdrawing its application to release billions of genetically engineered mosquitoes in California, according to a recent update from the California Department of Pesticide Regulation." https://beyondpesticides.org/dailynewsblog/2023/05/efficacy-and-health-issues-stop- release-of-genetically-engineered-mosquitoes-in-california-florida-continues/ There are parallels between GM and Wolbachia techniques. Biologically Wolbachia lab infected mosquitoes are not GM mosquitoes, but the study designs, math, and adherence to protocol apply to both situations. The main biological difference is there is slower horizontal transfer of mutations of the GM mosquito than with horizontal transfer of Wolbachia. This means Wolbachia as a natural gene drive has the potential to have greater unknown impact on the environment, which necessitates the need for a full scope Environmental Impact Statement (EIS). Horizontal Spread, Vertical Transmission, and Wolbachia as Gene Drive "The evidence of horizontal spread of Wolbachia shows that the bacteria go not only to sexual cells, but also to somatic cells (non-sexual cells of the body). Wolbachia can also live outside of the intra-cellular systems for several months." Wolbachia Horizontal Transmission Events in Ants: What Do We Know and What Can We Learn? https://pubmed.ncbi.nlm.nih.gov/30894837/ Horizontal Gene Transfer Between Wolbachia and the Mosquito Aedes aegypti https://bmcgenomics.biomedcentral.com/articles/10.1186/1471-2164-10-33 This document submitted by Oxitec to the EPA in 2015 outlines numerous legitimate and studied issues regarding the use of Wolbachia. https://downloads.regulations.gov › EPA-HQ-OPP-2015-0374-0018 › attachment_1.pdf "Wolbachia is a bacterium residing within the cells of insects, and is passed through vertical transmission from mother to offspring. Even a single Wolbachia infected female could lay hundreds of eggs that would invade the wild population, rendering the Incompatible Insect Technique ineffective and spreading a new strain of Wolbachia into the environment. Modelling has shown that conditions of lower competition can favour infected females [6-8]. In other words, as a mosquito population is reduced, or if a population is already low, the chances of Wolbachia invading the wild population are increased." "The Wolbachia is an endosymbiont on the cytoplasm of the cell so over a thousand new genes are introduced into the insect cells, some or all of which have the potential to randomly integrate into the insect's nuclear genome with unknown consequences.	

Entry Date	Comment	Responses
	Moreover, the possible persistence of Wolbachia mosquitoes themselves is a significant concern. For the reasons set forth below, each new strain of mosquito, or indeed any artificially Wolbachia infected insect needs to be treated as a new strain and thoroughly tested in the laboratory before any field releases." "The whole genome of Wolbachia can transfer to a host genome, meaning a host mosquito could be transformed with over one thousand new genes with unpredictable results [2-5]." "It has already been shown that horizontal gene transfer (HGT) can transfer genes between Wolbachia and its host in Aedes aegypti [12] and several other mosquito species [13]. Therefore, Wolbachia can genetically transform its host with functional genes with currently unknown consequences." "Horizontal transmission between unrelated host species is a proven phenomenon in Wolbachia [25]. Studies have demonstrated that genetic sequences, ranging in size from Horizontal transmission between unrelated host species is a proven phenomenon in Wolbachia [25]. Studies have demonstrated that genetic sequences, ranging in size from single genes to entire bacterial genomes, have been transferred from Wolbachia to many of their insect hosts [2-5], and its effect on disease transmission is variable and potentially dangerous." Owain Edwards of CSIRO in Australia (Commonwealth Scientific and Industrial Research Organisation) was involved in the Aedes aegypti trial around Innisfail (Beebe et al 2021) that was funded by Verily Life Sciences. Dr. Edwards refers to Wolbachia as a type of natural gene drive during his 2016 presentation for APVMA. https://www.youtube.com/watch?v=Lm_WS9eXYIU Dr. Edwards elaborates there are limitations on the use of Wolbachia application over time which can lead to limited choice of genes and for the Wolbachia technique to remain effective at suppressing mosquito population, a variety of natural strains are needed. The next step in the process is explained using CRISPR technology - synthetic gene drives. Dr. Edwards emphasizes while working on synthetic gene drives, "it requires double and triple containment to make sure these don't get out of the laboratory." This is concerning since page 32 of EA says, "DLNR is also exploring future options for establishing a state-run mosquito-rearing facility in Hawai'i; mosquito sources could also originate from a similar but state-run mosquito-rearing facility in the future. Should DLNR pursue this option, the appropriate regulatory permits and documentation (environmental reviews and facility compliance) would be necessary." Federal documents state plans for future tools to include synthetic gene drives, next generation tools, synthetic biology control tools, novel technology deployment, and precision-guided Sterile Insect Technique (pgSIT) (CRISPR technology) in Hawai'i. While "technology for this approach is not available for near-term implementation," development and deployment of these tools appear to be a long-term goal at the federal level." U.S. Department of the Interior Strategy for Preventing the Extinction of Hawaiian Forest Birds – https://www.fws.gov/sites/default/files/documents/DOI%20Strategy%20for%20Preventin g%20the%20Extinction%20of%20Hawaiian%20Forest%20Birds%20%28508%29.pdf Wolbachia DNA into Host DNA – "A team of researchers has discovered that a bacterial parasite (called Wolbachia) can insert almost its entire genome into the genomes of members of one host species (a fly called Drosophila ananassae), and can insert parts of its genome into the genomes of members of several other host species." https://www.nsf.gov/news/news_summ.jsp?cntn_id=109957 Lack of Bio-Security There has been no documentation offered to the public outlining risk analysis conducted on the security vulnerabilities for lab bred mosquitoes that can be utilized as bio- weapons against a population (intended) nor details of quality control mechanisms for accidental transmission of pathogens (unintended). This includes failure to discuss how they will deal with accidental female escape, wind drift, or how male lab bred culex q. mosquitoes released into the wild can pass pathogen to biting females thru mating and shared feeding/water sources. The public has no idea how these lab mosquitoes will be quality controlled and tested.	

Entry Date	Comment	Responses
	Intended entomological warfare involves infecting insects with a pathogen and then dispersing the vectors over target areas. Invasive insects can also be deployed into a country en masse to take out crops and cripple a food supply. In New York the Plum Island lab was involved in the development of offensive bioweapons that led to Lyme's disease outbreaks. Japan's biological warfare unit (Unit 731) was deployed against China during World War II. The unit deployed plague-infected fleas and cholera-infected flies to take out the Chinese. https://citizens.news/694097.html "We recommend careful invigilation of the international borders, airports, and seaports by the trained scientists to identify any accidental and/or deliberate import of alien arthropod vectors. Therefore, it is well advised to take seriously the possibility that arthropod could be used to attack people. Moreover, future research priorities should also includes high-throughput molecular diagnostics of diseases, identification of vectors, phylogenetic studies to understand the origin and distribution of the pathogen and vector strains. A rapid action team of trained scientist and health workers equipped with modern sophisticated diagnostic tools and suitable vector extinguishers should be appointed by the state and/or central health authorities to counter act any such emergency". Bioterrorism on Six Legs by Dr. Manas Sarkar. A patent was developed in 2014 involving drones that transport and release mosquitoes. It mentions in the patent these drones can be co-opted for bio-weapons military programs. https://patents.google.com/patent/US8967029B1/en Page 23 of the EA states "By contrast, male's proboscises are adapted to primarily feed on plant nectar and secretions, and do not feed on blood (Mullen and Durden 2009). Therefore, male mosquitoes cannot transmit disease." This is incorrect and misleading to the public since we come to find male lab bred mosquitoes can pass pathogens to wild biting females thru mating and shared feeding/water sources. Venereal Transmission of St. Louis Encephalitis Virus by Culex quinquefasciatus Males (Diptera: Culicidae) – Donald A. Shroyer (Journal of Medical Entomology, 5/1990) https://academic.oup.com/jme/article-abstract/27/3/334/2220754?login=false There is no mention in the Kaua'I EA on how lab batches will be quality controlled or tested for unintended pathogens upon arrival to Hawai'i or if lab employees in contact with these mosquitoes will go thru security clearance screening and training. No documented assurances have been made to the public that lab suppliers will be testing mosquitoes for human, equine, canine, or avian diseases to ensure that they are pathogen-free prior to shipping to Hawai'i. The science and tech industry in the United States, to include Silicon Valley and Academia, has been heavily infiltrated by the Chinese Communist Party (CCP) and non-government organizations such as Davos and the World Economic Forum whom have been strongly pushing Agenda 2030 thru climate change initiatives. Due to the deterioration of relations between the US and China, among other adversaries, mosquito control releases should not move forward until sound security protocols are adequately implemented. https://www.justice.gov/opa/pr/harvard-university-professor- and-two-chinese-nationals-charged-three-separate-china-related The Bill and Melinda Gates Foundation (Gates), also connected to the above-mentioned entities, are strong proponents of climate agenda and have openly discussed support of human depopulation. This is the same foundation that has been funding ongoing research of Wolbachia (World Mosquito Program and numerous grants) and GM mosquitoes including Oxitec since 2002. Gates has also funded research developing anti-malaria vaccines using mosquitoes as a delivery system which is highly concerning. https://www.npr.org/sections/goatsandsoda/2022/09/21/1112727841/a-box-of-200- mosquitoes-did-the-vaccinating-in-this-malaria-trial-thats-not-a-jo Wolbachia Has Been Implicated in Human Disease Wolbachia is NOT harmless to humans. It effects filarial worms that cause human disease such as river blindness and is implicated in Elephantiasis. These diseases effect millions of people each year. According to the CDC website, "There is a promising treatment	

Entry Date	Comment	Responses
	using doxycycline that kills the adult worms by killing the Wolbachia bacteria on which the adult worms depend in order to survive". https://www.cdc.gov/parasites/onchocerciasis/treatment.html "For decades, people have blamed a parasitic nematode worm for a disease that has blinded at least 250,000 people now living in Africa and South America. But the real culprit may be the ubiquitous Wolbachia, bacteria that colonize many hundreds of species, including the worm indicted in river blindness. Researchers now report that Wolbachia stimulate the severe immune system response that slowly robs people of their vision". https://www.science.org/content/article/worms-may-not-act-alone-river- blindness Anti-Wolbachia therapy for onchocerciasis & lymphatic filariasis: Current perspectives https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6755775/ Efficacy of 2- and 4-week rifampicin treatment on the Wolbachia of Onchocerca volvulus https://pubmed.ncbi.nlm.nih.gov/18679718/ The Kauai EA's assertion that released mosquitoes pose no risk to human health is based on unsound science. On page 25 of the EA it says "Wolbachia cannot live within vertebrate cells and cannot be transferred to humans even through the bite of a mosquito that carries it (Popovic et al. 2010). " In contrast we know science is recently discovering detection of Wolbachia genes in humans: Detection of Wolbachia genes in a patient with non-Hodgkin's lymphoma https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(14)00040- 8/fulltext "Wolbachia 16S rRNA and fbpA genes were twice detected over 5 days in the blood of a patient with high fever. The patient was given fluoroquinolones and the fever resolved. Four weeks later, he was diagnosed with non-Hodgkin's lymphoma and received R-CHOP (Rituximab, Cyclophosphamide, Doxorubicin, Vincristine, Prednisolone) treatment resulting in complete remission. This is the first report of detection of Wolbachia genes from the blood of human patients with non-Hodgkin's lymphoma." The 2010 article by Popovici et al. cited in the EA has been discredited by the EPA. The EPA Human Studies Review Board met in 2018, and the following question was posed: "Is the research described in the published article 'Assessing key safety concerns of a Wolbachia-based strategy to control dengue transmission by Aedes mosquitoes' scientifically sound, providing reliable data for the purpose of contributing to a weight of evidence determination in EPA's assessment of the risks to human health associated with releasing Wolbachia-infected mosquitoes?" The Board's response states: "The Board concluded that the research described in the article by Popovici et al. was not scientifically sound and does not provide reliable data to contribute to a weight of evidence determination for assessment of human health risks due to release of Wolbachia-infected mosquitoes." Inconsistent Climate Data and Mosquito Population Trends The EA states, "Some climate change models suggest that the mean temperatures in Hawai'i may increase by 3°– 4°C by 2100 (Hayhoe et al. 2018). The effects of climate change have been found to result in increased stress to natural systems through altered temperatures and rainfall patterns (Alexander et al. 2016). Increases in mean temperatures, for example, have facilitated the spread of mosquitoes and avian malaria into habitats where cool temperatures very recently limit mosquito presence and transmission of malaria to highly susceptible endemic forest birds (Atkinson et al. 2014)." Contrary to the above claims, from 1978 to 2017 (0 to 1600 meters) Kagawa and Giambelluca 2019, Spatial Patterns and Trends in Surface Air Temperatures and Implied Changes in Atmospheric Moisture Across the Hawaiian Islands, 1905–2017. Researchers summarized data from weather stations on several islands pooled together. They extended the range of observations to the year 2017. Daytime cooling was noted at upper elevation below the trade wind inversion that is consistent with observed cooling of −0.2 to −0.8°C/decade at multiple high elevation stations during 1988–2013 (960–2,990 m; Longman, Giambelluca, et al., 2015). https://agupubs.onlinelibrary.wiley.c	

Entry Date	Comment	Responses
	Additional skepticism to global warming trend is gaining momentum among the scientific community. The World Climate Declaration – There is no Climate Emergency was signed by over 1580 vetted scientists and continues to grow. https://clintel.org/wp-content/uploads/2021/03/WCD-A4version09202013.pdf Greenpeace Founder Patrick Moore Says Climate Change Based on False Narratives https://www.theepochtimes.com/science/exclusive-former-greenpeace-founder-patrick- moore-debunks-the-false-narratives-of-climate-change-4709568?rs=SHRDHWFRF Climate Activists Invest in Property on Beaches They Say are Disappearing https://www.washingtonexaminer.com/politics/climate-activists-invest-property-beaches- climate-change-sea-rise In 2013 Lisa Crampton and Anouk Glad conducted a study of Plasmodium relictum infection in Culex quinquefasciatus. The rate of capture of adult mosquitoes and Plasmodium relictum percentage was extremely low at Alakai Plateau of Kaua'i. https://onlinelibrary.wiley.com/doi/pdfdirect/10.1111/jvec.12157 Vol. 40, no. 2 Journal of Vector Ecology 225 "The infection rate of Plasmodium relictum is also essential to understanding the transmission rate to birds on the Alakai Plateau. We screened 17 mosquitoes caught at Halepa'akai and 16 mosquitoes caught at Kawaikoi in October and November for P. relictum infection using PCR. One mosquito from Halepa'akai tested positive for infection. We dissected 33 mosquitoes caught at Kawaikoi (winter and spring); none of them tested positive for infection by P. relictum (neither oocysts nor sporozoites were observed). Only three mosquitoes caught at Halepa'akai (January) were dissected, and none of them were infected (neither oocysts nor sporozoites were observed). Thus, the prevalence rate of P. relictum in our study is 1.45% (n=69)." Page 34 of EA uses mosquito estimates documented over 10 years ago from Hawai'i Island. "Estimates range from an abundance of approximately 600 mosquitoes per acre near sea level on Hawai'i Island where monthly temperatures average 70–75° F, to an abundance of five mosquitoes per acre at an elevation of approximately 4,000 feet where temperatures average 55–60° F (Samuel et al. 2011, Atkinson et al. 2014)." Page 19 of EA states "Mosquito populations and avian malaria have recently expanded into higher elevation habitat, which is the last refugia for these endangered avian species." I could not find a reference study proving the mosquitoes are invading higher elevations in the proposed release areas in Kaua'i or recent documentation on the prevalence rate of Plasmodium relictum since the Crampton and Glad study in 2013. Verily Life Sciences and Rhodamine B Verily's registrant representatives are listed in the Department of Agriculture Import Application - https://hdoa.hawaii.gov/wp-content/uploads/2018/05/HDOA-Mosquito- Request-PA_Final-6.8.21.pdf - and are co-authors of Mark Release Recapture of Male Aedes aegypti use of Rhodamine B to Estimate Movement, Mating and Population Parameters for an Incompatible Male Program https://www.researchgate.net/publication/345648051_Title_Mark-release-recapture_of_male_Aedes_aegypti_Diptera_Culicidae_use_of_rhodamine_B_to_estima te_movement_mating_and_population_parameters_in_preparation_for_an_incompatibl e_male_program The EA mentions no use of the toxin Rhodamine B. Will Rhodamine B be used in Kauai's MMR studies? Is there potential ongoing use of Rhodamine B could have implications on land and aquatic lifeforms? https://www.sciencedirect.com/science/article/abs/pii/S0045653521025522 Rhodamine B (RhB) is among the toxic dyes due to the carcinogenic, neurotoxic effects and ability to cause several diseases for humans. https://pubmed.ncbi.nlm.nih.gov/33857893/	

Entry Date	Comment	Responses
	In Summary I am opposed to request for approval of the draft Kauai Environmental Assessment for the numerous reasons documented in this testimony. Sections of the EA lack sufficient detail, contain outdated references and EPA discredited sources. It is unfortunate this project is being fast tracked and in hindsight, a full scope EIS should have been completed years ago. I am additionally concerned the use of Wolbachia IIT as a mosquito suppression method to save the birds will not have the intended outcome, according to the World Mosquito Program "there is no field evidence it can reduce the risk of mosquito born diseases". The logical next step already in discussion in Federal documents would be a segway into controversial and potentially dangerous synthetic gene drive technology in which corporate gain will be at the expense of the Hawaiian ecosystem. Respectfully, Kamuela, HI	
7/23/2023 17:10	Please implement this mosquito control action to give Hawaii's honey creepers a chance at continued existence. The no action alternative would be an unfathomable loss to our national avifauna and cultural and biological heritage. Thank you,	Thank you for your comment
7/23/2023 17:11	I support Wolbachia IIT to save Hawaiian forest birds by suppressing mosquitos and the threat they pose to the continued existence of several species of endemic birds. Without action, several species of honeycreepers, which are only found in Hawaii, will face extinction. Never again will Hawaii have their songs.	Thank you for your comment
7/23/2023 17:17	Please consider my testimony AGAINST any release of mosquitoes on any of the Hawaiian islands. It is a very concerning development that mosquitoes have already been released in eastern Maui. More thorough research, testing and environmental studies are definitely required. Please do not think that we can interfere in a complex environment like Hawaii's ecosystem without triggering undesirable and unexpected consequences. This is a living disease vector for animals and humans that has spread misery throughout the world. What a precious natural environment to be experimenting on. I can't even believe we would even remotely consider this.	Concerns: 2, 9, 10, 11, 19
7/23/2023 17:19	Just pass the damn thing. I don't have time to read it but we need to save these species.	Thank you for your comment
7/23/2023 17:20	Hello, I support Wolbachia IIT to save Hawaiian forest birds. Whatever can be done to save the last few remaining precious native honeycreepers on the Hawaiian Islands, in my opinion, should be done after humans have done so much to eviscerate this group. The least we can do is try to help protect them from avian malaria and other mosquito-borne diseases. Please, value these birds.	Thank you for your comment
7/23/2023 17:20	The environmental impact of doing nothing is unacceptable. This project should receive a finding of no significant impact and expedited. Humans depend on a complex web of life. Weakening one link weakens the web. Mahalo the birds. Mahalo	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 17:20	I support Wolbachia IIT to save Hawaiian forest birds because without an immediate plan to save the birds, they will go extinct. Avian malaria is the biggest threat to the survival of the native forest birds and mosquito control is the most pragmatic solution in all senses to combat this threat. Mosquito species infected with a different strain of wolbachia have been released elsewhere around the world to combat threats brought upon mosquito borne diseases. IIT is a proven concept and the use of Wolbachia strategies is the most ideal to swiftly take action. Studies have shown the failure of horizontal transfer of differing wolbachia strains from mosquitoes already infected to non-infected mosquitoes. There is no external threat to releasing these mosquitoes and only positive outcomes can be expected, backed up by scientific research. The time is now, before the remaining birds fall to avian malaria and our native forests will no longer be home to native forest birds.	Thank you for your comment
7/23/2023 17:21	Aloha, I am a Honolulu resident, an artist, a small business owner, and a volunteer for the Hawai'i Wildlife Center. My artwork is featured on this year's Hawai'i Conservation Stamp and I am writing in support of the Wolbachia program. In the past several years, I have witnessed interest in native birds surge among the community as evidenced by social media, art, and volunteerism. Social media groups focusing exclusively on Hawaiian birds have a combined following of over 55,000 people across multiple platforms. These individuals dream of seeing native birds flourishing in Hawaiian forests and now we have the opportunity to make that happen. The decline of Hawaiian birds is directly tied to human activity, including the introduction of mosquitoes and the rapid advancing of climate change that allows these pests to climb higher into the last havens of island birds. This is a chance to clean up our mistakes. The science is sound and the evidence of success can be seen in the US and globally. We can be confident in moving forward. The concerns of the opposition have been thoroughly addressed by the science community, however we continue to hear the same fearful speculations repeated. In response, I would like to remind the board that the introduction of mongoose was not, in fact, the result of a studied biocontrol but rather the whim of a farmer.—not the same thing at all. I'd also like to remind the board that nothing new is being created in the Wolbachia technique because this bacteria already exists in the environment around us. There is no gene altering taking place. There is no chance of creating a new type of mosquito. These are the same mosquitoes that have spread all over the world and we would be using the same method to mitigate their numbers as other countries. There will always be members of the community whose fear of doing something new is greater than their fear of doing nothing at all, but if we as a species embraced that kind of fear we would never have progressed to the places we are now. The fear manufactured around something already successfully in use in the US is a waste of our energy, resources, and time. It's likely, regardless of the decision today, that Wolbachia will eventually be used here to limit the mosquito-borne diseases that sicken humans. But having this effective control method already in place could prevent suffering, loss of life, and the economical impact of a public health crisis. I beg the board to not delay this program. A time consuming EIS (Environmental Impact Statement) will seal the fate of multiple species. Let's not make that mistake. Safety and effectiveness have already been established. Meanwhile extinction is looming for species that mean a great deal to Hawaiian history, Hawaiian culture, and Hawaiian identity. We need immediate action. Postponing this program for further redundant studies would be like asking a qualified EMT to go take a refresher course in CPR when there is a cardiac patient laying right in front of them. We know what works. A wealth of proof is before us in the form of real-world successes. Now is the time to make the decision to move forward. Mahalo for your time	Thank you for your comment
7/23/2023 17:32	I support this EA	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 17:40	I support the use of IIT to protect biodiversity and save native birds! Too many of Hawaii's native species have gone extinct already, let's save the ones we still have.	Thank you for your comment
7/23/2023 17:46	I wholeheartedly support the safe and scientifically supported IIT project described in the EA. I am a conservation worker on the island of Kauai and have worked at conserving native species of birds here for the last 10 years. My first two years on island were spent working with the Kauai Forest Bird Recovery Project. I worked closely with all species of Kauai's native forest birds, but in particular focused on the 'akikiki, 'akeke'e, and puaiohi. I helped to design and implement the egg collection techniques that were used to establish captive populations of 'akikiki. I have spent and continue to spend much of my time in the high elevation forests of Kauai and over the past 10 years have seen the mosquitoes spread and heard the birds go quiet. We must act now to attempt to save the birds that are left. This technique is the best available, poses no risk to people or the environment, and can be relatively easily implemented. Please approve this project to conserve our native birds.	Thank you for your comment
7/23/2023 17:46	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/23/2023 17:53	I support the use of IIT to protect and preserve our native manu.	Thank you for your comment
7/23/2023 17:55	Hi! I'm writing in support of mosquito suppression. Please do everything possibly to eliminate avian malaria and help the remaining honeycreepers survive. Thank you	Thank you for your comment
7/23/2023 18:08	When the birds are gone, they're gone forever. We've lost too many Hawaiian birds already to simply dither while even more of them slip away. The methods are science-based and this is our only chance.	Thank you for your comment
7/23/2023 18:12	Attention: Mosquito Control Project Kaua'i 23 July 2023 Department of Land and Natural Resources U.S. Fish and Wildlife Service In his testimony I am standing in opposition to the draft of Kaua'i Environmental Assessment (EA).We need to stop this right where it is, we can't be taking lightly this extermination technology. At the very list, we need to hit the pause button, and go though due diligence long term research on ALL possible side effects of releasing billions of infected mosquitos to the Hawaiian Island. Arthropods make up about 75% of all animals on Earth and even bigger percentage in Hawaii, and have a major role in maintaining ecosystems as pollinators present complex and poorly understood ecological relationships, and alterations in reproductive parameters of non-target species can generate ecological disturbances. The Cartagena Protocol - a United Nations safety regulation for transfer, handling, and use of genetically modified organisms is not applicable to Wolbachia-infected mosquitoes because the bacteria are considered non-trangenic. Therefore, the release of insects hosting Wolbachia was not subject to these regulations. But even in case of genetically modified mosquitoes, transfer of which in one Brazilian town was suppose to reduce the number of mosquitoes did not work as planned, laboratory produced mosquitos are continually breeding in Brazil, despite biotech firm's assurances to the contrary. The claim was that genes from the release strain would not get into the general population because offspring would die. That obviously was not what happened. Mutated insects have been found in the natural population of mosquitoes, which was never supposed to happen. There is a strong probability that Wolbachia strains being transferred to other insects and the potential environmental and economic impacts of this host. Wolbachia strains are capable of transferring horizontally among distantly related arthropods in a short	Concerns: 9, 14, 18

Entry Date	Comment	Responses
	evolutionary time. Moreover, some parasites are able to carry Wolbachia strains to other species. Although mosquitoes deliberately infected with Wolbachia could reduce the need for insecticide use, the consequences of Wolbachia host shift to native species are for now, unpredictable. One of many possible unplanned outcomes is that through horizontal transmission, arthropods may develop resistance to pesticides. As far as I am aware, no country has regulations specifically pertaining to Wolbachia-infected insect release or mitigation strategies to deal with unexpected results. The release of insects hosting Wolbachia strains should be more carefully considered, and further studies of the potential impact of these bacteria on biodiversity should be undertaken. The public has a right to meaningful participation in the decision-making process for this project. Any action by the BLNR to deny Hawaii Unites' petition for a contested case hearing would be an infringement on the public's right to due process and open government. Kihei, 96753	
7/23/2023 18:16	Aloha, We're writing to voice our support for the birds. Please do the right thing & prevent their extinction.	Thank you for your comment
7/23/2023 18:24	I support efforts to eliminate mosquitoes which carry disease to birds.	Thank you for your comment
7/23/2023 18:40	It is my strong belief that IIT is a safe and critical tool that must unambiguously be used to control mosquito populations on Kaua'i and other Hawaiian islands to stop the spread of avian malaria and protect the deeply engendered birds that were here long before mosquitos were brought to HI by colonization. Every available tool at our disposable should be used to protect Kaua'i endemic species. A lack of action and failre to deploy IIT in Kaua'i constitutes condemnation of irreplaceable native species to extinction to appease uneducated individuals without a strong grasp of the science and safety of the well studied biological tools that are available. I deeply support the native species of Kaua'i and hope the use of infertile mosquito technologies will help prevent the extinction of Akikiki and other vulnerable birds that call the island home.	Thank you for your comment
7/23/2023 18:40	I support this EA.	Thank you for your comment
7/23/2023 18:44	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, rivate landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	
7/23/2023 18:49	Aloha, I am saddened to hear that multiple bird species will go extinct within the next five years due to mosquitos. I support the birds and hope things can be done to save these beautiful birds. Mahalo,	Thank you for your comment
7/23/2023 18:54	I support the IIT to provide better habitat conditions and survivability of native and threatened/endangered wildlife. Specifically birds threatened by disease carried by mosquitoes. Human disturbance has exacerbated these impacts and I humbly ask the government via its natural resource agencies to take action to protect native species and enhance habitat conditions and chances of survival.	Thank you for your comment
7/23/2023 18:58	Aloha. I am writing in support of using Wolbachia IIT to save the Hawaiian honeycreepers on Kaua'i. Most of Kaua'i's honeycreepers will go extinct if we do not do this. And not only must we do this, but we must succeed. If this technique does not work, the birds will go extinct. For the past nine years I have worked to try and save the 'akikiki. I began in 2015, finding their little mossy nests high in the 'ōhi'a. I helped coordinate the crews that collected these eggs and flew them out of the field to be hatched and raised and eventually bred. We now have a small flock of about 50 birds in breeding facilities. Soon this is all that will remain. During this time I mapped and tracked the wild birds. I witnessed their decline in the valleys of Halepa'akai and Halehaha. The number of 'akikiki breeding pairs in those two valleys dwindled from 35 in 2015 to zero in 2022. I couldn't bring myself to go back to these valleys in 2023. I can't bear the idea of walking those forested ridges valleys and having them be entirely empty of 'akikiki. I knew so many of these birds individually, more than 100 of them. I followed different breeding pairs, knowing how many young each of them fledged every year. I then tracked those fledglings in following years, noting who paired with who, how many young they had, if they failed or succeeded at breeding. I celebrated their successes, I mourned the disappearances of beloved adults. This past field season I led the efforts to bring the very last 'akikiki in out of the wild. It broke my heart to do this. I wanted to believe that it was the wrong decision, that we still had time, that we should just leave these last individuals out there and hope that they would survive long enough for IIT to save them. But during the field season, as we tried our hardest to catch birds, we witnessed them disappearing faster than we could catch them. We observed 16 breeding pairs in March of this year, but by June there were only five individuals left. In that time we had only caught two. They simply died before we could catch them. Every nest that we did not collect eggs from also failed. In many cases the adults simply vanished while incubating or brooding their young, never to be seen again, abandoning their eggs and chicks to the rain. For nine years I had a front row seat to extinction in the wild. It will haunt me for the rest of my life. I will blame myself for not raising the alarm louder, for not raising it sooner, for not forcing everyone to take this more seriously before now. I doubt there will	Thank you for your comment

Entry Date	Comment	Responses
	be any ʻakikiki left the wild at the end of this year. Already we believe the male from the last breeding pair – one of the five remaining – has disappeared. The exact same thing is coming for the ʻanianiau, ʻakekeʻe, Kauaʻi ʻamakihi, ʻiʻiwi and ʻapapane. Not only can IIT save these birds, it can radically change the ecological landscape within which they live. Without mosquitoes and avian malaria, the dramatic declines in their populations may not only lessen, but their populations may begin to grow again. All of the habitat is still beautiful and perfect and intact. Rarely in conservation do we have the opportunity to do something remarkably positive for the environment. Most conservation actions can only hope to slow declines, not dramatically reverse them. That is what we have a chance to do here. If we do not act now the honeycreepers of Kauaʻi will quietly vanish, never to return. My first daughter, Fiona Wren Lilly, was born four days ago. She will never see ʻakikiki quietly work their way up and down the mossy ʻōhiʻa in the Alakaʻi. If we do not act now to limit mosquitoes with IIT, she will also not have the opportunity to see ʻanianiau sipping nectar from green ʻōhelo blossoms or watch the scarlet feathers of an ʻiʻiwi flash past her through the dark forest. I hope we do act, and that she can enjoy these wild birds as all the generations before us have.	
7/23/2023 18:59	Aloha, I am writing this email to urge you to support efforts to stop the extinction of our native birds by stopping the spread of mosquito-borne disease. One bite from a mosquito if sufficient to sicken and kill many of our already threatened native species of birds. For some it may already be too late. Without immediate action multiple species will go extinct within the next five years. Please allow this program to proceed. If you don't, Hawai'i will be a quieter, sadder and more silent place. Mahalo for your mālama and kuleana.	Thank you for your comment
7/23/2023 19:09	We, the people of Maui, should not be treated as lab rats. Already there have been problems reported in other states and other countries regarding the release of "biopesticide" mosquitos and genetically altered mosquitos. This type of experimentation is dangerous to humans in the absence of further testing. Everyone involved in this activity should be held accountable.	Concerns: 2, 4, 9, 11
7/23/2023 19:16	Hawai'i needs to act now so in order to stop and hopefully reverse the mass extinction of Hawaiian animals, especially our manu. Many Hawaiian born children have never seen a native honey creeper and at the current rate, they never will. Please allow for all action toward suppressing threats to our native animals. Please advocate for our animals and actively seek to eliminate controllable threats.	Thank you for your comment
7/23/2023 19:16	Please do not release mosquitoes on the people and aina! What a nightmare I can't believe this is even a thing! Is this the legacy you wish to leave? How much money is who getting?	Concern: 26

Entry Date	Comment	Responses
7/23/2023 19:19	I AM OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/23/2023 19:23	Aloha kākou, I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations an address this critical problem. Thank you for your time and consideration. Mahalo,	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 19:23	To whom it may concern, I am in strong support of saving our native endemic birds with the use of IIT (Incompatible Insect Technique) to help suppress mosquitoes and mosquito borne diseases such as avian malaria. I grew up on Oʻahu and frequently visited Kauaʻi. One of my fondest memories of birds on Kauaʻi is during the summer of 2015. It was one the first time hiking into the Alakaʻi swamp. I remember hiking and stopping at a vantage point with a bunch of photographers lined up. They were photographing an ʻiʻiwi, one of our native honey creepers. This was the last time I've seen or heard that bird on Kauaʻi. I recently traveled deep into the Alakaʻi, botanizing and birding off the the Mōhihi-Waiʻalae trail where some of the birds like the ʻakikiki and the ʻakekeʻe inhabit. Sadly I did not see or hear one native bird. These birds are going extinct within my lifetime and it is incredibly hard to witness this happen. Please approve the EA and FONSI to prevent this birds from going extinct! Sincerely,	Thank you for your comment
7/23/2023 19:27	Aloha kākou, I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations an address this critical problem. Thank you for your time and consideration. Mahalo	Thank you for your comment
7/23/2023 19:31	Aloha kākou, I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations and address this critical problem. Thank you for your time and consideration. Mahalo	Thank you for your comment
7/23/2023 19:32	Please protect Hawaii wildlife from mosquito borne diseases. Please use mosquito controls to keep endangered bird species alive.	Thank you for your comment
7/23/2023 19:34	We absolutely need to do this to save our birds. They are Hawaii. Writing in support of mosquito suppression to save our birds.	Thank you for your comment
7/23/2023 19:40	Our native birds are disappearing in large part due to mosquito borne diseases. Where I live in Volcano, there were no mosquitoes until about 2007. The forest around my home was full of Oma'o, our native thrush. The Oma'o have now disappeared from the area. The last time I saw or heard one was at least 7-8 years ago. Very sad. Thankfully Oma'o are still present in other areas. We have a chance to prevent the actual extinction of Kauai's native forest birds if we act quickly. Please approve the release of mosquitoes for this purpose. Extinction is forever. We have already lost too many species. Please don't contribute to more of this loss. Thank you. Aloha, Volcano, Hawaii	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 19:41	I strongly support the USFWS and DLNR's use of IIT to reduce the non native mosquito population. We must take immediate action to protect native species from becoming extinct. We have a crucial window in which to take advantage of the science available to us to prevent the loss of these birds. This is a safe and concrete action we can take to make real environmental change now. Please listen to the science and not to the conspiracy theories surrounding this initiative.	Thank you for your comment
7/23/2023 19:42	I support the use of IIT in order to suppress mosquitoes to save our native forest birds.	Thank you for your comment
7/23/2023 19:43	I support Wolbachia IIT to save Hawaiian forest birds because as a wildlife biologist, I know that honeycreepers are a unique and imperiled group of forest birds found nowhere else. Without swift action, even more of them will fall to extinction, and soon. Avian malaria is a threat to these special birds. The invasive mosquitoes that have arrived in Hawaii could actually be suppressed by the incompatible insect technique and maybe we can help save the native forest birds.	Thank you for your comment
7/23/2023 19:53	It is absolutely imperative this project starts as soon as possible. There is no other tool we have to readily prevent the extinction of some of Kauai's native birds. These species deserve a place on this plant in the Hawaiian forests and we owe it to them to rescue them from extinction. Furthermore, the use of wolbachia is tried and true as it has been used in other cases successfully.	Thank you for your comment
7/23/2023 19:58	I support the use of IIT to suppress mosquitoes on Kauai and protect our native forest birds.	Thank you for your comment
7/23/2023 19:58	Aloha, With the recent news of only 5 'akikiki being left in the wild, it is more imperative now than ever that we truly prioritize our native birds. Hawai'i is already the bird extinction capitol of the world. We are seeing history repeat itself and extinction right in front of our eyes. I support this project to help protect and hopefully save our native birds. Though this is only one aspect of the uphill journey to save our native and endangered birds, it is a crucial part to help deal with one of their biggest threats. As the climate warms, the spread of mosquitos will continue into more of our native habitat. It is crucial that we do all we can, while still thinking of all impacts to the environment, to protect our native birds especially from avian malaria. Mahalo nui	Thank you for your comment
7/23/2023 20:01	I am writing to voice my support for Kauai Mosquito Suppression through IIT. So many of these majestic and unique species of birds are dwindling and disappearing so fast due to human introduction of non-native mosquitoes, so we must take action to slow and stop the damage we have done and try to save as many of these birds as we can. This is not a natural cycle, this is a human introduced plague. If we don't do anything, our apathy will lead to their demise. Please keep the birds' lives in the forefronts of your minds when thinking about this. Thank you.	Thank you for your comment
7/23/2023 20:04	I support this wholeheartedly. I am a resident of Oahu but work with wildlife and dearly value the native birds. I hope that DLNR will move forward with this and protect our native species. Mahalo	Thank you for your comment
7/23/2023 20:13	The endemic birds of Hawaii are not only beloved, but an important part of the ecosystem. They bring in visitors to keep the Hawaiian economy robust, while fulfilling the important role of see dispensers. They are living textbooks on how evolution works. It is imperative to save them, and IIT is one major weapon in mitigating their declines from avian malaria. Please support the use of IIT so we may have a chance of saving some of these species from extinction.	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 20:16	I support Wolbachia IIT to save Hawaiian forest birds because if we do not do action we will see more native and endemic bird populations go extinct. Without swift action, several species of honeycreepers will become extinct in the next ten years. The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds. Mosquitos never belonged in Hawaii but birds like the ‘Akikiki do. Let's use the tools we have available like IIT and curb invasive mosquitoes in Hawai‘i where they never belonged!	Thank you for your comment
7/23/2023 20:19	Avian malaria, a disease transmitted by invasive southern house mosquitoes, is driving the extinction of our forest birds. A single bite by an infected mosquito can kill an ‘i‘iwi (and critically endangered forest bird species). As the climate warms, mosquitoes carrying avian malaria are moving upslope into the last refugia for Hawai‘i’s forest birds. The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds. Keep what makes Hawaii!	Thank you for your comment
7/23/2023 20:20	Aloha kākou, I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations an address this critical problem. Thank you for your time and consideration. Mahalo	Thank you for your comment
7/23/2023 20:21	>> I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations an address this critical problem. Thank you for your time and consideration. >> >> Mahalo	Thank you for your comment
7/23/2023 20:23	I support this EA and the use of mosquitos/wolbachia to help save native forest birds!	Thank you for your comment
7/23/2023 20:25	Aloha kākou, I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations an address this critical problem. Thank you for your time and consideration. Mahalo -- Family, Everything, Always	Thank you for your comment
7/23/2023 20:26	Aloha kākou, I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations an address this critical problem. Thank you for your time and consideration. Mahalo,	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 20:27	>> Aloha kākou,>> >> I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations an address this critical problem. Thank you for your time and consideration. >> Mahalo	Thank you for your comment
7/23/2023 20:37	Aloha mai, I was born and raised on Kaua'i and I've had the unfortunate opportunity to hear our forests that used to be full of life fall silent. As a kanaka, our birds connect us to our culture, to our aliʻi, to a time before western perspectives. They were highly revered and for good reason. They are the balance of the forest; the birds have evolved with the forest here and due to adaptive radiation, they create PERFECT HARMONY. They are the reason for healthy forests, healthy aquifers, and then some. We need to do everything we can to protect them as they are found no where else on Earth. How can we let a rare gem be lost forever? I wholeheartedly support the IIT movement; our birds need our help, we are the reason for their demise. Please for our ʻāina, for our kūpuna, for Kauaʻi.	Thank you for your comment
7/23/2023 20:37	I support mosquito control on Kaua'i. Wolbachia is a near-ubiquitous insect symbiont and poses an effective natural control for mosquito populations (which are non-native to Hawai'i). Mosquitos spread avian malaria (which is also non-native to Hawai'i), which is a major cause of declines in native Hawaiian birds, including the critically endangered honeycreeper.	Thank you for your comment
7/23/2023 20:39	I am in favor of mosquito control on Kaua'i and other islands to conserve and help to prevent the extinction of native Hawaiian birds. There is no time, native birds will become extinct and this a proven method that can give them a slim chance of survival. Please support mosquito control and save our native birds from extinction!	Thank you for your comment
7/23/2023 20:41	Yes, I'm for using the Incompatible Insect Technique to protect Kaua'i's native forest birds! It's to everyone's benefit.	Thank you for your comment
7/23/2023 20:44	Yes! I'm in favor of using the Incompatible Insect Technique to protect Kaua'i's native forest birds! It's important that we save what little is left of Hawai'i and to do so, we need to consider all options and use all available tools.	Thank you for your comment
7/23/2023 20:47	Please help save these beautiful and important birds!!	Thank you for your comment
7/23/2023 20:48	In other parts of the country and world, Incompatible Insect Technique has been tested and proven safe and effective when used for the benefit of humans. In which case, there's no reason we should prevent it from being used for the survival and recovery of Kaua'i's native forest birds, crucial not only to our diverse ecosystem, but unique culture. To steward such wonders of creation is our God-given duty, one which we've not properly exercised in our imperfect state and for which we will be held accountable. It's our responsibility to pull these birds back from the brink of extinction to which we've pushed them and provide such species as the 'akikiki, 'akeke'e, 'apapane, 'anianiau, i'iwi, and 'amakihi with an environment in which they're able to not just survive, but thrive.	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 20:54	As a bird biologist on Kaua'i, I would like to share my full support for this EA to suppress mosquitos on our island using the Incompatible Insect Technique. It is my professional opinion that this plan poses no risk to the public and is necessary to prevent the extinction of our remaining forest bird species. Opposers of this EA are fueled by misinfornation, conspiracy, and fear-mongering while supporters are backed by rigorous peer-reviewed scientific research. The loss of our Kaua'i manu would be a cultural and ecological tragedy. It is our kuleana to protect the aina by moving forward with this EA. Mosquito suppression using the Incompatible Insect Technique has been successfully applied in various other states and countries with no adverse effects. This EA is our best chance to change the tide of the bird extinction crisis in Hawaii and we have no tangible excuse not to move forward with this plan. Please listen to the recommendations of conservation professionals and move forward to safeguard our manu. Mahalo.	Thank you for your comment
7/23/2023 20:54	I am in favor of mosquito control on Kaua'i as a conservation action to prevent the extinction of native birds, especially Hawaiian honeycreepers.	Thank you for your comment
7/23/2023 20:56	Please enact policy to rid our islands of threats to native birds that our vital to perpetuating a healthy ecosystem.	Thank you for your comment
7/23/2023 20:58	Aloha! In other parts of the country and world, Incompatible Insect Technique (which uses naturally occurring bacteria, Wolbachia, from male mosquitoes that don't bite) has been tested and proven safe and effective when used for the benefit of humans. In which case, there's no reason we should prevent it from being used for the survival and recovery of Kaua'i's native forest birds, crucial not only to our diverse ecosystem, but unique culture. To steward such wonders of creation is our God-given duty, one which we've not properly exercised in our imperfect state and for which we'll be held accountable. It's our responsibility to pull these birds back from the brink of extinction to which we've pushed them and provide such species as the 'akikiki, 'akeke'e, 'apapane, 'anianiau, i'iwi, and 'amakihi with an environment in which they're able to not just survive, but thrive. Mahalo for realizing the importance of this matter and allowing the public to comment.	Thank you for your comment
7/23/2023 21:01	No to Kauai gmo mosquitoes. Why introduce one more animals that isn’t supposed to be introduced? DLNR is known for introducing the invasive fish species, egrets, toads, and now one mosquito that wasn’t even proven to save birds? No thank you., Kauai resident,	Concerns: 3, 4, 10
7/23/2023 21:02	Mosquito suppression is incredibly important at this juncture in Hawaiian history. Our native birds are on the brink of extinction due to mosquito-transmitted disease. We must support the draft environmental assessment for Kaua‘i mosquito suppression before it’s too late for Kaua‘i’s ‘akikiki and the ‘akeke‘e.	Thank you for your comment
7/23/2023 21:02	I oppose releasing these experimental mosquitos	Concern: 11
7/23/2023 21:03	I support the use of mosquito suppression to save native birds.	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 21:05	Please go forward with use of incompatible insect technique on Kaua‘i (and elsewhere in Hawai‘i) to save our native forest birds from extinction. This is absolutely the only shot we have of saving several species that without a doubt will go extinct very soon in the wild without this intervention. These birds are worth saving! We must not let Kaua‘i’s remote forests become quiet. Please do not give in to objections from the misinformed. This technique (IIT) has already been deployed for human health reasons in several places and has not caused any problems. There are virtually no risks to this action, but the payoff would be huge if Akeke‘e, Anianiau, Kaua‘i Amakihi, and Kaua‘i Elepaio, and I‘iwi can be saved on Kaua‘i! These birds are important to the health of our forests and to the Hawaiian culture, and they are precious gems that make this island truly special. We have already lost far too many Hawaiian birds forever. Let’s do something now that we finally can!	Thank you for your comment
7/23/2023 21:05	I support the suppression of mosquitos. Save the birds!	Thank you for your comment
7/23/2023 21:09	"I am in favor of mosquito control on Kaua'i as a conservation action to prevent the extinction of native birds, especially Hawaiian honeycreepers"	Thank you for your comment
7/23/2023 21:09	This is so critical! With current trend of native bird populations, action should be taken sooner while there is a fighting chance. With avian malaria being one of the main reasons for dwindling numbers, addressing the mosquito population would be the most effective way to help our native birds.	Thank you for your comment
7/23/2023 21:10	"I am in favor of mosquito control on Kaua'i as a conservation action. I dont like mosquitos. I like native birds"	Thank you for your comment
7/23/2023 21:11	To Whom It May Concern, I am 76 years old and a 55 year resident of Kekaha, Kaua`i. For 30 years I worked as a medical technologist at Kaua`i Vererans Memorial Hospital in the nearby town of Waimea, but my passion has always been to photograph the native forest birds of these Hawaiian islands. In the 1970s when I first began to hike the upland trails of Kaua`i, birds were everywhere. The Pihea Trail, a Hawaiian name which means cacophony, was certainly that. The calls of our native honeycreepers and native `Elepaio flycatcher, were nearly overwhelming. You didn‘t have to search for them. At any stop along the trail, dozens of noisy `Apapane were in the canopy above, feeding on the lehua blossoms. `Amakihi and `Anianiau were plentiful and busy in the understory below, feeding on the flowers of `ohelo, `ai`akamanu, kukaimoa, and naupaka kuahiwi. The squeaky-gate call of `I`iwi permeated the forest. When the lobelias were in bloom , particularly koli`i, there would be 5 or 6 of them at a time, all day long, chasing the `Amakihi away from it. It was a sight to behold. The now critically endangered `Akeke`e was not as easily seen as the aforementioned birds. It‘s habit of foraging through the ohi`a leaf clusters in the canopy made it hard to spot, but there were places where I could always easily find families of 4 or 5 birds calling back and forth to each other as they fed. The Alaka`i Swamp Trail crossing at Kawaiko`i Stream was a given for this species. They could even be seen at the Puu O Kila lookout. The `Akikiki was the least numerous of these honeycreepers but pairs of them could still be seen along Pihea. On many occasions while hiking further into the swamp along the Mohihi Trail, I would see flocks of 8 to 10 of these small birds coming up out of the valley below to forage up and down the branches and trunks of trees along the ridge. It was a habit they repeated every morning and late afternoon. Mohihi was a special place. I remember hiking along this trail with Tom Telfer, the Kaua`i District Land and Natural Resources Manager at the time. He pointed out places where only decade before he had seen the now extinct `O`u feeding along the ridge on the fruiting Tetraplasandra. Tom was one of the last to ever see the also extinct Kaua`i Nukupu`u along this trail on the flowers of the tall Cyanea leptostegia. I wondered at the time what happened to these wonderful birds and if the rest might also be in danger, but never thought that their demise would come about in my lifetime. Unfortunately, this is a once-upon-a-time story from an old man. You can only imagine my sadness when I visit these places today and find nothing, just the lonely call of a distant `Apapane. Sometimes when I travel between islands on Hawaiian Air and see the names or our native birds on the fuselage, I think how many people aboard this plane have ever see them. I feel blessed that I have.	Thank you for your comment

Entry Date	Comment	Responses
	I can also attest to the fact that there are a gazillion Culex mosquitoes on Kaua`i. I love to photograph the stars and occasionally go a few miles above Kekaha, away from light pollution, to setup my camera for the night. Around dusk, I begin to hear a low hum down in the valley below. In half an hour the hum has become a loud din as they rise up to attack. Personally, I can't understand the reluctance of those to are against this effort. Perhaps too many zombie movies have made the misinformed think that there is a danger in manipulating these insects. I'm not a scientist and cannot speak to the safety of the current proposal to rid our island of Culex mosquitoes, but I have read the Environmental Assessment and am confident that the research into this method is sound and has been exhaustive. I trust those who have said so. If I had my way, I would use the Gene Drive approach and get rid of them entirely. In February of 2021, I wrote about my concerns to the Garden Island Newspaper and to our local legislators. I have included that document below: Silent Mountain I am writing to voice my concern over the dramatic decline in native forest birds on Kaua`i. Fifty years ago when I first began to go into the forest to see and to photograph them, these birds were everywhere. Their voices filled the forest. Many older residents and generations before me have experienced this wonderful abundance. Now, all that is heard is the occasional call of an alien bird, the sound of the wind in the trees, and that of water dripping off the leaves. This is not just happening on the fringes of the mountain but in the remote interior as well. Personally, having seen these beautiful birds throughout the expanse of the Alaka`i, I am deeply saddened at this loss.  We face not just the extinction of our precious native species but a loss of a part our culture as well. In the not so distant past the colorful feathers of these forest birds were highly valued. Leis, helmets, and capes were made from them to adorn the ali`i. The Hawaiian songs we love to listen to today are full of references to them. The effect on our island economy is significant. Hawaiian honeycreepers are famous the world over for their adaptations. Nearly every week I get inquiries from potential visitors asking where they can go on Kaua`i to see our native birds. Lately, I have to tell them "don't come". If birds are the reason for your trip, go to the Big Island or Maui – the high islands where they can still be seen. In 1962 Rachel Carson wrote a book entitled Silent Spring. The book brought public attention to the detrimental effect the unregulated use of DDT and other pesticides was having on birds. In the book she predicted that its continued use would one day bring about a spring when there would be no birds to sing. The issue here is not the use of chemicals but the rapid spread of mosquito-borne diseases – avian malaria and viral pox. I fear that if we do not rid this island of the Culex mosquito we will be left with a silent mountain. The technology to do this exists. The sooner we make use of it, the better. The argument that ridding our island of mosquitoes may upset a delicate ecological balance does not apply. On the contrary, mosquitoes didn't arrive here until ships from foreign lands brought the larvae in their water barrels Of the 13 species of birds that were here when the Europeans arrived, 5 are already gone. The more we delay, the more birds we are going to lose and the native plants that depend on them for pollination. I urge you to introduce legislation to allow the use of this technology. A recent visitor into our forest remarked to me that it should be an easy decision "after all everybody loves birds and hates mosquitoes". Respectfully Submitted,	

Entry Date	Comment	Responses
7/23/2023 21:11	The use of the Incompatible Insect Technique (IIT) to reduce mosquito populations in Kaua'i's Kōke‘e and Alaka‘i areas is a commendable effort to protect native forest birds and their habitats. By focusing on critical higher-elevation forest areas spanning 59,204 acres, this targeted approach shows promise in suppressing disease-transmitting mosquitoes without harming other species. Implementing IIT requires careful monitoring and community involvement to ensure its effectiveness and minimize any unintended ecological impacts. Overall, this initiative represents a significant step toward preserving Kaua'i's delicate ecosystem for future generations.	Thank you for your comment
7/23/2023 21:12	I am in favor of mosquito control on Kaua'i as a conservation action to prevent the extinction of native birds, especially Hawaiian honeycreepers. I also don't like mosquitos because I get bitten a lot.	Thank you for your comment
7/23/2023 21:12	Dear god, PLEASE listen to the science here. Implementing the mosquito control program brings a very low chance of negative environmental impacts, and not implementing it come with a near 100% chance that multiple Hawaiian birds go extinct in the next decade.	Thank you for your comment
7/23/2023 21:17	I support the use of Wolbachia based IIT to suppress and control mosquito populations on Kauai. Without urgent intervention ALL of Kauai's native forest birds WILL go extinct within our lifetimes. All of our current conservation effort will have been for nothing. This is a proven technique that has successfully controlled mosquito populations in other locations. We cannot sit idley by and watch as more of our native species go extinct when we have the means by which to prevent it.	Thank you for your comment
7/23/2023 21:18	I am writing in support of mosquito control on Kaua'i in order to help prevent extinction of endemic Hawaiian birds. These birds are running out of time and options and it is desperate. Considering the impact that the mosquito population has on the spread of avian malaria, the only practical approach is to address this problem closer to the root cause. Wolbachia has proven to be safe for humans and animals, and has been used to reduce mosquito populations during outbreaks of zika and dengue fever. Without utilizing this proven technique the state of Hawai'i is essentially complicit in the extinction of endemic Hawaiian birds.	Thank you for your comment
7/23/2023 21:18	I am a concerned resident of Kauai working for ecotourism. I support this EA to protect Kauai forest birds through mosquito suppression using the incompatible insect technique.	Thank you for your comment
7/23/2023 21:18	I support the protection of native birds as they are an integral part of our ecosystem. The control of mosquitoes not only benefits the ‘akikiki, but ALL of our native avian fauna. These species have existed in our islands for thousands of years, but in a matter of decades have been decimated; due in large part from human created problems. Is it not our duty then, to utilize the knowledge and power we have to protect them from Extinction? As someone who deals with preventing the extinction of native species everyday, it hurts to see these amazing creatures helpless in the face of an uncertain future. We know the cause, and we have a solution to the problem. Will our keiki only know of these birds from photos and videos? What will we tell them when they learn that the birds could have been saved but we did nothing?	Thank you for your comment
7/23/2023 21:19	Yes, I support mosquito suppression to protect the native birds.	Thank you for your comment
7/23/2023 21:19	I support mosquito suppression on island for the sake of the native birds, native plants, and the future of the water supply.	Thank you for your comment
7/23/2023 21:21	Yes, I support mosquito suppression to protect our native birds.	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 21:21	Aloha kākou, I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations and address this critical problem. Mahalo for your time and consideration. Mahalo	Thank you for your comment
7/23/2023 21:22	Yes, I support mosquito suppression to protect our native birds.	Thank you for your comment
7/23/2023 21:24	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done right now to save these birds from disappearing forever.	Thank you for your comment
7/23/2023 21:26	I support mosquito suppression for the sake of native birds, plants, the watershed, and the overall cultural significance of the species affected by the diseases mosquitoes carry.	Thank you for your comment
7/23/2023 21:26	I support the implementation of IIT on Kaua'i and across the pae ʻāina. At this critical time it is imperative that we do everything possible to save our native birds. This is our kuleana as stewards of this land. Please move quickly to protect these fragile birds and their habitat. Mahalo	Thank you for your comment
7/23/2023 21:26	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and ʻāina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	
7/23/2023 21:31	I demand a full environmental impact study before you release any of Bill Gates mosquitoes on Kauai or any island!	Concern: 1, 26
7/23/2023 21:36	Dear Sirs; I write in strong opposition to the release of mosquitoes that are linked to malaria and zika. You are not offering an demonstrable method to eliminate the mosquitoes we currently have and in fact are reking the appearance of ilnesses like Malaira. Florida saw it's first case of malaria after the release of lab mosquitoes in their state. Other concerns is that information is coming out about the development of	Concerns: 2, 6, 28
7/23/2023 21:39	I visited Kaua'i not too long along and after visiting with local researchers and the native population it has put in perspective how detrimental this issue is and can become. With the introduction of invasive species into an already delicate ecosystem it has the potential to collapse the intricate foundation the island is built upon, not only is this worrisome for the local population but it has already resulted in crucial loss of valuable life within natures system. It has never been more important to raise awareness and take action not only for the well-being of the land lived upon but as respect to the island itself.	Thank you for your comment
7/23/2023 21:45	As a conservation biologist working on Kauai for the last couple years, in addition to working in endangered bird conservation across the world, I fully support the measures to introduce IIT to the ecosystems of Kauai. These measures have become the only option available to preserve Hawaii's native birds from human-caused extinction. If IIT introduction measures do not succeed, other species will be lost forever. The opposing voices to these measures are not founded in fact and seek only to spread misinformation and false paranoia. We have not only the ability but the responsibility to proceed with IIT and save these beautiful, vital stewards of Hawaii.	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 21:47	I support Wolbachia IIT to save Hawaiian forest birds because they are a significant biocultural resource. Not only are the health of these birds indicative of a healthy forest ecosystem, they also provide great cultural significance to Native Hawaiians as these birds are part of mo'olelo (stories, history) as well as are forms of ʻaumakua (ancestors, guardian spirits). Sadly, invasive mosquitoes transmit avian malaria, killing native forest birds and putting them closer to extinction. Only 17 species remain today, with some comprising of fewer than 500 individuals. Thus, it is urgent that we take action and tools like the Incompatible Insect Technique can suppress the invasive mosquito populations and give hope to these endangered native bird populations that have both ecological and cultural importance to Hawai'i. Thank you for your time and consideration.	Thank you for your comment
7/23/2023 21:50	The forest birds in Hawaii are facing an extinction crisis. They are being decimated by Avian Malaria that is being transmitted by non-native mosquitoes. I support the use of the Incompatible Insect Technique (Wolbachia), to reduce the mosquito populations in Kauai. Please allow these techniques to be implemented by DLNR and USFWS to save the ʻakikiki. Thank you for your consideration.	Thank you for your comment
7/23/2023 21:53	Aloha kākou, This statement is on behalf of Kānaka Climbers, a Hawaiʻi-grown non-profit organization. We are commenting in strong SUPPORT of using the Wolbachia Incompatible Insect Technique detailed in this draft Environmental Assessment to prevent the extinctions of Kauaʻi forest bird species, and agree with the Finding Of No Significant Impact (FONSI) We are a Kānaka ʻŌiwi (Native Hawaiian) and ally led non-profit that aims to cultivate a more responsible and ethical outdoor recreational community in Hawaiʻi. We hope to provide knowledge and guidance that will help people form meaningful connections with ʻāina (land) and in turn become better stewards. We actively engage in conversations with Kānaka 'Ōiwi, Native Hawaiian Organizations and locals within different recreational areas to assist in voicing and supporting area-specific concerns, which often involve the protection and preservation of sacred spaces. Our organization recognizes that our island home is unfortunately known as the endangered species capital of the world. Of more than 50 species of honeycreepers that used to live here, all but 17 have gone extinct. The Kānaka ʻŌiwi relationship to manu (birds) runs from the beginning of time. They play critical roles in our mele koʻihōnua (cosmogenies), moʻolelo and kaʻao (stories and legends), including the Kumulipo, the Epic of Hiʻiakaikapoliopele, and the legend of Keaomelemele. We value these manu as gods, ancestors, guardians, and keepers of mana or great spiritual power. There is a reason why their feathers were chosen to adorn the ahuʻula, mahiʻole, pāʻū and kāhili of our aliʻi. As Kānaka ʻŌiwi, we continue to live in unique times just as our kūpuna did. In an era of reclamation where we are revitalizing practices such as ʻŌlelo Hawaiʻi, wayfinding, and traditional food systems, we believe the restoration and protection of manu is a vital part of cultural preservation and modern-day ahupuaʻa management. It is clear that the actions detailed in the draft EA to suppress avian malaria are needed to make room for a future where manu nāhele thrive in the physical and spiritual landscapes of Hawaiʻi once again. Mahalo for this opportunity to comment. Me ke aloha ʻāina, Kānaka Climbers	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 21:56	Aloha, I strongly oppose the "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. The State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes, should complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, wildlife, ecosystem, environment and public health. This planned project is a dangerous experiment. The lab-infected biopesticide mosquitoes come with many risks. Additionally, there are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. There are plenty of unknowns. What about human health risks? Sound science is required. Have safer alternatives been considered? Have conflicts of interest been addressed? How long has all of this been researched and studied? Has all the research been provided? How long will the project last? Where did the funding for all of this come from? There is currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." An Environmental Impact Statement needs to be done.	Concerns: 1, 2, 7, 9, 11, 23, 26, 34
7/23/2023 21:56	Another travesty to our people to endanger us from something not proven to be safe or effective. Another example is GMO, which has glyphosates, and proven to be harmful, yet we continue to have this in our food. Brazil saw no positive effects whatsoever from these mosquitoes, and Florida has a rise of malaria cases because of these mosquitoes. Our leaders are not taking responsibility for their actions. See if it works and is safe, before you unleash this to our environment. This might take years to know what the effects or consequences are. Why are you taking this risk? Who is behind this? What is their track record?	Concerns: 2, 4, 5, 28, 32
7/23/2023 22:00	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/23/2023 22:01	I support the finding of no significant impact in the draft environmental assessment regarding the suppression of mosquitoes using the incompatible Wolbachia technique. Hawaiian forest birds represent an integral part of Hawai'i's biological and cultural history. Due to increasing temperatures, these birds no longer have a safe heaven from invasive mosquitoes which spread lethal diseases such as avian malaria. We are now at a critical point in the conservation of two species in particular, the 'akikiki and 'akeke'e. Both are predicted to go extinct within the next five years without intervention. Extinct is forever, and it is happening right before you. The incompatible Wolbachia technique is the most promising lifeline available to save our beloved Hawaiian forest birds.	Thank you for your comment
7/23/2023 22:02	Please do not insert a mosquito into the environment. Inserting non- native species always have consequences that often aren't discovered until after the fact.	

Entry Date	Comment	Responses
7/23/2023 22:04	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/23/2023 22:07	I am in full support of mosquito suppression methods on Kaua'i. As of now, male mosquito sterilization is the only way we can preserve the remaining endemic forest birds on the Hawaiian islands. These birds are crucial keystone species to the Hawaiian ecosystems, wonderfully diverse and delicate ecosystems that are not only important to keeping the islands beautiful and alive but also to the people of the Hawaiian islands. In order to keep Hawaii as self sufficient and sustainable as possible, we need healthy forests; without the birds, the native plants like the 'Ohi'a will lose one of their most important pollinators, and without these native plants the waterways become unclean, landslides become more frequent, shade becomes fewer and carbon dioxide levels become greater, increasing island temperatures, all this causing a butterfly effect of even more issues in the future. There are countless oli, mele and hula about the native forest birds dating back centuries, as these birds are rooted deeply in Hawaiian culture. It is no wonder the birds were important to Hawaiian ancestors, as they should be now and in the far future. To many hawaiian people, the forest birds are guardian spirits or 'aumakua, sometimes even believed to be passed on family members or ancestors of long family chains. In other words, the native forest birds of Hawaii are 'Ohana. Rarely in the world do we see endangered animal species that carry this much ecological and cultural importance, and if there was ever a time to save species from extinction, that time is right now. We need to act as quickly as possible to suppress invasive mosquito populations, because while we work quickly now, the mosquitoes work even quicker at spreading avian malaria which is killing our birds in jarring numbers, not to mention it is an agonizing disease for these poor animals to endure. The 'akikiki, 'akeke'e, puaohi, Kaua'i amakihi, 'anianiau, 'i'iwi, 'apapane and Kaua'i elepaio need our help; with man-made problems comes man-made solutions, and after centuries of mosquitoes on the islands, we finally have a safe and effective solution to controlling their populations, proven by previous successful operations in other parts of the world. Please, do your research on these studies, look into what is actually happening in these processes and note that wolbachia already exists in abundance in nature in Hawaii naturally, and that there are no possible negative ramifications for this kind of ecological procedure. We owe it to the 'Aina and to our future generations to do what we can to keep these species safe from extinction, please consider these words coming from a previous Hawaiian forest bird conservationist. Mahalo for reading	Thank you for your comment
7/23/2023 22:08	I support the Wolbachia IIT to save Hawaiian forest birds because it is all we have to combat the detrimental effects of the invasive mosquito and avian malaria WE humans brought to these special islands. My ancestors sailed here thousands of years ago and stepped into a manu oasis. I often wonder what Hawaii was like in all its beauty before humans converted so much of the land to agriculture and housing. Today, I can hike up to the highest peaks and find a parcel of that true Hawaii: native forest still intact, native birds here and there, and the gentle breeze and cool fog rolling through. It's taken a career in conservation to find that place, to reconnect to my Hawaiian ancestry, and feel it's real-life presence. I don't have kupuna that can tell me about the iiwi, or stories of the apapane because they've never experienced the upland forests. My parents don't have stories of when the birds lived close by because that time was lost in my lineage. Because of the efforts of the state and other organizations to save species on the brink of extinction, we still have the nene, Laysan duck, and monk seal to name a few. Today, I have stories about the curious elepaio of Kauai that follow me along my hikes, the sound of the flutter of the apapane through the canopy, and the sway of the olapalapa in the wind to share with my children. This project will dictate whether those experiences die with our generation forever, or are shared with the future generations. This project is pivotal in our history of what Hawaii is now and what it can be tomorrow. Optimism in the face of tragedy looks like a future where where the IIT suppresses 90% of the mosquito population, forest bird numbers flourish, where kids grow up hearing the flutter of the apapane and can look in the eye of the elepaio. The future can be a place where we almost lost the akikiki but then they made a comeback and can be seen hopping around the canopy for grubs and their call can be heard in group chats:)Failure is the lack of trying, the lack of care, and the lack of risk for a greater purpose than ourselves. I support this IIT project and I truly hope the work put in pays off and we can change history. Thank you!!!	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 22:15	Please suppress mosquitos to save our native species	Thank you for your comment
7/23/2023 22:23	I like me some native endemic birbs, and I hates mosquitos	Thank you for your comment
7/23/2023 22:25	Aloha! As a resident born and raised in the islands i understand There has always been issues with misqitotos but there has been little to no talk about prevention prior to the GM misqitotos being offered as a solution here. I believe there are not only other solutions at hand that are less invasive but ones far less dangerous to the human populations. There needs to be more studies before they are released as not enough is known. Some studies in florida showed that these misqitotos may actually INCREASE the avian malaria as well as viruses that can harm humans. Our islands are particularly precious and delicate and they need protecting, let's find other ways that do not potentially put us or the birds in harms way.	Concerns: 4, 7, 9, 28
7/23/2023 22:26	In reviewing this thorough 305-page environmental assessment, it is clear to me that wolbachia IIT is a safe and effective technique to control Culex mosquito populations in the Alakai to save our native forest birds from extinction. Although I wish we had this technology 5, 10 or 20 years ago so that we may have avoided the collapse of many forest bird populations and saved the 'akikiki, I recognize that the wolbachia IIT has gone through rigorous scientific study during this time, and may not have been ready for use on a landscape scale with Culex mosquitoes particularly until recently. Comment: As a scientist I recognize that our ability to continue using IIT to control Culex populations will depend on being able to show data that IIT is causing Culex populations to decline. I believe that Culex abundance will begin to decline within several months, but my only worry is that we will not have the ability to accurately show this decline in the data given the wording in the draft environmental assessment. My only comment therefore pertains to the repeated wording in the document along the lines of "only existing trails will be used for pedestrian releases and mosquito monitoring efforts; no new trails will be created". I have done an extensive amount of conservation work in the Alakai and have a solid understanding of the existing trail system used by conservation workers and hunters alike. Only placing mosquito monitoring equipment on these existing trails will mean we will not get data on huge areas of the Alakai. In addition, many of the trails follow ridge tops as they are the path of least resistance, but there is data to suggest that mosquitoes are much more abundant in streams that on windy ridges. I worry that we will be biasing our monitoring data based on a few sparse trails for the sake of a few native plants. I am not suggesting that trees be cut or sawed to make new trails, but many conservation organizations working in the Alakai are able to carefully walk off-trail through the forest to carry out scientific research or monitor invasive species (and have been trained to identify native flora and fauna as to have as little impact as possible on the forest). Hunters are permitted to follow pigs and deer throughout the Alakai. How different is this work to monitor Culex mosquitoes than that of a hunter or a conservation worker seeking to control invasive mammals? In addition, the proposed mosquito monitoring efforts for IIT have a very light impact as each mosquito trap only needs to be set for one night per week, versus previous monitoring efforts where each trap is set for 4+ consecutive nights (meaning 8 visits to the trap over a week). Therefore, I think that placing some traps "off trail" will allow researchers to get a better understanding of the whole treatment area, instead of only placing traps on few ridge tops with existing trails. Perhaps mitigation restoration efforts could be carried out to offset the impacts of the additional human traffic. Or perhaps the final EA document can better define what the authors perceive as a "trail", or set a limitation to the number of traps that can be placed off-trail. Final thoughts and observations: Our forests have suffered devastating changes since I started working in the Alakai in 2017. In only 7 years I have seen our 'akikiki population crash from over 400 individuals to FIVE (or 0?) today. I was working at what once was our core field site – HPK, as we considered it as the stronghold for our native honeycreepers including all 3 endangered species. It was the highest in elevation of our 3 main sites, so when we discovered Culex mosquitoes in our traps in 2019 we were astonished as we thought Culex were still moving up the mountain, but in fact we found that they had already invaded the highest elevations. In 2020, mosquito	Thank you for your comment

Entry Date	Comment	Responses
	(**anon., 7/23/2023 22:26, *Continued***) captures began to skyrocket and we saw the delayed effects of this unexpected "mosquito storm", as we were only able to find less than half of the breeding pairs of 'akikiki as the previous year. By 2021 there were only a handful of individuals left at HPK, and last 'akikiki was a bird I remember banding in 2018- "Carrot". He was captured and taken from that site into captivity to save him from the same fate as the rest of his family succumbed to, and it breaks my heart to imagine my favorite place in the world without 'akikiki. I'iwi have also all but disappeared from this site in the last 7 years; I have fond memories of seeing 10 or more there per day, and they have not been seen there at all this year. Our pristine native forest is already becoming eerily silent in areas that were previously abundant with 'akikiki, i'iwi, 'akeke'e, anianiau, amakihi, apapane, elepaio, puaiohi. The 'akekee is harder to study as they are more cryptic and fly much greater distances, but we are estimating their population to be less than 600 individuals. I am VERY worried about the anianiau as well. This species is not even listed as threatened and from what I can gather from our 5 year forest bird surveys that occurred this year, the population has drastically declined. I fear they could go extinct before they are able to be listed as threatened or endangered, as quickly as we may lose the 'akeke'e. We do not need or want an EIS, the time is NOW to act, to control mosquito populations and save our forest birds, before it is too late.	
7/23/2023 22:29	I fully support the Wolbachia-based mosquito suppression on Kaua'i proposed by DLNR. I believe this Environmental Assessment shows negligible negative environmental impact, and mosquito suppression will have a significant positive impact by helping native bird populations bounce back. Avian malaria has decimated native bird populations, with many of our unique birds already facing extinction as a result of this deadly disease. Those that remain are severely threatened. The best way to help native birds is to reduce the devastating spread of avian malaria, and the Wolbachia-based incompatible insect technique is a non-intrusive and effective way to do just that. We must act now, otherwise many of our native honeycreepers could risk extinction within the next decade. Kaua'i does not have mosquito free high-altitude refugia that the birds can escape to. They have nowhere to go, so we must take these steps to reduce the mosquito population and give our manu a fighting chance. Therefore, I urge you to pass DLNR's EA for mosquito suppression on Kaua'i. Mahalo nui.	Thank you for your comment
7/23/2023 22:30	Aloha. I am writing in strong support of the suppression of mosquitoes on Kaua'i (and all of Hawai'i). Avian malaria, a disease transmitted by invasive southern house mosquitoes, is driving the extinction of our forest birds and we must do anything possible to stop it. There seems to be no evidence that mosquitoes carrying wolbachia will have any negative impact on the environment, and it's our best chance to save our birds. That this method has dramatically reduced the spread of dengue is enough for me to wholly support this plan . Please move forward with efforts to reduce the spread of avian malaria and the mosquito population.	Thank you for your comment
7/23/2023 22:37	I support the EA. The proposed action to release Wolbachia incompatible mosquitoes in the project area on Kaua'i benefits not only native Hawaiian birds and the environment, but also humans. Mosquitoes have no place in our ecosystem and will continue to cause the extinction of native bird species if nothing is done. Mosquitoes will only continue to increase their negative impact on our islands with climate change, and humans are not exempt from this because mosquitoes can and do spread deadly human diseases as well.	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 22:38	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/23/2023 22:44	I support mosquito suppression	Thank you for your comment
7/23/2023 22:55	I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement. We have countless examples of how introduced species, although apparently introduced to assist, actually caused eventual harm. This is a dangerous game and we cannot reverse it once it has been done. I feel that Hawaii's fragile ecosystem be untampered with and let the aina restore herself.	Concern: 1, 3
7/23/2023 23:22	Totally against releasing these mosquitoes. Look ar what happened in Florida - they now have malaria cases & there were none before there release for 20 years. Don't you have family & children who may be harmed from this experiment?	Concern: 28
7/23/2023 23:22	Our ecosystems rely on the health of our birds. Our native plants require them, as do our native peoples. Native birds are a vital piece of our culture. Mosquito suppressant needs to be a priority in order to save what species we have left.	Thank you for your comment

Entry Date	Comment	Responses
7/23/2023 23:26	Honeycreepers are a unique group of forest birds found only in Hawaii, which once had more than 50 species. Today, only 17 species remain, some with fewer than 500 individuals left. Without swift action, several species of honeycreepers will become extinct in the next ten years. Avian malaria, a disease transmitted by invasive southern house mosquitoes, is driving the extinction of our forest birds. A single bite by an infected mosquito can kill an 'iwi (and critically endangered forest bird species). As the climate warms, mosquitoes carrying avian malaria are moving upslope into the last refugia for Hawaii's forest birds. The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds. Hawaii is at risk of losing at least four more critically endangered forest bird species to avian malaria in the next decade, and they need all the help and support we can provide.	Thank you for your comment
7/23/2023 23:26	I support Wolbachia IT to save Hawaiian forest birds because like all animals in our world, they are the building blocks of an ecosystem. Many species of honeycreepers are already extinct and we have a chance to prevent that. The Wolbachia IT can help by reducing the mosquito population, which can in turn reduce the spread of avian malaria. The Wolbachia IT is a promising approach because it is a natural and sustainable solution to controlling mosquito populations. Unlike traditional insecticides, which can have negative impacts on the environment and non-target species, the Wolbachia IT targets only mosquitos and does not harm other organisms. Furthermore, the Wolbachia IT has been successfully used in other areas to control mosquito populations and reduce the spread of mosquito-borne diseases. By supporting the Wolbachia IT, we can help protect Hawaiian forest birds and preserve the unique biodiversity of Hawaii.	Thank you for your comment
7/23/2023 23:26	I support the proposal for IIT mosquito suppression to save ʻAkikiki and other endangered species on Kauaʻi. The science is clear and this initiative is our best hope to save the forest birds. We are running out of time to save these endangered species, and this safe IIT mosquito control technique offers a solution to give the birds a chance at survival.	Thank you for your comment
7/23/2023 23:44	Aloha kākou, My name is and I am commenting on the draft EA as a Hawaiʻi resident in strong SUPPORT of using Wolbachia Incompatible Insect Technique (IIT) to suppress mosquitoes and the spread of avian malaria on Kauaʻi to prevent future Hawaiian honeycreeper extinctions. In 2019, I had the privilege of working on the USGS Avian Malaria Genome Research Project. As part of a small crew, I helped to safely collect blood samples from forest birds to be tested for avian malaria. Our work took us to Kauaʻi where we watched ʻAkekeʻe and ʻAkikiki forage in the moss-laden ʻōhiʻa trees right next to our camp, surrounded by the songs of our Hawaiian forest birds. It was an unforgettable experience that grew my love for our manu and my desire to prevent their extinction. Just a few days ago, I heard the devastating news that there are only 5 ʻakikiki known in the wild. I wept for our forests, the ʻAkikiki, and all of the current and future generations that may never see a ʻAkikiki. According to reports by the team at Kauaʻi Forest Birds, the forests are falling silent and dead honeycreepers are seen along the trails in the Alakaʻi. Over the past 4 years since I visited, Culex quinquefasciatus mosquitoes carrying avian malaria have invaded the most pristine forests of Kauaʻi and killed our manu. Currently, I am a graduate student at University of Hawaiʻi at Mānoa studying mosquitoes. With the reading I have done related to native Hawaiian forest birds, mosquitoes and avian malaria, I believe mosquito population suppression using Wolbachia IIT is the only viable option we have right now to prevent extinctions of our forest birds. As described in the EA, Wolbachia IIT has been used successfully around the world to suppress mosquito species (including Culex quinquefasciatus) and the diseases they carry. Wolbachia IIT does not involve genetic modification. Wolbachia spp. bacteria live in close symbiosis with their invertebrate hosts and cannot infect humans, pets, birds, or other wildlife.	Thank you for your comment

Entry Date	Comment	Responses
	(**, *Continued***) One of the most popular phrases in comments submitted by those against the EA for Maui was "This project is an experiment on our island home. There are serious risks, and the outcome is admittedly unknown." This comment not only rings with anti-science sentiment (using the word "experiment" to stoke fear), but it is also vague and not supported by decades of research. While it is true that no one can with absolute certainty that Wolbachia IIT will save our birds, we have plenty of evidence to show that failure to control the spread of avian malaria will lead to the extinction of many more honeycreeper species. The Kauaʻi draft EA is thorough and has gone to lengths to discuss and address possible foreseen negative impacts of Wolbachia IIT deployment. These include impacts to other threatened and endangered species, noise pollution from drones and helicopters, as well as potential impacts of the noise and deployment activities on subsistence hunters and cultural practitioners. These potential impacts are detailed because they must be carefully considered and understood. Ultimately, these negative impacts can be mitigated while the certain loss of more honeycreeper species under the No Action Alternative cannot be. Extinction is forever. As a Native Hawaiian person, I believe our manu are kin. They are manifestations of our gods, our ʻaumakua and our kupuna (ancestors). They play critical roles in our ecosystems, pollinating the pillars of our forests such as ʻōhiʻa and koa trees, spreading the seeds of native plants and preying on invertebrates. Losing these species to extinction is the irreversible loss of connections to our ʻāina and Hawaiian culture forever. We cannot allow anti-science rhetoric, fear mongering, and conspiracy theorists to kill our beloved manu ʻōiwi. In conclusion, I am in strong SUPPORT of the Wolbachia IIT project described in the draft Kauaʻi EA, as well as the Finding of No Significant Impact (FONSI). Our manu are quickly running out of time and Wolbachia IIT is the best chance we have at saving them. Me ka haʻahaʻa,	
7/23/2023 23:44	As a Native Hawaiian we must protect our native birds and with that we must get rid of the mosquito problem within our islands!	Thank you for your comment
7/23/2023 23:52	Protect native species, always!!	Thank you for your comment
7/23/2023 23:56	I support the mosquito suppression project. Please do whatever it takes to save Kauai's native birds. We have every indication that these techniques are safe and effective. Hawaii's endemic species are part of what makes these islands so special. Their imperilment is the result of human action and it is our duty to mitigate our impacts. Once they go extinct they are gone forever. Thank you.	Thank you for your comment
7/24/2023 0:00	To: DLNR My name is . I have been a resident of Hawaii since 1974, and lived on Kauai since 1982. I think it is a horrible idea to let loose up to 775,000,000 mosquitoes per week for at least 20 years. If anything goes wrong you can decimate Kauai's bird populations. There has been no assessments to human health risks, already there were four cases of malaria in Florida and on case in Texas. Wolbachia bacteria can transmit to wild mosquitoes vectors of disease. You are creating a Frankenstein and the citizens of east Maui did not like you dumping your experiment on them. Does the DLNR really want to be the cause of killing birds and humans in the future. Do not proceed. .	Concerns: 2, 13, 14, 19, 28,
7/24/2023 0:04	Please implement the mosquito control as soon as possible. Humans have driven these birds to pretty much extinction and we need to do what we can to help. This technique is safe and mosquitoes are invasive i.e. if every mosquito was eliminated from the islands, no harm would be done. I am kamaʻāina and am in full support of Incompatible Insect Technique.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 0:04	The Kauai ‘Akikiki and Akeke‘e are in dire need of help in the form of releasing the Wolbachia-incompatible males southern house mosquitos. It's a proven method to stop the spread of invasive mosquitos, which carry avian disease. These two indigenous birds will be extinct soon without this method - which will be release-controlled and monitored. Science backs up its success, and has proven that it's not a threat to humans or animals (eg. fish, birds, pets). It would be a giant step in the right direction if we could help these native birds, and other indigenous Manu (Kaua‘i ‘Amakihi, ‘I‘iwi, ‘Apapane and ‘Anianiau)! Mahalo,	Thank you for your comment
7/24/2023 0:05	There are approximately 8,759 species found only in the Hawaiian archipelago. With our vast isolation and climactic variation, this makes the islands an ecological hotspot to host an array of diverse flora and fauna that is found nowhere else in the world. Such a high degree of endemism comes with the assumption that populations of these species are rather low. This also means that ecosystems can be somewhat fragile; especially if they are threatened by rising invasive species. Every part of an ecosystem must work symbiotically in order to be considered healthy. Everything is connected. If one species is affected, unfortunately the others will be soon to follow. We see this happening with our native honeycreepers. With the decline in native plants that serve as their food source, this creates a huge disadvantage for native birds, snails, etc. Less pollination equals less plants, which leads to less food and homes for surrounding native species. Along with declining food sources, native birds are also being affected by rising mosquito populations. There are no native mosquito species found in Hawai’i, concluding that they are all categorized as invasive which gives us all the more reason to find effective ways to control such populations. What role do we play in all of this and how does this affect us? Humans have the capability to destroy nature for future generations in order to gain incomes in the short term. A loss of biodiversity can mean having a harder time growing and gathering food, decreasing air quality, pollution, erosion, increase the likelihood of extreme weather, and it can also make us sicker. This may sound a bit extreme, but if we continue the way we have been and don’t hold ourselves accountable, it may become our reality. Without our native birds to pollinate our native plants, the islands can be subjected to erosion, our natural aquifers can be effected making it difficult to grow food and to gather water. If money is the only thing that will make people pay attention, look at this as an investment.. An investment that will determine the trajectory of our lives and the lives of future generations. As long as it will not harm surrounding species, including humans (which from my understanding, it won’t) I am in support of this project.	Thank you for your comment
7/24/2023 0:14	Aloha nui, Mahalo foe the opportunity to engage in this critical point of Hawai‘i and the mo’olelo that will be carried forward. It is absolutely imperative that all available resources as well as ones needing to be identified and developed be utilized in collaboration to ensure the protection of our native birds. These birds are a critical element of the very culture of which is Hawai‘i. I support the protection of native birds at all cost including the implentation of processes intended to eradicate mosquitoes. Mahalo nunui for your consideration and prioritizing the protection of native birds, culture and Hawai‘i.	Thank you for your comment
7/24/2023 0:17	This is an urgent and much needed action, and in my belief, the only real solution to this problem. I am a mathematical disease modeller with degrees from Imperial College London (where I first researched the use of gene drives, a similar innovation), the University of Cambridge, and the London School of Hygiene and Tropical Medicine. I am currently working at Yale. The research so far, including the trial runs in Australia and parts of central America, has shown how safe and effective this technique is. There may be voices of dissent from those who do not believe in "interference", but we have already interfered in an unintended, uncontrolled, and dangerous way many times over. The deliberate use of this technique offers us a rare chance to mitigate those harms.	Thank you for your comment
7/24/2023 0:34	i support mosquito suppression!! save our birds	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 0:45	Protecting native wildlife is critical to the health of ecosystems and if the native bird species go extinct it could have disastrous effects on every other area of the island. I must ask that you do all you can to protect these birds for the sake of the entire island ecosystem as well as to preserve a unique creature to be seen and appreciated by future generations	Thank you for your comment
7/24/2023 0:57	[PDF ATTACHED IN ADDITION TO THIS TEXT - 2023_0508_Hawaii_Unites_and_Lia_v_BLNR_and_DLNR] July 24, 2023 Attn: Mosquito Control Project Department of Land and Natural Resources Division of Forestry and Wildlife 1151 Punchbowl Street, Room 325 Honolulu, HI 96813 RE: Comment in Opposition to Wolbachia-based Suppression of Mosquitoes on Kaua'i - Draft EA (AFNSI) Hawaii Unites is a nonprofit organization dedicated to the conservation and protection of our environment and natural resources. We are opposed to "Wolbachia-based Suppression of Mosquitoes on Kaua'i - Draft EA (AFNSI).” We demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, “Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.” This project is an experiment on Hawaii’s people, wildlife, and ‘āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release. The 59,204-acre Kaua‘i project area and the 64,666-acre East Maui project area would be the largest Wolbachia mosquito releases of any kind globally to date. Female mosquitoes that bite, breed, and spread disease will be released. EPA guidelines allow for one female to be accidentally released with every 250,000 males. Southern house mosquitoes transmit diseases to humans, birds, and other animals, including avian malaria, avian pox, heartworm, elephantiasis, West Nile virus, Western equine encephalitis, and St. Louis encephalitis; and they’re a potential vector of Zika virus. Wolbachia is a complicated and potentially dangerous bacteria. Strains of Wolbachia in parasitic worms play a role in elephantiasis, heartworm, and river blindness. Assertions of no human health risks are based on unsound science discredited by the EPA. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Our organization filed a FOIA request with the EPA for the Data Evaluation Record (DER) for these biopesticide mosquitoes, including a confidential attachment. That DER document containing a full review of the manufacturing process, including testing for relevant pathogens, has been withheld from the public and was not included in the FOIA document received from the EPA. This is unacceptable. There should be complete transparency with the details of this bacteria-infected disease vector product that is planned for mass release on our island home. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven’t been considered. Conflicts of interest haven’t been addressed. The University of Hawaii and USGS disclosed in their April, 2022 Technical Report HCSU-103 that the Department of Land and Natural Resources (DLNR) has been funded to build out an insectary where they intend to mass produce lab-altered mosquitoes for release on the islands. This mosquito production at the DLNR	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 31, 34

Entry Date	Comment	Responses
	(**, *Continued***) insectary is planned to continue "into perpetuity" (forever). The draft environmental assessment proposing agency's own board has final approval on a project that benefits the proposing agency: "The state has been funded to develop a small-scale insectary that will be equipped with a containment biobubble to maintain tool efficacy and meet both federal and state permitting requirements regarding an Arthropod Safety Level 2 (ASL-2) facility." We have an active case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. We are in the process of a hearing for a Temporary Restraining Order and Preliminary Injunction to stop the release of bacteria-infected mosquitoes on East Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. We do not accept the Anticipated Finding of No Significant Impact (AFNSI) for the "Wolbachia-based Suppression of Mosquitoes on Kaua'i - Draft EA (AFNSI)." We demand an Environmental Impact Statement. Details about the risks of these lab-infected mosquitoes are documented in our case in environmental court filed May 8, 2023 (attached): Hawaii Unites and Tina Lia v. Board of Land and Natural Resources, State of Hawai'i, and Department of Land and Natural Resources, State of Hawai'i. Aloha, REFERENCES: U.S. Department of the Interior Strategy for Preventing the Extinction of Hawaiian Forest Birds (12/15/22) https://www.fws.gov/sites/default/files/documents/DOI%20Strategy%20for%20Preventing%20the%20Extinction%20of%20Hawaiian%20Forest%20Birds%20%28508%29.pdf "Hawaiian Forest Bird Conservation Strategies for Minimizing the Risk of Extinction: Biological and Biocultural Considerations" – Eben H. Paxton, Megan Laut, Stanton Enomoto, Michelle Bogardus (USGS, UH Hilo, April 2022) (Appendix VI. Wolbachia IIT Implementation Outline, pages 80-85) https://dspace.lib.hawaii.edu/server/api/core/bitstreams/8b60e14e-0935-4b61-8339-4107fce3ce91/content Hawaii Unites and Tina Lia v. Board of Land and Natural Resources, State of Hawai'i, and Department of Land and Natural Resources, State of Hawai'i (5/8/23) https://hawaiiunites.org/wp-content/uploads/2023/05/2023_0508_Hawaii_Unites_and_Lia_v_BLNR_and_DLNR.pdf	
7/24/2023 1:02	I strongly support the release of lab-reared incompatible male mosquitoes on the island of Kaua‘i. I have had the enormous privilege of working with Hawai‘i's native birds over the last two and a half years, including the ‘akikiki on Kaua‘i. These birds are important for their ecological services to the ‘āina, for their place in Hawaiian culture, and for their natural beauty. Protecting them from the effects of avian malaria and other human-caused problems should be a high priority. Wolbachia IIT represents a very promising, safe way to do this. We should not be afraid of using this technique. It has been carefully vetted by the scientific community and is the best available option for saving the incredible manu of Hawai‘i.	Thank you for your comment
7/24/2023 1:11	Humans need birds to survive. The islands would not be what they are without our special birds. Human behaviors have caused our birds to be imperiled, which means our ecosystems and our people too are imperiled. Humans must act meaningfully to try and reverse this course of mass extinction in the extinction capital of the world. As a land steward and conservation worker, I fully support the plan to release Wohlbachia affected mosquitoes in an attempt to control the mosquito populations that are devastating our birds, our lifeline. We must do whatever we thoughtfully can to save our birds.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 1:18	This is our responsibility to protect native forest birds from extinction. They are dying right now as you reading my message. Moho braccatus could have been with us if someone would have made appreciate decisions 50 years ago.	Thank you for your comment
7/24/2023 1:28	I'm opposed to this Wolbachia based Suppression of mosquitoes on Kaua'i" Environmental Assessment. I demand that the state of Hawaii and its multi-agency partnership, birds not mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds,environment and public health. The planned project is a dangerous experiment on the land, birds and people of these islands. The lab infected biopesticide mosquitoes, come with many risks,including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events,population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild,horizontal gene transfer, biopesticide wind drift,and mosquitoes becoming more capable of transmitting avian malaria and west nile virus (human and bird). Scientific studies document these concerns. Per the US Department of Interior Strategy "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife and aina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release,and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquitoe release of any kind globally to date. Southern house mosquitoes transmits diseases to humans,birds and other animals. There are no documented biosecurity protocols for these mosquitoes,and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong- the federal government, the State of Hawaii, agency partners,private landowners? The scope, risks and experimental nature of this plan require a EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquitoe releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further studies for the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Findings of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based incompatible Insect technique for the suppression of non-native southern house mosquitoe populations on Kaua'i." I demand an Environmental Impact Study. Mahalo nui loa.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/24/2023 1:30	Aloha mai kākou, I SUPPORT, Wolbachia IIT to SAVE our native Hawaiian forest birds. Hawai'i is my home. Growing up here, my heart is heavy to think that our precious native birds could be lost forever, and that my children and future grandchildren may not be able to hear them and enjoy watching them in our native forests. Mahalo nui for the opportunity to comment on this important issue. I speak on behalf of the birds who have no voice, no voice to ask for help. Please find it in your hearts to make a difference, and to help save them. Their lives are in your hands, and they are running out of time. Finding ways to help save species from extinction is incredibly challenging. With those challenges come many personal and political issues, difficulties that may even cause division. Today, I am asking you to put all of that aside. Consider all the facts, pros and cons. As a scientist/researcher, I believe this is one of the safest options available to help save our precious birds that are such an important part of our home and Hawaiian culture.	Thank you for your comment

Entry Date	Comment	Responses
	I understand people may be hesitant about things they are unfamiliar with. Wolbachia is a non-GMO and already exists in many arthropods in Hawai'i. Looking at previous studies, its use in other places around the world for disease mitigation, and the fact that chances are, many, though unaware, may have already been exposed to Wolbachia through other arthropods in Hawai'i. I feel this may be the best way to help the birds. To my knowledge, this is the safest method available we have to help. Have you ever been bitten by a mosquito in Hawai'i? If you've spent any time in Hawai'i at all (let alone lived here), you've most likely been bitten many, many more than just once. Now, can you imagine if all it took was 1 single mosquito bite to be deadly? All it takes is 1 single bite by an infected mosquito to kill one of our precious endangered native forest birds. Time is of the essence as every wasted moment moves them closer to extinction. If nothing is done to help them, we are choosing to let them be lost forever. We, however, still have a small window of opportunity. That small bit of time to save many species is still here within our grasp. Now is the time to take action! I submitted this very close to the deadline. Similarly, our native birds are approaching a very real DEADline. A literal one. Without our help, they will be lost forever. Can you imagine a quiet native forest without their voices? It would not be the same forest, it would be empty, void, and heartbreaking. Along with the loss of our precious native species, we'd lose all the important 'services' they bring to our native forests, we'd lose another part of our Hawaiian culture... It brings tears to my eyes just thinking about it. Many times in our Hawai'i nei, negative impacts to our ecosystem may happen (such as introduction of invasives, loss of culture, decline/extinction of Hawaiian species) and due to various reasons, we wait until things are too late... Too far gone. It's then that many are saddened and we realize that we should have taken action sooner. The sooner we take action, the more of a chance we have to make a literal life changing difference! With every moment that passes that we do nothing, they are moving closer to that DEADline. I urge you to please take this final opportunity to save our native birds from extinction. They have no voice to cry for help. Please be their voice & change the course of what could be their inevitable history. We are their last and only hope. Please SUPPORT the mosquito control efforts of Wolbachia IIT on Kaua'i, and on every island in our Hawaiian Islands. Please take a stand for our native species and make a difference for them, for our aina, for our culture, and for our future. Mahalo for your time and consideration.	
7/24/2023 1:50	We need to take swift and radical action to save the Hawaiian honeycreepers. The release of Wohlbachia infected male mosquitoes is the best and scientifically backed option to save the Akikiki and the akeke and the other native Hawaiian birds that are disappearing forever from the planet. We must be rapid in the approval because there is no time or we will lose our Hawaiian native birds forever.	Thank you for your comment
7/24/2023 1:52	Dear sirs: I strongly oppose the release of experimental mosquitoes in our island of Kaua and the rest of Hawaii. There was a public meeting but the answers to the questions did not make sense / I asked specifically if this exact method has been used successfully anywhere in the World. The answer I was given was yes.I have learned that this is not true.The risks are too high for something that puts us at risk. States like Florida have seen the appearance of malaria after experimental mosquitoes were released there. Lab manipulated ticks have caused havoc in the lives of millions of people. The last thing we need is to endanger the lives of people in Kauai with an experiment with insects that could cause damage to humans and even the birds we are being told would be protected by these mosquitoes. There is not enough transparency about exactly who is behind the mosquitoes provision. Names like the Gate foundation are connected and Bill Gates has been very vocal about the need decrease the World population so that doesn't inspire a lot of trust.	

Entry Date	Comment	Responses
	It is now known the lab manipulated ticks are the cause of Lyme decease. that has harmed so many creating havoc on their healths.. https://www.newsweek.com/pentagon-weaponized-ticks-lyme-disease-investigation-1449737 There are reports of mosquitoes as bio weapons.and of experiments on unsuspecting subjects in the past https://www.usatoday.com/story/news/nation/2021/02/04/big-buzz-mosquito-experiment-savannah-black-distrust-covid-vaccine/4391880001/ I am also attaching a testimony a fully agree with in opposition of this ill conceived lab manipulated mosquito experiment. Sincerely, . Kapaa, Hi Attention: Mosquito Control Project Kaua'i 22 July 2023 Department of Land and Natural Resources U.S. Fish and Wildlife Service Aloha, This testimony is in regards to draft Kaua'i Environmental Assessment (EA) completed in June 2023. I am strongly opposed to the request for Anticipated Finding of No Significant Impact (AFONSI) for the release of lab bred Wolbachia southern house mosquitoes in Kaua'i and all Hawaiian Islands for numerous reasons documented in this extensive testimony. There is insufficient detail for the public to properly evaluate the EA as being safe for the environment. The Kaua'i draft EA requires much more study on secondary impacts with no less than a full scope Environmental Impact Statement (EIS) since mosquitoes are a vector of disease. The Incompatible Insect Technique (IIT) is being promoted in the EA as a mosquito control method to help save endangered birds from avian malaria. Page 9 of the EA states this technique has been successfully implemented in 14 countries and 4 cities in the United States, but fails to list the countries and projects that are connected. The only Wolbachia program that has been implemented worldwide at this scale is the World Mosquito Program funded by The Bill and Melinda Gates Foundation. This is a different method involving Aedes aegypti males and females released into urban areas for population replacement to control Dengue fever, a human disease. The World Mosquito program chart on its website lists difference between the methods used worldwide. The IIT method proposed for Maui and Kaua'i "relies on the continuous production and release of male mosquitoes and is, therefore, more expensive than the World Mosquito Program's method. There is no field evidence that it can reduce the risk of mosquito- borne diseases." https://www.worldmosquitoprogram.org/en/learn/how-our-method-compares The IIT method has never been used for conservation purposes or with the species Culex quinquefasciatus (southern house mosquito) anywhere worldwide. This is an experiment based on several unsound justifications and references. Federal documents (**,** ***Continued***) admit the outcome is unknown. The public has already voiced numerous concerns about the release of lab bred mosquitoes in response to the Maui EA which is now being challenged in environmental court to seek a ruling to require an Environmental Impact Statement. No further actions should be taken to release biopesticide mosquitoes anywhere Hawai'i while the need for further study of the risks is actively being litigated. Since spring 2022, as a veteran in National Security and Investigations for over 30 years, I have personally studied the science in depth behind the use of Wolbachia for mosquito control. After reviewing thousands of pages of scientific papers, environmental assessments, government documents, videos, interviews, funding, and grants related to Wolbachia; as well as consulting with experts regularly; what stands out from all this research is that Wolbachia bacterium strains are still being discovered and its impacts are yet to be fully understood. Its influence on other life forms; including humans, native	

Entry Date	Comment	Responses
	birds, arthropods and filarial worms' reproductive cycle and pathogen infection (either to block or promote) is still in process of being vetted. Science is still grasping the mechanisms of Wolbachia as documented on page 32 of Evaluation of Existing EFSA Guidelines for their Adequacy for the Molecular Characterization and Environmental Risk Assessment of Genetically Modified Insects with Synthetically Engineered Gene Drives. "The mechanism of Wolbachia-induced pathogen-blocking is not well understood (Marshall et al., 2019). Yet, this feature, along with the gene drive-like inheritance pattern of Wolbachia, has been harnessed in replacement strategies to limit disease transmission by mosquito populations." http://www.ask-force.org/web/EFSA/EFSA-GMO-Panel-Gene-drive-document-for- consultation-20200129.pdf We are awaiting results of grants researched out of Penn State University thru NIH including WOLBACHIA-INDUCED ENHANCEMENT OF HUMAN ARBOVIRAL PATHOGENS. "A SOBERING REMINDER THAT THE PATHOGEN INHIBITORY EFFECTS RESULTING FROM WOLBACHIA INFECTION IN SOME INSECTS CANNOT AND SHOULD NOT BE GENERALIZED ACROSS VECTOR-PATHOGEN SYSTEMS. UNDERSTANDING THE GENERAL ARE CRITICAL FOR ESTIMATING HOW LIKELY WOLBACHIA-BASED CONTROL STRATEGIES ARE TO FAIL OR MAKE THINGS WORSE, FOR IDENTIFYING POTENTIAL POINTS WHERE WOLBACHIA-BASED CONTROL IS LIKELY TO BREAK DOWN IN THE FIELD, AND FOR PLANNING RISK MITIGATION STRATEGIES IN HE CASE OF UNFORESEEN HARMFUL OUTCOMES. IN THIS RESEARCH, WE WILL INVESTIGATE THE HYPOTHESIS THAT WOLBACHIA-INDUCED MODULATION OF THE MOSQUITO HOLOGENOME CAN LEAD TO INCREASED ARBOVIRUS INFECTION/TRANSMISSION IN SOME VECTOR-PATHOGEN SYSTEMS OF HUMAN IMPORTANCE." https://govtribe.com/award/federal-grant-award/project-grant-r01ai116636 Wolbachia Potential to Increase Pathogen Infection The Southern House Mosquito can transmit Avian Malaria, Avian Pox, Western Equine Encephalitis, West Nile Virus, Canine Heartworm, Lymphatic Filariasis/Elephantiasis, St. Louis Encephalitis and is a potential vector of Zika virus. There are Wolbachia studies that have shown it to increase pathogen infection in some instances. "Mosquitoes infected with the bacteria Wolbachia are more likely to become infected with West Nile virus and more likely to transmit the virus to humans, according to a team of researchers." "The results suggest that caution should be used when releasing Wolbachia-infected mosquitoes into nature to control vector-borne diseases of humans." https://www.sciencedaily.com/releases/2014/07/140710141628.htm Wolbachia Enhances West Nile Virus (WNV) Infection in the Mosquito Culex tarsalis https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0002965 Wolbachia Can Enhance Plasmodium Infection in Mosquitoes: Implications for Malaria Control? https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4154766/ (***Continued***) Antibiotic Resistance Page 12 of Kauai EA states: "To produce the incompatible male southern house mosquitoes for this project, a laboratory line of Hawai'i mosquitoes was generated with the wAlbB strain of Wolbachia. This was accomplished through a multi-step process that involved rearing Hawai'i mosquitoes in the lab and removing the wPip Wolbachia from their bodies with common antibiotics. The wAlbB strain of Wolbachia was then transferred into the eggs of these Wolbachia-free Hawai'i mosquitoes." Use of this method over time with constant releases can lead to antibiotic resistance with unknown effects on the environment and can cancel out effectiveness of treatment for diseases in which Wolbachia is implicated in humans which is highly concerning.	

Entry Date	Comment	Responses
	The endosymbiont Wolbachia rebounds following antibiotic treatment https://pubmed.ncbi.nlm.nih.gov/32639986/ Previous mosquito control projects in California and Cayman Islands using Genetically Modified (GM) mosquitoes (which also uses antibiotics during lab rearing) have not renewed contracts. "Cayman Island officials were set to renew their contract. But data from the trials indicated serious problems, leading the territory's environmental health minister to tell the Edmonton Journal, the scheme was not getting the results we were looking for. There was further concern that the released mosquitoes could be spreading antibiotic resistance or make mosquito-borne diseases worse by lowering individual immunity." Modified Mosquitoes Fail to Beat Malaria https://www.pressreader.com/canada/edmonton-journal/20181126/281951723871847 "British biotechnology company Oxitec is withdrawing its application to release billions of genetically engineered mosquitoes in California, according to a recent update from the California Department of Pesticide Regulation." https://beyondpesticides.org/dailynewsblog/2023/05/efficacy-and-health-issues-stop- release-of-genetically-engineered-mosquitoes-in-california-florida-continues/ There are parallels between GM and Wolbachia techniques. Biologically Wolbachia lab infected mosquitoes are not GM mosquitoes, but the study designs, math, and adherence to protocol apply to both situations. The main biological difference is there is slower horizontal transfer of mutations of the GM mosquito than with horizontal transfer of Wolbachia. This means Wolbachia as a natural gene drive has the potential to have greater unknown impact on the environment, which necessitates the need for a full scope Environmental Impact Statement (EIS). Horizontal Spread, Vertical Transmission, and Wolbachia as Gene Drive "The evidence of horizontal spread of Wolbachia shows that the bacteria go not only to sexual cells, but also to somatic cells (non-sexual cells of the body). Wolbachia can also live outside of the intra-cellular systems for several months." Wolbachia Horizontal Transmission Events in Ants: What Do We Know and What Can We Learn? https://pubmed.ncbi.nlm.nih.gov/30894837/ Horizontal Gene Transfer Between Wolbachia and the Mosquito Aedes aegypti https://bmcgenomics.biomedcentral.com/articles/10.1186/1471-2164-10-33 This document submitted by Oxitec to the EPA in 2015 outlines numerous legitimate and studied issues regarding the use of Wolbachia. https://downloads.regulations.gov › EPA-HQ-OPP-2015-0374-0018 › attachment_1.pdf "Wolbachia is a bacterium residing within the cells of insects, and is passed through vertical transmission from mother to offspring. Even a single Wolbachia infected female could lay hundreds of eggs that would invade the wild population, rendering the Incompatible Insect Technique ineffective and spreading a new strain of Wolbachia into the environment. Modelling has shown that conditions of lower competition can favour infected females [6-8]. In other words, as a mosquito population is reduced, or if a population is already low, the chances of Wolbachia invading the wild population are increased." (**, *Continued***) "The Wolbachia is an endosymbiont on the cytoplasm of the cell so over a thousand new genes are introduced into the insect cells, some or all of which have the potential to randomly integrate into the insect's nuclear genome with unknown consequences. Moreover, the possible persistence of Wolbachia mosquitoes themselves is a significant concern. For the reasons set forth below, each new strain of mosquito, or indeed any artificially Wolbachia infected insect needs to be treated as a new strain and thoroughly tested in the laboratory before any field releases." "The whole genome of Wolbachia can transfer to a host genome, meaning a host mosquito could be transformed with over one thousand new genes with unpredictable results [2-5]."	

Entry Date	Comment	Responses
	"It has already been shown that horizontal gene transfer (HGT) can transfer genes between Wolbachia and its host in Aedes aegypti [12] and several other mosquito species [13]. Therefore, Wolbachia can genetically transform its host with functional genes with currently unknown consequences." "Horizontal transmission between unrelated host species is a proven phenomenon in Wolbachia [25]. Studies have demonstrated that genetic sequences, ranging in size from Horizontal transmission between unrelated host species is a proven phenomenon in Wolbachia [25]. Studies have demonstrated that genetic sequences, ranging in size from single genes to entire bacterial genomes, have been transferred from Wolbachia to many of their insect hosts [2-5], and its effect on disease transmission is variable and potentially dangerous." Owain Edwards of CSIRO in Australia (Commonwealth Scientific and Industrial Research Organisation) was involved in the Aedes aegypti trial around Innisfail (Beebe et al 2021) that was funded by Verily Life Sciences. Dr. Edwards refers to Wolbachia as a type of natural gene drive during his 2016 presentation for APVMA. https://www.youtube.com/watch?v=Lm_WS9eXYIU Dr. Edwards elaborates there are limitations on the use of Wolbachia application over time which can lead to limited choice of genes and for the Wolbachia technique to remain effective at suppressing mosquito population, a variety of natural strains are needed. The next step in the process is explained using CRISPR technology - synthetic gene drives. Dr. Edwards emphasizes while working on synthetic gene drives, "it requires double and triple containment to make sure these don't get out of the laboratory." This is concerning since page 32 of EA says, "DLNR is also exploring future options for establishing a state-run mosquito-rearing facility in Hawai'i; mosquito sources could also originate from a similar but state-run mosquito-rearing facility in the future. Should DLNR pursue this option, the appropriate regulatory permits and documentation (environmental reviews and facility compliance) would be necessary." Federal documents state plans for future tools to include synthetic gene drives, next generation tools, synthetic biology control tools, novel technology deployment, and precision-guided Sterile Insect Technique (pgSIT) (CRISPR technology) in Hawai'i. While "technology for this approach is not available for near-term implementation," development and deployment of these tools appear to be a long-term goal at the federal level." U.S. Department of the Interior Strategy for Preventing the Extinction of Hawaiian Forest Birds – https://www.fws.gov/sites/default/files/documents/DOI%20Strategy%20for%20Preventin g%20the%20Extinction%20of%20Hawaiian%20Forest%20Birds%20%28508%29.pdf Wolbachia DNA into Host DNA – "A team of researchers has discovered that a bacterial parasite (called Wolbachia) can insert almost its entire genome into the genomes of members of one host species (a fly called Drosophila ananassae), and can insert parts of its genome into the genomes of members of several other host species." https://www.nsf.gov/news/news_summ.jsp?cntn_id=109957 Lack of Bio-Security There has been no documentation offered to the public outlining risk analysis conducted on the security vulnerabilities for lab bred mosquitoes that can be utilized as bio- weapons against a population (intended) nor details of quality control mechanisms for accidental transmission of pathogens (unintended). This includes failure to discuss how they will deal with accidental female escape, (**, *Continued***) wind drift, or how male lab bred culex q. mosquitoes released into the wild can pass pathogen to biting females thru mating and shared feeding/water sources. The public has no idea how these lab mosquitoes will be quality controlled and tested. Intended entomological warfare involves infecting insects with a pathogen and then dispersing the vectors over target areas. Invasive insects can also be deployed into a country en masse to take out crops and cripple a food supply. In New York the Plum Island lab was involved in the development of offensive bioweapons that led to Lyme's disease outbreaks. Japan's biological warfare unit (Unit 731) was deployed against China during World War II. The unit deployed plague-infected fleas and cholera-infected flies to take out the Chinese. https://citizens.news/694097.html "We recommend careful invigilation of the international borders, airports, and seaports by the trained scientists to identify any accidental and/or deliberate import of alien arthropod vectors. Therefore, it is well advised to take seriously the possibility that	

Entry Date	Comment	Responses
	arthropod could be used to attack people. Moreover, future research priorities should also includes high-throughput molecular diagnostics of diseases, identification of vectors, phylogenetic studies to understand the origin and distribution of the pathogen and vector strains. A rapid action team of trained scientist and health workers equipped with modern sophisticated diagnostic tools and suitable vector extinguishers should be appointed by the state and/or central health authorities to counter act any such emergency". Bioterrorism on Six Legs by Dr. Manas Sarkar. A patent was developed in 2014 involving drones that transport and release mosquitoes. It mentions in the patent these drones can be co-opted for bio-weapons military programs. https://patents.google.com/patent/US8967029B1/en Page 23 of the EA states "By contrast, male's proboscises are adapted to primarily feed on plant nectar and secretions, and do not feed on blood (Mullen and Durden 2009). Therefore, male mosquitoes cannot transmit disease." This is incorrect and misleading to the public since we come to find male lab bred mosquitoes can pass pathogens to wild biting females thru mating and shared feeding/water sources. Venereal Transmission of St. Louis Encephalitis Virus by Culex quinquefasciatus Males (Diptera: Culicidae) – Donald A. Shroyer (Journal of Medical Entomology, 5/1990) https://academic.oup.com/jme/article-abstract/27/3/334/2220754?login=false There is no mention in the Kaua'I EA on how lab batches will be quality controlled or tested for unintended pathogens upon arrival to Hawai'i or if lab employees in contact with these mosquitoes will go thru security clearance screening and training. No documented assurances have been made to the public that lab suppliers will be testing mosquitoes for human, equine, canine, or avian diseases to ensure that they are pathogen-free prior to shipping to Hawai'i. The science and tech industry in the United States, to include Silicon Valley and Academia, has been heavily infiltrated by the Chinese Communist Party (CCP) and non-government organizations such as Davos and the World Economic Forum whom have been strongly pushing Agenda 2030 thru climate change initiatives. Due to the deterioration of relations between the US and China, among other adversaries, mosquito control releases should not move forward until sound security protocols are adequately implemented. https://www.justice.gov/opa/pr/harvard-university-professor- and-two-chinese-nationals-charged-three-separate-china-related The Bill and Melinda Gates Foundation (Gates), also connected to the above-mentioned entities, are strong proponents of climate agenda and have openly discussed support of human depopulation. This is the same foundation that has been funding ongoing research of Wolbachia (World Mosquito Program and numerous grants) and GM mosquitoes including Oxitec since 2002. Gates has also funded research developing anti-malaria vaccines using mosquitoes as a delivery system which is highly concerning. https://www.npr.org/sections/goatsandsoda/2022/09/21/1112727841/a-box-of-200- mosquitoes-did-the-vaccinating-in-this-malaria-trial-thats-not-a-jo Wolbachia Has Been Implicated in Human Disease (***Continued***) Wolbachia is NOT harmless to humans. It effects filarial worms that cause human disease such as river blindness and is implicated in Elephantiasis. These diseases effect millions of people each year. According to the CDC website, "There is a promising treatment using doxycycline that kills the adult worms by killing the Wolbachia bacteria on which the adult worms depend in order to survive". https://www.cdc.gov/parasites/onchocerciasis/treatment.html "For decades, people have blamed a parasitic nematode worm for a disease that has blinded at least 250,000 people now living in Africa and South America. But the real culprit may be the ubiquitous Wolbachia, bacteria that colonize many hundreds of species, including the worm indicted in river blindness. Researchers now report that Wolbachia stimulate the severe immune system response that slowly robs people of their vision". https://www.science.org/content/article/worms-may-not-act-alone-river- blindness Anti-Wolbachia therapy for onchocerciasis & lymphatic filariasis: Current perspectives https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6755775/	

Entry Date	Comment	Responses
	Efficacy of 2- and 4-week rifampicin treatment on the Wolbachia of Onchocerca volvulus https://pubmed.ncbi.nlm.nih.gov/18679718/ The Kauai EA's assertion that released mosquitoes pose no risk to human health is based on unsound science. On page 25 of the EA it says "Wolbachia cannot live within vertebrate cells and cannot be transferred to humans even through the bite of a mosquito that carries it (Popovic et al. 2010). " In contrast we know science is recently discovering detection of Wolbachia genes in humans: Detection of Wolbachia genes in a patient with non-Hodgkin's lymphoma https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(14)00040- 8/fulltext "Wolbachia 16S rRNA and fbpA genes were twice detected over 5 days in the blood of a patient with high fever. The patient was given fluoroquinolones and the fever resolved. Four weeks later, he was diagnosed with non-Hodgkin's lymphoma and received R-CHOP (Rituximab, Cyclophosphamide, Doxorubicin, Vincristine, Prednisolone) treatment resulting in complete remission. This is the first report of detection of Wolbachia genes from the blood of human patients with non-Hodgkin's lymphoma." The 2010 article by Popovici et al. cited in the EA has been discredited by the EPA. The EPA Human Studies Review Board met in 2018, and the following question was posed: "Is the research described in the published article 'Assessing key safety concerns of a Wolbachia-based strategy to control dengue transmission by Aedes mosquitoes' scientifically sound, providing reliable data for the purpose of contributing to a weight of evidence determination in EPA's assessment of the risks to human health associated with releasing Wolbachia-infected mosquitoes?" The Board's response states: "The Board concluded that the research described in the article by Popovici et al. was not scientifically sound and does not provide reliable data to contribute to a weight of evidence determination for assessment of human health risks due to release of Wolbachia-infected mosquitoes." Inconsistent Climate Data and Mosquito Population Trends The EA states, "Some climate change models suggest that the mean temperatures in Hawai'i may increase by 3°– 4°C by 2100 (Hayhoe et al. 2018). The effects of climate change have been found to result in increased stress to natural systems through altered temperatures and rainfall patterns (Alexander et al. 2016). Increases in mean temperatures, for example, have facilitated the spread of mosquitoes and avian malaria into habitats where cool temperatures very recently limit mosquito presence and transmission of malaria to highly susceptible endemic forest birds (Atkinson et al. 2014)." Contrary to the above claims, from 1978 to 2017 (0 to 1600 meters) Kagawa and Giambelluca 2019, Spatial Patterns and Trends in Surface Air Temperatures and Implied Changes in Atmospheric Moisture Across the Hawaiian Islands, 1905–2017. Researchers summarized data from weather stations on several islands pooled together. They extended the range of observations to the year 2017. Daytime cooling was noted at upper elevation below the trade wind inversion that is consistent with observed cooling of −0.2 (***Continued***) to −0.8°C/decade at multiple high elevation stations during 1988–2013 (960–2,990 m; Longman, Giambelluca, et al., 2015). https://agupubs.onlinelibrary.wiley.c Additional skepticism to global warming trend is gaining momentum among the scientific community. The World Climate Declaration – There is no Climate Emergency was signed by over 1580 vetted scientists and continues to grow. https://clintel.org/wp-content/uploads/2021/03/WCD-A4version09202013.pdf Greenpeace Founder Patrick Moore Says Climate Change Based on False Narratives https://www.theepochtimes.com/science/exclusive-former-greenpeace-founder-patrick- moore-debunks-the-false-narratives-of-climate-change-4709568?rs=SHRDHWFRF	

Entry Date	Comment	Responses
	Climate Activists Invest in Property on Beaches They Say are Disappearing https://www.washingtonexaminer.com/politics/climate-activists-invest-property-beaches- climate-change-sea-rise In 2013 Lisa Crampton and Anouk Glad conducted a study of Plasmodium relictum infection in Culex quinquefasciatus. The rate of capture of adult mosquitoes and Plasmodium relictum percentage was extremely low at Alakai Plateau of Kaua'i. https://onlinelibrary.wiley.com/doi/pdfdirect/10.1111/jvec.12157 Vol. 40, no. 2 Journal of Vector Ecology 225 "The infection rate of Plasmodium relictum is also essential to understanding the transmission rate to birds on the Alakai Plateau. We screened 17 mosquitoes caught at Halepa'akai and 16 mosquitoes caught at Kawaikoi in October and November for P. relictum infection using PCR. One mosquito from Halepa'akai tested positive for infection. We dissected 33 mosquitoes caught at Kawaikoi (winter and spring); none of them tested positive for infection by P. relictum (neither oocysts nor sporozoites were observed). Only three mosquitoes caught at Halepa'akai (January) were dissected, and none of them were infected (neither oocysts nor sporozoites were observed). Thus, the prevalence rate of P. relictum in our study is 1.45% (n=69)." Page 34 of EA uses mosquito estimates documented over 10 years ago from Hawai'i Island. "Estimates range from an abundance of approximately 600 mosquitoes per acre near sea level on Hawai'i Island where monthly temperatures average 70–75° F, to an abundance of five mosquitoes per acre at an elevation of approximately 4,000 feet where temperatures average 55–60° F (Samuel et al. 2011, Atkinson et al. 2014)." Page 19 of EA states "Mosquito populations and avian malaria have recently expanded into higher elevation habitat, which is the last refugia for these endangered avian species." I could not find a reference study proving the mosquitoes are invading higher elevations in the proposed release areas in Kaua'i or recent documentation on the prevalence rate of Plasmodium relictum since the Crampton and Glad study in 2013. Verily Life Sciences and Rhodamine B Verily's registrant representatives are listed in the Department of Agriculture Import Application - https://hdoa.hawaii.gov/wp-content/uploads/2018/05/HDOA-Mosquito- Request-PA_Final-6.8.21.pdf - and are co-authors of Mark Release Recapture of Male Aedes aegypti use of Rhodamine B to Estimate Movement, Mating and Population Parameters for an Incompatible Male Program https://www.researchgate.net/publication/345648051_Title_Mark-release-recapture_of_male_Aedes_aegypti_Diptera_Culicidae_use_of_rhodamine_B_to_estima te_movement_mating_and_population_parameters_in_preparation_for_an_incompatibl e_male_program The EA mentions no use of the toxin Rhodamine B. Will Rhodamine B be used in Kauai's MMR studies? Is there potential ongoing use of Rhodamine B could have implications on land and aquatic lifeforms? https://www.sciencedirect.com/science/article/abs/pii/S0045653521025522 Rhodamine B (RhB) is among the toxic dyes due to the carcinogenic, neurotoxic effects and ability to cause several diseases for humans. https://pubmed.ncbi.nlm.nih.gov/33857893/ (***Continued***) In Summary I am opposed to request for approval of the draft Kauai Environmental Assessment for the numerous reasons documented in this testimony. Sections of the EA lack sufficient detail, contain outdated references and EPA discredited sources. It is unfortunate this project is being fast tracked and in hindsight, a full scope EIS should have been completed years ago. I am additionally concerned the use of Wolbachia IIT as a mosquito suppression method to save the birds will not have the intended outcome, according to the World Mosquito Program "there is no field evidence it can reduce the risk of mosquito born diseases". The logical next step already in discussion in Federal documents would be a segway into controversial and potentially dangerous synthetic gene drive technology in which corporate gain will be at the expense of the Hawaiian ecosystem. Respectfully,	

Entry Date	Comment	Responses
	Kamuela, HI	
7/24/2023 2:30	Save the akikiki! Kauai is the where my passion for birds started. It saddens me to see the birds that got me into this wonderful passion actively going extinct. This is the last chance to save them.	Thank you for your comment
7/24/2023 2:30	Please do what you can to save Hawaii's unique birds!	Thank you for your comment
7/24/2023 2:44	Rainbows are circles, but humans believe them to be arches because of our perception from the ground. If we don't preserve species that are capable of looking at life in ways we can't, we will be forced to look at life in ways we shouldn't. Our evolution is dependent upon the survival of those greater than ourselves. And to think a small bird isn't greater, is to insist that a rainbow will never be a circle, or that humans may one day fly. Invest in the projects and your teams, but remember money is paper to a bird. and one day we'll learn that it's just paper to us too. Our evolution is dependent upon the survival of those greater than ourselves.	
7/24/2023 3:04	The forest birds of Hawaii are so unique to this Earth, and can't be found anywhere else. It's our responsibility to protect them against invasive, non-natural species like the mosquito. There are only 4-5 akikiki left in the wild. They and other species will go extinct without intervention such as the use of Wolbachia. I whole heartedly support the Wolbachia incompatible insect technique to save these species before they disappear from this world.	Thank you for your comment
7/24/2023 3:06	I am in full support of mosquito suppression. Native populations are at stake, and have faced extinction. Please do your part to protect the remaining forest birds.	Thank you for your comment
7/24/2023 3:07	I believe that these birds should be protected at all costs.	Thank you for your comment
7/24/2023 3:09	I support this proposal! Please save the birds!	Thank you for your comment
7/24/2023 3:16	I am in favor of the IIT program on Kaua'i	Thank you for your comment
7/24/2023 3:19	I support mosquito suppression in order to protect the birds of Hawaii!!!	Thank you for your comment
7/24/2023 3:25	I support mosquito suppression!	Thank you for your comment
7/24/2023 3:30	Save the birds!!!	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 3:35	I support saving these birds, and stopping the spread of avian malaria!	Thank you for your comment
7/24/2023 3:42	I support mosquito suppression efforts on Kauai island.	Thank you for your comment
7/24/2023 3:50	Aloha kākou, I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations an address this critical problem. Thank you for your time and consideration. Mahalo,	Thank you for your comment
7/24/2023 3:53	I wholeheartedly support this effort, which is based on science-backed evidence and run by a team of skilled professionals. It is essential to give these incredible native Hawaiian birds a fighting chance against avian malaria, and time is quickly running out for the ʻakikiki!	Thank you for your comment
7/24/2023 4:03	I support the use of IIT for mosquito suppression on Kauai. This is a necessary step in Hawaiian forest bird conservation. We have lost too many native species already and action must be taken now. The mosquito project poses no threat to humans of Āina, I am in support to using it to help save the birds.	Thank you for your comment
7/24/2023 4:06	I am in favor of mosquito control on Kaua'i as a conservation action to prevent the extinction of native birds. These methods are backed by science to give native bird species a chance against avian malaria, a disease that will eradicate them if no action is taken. Opposition to this conservation action is based on deeply, dangerously false information and should not carry weight in conservation decisions. Thank you for protecting native birds with mosquito control!	Thank you for your comment
7/24/2023 4:20	I am in favor of mosquito control on Kaua'i as a conservation action to prevent the extinction of native birds, especially Hawaiian honeycreepers. This is an incredibly important conservation action item that I fully support.	Thank you for your comment
7/24/2023 4:22	Please do this as soon as possible.	Thank you for your comment
7/24/2023 4:25	I strongly support the mosquito control efforts to save Kaua'i's native forest birds. I can't think of a worthier cause for the sake of the natural and cultural heritage of Hawai'i. I had the privilege of visiting Alaka'i Wilderness in March of this year (2023), when there were still multiple pairs of 'Akikiki trying to raise their young in these beautiful Kaua'i forests. It was a joy to see them living their lives there, but also sad to know that they and the other birds in the forest were in such danger. Since that time, over the course of only a few months, it has been heartbreaking to hear that nearly every 'Akikiki has disappeared, their nests dying and the adults vanishing as they die of mosquito-borne disease. I can't believe that these birds, which were here in March, are now basically extinct by August of the same year. I also know that the other birds of the Alaka'i Wilderness are in danger of the same fate, especially the 'Akeke'e and the beautiful and iconic 'I'iwi. So many of Hawai'i's native birds are extinct already, taking with them the opportunity for others to witness and enjoy these beautiful species, which are so special to Hawai'i and to the world. For the sake of the faint hope of re-introducing 'Akikiki, and for the sake of the 'Akeke'e and 'I'iwi and all of the other birds in danger, please support and go through with this safe, well-reasoned, and well-designed plan to eradicate mosquitos from Kaua'i.	Thank you for your comment
7/24/2023 4:29	I support Wolbachia IIT to save Hawaiian forest birds because it can help suppress mosquito populations and help save the remaining native birds in the Hawaiian Islands.	Thank you for your comment
7/24/2023 4:39	PLEASE SAVE OUR NATiVE BIRDS!!!	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 4:50	I support mosquito suppression	Thank you for your comment
7/24/2023 4:53	It is vital to prevent the extinction of honeycreeper birds. Many of these birds have already gone extinct and we should not lose more species than we already have. By using the incompatible mosquitos, we may be able to save honeycreepers from extinction. Using mosquitoes is an important action that needs to be taken NOW.	Thank you for your comment
7/24/2023 4:54	Please use the incompatible mosquito release to save the honeycreepers.	Thank you for your comment
7/24/2023 4:56	I support this EA. These birds are so vital to the ecosystem. We can learn so much from studying them and keeping them around. Please support these birds so our future generations can learn about them and understand their uniqueness.	Thank you for your comment
7/24/2023 4:57	Preserving native bird species is extremely important and efforts to do so should be prioritized by environmental initiatives. IIT is an approach that can help reduce the population of non-native mosquitoes and subsequently protect native species of birds. This approach has been proven to be successful previously. I would like to voice my support for the project.	Thank you for your comment
7/24/2023 4:59	Please input mosquito control to save these birds!	Thank you for your comment
7/24/2023 4:59	I strongly support the effort to suppress mosquito populations. All mosquito species are introduced to Hawai'i and threaten not only human health but the health of our native ecosystems. The approach being taken here, which has been successfully implemented in several other places globally, offers the first real hope to stop and maybe even reverse the decline of our native forest birds and with them our native forests. This is crucial for the perpetuation of our watersheds. The EA addresses all concerns and this project should move forward with the urgency that the situation requires.	Thank you for your comment
7/24/2023 5:14	The suppression of mosquitos on Kaua'i is urgent. Without mosquito suppression all native honeycreepers will be lost to avian malaria in a very short time, as climate change increases suitable habitat for the non-native southern house mosquitos that spread the disease. I worked as an intern with Kaua'i Forest Birds from 2018-2019, and returned to work with the project as a technician in the spring of 2021. I only missed one breeding season (spring of 2020), and the decline of individual 'akikiki, i'iwi, and akeke'e was unbelievable. Now with only 5 'akikiki remaining, I fear the other species of honey creepers on Kaua'i will face the same fate. Mosquito suppression is critical to preventing extinction and will also benefit the honey creeper species that are also facing decline but not yet endangered. I support the Environmental Assessment's findings and believe the risks have been appropriately considered. Potential impacts of the operations on the native ecosystem have been noted in the assessment and I believe they are outweighed by the benefit of preventing extinction of the honeycreeper species.	Thank you for your comment
7/24/2023 5:15	I oppose the experimental release of waboquia mosquitoes. For reasons too numerous to mention; this is a health hazard that is unnecessary to the people of HAWAII & KAUAI. Please do not rely on subjective science. This is a danger. Period. And it must be stopped. The Church @ Koloa, HI Mahalo Ke Akua	Concern: 2, 11
7/24/2023 5:31	Imagine a future where your children have no birds. wouldnt you do anything to prevent that?	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 5:32	Please accept this email as my support for the Kauai Mosquito Suppression draft Environmental assessment. The effects of avian malaria, spread by non-native mosquitos, on Hawaii's native wildlife, are well documented. While this method has not been used in Hawaii, it has successfully reduced mosquito populations elsewhere (Texas, California, Mexico, Singapore, Australia). This draft EA is extensive and discusses the proposal well and clearly illustrates the options and their risks, including what happens if we do nothing... the loss of some of the most rare species on earth. Other conservation management techniques to bolster native bird populations are a waste of time and money without large-scale mosquito control efforts to reduce avian malaria on the landscape. The approval of this draft EA is critical in the next steps to protecting Kauai's native birds, and birds across the Hawaiian chain. I had the privilege of working with endangered forest birds on Kaua'i from 2010-2014. When it was not uncommon to see and hear species like Akikiki and Akeke'e in the Alaka'i. When I started working for KFBRP in 2010 both species had just been listed but it felt like there was still time. Now, in less than a decade since I left that position, Akikiki and Akeke'e are at critically low numbers at no fault to the dedicated individuals who continue to try to save them with limited options, funding and support. Forests that less than 20 years ago were noted by biologists as being vibrant with the songs and calls of native birds are now growing silent. It is heartbreaking to come to terms with the undeniable fact that we are willingly witness species go extinct, especially species I worked so closely with, while there are proven methods that could save them. Now is our only opportunity to keep them from blinking out of existence. Please approve and support the draft EA for mosquito suppression on Kauai and pave the way forward for mosquito suppression on other Hawaiian Islands. Please do not let our last few remaining native forest birds go the way of the O'O and Po'ouli.	Thank you for your comment
7/24/2023 5:40	Please please please listen to these experts. It's so sad and maddening to see species just disappear in front of our eyes when there is a feasible solution. I'm and avid 15 year old birder and would like to see these incredible birds one day, please consider the solutions so that everybody can enjoy them in the future. We've brought back species from the brink of extinction before, let's do it again.	Thank you for your comment
7/24/2023 5:46	Introducing species? When will you learn? This has never gone well for Hawai'i! Stop the madness! Stop experimenting on Hawaiian People and Islands! You are suppose to represent what the people want and We don't want this!	Concerns: 3, 10, 16
7/24/2023 5:51	I am in support of the birds not mosquitos project. It is an effective and safe way to protect our Native birds. It is also a necessary effort, if this project is not allowed then you are ensuring the extinction of our Native manu. Treat these birds with respect, like 'ohana, and save their lives.	Thank you for your comment
7/24/2023 5:51	I support the proposed mosquito control methods to save Hawai'i's native forest birds	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 5:55	Hawaii's avifauna has been decimated from what it was prior to European arrival. A delicate balance was upset and one major driver of that was the introduction of mosquitoes. Mosquitoes have acted as highly efficient vectors for avian malaria parasites and avipoxvirus. Hawaiian honeycreepers are particularly vulnerable and many species have been lost and most others continue to decline. This is a heart breaking situation and, until recently, there has been very little management opportunities to stop it occurring. Sadly, the impacts on Hawaii's remaining native birds is only accelerating under global climate change with warmer temperatures allowing mosquitoes to invade ever higher altitudes – the last remaining refugia for many of Hawaii's birds. The avifauna on Kaua'i is no exception. Only this year has an emergency operation got fully underway to rescue the 'akikiki from the brink of extinction. Its extinction in the wild predicted in the near future and may already have effectively occurred. Its not the only species crashing because of the mosquito advance. In the face of all of this, there are dedicated people and organizations fighting to save these Hawaiian species. It takes immense strength and resolve to continue fighting against extinction when the odds are so heavily stacked against you. I want to express my immense gratitude to everyone involved in work to recover Hawaii's unique and precious native avifauna.	Thank you for your comment
7/24/2023 5:56	Please do the mosquito release on other islands that you are already doing on Maui. Thank you, , Kailua-Kona	Thank you for your comment
7/24/2023 6:10	This is a bioweapon and experimental drug project without any safety studies! I completely oppose this project! No to lab-infected mosquito release! No to genetically modified technology that has not been studied long enough for safety! Captain Cook, Hawaii	Concerns: 4, 9
7/24/2023 6:14	Here is my comment: "This is a bioweapon and experimental drug without long-term safety studies! I completely oppose the planned lab-infected mosquito release in Hawaii! No to technology without long-term safety trials!" - , Captain Cook, Hawaii	Concerns: 9, 11
7/24/2023 6:18	Do it	Thank you for your comment
7/24/2023 6:29	I support the birds!	Thank you for your comment
7/24/2023 6:32	The plan is essential for the survival of the native honeycreepers of Kauai and the other Hawaiian islands as a whole. This plan is absolutely necessary, with so much of Hawaiis native flora and fauna being restricted to a mere fraction of what it was is all the more reason to make sure this plan goes into action. I'm sure it's difficult for folks who haven't visited the Alaka'i to understand the impact besides reading stats, but watching Kauai Elepaio so sick they can't even fly off the ground right by your feet because of this sickness is heartbreaking. Even in the only safe place for them in the forest they're still not safe.	Thank you for your comment
7/24/2023 6:32	I am in full support of the scienced based IIT as a means of mosquito suppression and endemic bird conservation in Kauai	Thank you for your comment
7/24/2023 6:46	I strongly support instituting this mitigation technique to prevent further decline in Hawaiian native biodiversity.The methods have had success elsewhere and the stakes to save endemic Kauai species are very high. I believe it is critical to implement the best available science as soon as feasible to ensure the survival of Kauai's native forest birds.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 6:48	Hello, I am a wildlife expert with a research program that focuses on the effects of introduced species on birds. I understand in detail the challenges of conserving wildlife in a complex and populated world. I enthusiastically support Wolbachia IIT to save Hawaiian forest birds because Hawaiian birds are infinitely precious, incredibly unique, and highly threatened by disease and climate change. In particular, avian malaria was introduced to Hawaii and native honeycreepers are highly susceptible. Human-caused climate change has exacerbated the problem because it allows disease-carrying mosquitoes to occupy habitat at higher elevations than normal, putting more birds at risk of mortality or morbidity from a disease they never should have experienced. Bird population declines in the islands have been steep and extinction is imminent unless countermeasures are taken. This would be tragic and wrong. I believe that it is our duty to be good stewards of nature, and to counteract harm that is the direct result of human action. We should do everything we can to help these birds thrive. Mosquito control and eradication is a necessary and important step towards that goal. Thank you, Avian Ecologist, University of Florida	Thank you for your comment
7/24/2023 6:49	To whom is may concern, I SUPPORT Board approval of the Wolbachia Incompatible Insect Technique (IIT) Environmental Assessment (EA) on Kauai! I write today in shear desperation. Much of my life has been dedicated to the conservation of rare and enigmatic wildlife. PLEASE give Hawaii's enigmatic avifauna the opportunity to heal from mosquitos and mosquito borne illnesses alien to Hawaii. Mahalo	Thank you for your comment
7/24/2023 6:53	Aloha, I am a resident on Kauai and I fully support the Wolbachia/IIT mosquito suppression techniques. The science confirms that this will actually help benefit the native forest birds. Despite the political climate in our country, and those with loud opinions who don't have the education, we need to stay true to what will actually benefit our aina. Negativity will not. Facts and preservation of our unique biodiversity are what will hold true for generations to come. The future will be disappointed if we strip them of possibility now. Please support the mosquito suppression so we can save our unique wildlife.	Thank you for your comment
7/24/2023 7:00	I am writing in support of the IIT efforts to suppress mosquito populations on Kaua'i. The Hawaiian honeycreepers are the ancestors of Hawai'i. Their voices were some of the first this place has known and today they are being silenced. The sound of mosquitoes is instead replacing them. The diseases these invasive pests carry are harming the birds and the ecosystems they call home. We, humans, are the sole cause of this issue and we have the responsibility to take action and try to do right in these places and for these species. Please support this effort and give the birds a chance to survive for future generations.	Thank you for your comment
7/24/2023 7:01	I support this project and urge authorities to provide the necessary means for endangered species to be protected and consider cancelling anything that would have the opposite effect.	Thank you for your comment
7/24/2023 7:09	I support for Incompatible Insect Technique (IIT) to reduce mosquito populations on Kauai. Honeycreepers are a unique group of forest birds found only in Hawaii, which once had more than 50 species. Today, only 17 species remain, some with fewer than 500 individuals left. Without swift action, several species of honeycreepers will become extinct in the next ten years. Avian malaria, a disease transmitted by invasive southern house mosquitoes, is driving the extinction of our forest birds. A single bite by an infected mosquito can kill an 'i'iwi (and critically endangered forest bird species). As the climate warms, mosquitoes carrying avian malaria are moving upslope into the last refugia for Hawaii's forest birds. The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds. I appreciate your support as well in implementing IIT. Mahalo	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 7:11	Protecting native species and ecosystems is the responsibility of everyone who calls Hawai'i home. We must learn from the place we occupy, listen to the stories, meet the residents, and do what we can to preserve the unique biodiversity that has suffered as a result of human impact and oversight. I support the wolbachia suppression of mosquitos to protect endangered forest birds. We hope to give a fighting chance to the species that still provide and ensure future generations are not only learning about Hawaiian honeycreepers in text books. It is something profound and special to find yourself in native forest in Hawai'i surrounded by manu and kahuli, sharing the voices that have echoed through the mountains for hundreds of years. This is our chance to add our human voices and advocate for those that came before us.	Thank you for your comment
7/24/2023 7:15	Please stop the spread of mosquito born disease that decimates bird population. Thank you Kakaako	Thank you for your comment
7/24/2023 7:19	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I DEMAND that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This is in court, and should not be able to be released without an impact study!!!! If you approve this to go through and these mosquitoes to be released, you will personally be responsible for the damage. Think about that you will be morally responsible and it will haunt you!!! We look forward to connecting with you! Kauai	Concern: 1, 34
7/24/2023 7:26	There is no choice but to act now. With only 5 remaining individuals, the 'akikiki are on their last legs. For too long have the ecologically inconsiderate actions of invasive people brought destruction to unique wildlife. In a place so special with an indigenous culture uniquely tied to it's native birds, it is of utmost importance to reverse the damage caused. For the entire birding and environmental community, and for the people and nature of Hawai'i, please do this in order to save the birds and set an example and beacon of hope for conservation worldwide. We implore you to take action immediately.	Thank you for your comment
7/24/2023 7:29	I am writing to express my full support for this plan. Native forest birds hold so much ecological and cultural value, and avian malaria is one of the greatest threats to their survival. Many are already extinct in the wild, and cannot persist without our help. I am in full support of the use of IIT, which has been proved to be safe and effective for mosquito control in other regions, as a tool to help conserve our native wildlife.	Thank you for your comment
7/24/2023 7:36	PROTECT OUR NATIVE FOREST BIRDS!!	Thank you for your comment
7/24/2023 7:36	I support mosquito suppression because mosquitoes are an invasive species that are threatening the existence of our native birds. We need our native Hawaiian birds to thrive in order to keep the entire native Hawaiian ecosystem around them thriving. But this is not possible if they are being wiped out by the invasive mosquito. I believe that action must be brought quickly to save our damaged, native ecosystem.	Thank you for your comment
7/24/2023 7:45	Please save the birds!!!	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 7:49	Aloha, I am writing this email today in show of my support of the mosquito control methods on the island of Kaua'i. For the sake of preserving the island's unique biodiversity, mosquitoes must be eradicated. The IIT method has been proven effective elsewhere on the globe, and without its implementation on Kaua'i we will certainly see the loss of many of the island's endemic forest birds. I wouldn't want to have to see another go extinct in my lifetime. Here's to hoping for a better future for our manu! Mahalo.	Thank you for your comment
7/24/2023 7:49	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever.	Thank you for your comment
7/24/2023 7:52	The native Hawaiian wildlife must be protected at all costs.	Thank you for your comment
7/24/2023 7:53	I completely support the Incompatible Insect Technique to suppress the population of mosquitos on Kaua'i. After working in the Alaka'i and Koke'e area for three years to protect seabird populations, I gained a deep appreciate for the cultural and economic value of both the seabirds and native forest birds. Losing our forest birds results in a less biodiverse and more unstable ecosystem, and each species lost tilts the forest further toward collapse. The IIT is a major step in the right direction toward preserving our forests for future generations.	Thank you for your comment
7/24/2023 7:58	I am in firm opposition to the release of Wolbachia-infected mosquitoes on ANY Hawaiian island. I am a 35-year resident of Kauai. My husband has even longer residence. Through the decades lived here, we have experienced the after-effects of many other "experimental" releases of non-indigenous plants and animals. Consider the genocidal effect of the Mongoose upon native Hawaiian birds. Consider the tree-choking Golden Pothos vine as it takes over acres of trees. Consider the white Egrets as they compete voraciously with Nene Goose for food. Look at the Guinea Grass takeover along our roads and highways on Kauai, blocking views and access to pull over on roadsides for safety purposes. The bulky, clumping grass blocks waterways, contributing to later flooding. Millions of dollars are spent trying to keep up with mowing that grass. Unintended, unseen consequences are inherent to all these examples. What dire consequences will ensue from lab-infected mosquitoes upon our fauna, flora, and people? This proposed course of action must be stopped. Kapaa, HI 96746	Concerns: 2, 3, 5, 9, 10

Entry Date	Comment	Responses
7/24/2023 7:59	Aloha kākou, I support Wolbachia IIT to save Hawaiian forest birds because without swift action, four of our beloved native birds are heading for extinction within the next few short years. This technique will suppress mosquito populations and address this critical problem. Mahalo for your time and consideration! Mahalo,	Thank you for your comment
7/24/2023 8:04	We need to save these birds from extinction and to do that we need all the tools necessary including lands scape control of mosquitoes using naturally occurring wolbachia.	Thank you for your comment
7/24/2023 8:09	Aloha, I hope this email finds you in good spirits. I am in support of the use of wolbachia mosquitoes. Our native Manu are disappearing at alarming rates. Although they play a significant role in Hawaiian culture their ecological roles are of equal importance. I have personally collected wolbachia data on Maui in Kipahulu valley and the numbers we saw were alarming. One pool contained hundreds if not thousands of larvae, all disease carrying vectors. Without our native birds the ecosystem will have a cascade effect and our native ecosystems will cease to exist. Please give our Manu a fighting chance. Me ke aloha,	Thank you for your comment
7/24/2023 8:09	I am writing in support of using the Incompatible Insect Technique (IIT) to reduce mosquito populations in Kōke'e and Alaka'i swamp on Kaua'i. This method is the best way to save Kauai's forest birds, who are an essential part of the island ecosystem and Kauai's culture of place. I am praying that the DLNR and USFWS' proposal to use IIT is accepted.	Thank you for your comment
7/24/2023 8:09	I support the use of IIT to suppress mosquito populations on Kaua'i and protect critically endangered birds. It is our responsibility to take care of the native birds who are on the precipice of extinction. The situation is incredibly dire with only 5 Akikiki remaining. Every moment that we delay using these safe and effective tools puts us at risk for losing species forever. This technology has already been used safely and effectively in other areas for protecting human populations. This is an action that we can do to give hope to native forests now and in the future.	Thank you for your comment
7/24/2023 8:12	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	
7/24/2023 8:12	NO TO MOSQUITO SPRAYING!!! Hawaii is one of the worlds treasures, especially Kauait. Please, please do not allow this massive chemical invasion. THANK YOU!!!	Thank you for your comment
7/24/2023 8:13	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
7/24/2023 8:17	Dear Department of Land and Natural Resources, Division of Forestry and Wildlife, I SUPPORT the approval of the Kaua‘i NPS Wolbachia Incompatible Insect Technique (IIT) Environmental Assessment (EA). Native birds of Hawai‘i have been experiencing extinctions and population declines driven by avian malaria for nearly the past 200 years, that have only accelerated over the past 20 years. With Hawai‘i standing as the bird extinction capital of the world, this is evidenced by the reduction of what were originally more than 50 honeycreeper species endemic to the Hawaiian Islands to just 17 that remain, and more than half are listed as Endangered or Threatened species. Wolbachia IIT has been used successfully in other parts of the world to suppress mosquitoes and the diseases they carry with no negative impacts to people or the environment. Successful IIT projects have resulted in mosquito population declines of 90 percent or more. Beyond supporting conservation, Wolbachia IIT can also lead to positive public health impacts, with the reduction of mosquito populations that can vector human disease. The EA that has been conducted thoroughly analyzed all potential impacts of the implementation of Wolbachia IIT for Kaua‘i, with thoughtfulness towards safeguarding the health and well-being of both the forest birds and people of Kaua‘i. It is made clear, through research supported by decades of peer-reviewed science, that there are no significant negative environmental or cultural impacts that will result. I believe this report provides ample evidence that is sufficient to warrant moving forward with the Wolbachia IIT for the island of Kaua‘i. Compliance has been demonstrated with NEPA and HEPA. Wolbachia IIT is currently the only hope we have to avert further extinctions of these culturally and ecologically significant species. We cannot afford any delays. I urge you to please APPROVE the Kaua‘i NPS Wolbachia IIT EA and issue a FNSI to save Kaua‘i forest birds. Mahalo for the opportunity to provide testimony	Thank you for your comment
7/24/2023 8:17	I’m OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/24/2023 8:21	Aloha members of the Dept. of Land and Natural Resources board, The Friends of Hakalau Forest would like to support mosquito control and the draft Environmental Assessment for Kaua‘i Mosquito Suppression. The Friends of Hakalau Forest NWR is a 501C3 non-profit organization dedicated to the conservation and protection of native birds and plants at the Hakalau Forest National Wildlife Refuge and surrounding lands. We represent almost 400 members, including many biologists as well as community members who know and love our native birds. We watch with alarm as disease-bearing mosquitoes begin to reach higher elevations and threaten the endangered birds at Hakalau. We sympathize with our colleagues on Kaua‘i who have seen all of their native forests invaded by mosquitoes and their native birds die out. The Incompatible Insect Technique is an environmentally-friendly method to control mosquitoes and our best shot at saving our native birds. We look forward to its successful implementation on Kaua‘i and hope that it will also be deployed at Hakalau in the future. Sincerely, President, Friends of Hakalau Forest NWR	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 8:21	Why on Earth would anyone want to introduce mosquitoes into the environment they do not do anything positive and many people react physically to the bites. Please stop this nonsense!!	Thank you for your comment
7/24/2023 8:26	My wife and I are OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full-scope Environmental Impact Statement (EIS) documenting the impacts on our native birds, environment, and public health. This release is non-reversible so more thorough studies need to be conducted to prevent unintended consequences.	Concern: 1
7/24/2023 8:27	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/24/2023 8:28	Please help protect the native bird species by suppressing the mosquito population.	Thank you for your comment
7/24/2023 8:28	I support the Draft EA statement for Kaua'i mosquito suppression. The IIT method is a the best chance we have to save these native honey creepers from the brink of extinction. Used in other countries, including the United States to successfully to suppress mosquitos for human health reasons, we owe it to these bird species the same kind of help. Please vote to support this draft EA. Maholo for your time.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 8:29	Dear Land Board, I am writing to support mosquito control on Kaua‘i through the Incompatible Insect Technique. I recall working up in Koke‘e in the 1990s when we would see ‘i’iwi almost every day. Now I hear that sightings are rare and the rare birds are on the brink of extinction. The Incompatible Insect Technique has been deployed in other places with success and it’s our last shot at saving some of our native birds. Please support mosquito control and support our native birds. Mahalo Life is like riding a bicycle - in order to keep your balance, you must keep moving. - Albert Einstein	Thank you for your comment
7/24/2023 8:32	I am completely against this mosquito experiment you are pushing the islands into. This needs much more research especially since this is the same people placed the mosquitos into Florida, who immediately after now have the first cases in 20 years of mosquito born virus. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? Will you be the responsible one? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven’t been considered. Conflicts of interest haven’t been addressed. There’s currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua’i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the “Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua’i.” I demand an Environmental Impact Statement. “We the people …. “	Concerns: 9, 28
7/24/2023 8:34	I’m OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, “Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.” This project is an experiment on Hawaii’s people, wildlife, and ‘āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven’t been considered. Conflicts of interest haven’t been addressed. There’s currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua’i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the “Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua’i.” I demand an Environmental Impact Statement.	
7/24/2023 8:35	I support the use of Wolbachia for mosquito control in Kaua'i	Thank you for your comment
7/24/2023 8:36	I fully support the use of this benign and proven technology to save our endangered Hawaiian birds from extinction. WolbachIa has been used successfully around the world to control mosquitoes for health reasons… a small minority of vocal opponents should not block what the majority of the population supports, namely action to save birds which will otherwise be lost forever	Thank you for your comment
7/24/2023 8:37	I strongly support the draft EA to suppress mosquito populations on Kaua’i. This method is a proven tool that is the last chance to save some of the native forest birds from extinction due to avian malaria.	Thank you for your comment
7/24/2023 8:44	In this day and age where invasive species are running rampant and climate change is exacerbating disease, we need to support efforts to protect native flora and fauna and contain the spread of diseases such as avian malaria. Please choose to support mosquito suppression and protect native birds!	Thank you for your comment
7/24/2023 8:45	We need this mosquito control to work and we need it now. I was lucky enough to see some of the remaining akikiki and the wild. Seeing how vulnerable they (and many other species) are to the (sadly) growing mosquito population is horrible. This work should have been done a long time ago and now is our chance (maybe last chance) to help them. I fully support this project and hope the rest of the public do to.	Thank you for your comment
7/24/2023 8:46	As a former volunteer with PIERC USGS, I appreciate the importance of Hawaii’s native bird species. Further, as a master’s student studying ornithology in Dr. Robert Curry’s lab, I recognize that birds serve as bio-indicators of the environment. Therefore, it is devastating to see the negative effects that mosquitoes are having on bird populations in HI. We are hopeful that this approach will be effective in reducing the mosquito population, ultimately saving the Hawaiian Honeycreepers. Thank you for your time and consideration!	Thank you for your comment
7/24/2023 8:47	I am writing to express my profound support for the Kaua‘i Mosquito Suppression Project, a critical initiative aimed at protecting Hawai‘i's invaluable forest bird species. The plight of our native Hawaiian honeycreepers is deeply concerning. With a significant number of these species already extinct and many others threatened, the urgency of this situation cannot be overstated. The principal threats—avian malaria and avian pox—spread by the nonnative southern house mosquito, require innovative and effective solutions. This is why the proposed use of the Incompatible Insect Technique (IIT) in Kaua‘i's Kōke‘e and Alaka‘i Wilderness areas is a cause for optimism. Having seen the successful implementation of IIT in other parts of the world, it's heartening to see this environmentally friendly solution being considered for our precious island. What I appreciate most about IIT is its respect for nature's balance—it uses the naturally-occurring bacterium Wolbachia and doesn't involve genetic modification. This aligns perfectly with our shared commitment to preserving Hawai‘i's unique biodiversity.	Thank you for your comment

Entry Date	Comment	Responses
	The comprehensive approach to the project, including extensive pre- and post-release monitoring, speaks volumes about the careful planning and foresight invested in this initiative. I am hopeful that this project will bring about a significant positive change in the fight against avian diseases affecting our forest birds. Please accept my deepest gratitude for your commitment to this cause. I fully support this project and look forward to witnessing its positive impact on the preservation of Kaua‘i's forest birds.	
7/24/2023 8:55	Please save these beautiful animals	Thank you for your comment
7/24/2023 8:55	TO DLNR HAWAII, I’m OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, “Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.” This project is an experiment on Hawaii’s people, wildlife, and ‘āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven’t been considered. Conflicts of interest haven’t been addressed. There’s currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua’i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the “Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua’i.” I demand an Environmental Impact Statement. This is a dangerous move that will impact the PEOPLE of Hawaii for years to come. Sincerely	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
7/24/2023 8:58	To the Hawaii Department of Land and Natural Resources, I am adamantly opposed to introducing laboratory infected biopesticide mosquitoes into Kauai's human population. There are no long term studies to determine if there could be negative consequences to the human population from horizontal transmission or possible unanticipated evolutionary events. Any harmful effects potentially generated from the introduction of these modified mosquitoes on Kauai could not only hurt the human and animal population of Kauai but also could leave the County of Kauai and State of Hawaii open to massive litigation. I am opposed to the current environmental assessment and the introduction of these mosquitoes until a long term complete, full scope, Environmental Impact Study can be done. Mahalo for your consideration	Concerns: 1, 2, 9, 14, 15, 19
7/24/2023 8:58	The dire reality facing native Hawaiian forest birds cannot be overstated. Action must be taken swiftly to prevent further losses of these uniquely wonderful species. Please move forward with mosquito suppression efforts as promptly and efficiently as possible to save our birds.	Thank you for your comment
7/24/2023 9:02	I support mosquito suppression on Kaua'i! Saving native birds is so important, but also mosquitoes suck let's eradicate them! They aren't native here and they are only harmful to the local ecosystem. This method of mosquito suppression is safe and won't cause any harm, this is a no brainer!	Thank you for your comment
7/24/2023 9:03	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
7/24/2023 9:03	As a research scientist and an avid bird watcher, I am writing to express my wholehearted support for the proposed Environmental Assessment for Kauaʻi Mosquito Suppression, particularly the implementation of the Incompatible Insect Technique (IIT) to protect the endangered Hawaiian forest bird species from avian malaria transmitted by non-native mosquitoes. The decline in populations of native forest birds on Kauaʻi over the last two decades is a distressing reality that demands immediate and effective action. Avian malaria, primarily spread by non-native southern house mosquitoes, poses a grave threat to the survival of these beautiful and unique bird species. The extinction of 10 out of Kauaʻi's 16 native honeycreepers is a heartbreaking reminder of the urgent need for conservation efforts to protect the remaining species. The proposed approach utilizing IIT is a groundbreaking and promising solution to mitigate the impact of avian malaria on native bird populations. IIT has demonstrated its safety and effectiveness in various locations worldwide, including successful trials in California, Kentucky, and French Polynesia. The potential benefits of IIT in the fight against mosquito-borne diseases are well-documented, and I firmly believe that it can be a game-changer for the conservation of Kauaʻi's endangered avian species. The use of lab-raised male mosquitoes carrying Wolbachia to suppress the wild mosquito population by at least 90% is a precisely targeted and eco-friendly method. I am heartened to learn that Wolbachia is already present in mosquitoes in Hawaiʻi, and the strain used for this project naturally occurs in the Asian tiger mosquito. The fact that no new organisms will be introduced to the island through this project allays any concerns regarding the introduction of foreign species. IIT does not involve genetic engineering and does not result in genetically modified organisms (GMOs). As a research scientist, I appreciate the importance of employing safe and scientifically proven methods for conservation efforts, and IIT aligns perfectly with these principles. The extensive body of data supporting the safety and effectiveness of IIT reinforces my confidence in the project's potential to protect native bird species on Kauaʻi. Furthermore, the success of this project could have broader implications beyond Kauaʻi, offering hope for the conservation of other endangered bird populations in Hawaiʻi and elsewhere facing similar threats from mosquito-borne diseases. Preserving Hawaii's unique and diverse avifauna is not just an ecological imperative but also a cultural responsibility. Native Hawaiian forest birds have played a vital role in the island's cultural heritage, and their continued decline would represent an irreplaceable loss. It is our moral obligation to do everything in our power to prevent their extinction. In conclusion, I wholeheartedly endorse the proposed Kauaʻi Mosquito Suppression Environmental Assessment and urge the authorities to move forward with the implementation of IIT as part of a comprehensive strategy to protect the native bird species of Kauaʻi. As a research scientist and avid bird watcher, I firmly believe that this project holds great promise and represents a vital step towards securing the future of Kauaʻi's endangered forest birds. Thank you for your dedication to the conservation of Hawaii's unique biodiversity, and I trust that the decision-makers will prioritize the long-term survival of these iconic bird species through this important initiative.	Thank you for your comment
7/24/2023 9:04	This mosquito suppression plan is the only shot of saving Akekee, Akohekohe, and Kiwikiu. If this plan is rejected it will be catastrophic for these treasured birds who have called Kauai home for thousands of years.	Thank you for your comment
7/24/2023 9:06	protect the birds	Thank you for your comment
7/24/2023 9:09	As an ornithologist and evolutionary biologist, I strongly support the Kaua'i Mosquito Suppression initiative. The non-native mosquitos on the Hawaiian islands are an extreme threat to biodiversity, and the scientifically-supported and safe proposal to release Wolbachia-infected mosquitos into the wild is the single best opportunity that Hawaii has to preserve their incredible unique avian communities.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 9:09	Oppose to Wolbachia-based Suppression of Mosquitoes on Kauai. There are unknown long term environmental effects as well as potential disease that could come out of this harmful act.	Concerns: 2, 5
7/24/2023 9:12	As a biologist who has worked in natural resource management and avian conservation in Hawai'i, I approve of the Kaua'i Mosquito Suppression Plan. The environmental assessment is sound and the plan should be enacted as soon as possible. Honeycreepers are a unique group of forest birds found only in Hawai'i, with only 17 out of 50 species remaining. We are on track to lose several more in the next few years, and the 'Akikiki this year if swift action is not taken. Avian malaria, a disease transmitted by invasive mosquitoes, is rapidly decimating the archipelago's native birds, and it will only continue to expand upslope into the last refugia for Hawai'i's honeycreepers without the Incompatible Insect Technique. We know that this technique is proven to be safe and effective, and the time to put it in action in Hawai'i is long past due. Please do not let ignorance and misinformation derail this plan -- We are in the eleventh hour for the 'Akikiki and we will lose it forever without swift and immediate mosquito control on Kaua'i.	Thank you for your comment
7/24/2023 9:15	Aloha, I am totally against the release of these on native mosquitos. Really what are you thinking? This is an experiment that could have disastrous impact. Please stop this.	Concern: 11
7/24/2023 9:16	I support the need to better the forest mosquito problem and get more resources.	Thank you for your comment
7/24/2023 9:18	Save the birds from avian malaria!	Thank you for your comment
7/24/2023 9:20	Please support mosquito suppression to protect the critically endangered Akikiki, Akeke'e, and other native Hawaiian birds.	Thank you for your comment
7/24/2023 9:21	I support ITT to save the birds. Wildlife is precious and must be protected from deforestation and other global attacks.	Thank you for your comment
7/24/2023 9:29	Control of invasive mosquitos to save endemic birds is our duty. We created the mess, we have an obligation to do our best to mitigate the effects before it's too late. I support the efforts to release sterile male mosquitos. to curb population levels.	Thank you for your comment
7/24/2023 9:30	While human intervention in the local ecosystem is what got Kaua'i and its native birds into their current situation, this seems to be a crucial last-stitch effort to save Akeke'e from extinction and I'iwi from extirpation. This plan will undoubtedly face public backlash, but please do not succumb to public pressure. This may be the only hope of saving these birds.	Thank you for your comment
7/24/2023 9:34	I support IIT wolbachia mosquito control. Malama the manu!	Thank you for your comment
7/24/2023 9:41	This needs to be passed and is absolutely crucial for the survival of some Hawai'ian honeycreeper species. Without this going through, the 'Akikiki, 'Akeke'e, Kauai population of I'iwi, and probably 'Anianiau will go extinct. Now is a critical time for these species with single digits of 'Akikiki left in the wild, and time is of the essence where this needs to be passed.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 9:44	Aloha I am in support of the mosquito suppression efforts through the DLNR and USFWS. As a native Hawaiian and conservation worker, there is not our culture without our environment. Our gods, our people, our spirit lives with the birds, the plants, the fish. For us to lose such a vital part of our environment is to lose a vital piece of our culture. Not only will the mosquito suppression be saving the birds, it is another step forward in protecting us as a people. Thank you,	Thank you for your comment
7/24/2023 9:45	To: DLNR, I Oppose the "Wolbachia-based Suppression of Mosquitoes on Kaua'i" As I look down and see a mosquito about to bite my hand I am reminded of 1992. In 1992, I was sitting in a coffee shop in Petaluma, California, reading a San Francisco paper. In the back of the paper there was a small 2 inch announcement. It stated something like this: "The United States, under Herbert Walker Bush, declares that if any indigenous group falls at or below 2% pure, the United States reserves the right to declare that group null and void and any benefits afforded to the group will be withdrawn." This is what is happening with the mosquito release. The release of Bill Gate's, death jab mosquitoes, is being planned to remove people from Hawaiian lands by death and disease, the birds don't own the land. The citizens of Hawaii will not stand by and let you release billions of infected mosquitoes in an attempt to kill us. You want us to believe that you did genital exams on the mosquitoes but we know that's not true. You want us to believe the mosquito agreed to only mate with infected partners! You want us to believe that death jab mosquitos promised to never bite a human! You obviously do not know the true nature of mosquitoes! Mosquitoes do not follow your orders. They will mate and they will spread disease to uninfected birds and diseases that will infect people. We cannot allow you to bring untested foreign mosquitoes into our land. It is against the law in Hawaii to bring invasive species in especially infected ones. Have you change the law without telling us? I have seen no proof that you have done the required environmental studies. In my opinion you are attempting murder on the citizens of Hawaii and you will be prosecuted. Stop this nonsense and go home with your mosquitoes! You are not welcome.	Concerns: 2, 12, 13, 16, 19
7/24/2023 9:47	Protect the birds! What are we doing here. With climate change already here we can't cause any more damage, especially explicitly, than will l ready happen naturally. STOP PILLAGING HAWAII	Thank you for your comment
7/24/2023 9:48	I trust the conservation experts of Hawai'i to take all measures necessary to save the remaining native bird species in our islands. I am in support of the methods they choose and am hopeful for a positive outcome. These birds are precious to our work in conservation and beyond valuable in Hawaiian culture.	Thank you for your comment
7/24/2023 9:50	Suppressing mosquito populations is our only hope to protect the native forest birds of Kaua'i from extinction.	Thank you for your comment
7/24/2023 9:53	I support the evaluation assessment. It is critical that we eradicate invasive mosquitoes in order to preserve the native and endemic species that are integrated in the native and endemic ecology of Hawaii. It is our kuleana to step up as stewards of not only our home, but this shared space that has been called home by many species before us.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 9:53	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/24/2023 9:56	It is clear that thoughtful and informed management needs to be made to give these species a chance.	Thank you for your comment
7/24/2023 9:57	I support this EA	Thank you for your comment
7/24/2023 9:57	I strongly support Alternative 2, the proposed release of lab-raised mosquitoes carrying the Wolbachia wAlbB strain. Based on the Environmental Assessment, the proposed action has been extensively researched and very carefully planned. It is a rare example in conservation in which a feasible method that has no detriments to humans or other life forms can be put in place at a large scale to save several endangered species of birds. I personally am a graduate student in biology who studies birds and witnessed the astonishingly rapid decline of native birds in the Hawaiian highlands earlier this year (the adult birds at a nest I found died just days afterwards). I urge decision makers to approve the proposed action to help save these endangered bird species.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 9:58	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are additional alternatives that were not discussed in the Environmental Assessment. Further, combining any of the dismissed alternatives – such as habitat source reduction, translocation of birds, and treatment of infected birds – does not appear to have been considered. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 20, 23, 27, 28, 34, 38
7/24/2023 10:00	I support using Wolbachia to suppress mosquitoes and try to save native birds. We can't afford to lose any more bird species and they are in dire straits unless we take drastic action to save them. Kauai's species are among the most threatened in the world. We owe it to future generations to do everything possible to protect them.	Thank you for your comment
7/24/2023 10:01	I support the environmental assessment. It's a no brainer.	Thank you for your comment
7/24/2023 10:02	I am in full support of IIT and the methods mentioned in the draft EA for Kauai Mosquito Suppression. With several degrees in the environmental science field, I can attest that this technology has a substantial body of trustworthy, science-based and evidence driven studies to back-up its claims of mosquito suppression. IIT is a not a new technology, it does not involve GMOs, and will not have an adverse impact to humans. Proponents of this project not only include well-respected global conservation organizations like The Nature Conservancy and National Park Service, but also human-health related associations like the Hawaii Department of Health and Department of Agriculture. Implementing this is our best shot at suppressing mosquito populations to minimize the already detrimental effects mosquitos have posed on the Native Hawaiian bird populations and Hawaiian ecosystems. There is no more time to contemplate - Native Hawaiian birds are on the brink of extinction as we speak.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 10:07	I am writing in full support of the draft Environmental Assessment for Kaua'i Mosquito Suppression and the strategies mentioned within to mitigate the impacts of mosquitoes on native forest birds. As a professional in the conservation field for 6 years, I have witnessed the precipitous declines and extinctions of endemic species within my short time working to protect them. Further, having listened and learned from those who have dedicated their lives and careers to protecting and preserving our native forest birds for both cultural and conservation benefit I understand the dire situation we are now presented with. IIT has been rigorously tested and successfully implemented and stands as one of our best options to combat the overwhelming threat of both avian malaria and avian pox.	Thank you for your comment
7/24/2023 10:09	Yes definitely support using wolbakia to save forest birds.	Thank you for your comment
7/24/2023 10:09	We already have Dengue, Chikungunya & Zika carrying mosquitoes. We do not need any other mosquitos to make the humans & animals sick. If this goes through and we get a new deadly virus from this its on YOU! Hope you have a plan for that!	Concerns: 2, 19
7/24/2023 10:10	I support the IIT plan for mosquito control. We need to continue taking action to save Hawaiian Honeycreepers and this plan is safe and science based.	Thank you for your comment
7/24/2023 10:12	To whom it may concern: I support Wolbachia to save the forest birds. Thank you,	Thank you for your comment
7/24/2023 10:19	I have spent 50 of the past 100 days living in critical forest bird habitat. Over that period of time there has been a DRAMATIC change in the presence/habit of native forest birds on the Alaka'i plateau. The need for intervention to prevent the spread of mosquitoes/avian malaria is imminent. I support the use of Wolbachia to save Hawaiian forest birds. Please do not let conspiracy theorists and false information derail good conservation work. The people that are behind this project work tirelessly around the clock (and I wouldn't hesitate to say would give their lives) to save Hawai'i forest bird species from anthropogenic extinction. This technique has been used successfully ALL OVER THE WORLD to mitigate the spread of mosquito-borne illnesses that infect people. LETS DO THE RIGHT THING AND DO EVERYTHING WE CAN TO SAVE THESE INCREDIBLE SPECIES. THIS IS OUR ONLY SHOT.	Thank you for your comment
7/24/2023 10:21	I oppose the release of mosquitoes. Testing has been insufficient. The stakes are too high for a Rush-To-Release (RTR) based upon a mindset that the crisis is so far along, so devastating, that there isn't time for the normal precautionary assessments and community input. British scientist Helen Wallace has studied GM mosquito release over a 10 year period in various parts of the world. She states: "Releases of genetically modified mosquitoes and other insects into the environment more than 10 years ago have basically been a failure. "Oxitec has been doing experimental releases of millions of GM mosquitoes, releasing large numbers of female GM mosquitoes inadvertently, which can bind to transmitted disease. Risks include not properly accounting for the fact that there are multiple species that transmit diseases, so if you only attack one you can create worse problems. They released large numbers of genetically modified mosquitoes to mate with the mosquitoes and then the offspring of those meetings was a postive darling at the larval stage and the idea was to suppress the numbers of the wild mosquito. They've claimed great success in suppressing wild mosquito populations, but in fact recent information from the Cayman Islands has shown all those claims have been misleading, and it's diverted resources away from better ways of tackling tropical diseases. "The intention was to release only male mosquitoes because they don't bite, but in practice with Oxitec's technology the sorting process was actually very poor and large numbers of GM female mosquitoes were released, which can bite and transmit disease.	Concerns: 4, 15, 26

Entry Date	Comment	Responses
	"There are also concerns about the survival of future generations of GM mosquitoes that are supposed to die off, but in fact that's also not perfect. There are multiple species which transmit these diseases, so if you successfully suppress one species, other species can move in and actually potentially become more difficult to eradicate. Proper risk assessments were never really done and certainly risk assessments that met European standards which was the legal requirement for the export of these GM or scooters were never published and consulted on. In addition, we don't even really know whether reducing the population is actually going to reduce the transmission of disease so there were many uncertainties which were kind of brushed under the carpet." A small group of individuals seem certain that Oxitec's GM mosquito release is the best option. Before moving forward, it is imperative that due time is taken in compiling reports and studies, and bringing this information not only to Kauai and Maui, but across the entire state, given the potential for mobility of mosquitoes to spread in various ways. It would be an unconscionable dereliction of duty to push a proposal that later proved harmful to our precious Hawaii Ne. This generation carries a heavy responsibility to those who have dwelt here in the past, as well as to our keiki and our keiki's keiki. Let us exercise caution!	
7/24/2023 10:21	Aloha, I fully support the draft EA for mosquito suppression on Kauai. Mahalo, Kailua, Oahu, Hawaii	Thank you for your comment
7/24/2023 10:23	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
7/24/2023 10:24	Aloha- I'm opposed to the planned biopesticide mosquito releases on Kauai. This project is an experiment on our island home. There are countless risks and this experiment cannot be controlled. The experimental lab mosquitoes will be infected with a different strain of Wolbachia bacteria, which could cause them to become more capable of spreading diseases like avian malaria and West Nile virus (bird and human). While state agencies and wildlife officials are hoping this novel strategy will prevent extinction of native birds, it may cause their extinction, and it could impact human health. Why would a loving state whose government cares about its people do this? There will be natural consequences to all the islands if this release happens. No one will be excluded from diseases after being bit by a mosquito and traveling with what tourists have received on our islands. I'm attaching testimony that I support. Attention: Mosquito Control Project Kaua'i Department of Land and Natural Resources U.S. Fish and Wildlife Service Aloha, This testimony is in regards to draft Kaua'i Environmental Assessment (EA) completed in June 2023. I am strongly opposed to the request for Anticipated Finding of No Significant Impact (AFONSI) for the release of lab bred Wolbachia southern house mosquitoes in Kaua'i and all Hawaiian Islands for numerous reasons documented in this extensive testimony. There is insufficient detail for the public to properly evaluate the EA as being safe for the environment. The Kaua'i draft EA requires much more study on secondary impacts with no less than a full scope Environmental Impact Statement (EIS) since mosquitoes are a vector of disease. The Incompatible Insect Technique (IIT) is being promoted in the EA as a mosquito control method to help save endangered birds from avian malaria. Page 9 of the EA states this technique has been successfully implemented in 14 countries and 4 cities in the United States, but fails to list the countries and projects that are connected. The only Wolbachia program that has been implemented worldwide at this scale is the World Mosquito Program funded by The Bill and Melinda Gates Foundation. This is a different method involving Aedes aegypti males and females released into urban areas for population replacement to control Dengue fever, a human disease. The World Mosquito program chart on its website lists difference between the methods used worldwide. The IIT method proposed for Maui and Kaua'i "relies on the continuous production and release of male mosquitoes and is, therefore, more expensive than the World Mosquito Program's method. There is no field evidence that it can reduce the risk of mosquito- borne diseases." https://www.worldmosquitoprogram.org/en/learn/how-our-method-compares The IIT method has never been used for conservation purposes or with the species Culex quinquefasciatus (southern house mosquito) anywhere worldwide. This is an experiment based on several unsound justifications and references. Federal documents admit the outcome is unknown. The public has already voiced numerous concerns about the release of lab bred mosquitoes in response to the Maui EA which is now being challenged in environmental court to seek a ruling to require an Environmental Impact Statement. No further actions should be taken to release biopesticide mosquitoes anywhere Hawai'i while the need for further study of the risks is actively being litigated.	Concerns: 2, 9, 13, 19

Entry Date	Comment	Responses
	Since spring 2022, as a veteran in National Security and Investigations for over 30 years, I have personally studied the science in depth behind the use of Wolbachia for mosquito control. After reviewing thousands of pages of scientific papers, environmental assessments, government documents, videos, interviews, funding, and grants related to Wolbachia; as well as consulting with experts regularly; what stands out from all this research is that Wolbachia bacterium strains are still being discovered and its impacts are yet to be fully understood. Its influence on other life forms; including humans, native birds, arthropods and filarial worms' reproductive cycle and pathogen infection (either to block or promote) is still in process of being vetted. Science is still grasping the mechanisms of Wolbachia as documented on page 32 of Evaluation of Existing EFSA Guidelines for their Adequacy for the Molecular Characterization and Environmental Risk Assessment of Genetically Modified Insects with Synthetically Engineered Gene Drives. "The mechanism of Wolbachia-induced pathogen-blocking is not well understood (Marshall et al., 2019). Yet, this feature, along with the gene drive-like inheritance pattern of Wolbachia, has been harnessed in replacement strategies to limit disease transmission by mosquito populations." http://www.ask-force.org/web/EFSA/EFSA-GMO-Panel-Gene-drive-document-for- consultation-20200129.pdf We are awaiting results of grants researched out of Penn State University thru NIH including WOLBACHIA-INDUCED ENHANCEMENT OF HUMAN ARBOVIRAL PATHOGENS. "A SOBERING REMINDER THAT THE PATHOGEN INHIBITORY EFFECTS RESULTING FROM WOLBACHIA INFECTION IN SOME INSECTS CANNOT AND SHOULD NOT BE GENERALIZED ACROSS VECTOR-PATHOGEN SYSTEMS. UNDERSTANDING THE GENERAL ARE CRITICAL FOR ESTIMATING HOW LIKELY WOLBACHIA-BASED CONTROL STRATEGIES ARE TO FAIL OR MAKE THINGS WORSE, FOR IDENTIFYING POTENTIAL POINTS WHERE WOLBACHIA-BASED CONTROL IS LIKELY TO BREAK DOWN IN THE FIELD, AND FOR PLANNING RISK MITIGATION STRATEGIES IN HE CASE OF UNFORESEEN HARMFUL OUTCOMES. IN THIS RESEARCH, WE WILL INVESTIGATE THE HYPOTHESIS THAT WOLBACHIA-INDUCED MODULATION OF THE MOSQUITO HOLOGENOME CAN LEAD TO INCREASED ARBOVIRUS INFECTION/TRANSMISSION IN SOME VECTOR-PATHOGEN SYSTEMS OF HUMAN IMPORTANCE." https://govtribe.com/award/federal-grant-award/project-grant-r01ai116636 Wolbachia Potential to Increase Pathogen Infection The Southern House Mosquito can transmit Avian Malaria, Avian Pox, Western Equine Encephalitis, West Nile Virus, Canine Heartworm, Lymphatic Filariasis/Elephantiasis, St. Louis Encephalitis and is a potential vector of Zika virus. There are Wolbachia studies that have shown it to increase pathogen infection in some instances. "Mosquitoes infected with the bacteria Wolbachia are more likely to become infected with West Nile virus and more likely to transmit the virus to humans, according to a team of researchers." "The results suggest that caution should be used when releasing Wolbachia-infected mosquitoes into nature to control vector-borne diseases of humans." https://www.sciencedaily.com/releases/2014/07/140710141628.htm Wolbachia Enhances West Nile Virus (WNV) Infection in the Mosquito Culex tarsalis https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0002965 Wolbachia Can Enhance Plasmodium Infection in Mosquitoes: Implications for Malaria Control? https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4154766/ Antibiotic Resistance Page 12 of Kauai EA states: "To produce the incompatible male southern house mosquitoes for this project, a laboratory line of Hawai'i mosquitoes was generated with the wAlbB strain of Wolbachia. This was accomplished through a multi-step process that	

Entry Date	Comment	Responses
	involved rearing Hawai'i mosquitoes in the lab and removing the wPip Wolbachia from their bodies with common antibiotics. The wAlbB strain of Wolbachia was then transferred into the eggs of these Wolbachia-free Hawai'i mosquitoes." Use of this method over time with constant releases can lead to antibiotic resistance with unknown effects on the environment and can cancel out effectiveness of treatment for diseases in which Wolbachia is implicated in humans which is highly concerning. The endosymbiont Wolbachia rebounds following antibiotic treatment https://pubmed.ncbi.nlm.nih.gov/32639986/ Previous mosquito control projects in California and Cayman Islands using Genetically Modified (GM) mosquitoes (which also uses antibiotics during lab rearing) have not renewed contracts. "Cayman Island officials were set to renew their contract. But data from the trials indicated serious problems, leading the territory's environmental health minister to tell the Edmonton Journal, the scheme was not getting the results we were looking for. There was further concern that the released mosquitoes could be spreading antibiotic resistance or make mosquito-borne diseases worse by lowering individual immunity." Modified Mosquitoes Fail to Beat Malaria https://www.pressreader.com/canada/edmonton-journal/20181126/281951723871847 "British biotechnology company Oxitec is withdrawing its application to release billions of genetically engineered mosquitoes in California, according to a recent update from the California Department of Pesticide Regulation." https://beyondpesticides.org/dailynewsblog/2023/05/efficacy-and-health-issues-stop- release-of-genetically-engineered-mosquitoes-in-california-florida-continues/ There are parallels between GM and Wolbachia techniques. Biologically Wolbachia lab infected mosquitoes are not GM mosquitoes, but the study designs, math, and adherence to protocol apply to both situations. The main biological difference is there is slower horizontal transfer of mutations of the GM mosquito than with horizontal transfer of Wolbachia. This means Wolbachia as a natural gene drive has the potential to have greater unknown impact on the environment, which necessitates the need for a full scope Environmental Impact Statement (EIS). Horizontal Spread, Vertical Transmission, and Wolbachia as Gene Drive "The evidence of horizontal spread of Wolbachia shows that the bacteria go not only to sexual cells, but also to somatic cells (non-sexual cells of the body). Wolbachia can also live outside of the intra-cellular systems for several months." Wolbachia Horizontal Transmission Events in Ants: What Do We Know and What Can We Learn? https://pubmed.ncbi.nlm.nih.gov/30894837/ Horizontal Gene Transfer Between Wolbachia and the Mosquito Aedes aegypti https://bmcgenomics.biomedcentral.com/articles/10.1186/1471-2164-10-33 This document submitted by Oxitec to the EPA in 2015 outlines numerous legitimate and studied issues regarding the use of Wolbachia. https://downloads.regulations.gov › EPA-HQ-OPP-2015-0374-0018 › attachment_1.pdf "Wolbachia is a bacterium residing within the cells of insects, and is passed through vertical transmission from mother to offspring. Even a single Wolbachia infected female could lay hundreds of eggs that would invade the wild population, rendering the Incompatible Insect Technique ineffective and spreading a new strain of Wolbachia into the environment. Modelling has shown that conditions of lower competition can favour infected females [6-8]. In other words, as a mosquito population is reduced, or if a population is already low, the chances of Wolbachia invading the wild population are increased." "The Wolbachia is an endosymbiont on the cytoplasm of the cell so over a thousand new genes are introduced into the insect cells, some or all of which have the potential to randomly integrate into the insect's nuclear genome with unknown consequences.	

Entry Date	Comment	Responses
	Moreover, the possible persistence of Wolbachia mosquitoes themselves is a significant concern. For the reasons set forth below, each new strain of mosquito, or indeed any artificially Wolbachia infected insect needs to be treated as a new strain and thoroughly tested in the laboratory before any field releases." "The whole genome of Wolbachia can transfer to a host genome, meaning a host mosquito could be transformed with over one thousand new genes with unpredictable results [2-5]." "It has already been shown that horizontal gene transfer (HGT) can transfer genes between Wolbachia and its host in Aedes aegypti [12] and several other mosquito species [13]. Therefore, Wolbachia can genetically transform its host with functional genes with currently unknown consequences." "Horizontal transmission between unrelated host species is a proven phenomenon in Wolbachia [25]. Studies have demonstrated that genetic sequences, ranging in size from Horizontal transmission between unrelated host species is a proven phenomenon in Wolbachia [25]. Studies have demonstrated that genetic sequences, ranging in size from single genes to entire bacterial genomes, have been transferred from Wolbachia to many of their insect hosts [2-5], and its effect on disease transmission is variable and potentially dangerous." Owain Edwards of CSIRO in Australia (Commonwealth Scientific and Industrial Research Organisation) was involved in the Aedes aegypti trial around Innisfail (Beebe et al 2021) that was funded by Verily Life Sciences. Dr. Edwards refers to Wolbachia as a type of natural gene drive during his 2016 presentation for APVMA. https://www.youtube.com/watch?v=Lm_WS9eXYIU Dr. Edwards elaborates there are limitations on the use of Wolbachia application over time which can lead to limited choice of genes and for the Wolbachia technique to remain effective at suppressing mosquito population, a variety of natural strains are needed. The next step in the process is explained using CRISPR technology - synthetic gene drives. Dr. Edwards emphasizes while working on synthetic gene drives, "it requires double and triple containment to make sure these don't get out of the laboratory." This is concerning since page 32 of EA says, "DLNR is also exploring future options for establishing a state-run mosquito-rearing facility in Hawai'i; mosquito sources could also originate from a similar but state-run mosquito-rearing facility in the future. Should DLNR pursue this option, the appropriate regulatory permits and documentation (environmental reviews and facility compliance) would be necessary." Federal documents state plans for future tools to include synthetic gene drives, next generation tools, synthetic biology control tools, novel technology deployment, and precision-guided Sterile Insect Technique (pgSIT) (CRISPR technology) in Hawai'i. While "technology for this approach is not available for near-term implementation," development and deployment of these tools appear to be a long-term goal at the federal level." U.S. Department of the Interior Strategy for Preventing the Extinction of Hawaiian Forest Birds – https://www.fws.gov/sites/default/files/documents/DOI%20Strategy%20for%20Preventin g%20the%20Extinction%20of%20Hawaiian%20Forest%20Birds%20%28508%29.pdf Wolbachia DNA into Host DNA – "A team of researchers has discovered that a bacterial parasite (called Wolbachia) can insert almost its entire genome into the genomes of members of one host species (a fly called Drosophila ananassae), and can insert parts of its genome into the genomes of members of several other host species." https://www.nsf.gov/news/news_summ.jsp?cntn_id=109957 Lack of Bio-Security There has been no documentation offered to the public outlining risk analysis conducted on the security vulnerabilities for lab bred mosquitoes that can be utilized as bio- weapons against a population (intended) nor details of quality control mechanisms for accidental transmission of pathogens (unintended). This includes failure to discuss how they will deal with accidental female escape, wind drift, or how male lab bred culex q. mosquitoes released into the wild can pass pathogen to biting females thru mating and shared feeding/water sources. The public has no idea how these lab mosquitoes will be quality controlled and tested.	

Entry Date	Comment	Responses
	Intended entomological warfare involves infecting insects with a pathogen and then dispersing the vectors over target areas. Invasive insects can also be deployed into a country en masse to take out crops and cripple a food supply. In New York the Plum Island lab was involved in the development of offensive bioweapons that led to Lyme's disease outbreaks. Japan's biological warfare unit (Unit 731) was deployed against China during World War II. The unit deployed plague-infected fleas and cholera-infected flies to take out the Chinese. https://citizens.news/694097.html "We recommend careful invigilation of the international borders, airports, and seaports by the trained scientists to identify any accidental and/or deliberate import of alien arthropod vectors. Therefore, it is well advised to take seriously the possibility that arthropod could be used to attack people. Moreover, future research priorities should also includes high-throughput molecular diagnostics of diseases, identification of vectors, phylogenetic studies to understand the origin and distribution of the pathogen and vector strains. A rapid action team of trained scientist and health workers equipped with modern sophisticated diagnostic tools and suitable vector extinguishers should be appointed by the state and/or central health authorities to counter act any such emergency". Bioterrorism on Six Legs by Dr. Manas Sarkar. A patent was developed in 2014 involving drones that transport and release mosquitoes. It mentions in the patent these drones can be co-opted for bio-weapons military programs. https://patents.google.com/patent/US8967029B1/en Page 23 of the EA states "By contrast, male's proboscises are adapted to primarily feed on plant nectar and secretions, and do not feed on blood (Mullen and Durden 2009). Therefore, male mosquitoes cannot transmit disease." This is incorrect and misleading to the public since we come to find male lab bred mosquitoes can pass pathogens to wild biting females thru mating and shared feeding/water sources. Venereal Transmission of St. Louis Encephalitis Virus by Culex quinquefasciatus Males (Diptera: Culicidae) – Donald A. Shroyer (Journal of Medical Entomology, 5/1990) https://academic.oup.com/jme/article-abstract/27/3/334/2220754?login=false There is no mention in the Kaua'I EA on how lab batches will be quality controlled or tested for unintended pathogens upon arrival to Hawai'i or if lab employees in contact with these mosquitoes will go thru security clearance screening and training. No documented assurances have been made to the public that lab suppliers will be testing mosquitoes for human, equine, canine, or avian diseases to ensure that they are pathogen-free prior to shipping to Hawai'i. The science and tech industry in the United States, to include Silicon Valley and Academia, has been heavily infiltrated by the Chinese Communist Party (CCP) and non-government organizations such as Davos and the World Economic Forum whom have been strongly pushing Agenda 2030 thru climate change initiatives. Due to the deterioration of relations between the US and China, among other adversaries, mosquito control releases should not move forward until sound security protocols are adequately implemented. https://www.justice.gov/opa/pr/harvard-university-professor- and-two-chinese-nationals-charged-three-separate-china-related The Bill and Melinda Gates Foundation (Gates), also connected to the above-mentioned entities, are strong proponents of climate agenda and have openly discussed support of human depopulation. This is the same foundation that has been funding ongoing research of Wolbachia (World Mosquito Program and numerous grants) and GM mosquitoes including Oxitec since 2002. Gates has also funded research developing anti-malaria vaccines using mosquitoes as a delivery system which is highly concerning. https://www.npr.org/sections/goatsandsoda/2022/09/21/1112727841/a-box-of-200- mosquitoes-did-the-vaccinating-in-this-malaria-trial-thats-not-a-jo Wolbachia Has Been Implicated in Human Disease Wolbachia is NOT harmless to humans. It effects filarial worms that cause human disease such as river blindness and is implicated in Elephantiasis. These diseases effect millions of people each year. According to the CDC website, "There is a promising treatment	

Entry Date	Comment	Responses
	using doxycycline that kills the adult worms by killing the Wolbachia bacteria on which the adult worms depend in order to survive". https://www.cdc.gov/parasites/onchocerciasis/treatment.html "For decades, people have blamed a parasitic nematode worm for a disease that has blinded at least 250,000 people now living in Africa and South America. But the real culprit may be the ubiquitous Wolbachia, bacteria that colonize many hundreds of species, including the worm indicted in river blindness. Researchers now report that Wolbachia stimulate the severe immune system response that slowly robs people of their vision". https://www.science.org/content/article/worms-may-not-act-alone-river- blindness Anti-Wolbachia therapy for onchocerciasis & lymphatic filariasis: Current perspectives https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6755775/ Efficacy of 2- and 4-week rifampicin treatment on the Wolbachia of Onchocerca volvulus https://pubmed.ncbi.nlm.nih.gov/18679718/ The Kauai EA's assertion that released mosquitoes pose no risk to human health is based on unsound science. On page 25 of the EA it says "Wolbachia cannot live within vertebrate cells and cannot be transferred to humans even through the bite of a mosquito that carries it (Popovic et al. 2010). " In contrast we know science is recently discovering detection of Wolbachia genes in humans: Detection of Wolbachia genes in a patient with non-Hodgkin's lymphoma https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(14)00040- 8/fulltext "Wolbachia 16S rRNA and fbpA genes were twice detected over 5 days in the blood of a patient with high fever. The patient was given fluoroquinolones and the fever resolved. Four weeks later, he was diagnosed with non-Hodgkin's lymphoma and received R-CHOP (Rituximab, Cyclophosphamide, Doxorubicin, Vincristine, Prednisolone) treatment resulting in complete remission. This is the first report of detection of Wolbachia genes from the blood of human patients with non-Hodgkin's lymphoma." The 2010 article by Popovici et al. cited in the EA has been discredited by the EPA. The EPA Human Studies Review Board met in 2018, and the following question was posed: "Is the research described in the published article 'Assessing key safety concerns of a Wolbachia-based strategy to control dengue transmission by Aedes mosquitoes' scientifically sound, providing reliable data for the purpose of contributing to a weight of evidence determination in EPA's assessment of the risks to human health associated with releasing Wolbachia-infected mosquitoes?" The Board's response states: "The Board concluded that the research described in the article by Popovici et al. was not scientifically sound and does not provide reliable data to contribute to a weight of evidence determination for assessment of human health risks due to release of Wolbachia-infected mosquitoes." Inconsistent Climate Data and Mosquito Population Trends The EA states, "Some climate change models suggest that the mean temperatures in Hawai'i may increase by 3°– 4°C by 2100 (Hayhoe et al. 2018). The effects of climate change have been found to result in increased stress to natural systems through altered temperatures and rainfall patterns (Alexander et al. 2016). Increases in mean temperatures, for example, have facilitated the spread of mosquitoes and avian malaria into habitats where cool temperatures very recently limit mosquito presence and transmission of malaria to highly susceptible endemic forest birds (Atkinson et al. 2014)." Contrary to the above claims, from 1978 to 2017 (0 to 1600 meters) Kagawa and Giambelluca 2019, Spatial Patterns and Trends in Surface Air Temperatures and Implied Changes in Atmospheric Moisture Across the Hawaiian Islands, 1905–2017. Researchers summarized data from weather stations on several islands pooled together. They extended the range of observations to the year 2017. Daytime cooling was noted at upper elevation below the trade wind inversion that is consistent with observed cooling of −0.2 to −0.8°C/decade at multiple high elevation stations during 1988–2013 (960–2,990 m; Longman, Giambelluca, et al., 2015). https://agupubs.onlinelibrary.wiley.c	

Entry Date	Comment	Responses
	Additional skepticism to global warming trend is gaining momentum among the scientific community. The World Climate Declaration – There is no Climate Emergency was signed by over 1580 vetted scientists and continues to grow. https://clintel.org/wp-content/uploads/2021/03/WCD-A4version09202013.pdf Greenpeace Founder Patrick Moore Says Climate Change Based on False Narratives https://www.theepochtimes.com/science/exclusive-former-greenpeace-founder-patrick- moore-debunks-the-false-narratives-of-climate-change-4709568?rs=SHRDHWFRF Climate Activists Invest in Property on Beaches They Say are Disappearing https://www.washingtonexaminer.com/politics/climate-activists-invest-property-beaches- climate-change-sea-rise In 2013 Lisa Crampton and Anouk Glad conducted a study of Plasmodium relictum infection in Culex quinquefasciatus. The rate of capture of adult mosquitoes and Plasmodium relictum percentage was extremely low at Alakai Plateau of Kaua'i. https://onlinelibrary.wiley.com/doi/pdfdirect/10.1111/jvec.12157 Vol. 40, no. 2 Journal of Vector Ecology 225 "The infection rate of Plasmodium relictum is also essential to understanding the transmission rate to birds on the Alakai Plateau. We screened 17 mosquitoes caught at Halepa'akai and 16 mosquitoes caught at Kawaikoi in October and November for P. relictum infection using PCR. One mosquito from Halepa'akai tested positive for infection. We dissected 33 mosquitoes caught at Kawaikoi (winter and spring); none of them tested positive for infection by P. relictum (neither oocysts nor sporozoites were observed). Only three mosquitoes caught at Halepa'akai (January) were dissected, and none of them were infected (neither oocysts nor sporozoites were observed). Thus, the prevalence rate of P. relictum in our study is 1.45% (n=69)." Page 34 of EA uses mosquito estimates documented over 10 years ago from Hawai'i Island. "Estimates range from an abundance of approximately 600 mosquitoes per acre near sea level on Hawai'i Island where monthly temperatures average 70–75° F, to an abundance of five mosquitoes per acre at an elevation of approximately 4,000 feet where temperatures average 55–60° F (Samuel et al. 2011, Atkinson et al. 2014)." Page 19 of EA states "Mosquito populations and avian malaria have recently expanded into higher elevation habitat, which is the last refugia for these endangered avian species." I could not find a reference study proving the mosquitoes are invading higher elevations in the proposed release areas in Kaua'i or recent documentation on the prevalence rate of Plasmodium relictum since the Crampton and Glad study in 2013. Verily Life Sciences and Rhodamine B Verily's registrant representatives are listed in the Department of Agriculture Import Application - https://hdoa.hawaii.gov/wp-content/uploads/2018/05/HDOA-Mosquito- Request-PA_Final-6.8.21.pdf - and are co-authors of Mark Release Recapture of Male Aedes aegypti use of Rhodamine B to Estimate Movement, Mating and Population Parameters for an Incompatible Male Program https://www.researchgate.net/publication/345648051_Title_Mark-release-recapture_of_male_Aedes_aegypti_Diptera_Culicidae_use_of_rhodamine_B_to_estima te_movement_mating_and_population_parameters_in_preparation_for_an_incompatibl e_male_program The EA mentions no use of the toxin Rhodamine B. Will Rhodamine B be used in Kauai's MMR studies? Is there potential ongoing use of Rhodamine B could have implications on land and aquatic lifeforms? https://www.sciencedirect.com/science/article/abs/pii/S0045653521025522 Rhodamine B (RhB) is among the toxic dyes due to the carcinogenic, neurotoxic effects and ability to cause several diseases for humans. https://pubmed.ncbi.nlm.nih.gov/33857893/	

Entry Date	Comment	Responses
	In Summary I am opposed to request for approval of the draft Kauai Environmental Assessment for the numerous reasons documented in this testimony. Sections of the EA lack sufficient detail, contain outdated references and EPA discredited sources. It is unfortunate this project is being fast tracked and in hindsight, a full scope EIS should have been completed years ago. I am additionally concerned the use of Wolbachia IIT as a mosquito suppression method to save the birds will not have the intended outcome, according to the World Mosquito Program "there is no field evidence it can reduce the risk of mosquito born diseases". The logical next step already in discussion in Federal documents would be a segway into controversial and potentially dangerous synthetic gene drive technology in which corporate gain will be at the expense of the Hawaiian ecosystem. Respectfully,	
7/24/2023 10:25	I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever.	Thank you for your comment
7/24/2023 10:27	Please do not release lab mosquitoes onto our islands. No more harm to the people of Hawaii.	Thank you for your comment
7/24/2023 10:27	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	
7/24/2023 10:29	I am absolutely in favor of the Kaua'i Mosquito Suppression project. We have plenty of data to support that this poses no issue to humans and by not acting we are allowing these birds to go extinct, all for no reason. I support being able to help the birds making sure we can keep the natural diversity that the island of Kaua'i exhibits.	Thank you for your comment
7/24/2023 10:31	I greatly support Wolbachia IIT, the incompatible insect technique to save native Hawaiian birds because these birds are culturally, biologically, and environmentally essential to the Hawiian landscape. Honeycreepers deserve to live for their own inherent reasons to live and thrive on the islands which have been their sacred place of birth, evolution, and home for millions of years! Moreover these birds provide essential ecological benefits to other species and the island ecosystem as a whole.These amazing species face so many threats from habitat loss, to resoure depletion, to climate change, and their last remaining refuge in high elevation forested area is now at risk from Avian Malaria from mosquitos spreading there. We have the power to reduce this threat, so we must act now and expedite this process to help the populations of these species who are on the brink. If we delay employing this technique any longer we will lose more species than we already have to extinction. Please help save the four most crtically endnagered forest bird species before they go extinct from Avian Malaria over the next years to decade. Please help all the precious remaining Hawaiian Honeycreepers and other native birds. Please implement the Wolbachia Incompatible insect technique as soon as possible!	Thank you for your comment
7/24/2023 10:36	Let's not miss this opportunity to protect the few remaining endemic species from extinction. It is critical that we act fast.	Thank you for your comment
7/24/2023 10:37	I support the proposed action in the draft Envrionmental Assessment fro Kaua'i Mosquito Suppression. Our native birds desperately need our help to survive and addressing avian malaria is the only way. Please take action to help our Hawaiian birds.	Thank you for your comment
7/24/2023 10:40	I strongly support swift action to save Hawaii's unique and beautiful honeycreepers and other forest birds by using the IIT to reduce mosquito populations. Follow the science and do the right thing before it's too late!	Thank you for your comment
7/24/2023 10:43	I am in full support of the Incompatible Insect Technique!!!	Thank you for your comment
7/24/2023 10:44	Kaua'i has an amazingly diverse ecosystem that has faced years of difficult changes with Western tourism, invasive imports, and climate change. This is an opportunity to take action on behalf of the birds of this unique island. Any chance we have to help species of plants, animals, and indigenous peoples of this island should be taken very seriously.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 10:47	I oppose the Kaua'i Environmental Assessment. It is an incomplete study that cannot be properly evaluated. I support the research and documentation in the testimony attached PDF. Do not play "Russian Roulette" with the Hawaiian people. Everyone is on alert due to the suspicious high speed pace at which they are trying to ram this program through for approval without the proper studies. I demand a full scope environmental impact statement. Attention: Mosquito Control Project Kaua'i 22 July 2023 Department of Land and Natural Resources U.S. Fish and Wildlife Service Aloha, This testimony is in regards to draft Kaua'i Environmental Assessment (EA) completed in June 2023. I am strongly opposed to the request for Anticipated Finding of No Significant Impact (AFONSI) for the release of lab bred Wolbachia southern house mosquitoes in Kaua'i and all Hawaiian Islands for numerous reasons documented in this extensive testimony. There is insufficient detail for the public to properly evaluate the EA as being safe for the environment. The Kaua'i draft EA requires much more study on secondary impacts with no less than a full scope Environmental Impact Statement (EIS) since mosquitoes are a vector of disease. The Incompatible Insect Technique (IIT) is being promoted in the EA as a mosquito control method to help save endangered birds from avian malaria. Page 9 of the EA states this technique has been successfully implemented in 14 countries and 4 cities in the United States, but fails to list the countries and projects that are connected. The only Wolbachia program that has been implemented worldwide at this scale is the World Mosquito Program funded by The Bill and Melinda Gates Foundation. This is a different method involving Aedes aegypti males and females released into urban areas for population replacement to control Dengue fever, a human disease. The World Mosquito program chart on its website lists difference between the methods used worldwide. The IIT method proposed for Maui and Kaua'i "relies on the continuous production and release of male mosquitoes and is, therefore, more expensive than the World Mosquito Program's method. There is no field evidence that it can reduce the risk of mosquito- borne diseases." https://www.worldmosquitoprogram.org/en/learn/how-our-method-compares The IIT method has never been used for conservation purposes or with the species Culex quinquefasciatus (southern house mosquito) anywhere worldwide. This is an experiment based on several unsound justifications and references. Federal documents admit the outcome is unknown. The public has already voiced numerous concerns about the release of lab bred mosquitoes in response to the Maui EA which is now being challenged in environmental court to seek a ruling to require an Environmental Impact Statement. No further actions should be taken to release biopesticide mosquitoes anywhere Hawai'i while the need for further study of the risks is actively being litigated. Since spring 2022, as a veteran in National Security and Investigations for over 30 years, I have personally studied the science in depth behind the use of Wolbachia for mosquito control. After reviewing thousands of pages of scientific papers, environmental assessments, government documents, videos, interviews, funding, and grants related to Wolbachia; as well as consulting with experts regularly; what stands out from all this research is that Wolbachia bacterium strains are still being discovered and its impacts are yet to be fully understood. Its influence on other life forms; including humans, native birds, arthropods and filarial worms' reproductive cycle and pathogen infection (either to block or promote) is still in process of being vetted. Science is still grasping the mechanisms of Wolbachia as documented on page 32 of Evaluation of Existing EFSA Guidelines for their Adequacy for the Molecular Characterization and Environmental Risk Assessment of Genetically Modified Insects with Synthetically Engineered Gene Drives. "The mechanism of Wolbachia-induced pathogen-blocking is not well understood (Marshall	Concerns: 1, 9, 11, 26

Entry Date	Comment	Responses
	et al., 2019). Yet, this feature, along with the gene drive-like inheritance pattern of Wolbachia, has been harnessed in replacement strategies to limit disease transmission by mosquito populations.” http://www.ask-force.org/web/EFSA/EFSA-GMO-Panel-Gene-drive-document-for- consultation-20200129.pdf We are awaiting results of grants researched out of Penn State University thru NIH including WOLBACHIA-INDUCED ENHANCEMENT OF HUMAN ARBOVIRAL PATHOGENS. "A SOBERING REMINDER THAT THE PATHOGEN INHIBITORY EFFECTS RESULTING FROM WOLBACHIA INFECTION IN SOME INSECTS CANNOT AND SHOULD NOT BE GENERALIZED ACROSS VECTOR-PATHOGEN SYSTEMS. UNDERSTANDING THE GENERAL ARE CRITICAL FOR ESTIMATING HOW LIKELY WOLBACHIA-BASED CONTROL STRATEGIES ARE TO FAIL OR MAKE THINGS WORSE, FOR IDENTIFYING POTENTIAL POINTS WHERE WOLBACHIA-BASED CONTROL IS LIKELY TO BREAK DOWN IN THE FIELD, AND FOR PLANNING RISK MITIGATION STRATEGIES IN HE CASE OF UNFORESEEN HARMFUL OUTCOMES. IN THIS RESEARCH, WE WILL INVESTIGATE THE HYPOTHESIS THAT WOLBACHIA-INDUCED MODULATION OF THE MOSQUITO HOLOGENOME CAN LEAD TO INCREASED ARBOVIRUS INFECTION/TRANSMISSION IN SOME VECTOR-PATHOGEN SYSTEMS OF HUMAN IMPORTANCE." https://govtribe.com/award/federal-grant-award/project-grant-r01ai116636 Wolbachia Potential to Increase Pathogen Infection The Southern House Mosquito can transmit Avian Malaria, Avian Pox, Western Equine Encephalitis, West Nile Virus, Canine Heartworm, Lymphatic Filariasis/Elephantiasis, St. Louis Encephalitis and is a potential vector of Zika virus. There are Wolbachia studies that have shown it to increase pathogen infection in some instances. “Mosquitoes infected with the bacteria Wolbachia are more likely to become infected with West Nile virus and more likely to transmit the virus to humans, according to a team of researchers.” "The results suggest that caution should be used when releasing Wolbachia-infected mosquitoes into nature to control vector-borne diseases of humans." https://www.sciencedaily.com/releases/2014/07/140710141628.htm Wolbachia Enhances West Nile Virus (WNV) Infection in the Mosquito Culex tarsalis https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0002965 Wolbachia Can Enhance Plasmodium Infection in Mosquitoes: Implications for Malaria Control? https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4154766/ Antibiotic Resistance Page 12 of Kauai EA states: “To produce the incompatible male southern house mosquitoes for this project, a laboratory line of Hawai‘i mosquitoes was generated with the wAlbB strain of Wolbachia. This was accomplished through a multi-step process that involved rearing Hawai‘i mosquitoes in the lab and removing the wPip Wolbachia from their bodies with common antibiotics. The wAlbB strain of Wolbachia was then transferred into the eggs of these Wolbachia-free Hawai‘i mosquitoes.” Use of this method over time with constant releases can lead to antibiotic resistance with unknown effects on the environment and can cancel out effectiveness of treatment for diseases in which Wolbachia is implicated in humans which is highly concerning. The endosymbiont Wolbachia rebounds following antibiotic treatment https://pubmed.ncbi.nlm.nih.gov/32639986/ Previous mosquito control projects in California and Cayman Islands using Genetically Modified (GM) mosquitoes (which also uses antibiotics during lab rearing) have not renewed contracts. “Cayman Island officials were set to renew their contract. But data from the trials indicated serious problems, leading the territory’s environmental health minister to tell the Edmonton Journal, the scheme was not getting the results we were looking for. There was further concern that the released mosquitoes could be spreading antibiotic resistance or make mosquito-borne diseases worse by lowering individual immunity.”	

Entry Date	Comment	Responses
	Modified Mosquitoes Fail to Beat Malaria https://www.pressreader.com/canada/edmonton-journal/20181126/281951723871847 "British biotechnology company Oxitec is withdrawing its application to release billions of genetically engineered mosquitoes in California, according to a recent update from the California Department of Pesticide Regulation." https://beyondpesticides.org/dailynewsblog/2023/05/efficacy-and-health-issues-stop- release-of-genetically-engineered-mosquitoes-in-california-florida-continues/ There are parallels between GM and Wolbachia techniques. Biologically Wolbachia lab infected mosquitoes are not GM mosquitoes, but the study designs, math, and adherence to protocol apply to both situations. The main biological difference is there is slower horizontal transfer of mutations of the GM mosquito than with horizontal transfer of Wolbachia. This means Wolbachia as a natural gene drive has the potential to have greater unknown impact on the environment, which necessitates the need for a full scope Environmental Impact Statement (EIS). Horizontal Spread, Vertical Transmission, and Wolbachia as Gene Drive "The evidence of horizontal spread of Wolbachia shows that the bacteria go not only to sexual cells, but also to somatic cells (non-sexual cells of the body). Wolbachia can also live outside of the intra-cellular systems for several months." Wolbachia Horizontal Transmission Events in Ants: What Do We Know and What Can We Learn? https://pubmed.ncbi.nlm.nih.gov/30894837/ Horizontal Gene Transfer Between Wolbachia and the Mosquito Aedes aegypti https://bmcgenomics.biomedcentral.com/articles/10.1186/1471-2164-10-33 This document submitted by Oxitec to the EPA in 2015 outlines numerous legitimate and studied issues regarding the use of Wolbachia. https://downloads.regulations.gov › EPA-HQ-OPP-2015-0374-0018 › attachment_1.pdf "Wolbachia is a bacterium residing within the cells of insects, and is passed through vertical transmission from mother to offspring. Even a single Wolbachia infected female could lay hundreds of eggs that would invade the wild population, rendering the Incompatible Insect Technique ineffective and spreading a new strain of Wolbachia into the environment. Modelling has shown that conditions of lower competition can favour infected females [6-8]. In other words, as a mosquito population is reduced, or if a population is already low, the chances of Wolbachia invading the wild population are increased." "The Wolbachia is an endosymbiont on the cytoplasm of the cell so over a thousand new genes are introduced into the insect cells, some or all of which have the potential to randomly integrate into the insect's nuclear genome with unknown consequences. Moreover, the possible persistence of Wolbachia mosquitoes themselves is a significant concern. For the reasons set forth below, each new strain of mosquito, or indeed any artificially Wolbachia infected insect needs to be treated as a new strain and thoroughly tested in the laboratory before any field releases." "The whole genome of Wolbachia can transfer to a host genome, meaning a host mosquito could be transformed with over one thousand new genes with unpredictable results [2-5]." "It has already been shown that horizontal gene transfer (HGT) can transfer genes between Wolbachia and its host in Aedes aegypti [12] and several other mosquito species [13]. Therefore, Wolbachia can genetically transform its host with functional genes with currently unknown consequences." "Horizontal transmission between unrelated host species is a proven phenomenon in Wolbachia [25]. Studies have demonstrated that genetic sequences, ranging in size from Horizontal transmission between unrelated host species is a proven phenomenon in Wolbachia [25]. Studies have demonstrated that genetic sequences, ranging in size from single genes to entire bacterial genomes, have been transferred from Wolbachia to many of their insect hosts [2-5], and its effect on disease transmission is variable and potentially dangerous."	

Entry Date	Comment	Responses
	Owain Edwards of CSIRO in Australia (Commonwealth Scientific and Industrial Research Organisation) was involved in the Aedes aegypti trial around Innisfail (Beebe et al 2021) that was funded by Verily Life Sciences. Dr. Edwards refers to Wolbachia as a type of natural gene drive during his 2016 presentation for APVMA. https://www.youtube.com/watch?v=Lm_WS9eXYIU Dr. Edwards elaborates there are limitations on the use of Wolbachia application over time which can lead to limited choice of genes and for the Wolbachia technique to remain effective at suppressing mosquito population, a variety of natural strains are needed. The next step in the process is explained using CRISPR technology - synthetic gene drives. Dr. Edwards emphasizes while working on synthetic gene drives, "it requires double and triple containment to make sure these don't get out of the laboratory." This is concerning since page 32 of EA says, "DLNR is also exploring future options for establishing a state-run mosquito-rearing facility in Hawai'i; mosquito sources could also originate from a similar but state-run mosquito-rearing facility in the future. Should DLNR pursue this option, the appropriate regulatory permits and documentation (environmental reviews and facility compliance) would be necessary." Federal documents state plans for future tools to include synthetic gene drives, next generation tools, synthetic biology control tools, novel technology deployment, and precision-guided Sterile Insect Technique (pgSIT) (CRISPR technology) in Hawai'i. While "technology for this approach is not available for near-term implementation," development and deployment of these tools appear to be a long-term goal at the federal level." U.S. Department of the Interior Strategy for Preventing the Extinction of Hawaiian Forest Birds – https://www.fws.gov/sites/default/files/documents/DOI%20Strategy%20for%20Preventin g%20the%20Extinction%20of%20Hawaiian%20Forest%20Birds%20%28508%29.pdf Wolbachia DNA into Host DNA – "A team of researchers has discovered that a bacterial parasite (called Wolbachia) can insert almost its entire genome into the genomes of members of one host species (a fly called Drosophila ananassae), and can insert parts of its genome into the genomes of members of several other host species." https://www.nsf.gov/news/news_summ.jsp?cntn_id=109957 Lack of Bio-Security There has been no documentation offered to the public outlining risk analysis conducted on the security vulnerabilities for lab bred mosquitoes that can be utilized as bio- weapons against a population (intended) nor details of quality control mechanisms for accidental transmission of pathogens (unintended). This includes failure to discuss how they will deal with accidental female escape, wind drift, or how male lab bred culex q. mosquitoes released into the wild can pass pathogen to biting females thru mating and shared feeding/water sources. The public has no idea how these lab mosquitoes will be quality controlled and tested. Intended entomological warfare involves infecting insects with a pathogen and then dispersing the vectors over target areas. Invasive insects can also be deployed into a country en masse to take out crops and cripple a food supply. In New York the Plum Island lab was involved in the development of offensive bioweapons that led to Lyme's disease outbreaks. Japan's biological warfare unit (Unit 731) was deployed against China during World War II. The unit deployed plague-infected fleas and cholera-infected flies to take out the Chinese. https://citizens.news/694097.html "We recommend careful invigilation of the international borders, airports, and seaports by the trained scientists to identify any accidental and/or deliberate import of alien arthropod vectors. Therefore, it is well advised to take seriously the possibility that arthropod could be used to attack people. Moreover, future research priorities should also includes high-throughput molecular diagnostics of diseases, identification of vectors, phylogenetic studies to understand the origin and distribution of the pathogen and vector strains. A rapid action team of trained scientist and health workers equipped with modern sophisticated diagnostic tools and suitable vector extinguishers should be appointed by the state and/or central health authorities to counter act any such emergency". Bioterrorism on Six Legs by Dr. Manas Sarkar. A patent was developed in 2014 involving drones that transport and release mosquitoes. It mentions in the patent these drones can be co-opted for bio-weapons military programs. https://patents.google.com/patent/US8967029B1/en	

Entry Date	Comment	Responses
	Page 23 of the EA states "By contrast, male's proboscises are adapted to primarily feed on plant nectar and secretions, and do not feed on blood (Mullen and Durden 2009). Therefore, male mosquitoes cannot transmit disease." This is incorrect and misleading to the public since we come to find male lab bred mosquitoes can pass pathogens to wild biting females thru mating and shared feeding/water sources. Venereal Transmission of St. Louis Encephalitis Virus by Culex quinquefasciatus Males (Diptera: Culicidae) – Donald A. Shroyer (Journal of Medical Entomology, 5/1990) https://academic.oup.com/jme/article-abstract/27/3/334/2220754?login=false There is no mention in the Kaua'I EA on how lab batches will be quality controlled or tested for unintended pathogens upon arrival to Hawai'i or if lab employees in contact with these mosquitoes will go thru security clearance screening and training. No documented assurances have been made to the public that lab suppliers will be testing mosquitoes for human, equine, canine, or avian diseases to ensure that they are pathogen-free prior to shipping to Hawai'i. The science and tech industry in the United States, to include Silicon Valley and Academia, has been heavily infiltrated by the Chinese Communist Party (CCP) and non-government organizations such as Davos and the World Economic Forum whom have been strongly pushing Agenda 2030 thru climate change initiatives. Due to the deterioration of relations between the US and China, among other adversaries, mosquito control releases should not move forward until sound security protocols are adequately implemented. https://www.justice.gov/opa/pr/harvard-university-professor- and-two-chinese-nationals-charged-three-separate-china-related The Bill and Melinda Gates Foundation (Gates), also connected to the above-mentioned entities, are strong proponents of climate agenda and have openly discussed support of human depopulation. This is the same foundation that has been funding ongoing research of Wolbachia (World Mosquito Program and numerous grants) and GM mosquitoes including Oxitec since 2002. Gates has also funded research developing anti-malaria vaccines using mosquitoes as a delivery system which is highly concerning. https://www.npr.org/sections/goatsandsoda/2022/09/21/1112727841/a-box-of-200- mosquitoes-did-the-vaccinating-in-this-malaria-trial-thats-not-a-jo Wolbachia Has Been Implicated in Human Disease Wolbachia is NOT harmless to humans. It effects filarial worms that cause human disease such as river blindness and is implicated in Elephantiasis. These diseases effect millions of people each year. According to the CDC website, "There is a promising treatment using doxycycline that kills the adult worms by killing the Wolbachia bacteria on which the adult worms depend in order to survive". https://www.cdc.gov/parasites/onchocerciasis/treatment.html "For decades, people have blamed a parasitic nematode worm for a disease that has blinded at least 250,000 people now living in Africa and South America. But the real culprit may be the ubiquitous Wolbachia, bacteria that colonize many hundreds of species, including the worm indicted in river blindness. Researchers now report that Wolbachia stimulate the severe immune system response that slowly robs people of their vision". https://www.science.org/content/article/worms-may-not-act-alone-river- blindness Anti-Wolbachia therapy for onchocerciasis & lymphatic filariasis: Current perspectives https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6755775/ Efficacy of 2- and 4-week rifampicin treatment on the Wolbachia of Onchocerca volvulus https://pubmed.ncbi.nlm.nih.gov/18679718/ The Kauai EA's assertion that released mosquitoes pose no risk to human health is based on unsound science. On page 25 of the EA it says "Wolbachia cannot live within vertebrate cells and cannot be transferred to humans even through the bite of a mosquito that carries it (Popovic et al. 2010). "	

Entry Date	Comment	Responses
	In contrast we know science is recently discovering detection of Wolbachia genes in humans: Detection of Wolbachia genes in a patient with non-Hodgkin's lymphoma https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(14)00040- 8/fulltext "Wolbachia 16S rRNA and fbpA genes were twice detected over 5 days in the blood of a patient with high fever. The patient was given fluoroquinolones and the fever resolved. Four weeks later, he was diagnosed with non-Hodgkin's lymphoma and received R-CHOP (Rituximab, Cyclophosphamide, Doxorubicin, Vincristine, Prednisolone) treatment resulting in complete remission. This is the first report of detection of Wolbachia genes from the blood of human patients with non-Hodgkin's lymphoma." The 2010 article by Popovici et al. cited in the EA has been discredited by the EPA. The EPA Human Studies Review Board met in 2018, and the following question was posed: "Is the research described in the published article 'Assessing key safety concerns of a Wolbachia-based strategy to control dengue transmission by Aedes mosquitoes' scientifically sound, providing reliable data for the purpose of contributing to a weight of evidence determination in EPA's assessment of the risks to human health associated with releasing Wolbachia-infected mosquitoes?" The Board's response states: "The Board concluded that the research described in the article by Popovici et al. was not scientifically sound and does not provide reliable data to contribute to a weight of evidence determination for assessment of human health risks due to release of Wolbachia-infected mosquitoes." Inconsistent Climate Data and Mosquito Population Trends The EA states, "Some climate change models suggest that the mean temperatures in Hawai'i may increase by 3°– 4°C by 2100 (Hayhoe et al. 2018). The effects of climate change have been found to result in increased stress to natural systems through altered temperatures and rainfall patterns (Alexander et al. 2016). Increases in mean temperatures, for example, have facilitated the spread of mosquitoes and avian malaria into habitats where cool temperatures very recently limit mosquito presence and transmission of malaria to highly susceptible endemic forest birds (Atkinson et al. 2014)." Contrary to the above claims, from 1978 to 2017 (0 to 1600 meters) Kagawa and Giambelluca 2019, Spatial Patterns and Trends in Surface Air Temperatures and Implied Changes in Atmospheric Moisture Across the Hawaiian Islands, 1905–2017. Researchers summarized data from weather stations on several islands pooled together. They extended the range of observations to the year 2017. Daytime cooling was noted at upper elevation below the trade wind inversion that is consistent with observed cooling of −0.2 to −0.8°C/decade at multiple high elevation stations during 1988–2013 (960–2,990 m; Longman, Giambelluca, et al., 2015). https://agupubs.onlinelibrary.wiley.c Additional skepticism to global warming trend is gaining momentum among the scientific community. The World Climate Declaration – There is no Climate Emergency was signed by over 1580 vetted scientists and continues to grow. https://clintel.org/wp-content/uploads/2021/03/WCD-A4version09202013.pdf Greenpeace Founder Patrick Moore Says Climate Change Based on False Narratives https://www.theepochtimes.com/science/exclusive-former-greenpeace-founder-patrick- moore-debunks-the-false-narratives-of-climate-change-4709568?rs=SHRDHWFRF Climate Activists Invest in Property on Beaches They Say are Disappearing https://www.washingtonexaminer.com/politics/climate-activists-invest-property-beaches- climate-change-sea-rise In 2013 Lisa Crampton and Anouk Glad conducted a study of Plasmodium relictum infection in Culex quinquefasciatus. The rate of capture of adult mosquitoes and Plasmodium relictum percentage was extremely low at Alakai Plateau of Kaua'i. https://onlinelibrary.wiley.com/doi/pdfdirect/10.1111/jvec.12157 Vol. 40, no. 2 Journal of Vector Ecology 225 "The infection rate of Plasmodium relictum is also essential to understanding the transmission rate to birds on the Alakai Plateau. We screened 17 mosquitoes caught at Halepa'akai and 16 mosquitoes caught at Kawaikoi in October and November for P. relictum	

Entry Date	Comment	Responses
	infection using PCR. One mosquito from Halepa'akai tested positive for infection. We dissected 33 mosquitoes caught at Kawaikoi (winter and spring); none of them tested positive for infection by P. relictum (neither oocysts nor sporozoites were observed). Only three mosquitoes caught at Halepa'akai (January) were dissected, and none of them were infected (neither oocysts nor sporozoites were observed). Thus, the prevalence rate of P. relictum in our study is 1.45% (n=69)." Page 34 of EA uses mosquito estimates documented over 10 years ago from Hawai'i Island. "Estimates range from an abundance of approximately 600 mosquitoes per acre near sea level on Hawai'i Island where monthly temperatures average 70–75° F, to an abundance of five mosquitoes per acre at an elevation of approximately 4,000 feet where temperatures average 55–60° F (Samuel et al. 2011, Atkinson et al. 2014)." Page 19 of EA states "Mosquito populations and avian malaria have recently expanded into higher elevation habitat, which is the last refugia for these endangered avian species." I could not find a reference study proving the mosquitoes are invading higher elevations in the proposed release areas in Kaua'i or recent documentation on the prevalence rate of Plasmodium relictum since the Crampton and Glad study in 2013. Verily Life Sciences and Rhodamine B Verily's registrant representatives are listed in the Department of Agriculture Import Application - https://hdoa.hawaii.gov/wp-content/uploads/2018/05/HDOA-Mosquito- Request-PA_Final-6.8.21.pdf - and are co-authors of Mark Release Recapture of Male Aedes aegypti use of Rhodamine B to Estimate Movement, Mating and Population Parameters for an Incompatible Male Program https://www.researchgate.net/publication/345648051_Title_Mark-release-recapture_of_male_Aedes_aegypti_Diptera_Culicidae_use_of_rhodamine_B_to_estima te_movement_mating_and_population_parameters_in_preparation_for_an_incompatibl e_male_program The EA mentions no use of the toxin Rhodamine B. Will Rhodamine B be used in Kauai's MMR studies? Is there potential ongoing use of Rhodamine B could have implications on land and aquatic lifeforms? https://www.sciencedirect.com/science/article/abs/pii/S0045653521025522 Rhodamine B (RhB) is among the toxic dyes due to the carcinogenic, neurotoxic effects and ability to cause several diseases for humans. https://pubmed.ncbi.nlm.nih.gov/33857893/ In Summary I am opposed to request for approval of the draft Kauai Environmental Assessment for the numerous reasons documented in this testimony. Sections of the EA lack sufficient detail, contain outdated references and EPA discredited sources. It is unfortunate this project is being fast tracked and in hindsight, a full scope EIS should have been completed years ago. I am additionally concerned the use of Wolbachia IIT as a mosquito suppression method to save the birds will not have the intended outcome, according to the World Mosquito Program "there is no field evidence it can reduce the risk of mosquito born diseases". The logical next step already in discussion in Federal documents would be a segway into controversial and potentially dangerous synthetic gene drive technology in which corporate gain will be at the expense of the Hawaiian ecosystem. Respectfully,	
7/24/2023 10:47	Mosquitoes are wreaking havoc on Hawaii's endemic bird populations and we must act soon!	Thank you for your comment
7/24/2023 10:48	It is critical that we take measures to eradicate invasive mosquito species that are leading to the swift demise of Hawaii's endemic bird populations	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 10:48	Birds are a critical part of any ecosystem so preserving bird species is critical. Suppressing species of mosquitos that are decimating endangered endemic birds is important even if the technique might appear to be novel and therefore scary. I support mosquito suppression for this purpose.	Thank you for your comment
7/24/2023 10:49	I completely support the mosquito suppression project on Kauai to save native bird populations. With so few birds left on Kauai it's vital to get aggressive and use this technology to try and save what bird populations are left. What approach should have happened years ago cannot wait any longer. Our native birds are important to our culture, our ecosystems, and our identity as Hawaiian people and as a state.	Thank you for your comment
7/24/2023 10:53	Please STOP this insane idea!!! there needs to be a LONG study....No invasives have ever done any good for the islands...	Concerns: 3, 9
7/24/2023 10:54	This mosquito suppression plan is the only shot of saving Akekee, Akohekohe, and Kiwikiu. If this plan is rejected it will be catastrophic for these treasured birds who have called Kauai home for thousands of years.	Thank you for your comment
7/24/2023 10:55	I am evolutionary biologist and ornithologist PhD and I am in support of the proposed actions for mosquito suppression for the protection of Hawaiian native songbirds.	Thank you for your comment
7/24/2023 10:55	I support the use of IIT to control Culex mosquitos and save Hawaiian birds.	Thank you for your comment
7/24/2023 11:04	Aloha, I support the use of Wolbachia Incompatible Insect Technique (IIT) to save Hawaiian forest birds because we need to use this technology NOW to prevent the imminent extinction of several species of native birds, and because the concerns of those opposed to IIT are unfounded. These native birds are being driven to extinction by avian malaria, a disease spread by invasive southern house mosquitoes. IIT is the only feasible option for safely and successfully suppressing mosquito populations. IIT is not GMO, Wolbachia bacteria is already present in Hawaii, and Wolbachia IIT has been used successfully in over 14 countries, including the United States, with no negative effects on humans or wildlife. Support for use of this technique in Hawaii has come from collaboration between numerous government agencies, universities, and non-governmental organizations: American Bird Conservancy, Coordinating Group on Alien Pest Species, Hawaii Department of Agriculture, Hawaii Department of Health, Hawaii Department of Land and Natural Resources, Island Conservation, Kauai Forest Bird Recovery Project, Maui Forest Bird Recovery Project, Michigan State University, National Park Service, Office of Native Hawaiian Relations, Pacific Rim Conservation, The Nature Conservancy, U.S. Geological Survey, University of Hawaii, University of Kentucky, and U.S. Fish and Wildlife Service. Use of this technique has also received support from both executive and legislative branch leadership in Hawaii. Please do not let the voices of the uneducated minority opposition interfere with the work that absolutely must be done NOW to save these birds from disappearing forever. -- Natural Resources Manager	Thank you for your comment
7/24/2023 11:05	Control of Mosquitoes in Hawaii is important for our native birds. I am in support of the release of Wolbachia mosquitoes. This technique has proven effective in other countries to combat mosquito borne diseases for humans and the fear people have has no basis in fact. Especially since the Culex mosquito prefers avian blood. This is important and needs to be done soon. Otherwise we are going to lose our native birds.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 11:13	I very much support this plan. Please we need to do what we can to save these endangered birds.	Thank you for your comment
7/24/2023 11:15	NO, AS IN A'OLE!! TRANSLATION: NO!@!	Thank you for your comment
7/24/2023 11:17	Based on this assessment, the benefits of implementing ITT in the Alakai so outweigh any potential downsides that it's not even a question for me. Please implement ITT in the Alakai asap and save our native birds!	Thank you for your comment
7/24/2023 11:22	I support the preservation of our native birds and wildlife.	Thank you for your comment
7/24/2023 11:23	Aloha, My name is and I am OPPOSED to the "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. The State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health and have the EPA complete a risk assessment. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including transmission of the introduced bacteria strain, increased infection in mosquitoes, irreversible evolutionary events, accidental release of lab-reared females, creation of lab-strain females in the wild, gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an EIS and an EPA risk assessment. Further study of the risks is of utmost importance, when the natural, ecological balance of all life is at stake. Pahoa, Hawaii Island	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
7/24/2023 11:26	Aloha I live in Hilo hawaii and I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health Thank you, Kinoole st, Hilo, HI 96720	Concern: 1
7/24/2023 11:27	Hi, I fully support the release of incompatible Wolbachia mosquitos into the highlands of Kaua'i. This measure is absolutely critical to the survival of endangered native honeycreepers, which not only represent an important component within Hawaiian ecosystems, but also a priceless and irreplaceable part of the archipelago's natural and cultural history. Without this intervention, these birds—especially the 'akikiki—are condemned to death. The release of incompatible male mosquitos offers the ONLY way to save these birds, which represent some of the few surviving members of Hawaii's marvelous native avifauna, hold distinct cultural values for Hawaiian people, and represent a major ecotourism draw for the islands. I urge DNLR and USFWS to go forward with the release.	Thank you for your comment
7/24/2023 11:33	I fully support the implementation of IIT to reduce mosquito populations to help Hawai'i's native birds recover. As a professional ornithologist (PhD in Biology) and everyday person interested in nature, I am alarmed at the speed of which the unique birds of Hawaii are disappearing. In 1994, I visited Kauai and easily found 6 species of native songbirds on the Pihea Ridge trail (Kauai Elepaio, Kauai Amakihi, Apapane, Iiwi, Akekee, and Anianiau). I visited again earlier this month (July 2023) and only found a few Apapane and Kauai Elepaio, and even those were hard to find. I had heard Kauai's birds were struggling, but had no idea things had declined so rapidly. This plan represents the last best hope.	Thank you for your comment
7/24/2023 11:37	I oppose the release of mosquitoes. Testing has been insufficient. The stakes are too high for a Rush-To-Release (RTR) based upon a mindset that the crisis is so far along, so devastating, that there isn't time for the normal precautionary assessments and community input. British scientist Helen Wallace has studied GM mosquito release over a 10 year period in various parts of the world. She states: "Releases of genetically modified mosquitoes and other insects into the environment more than 10 years ago have basically been a failure. Oxitec has been doing experimental releases of millions of GM mosquitoes, releasing large numbers of female GM mosquitoes inadvertently, which can bind to transmitted disease. Risks include not properly accounting for the fact that there are multiple species that transmit diseases, so if you only attack one you can create worse problems. They released large numbers of genetically modified mosquitoes to mate with the mosquitoes and then the offspring of those meetings was a positive darling at the larval stage and the idea was to suppress the numbers of the wild mosquito. They've claimed great success in suppressing wild mosquito populations, but in fact recent information from the Cayman Islands has shown all those claims have been misleading, and it's diverted resources away from better ways of tackling tropical diseases. The intention was to release only male mosquitoes because they don't bite, but in practice with Oxitec's technology the sorting process was actually very poor and large numbers of GM female mosquitoes were released, which can bite and transmit disease." "There are also concerns about the survival of future generations of GM mosquitoes that are supposed to die off, but in fact that's also not perfect. There are multiple species which transmit these diseases, so if you successfully suppress one species, other species can move in and actually potentially become more difficult to eradicate. Proper risk assessments were never really done and certainly risk assessments that met European standards which was the legal requirement for the export of these GM or scooters were never published and consulted on. In addition, we don't even really know whether reducing the population is actually going to reduce the transmission of disease so there were many uncertainties which were kind of brushed under the carpet."	Concerns: 4, 9, 12

Entry Date	Comment	Responses
	A small group of individuals seem certain that Oxitec's GM mosquito release is the best option. Before moving forward, it is imperative that due time is taken in compiling reports and studies, and bringing this information not only to Kauai and Maui, but across the entire state, given the potential for mobility of mosquitoes to spread in various ways. It would be an unconscionable dereliction of duty to push a proposal that later proved harmful to our precious Hawaii Ne. This generation carries a heavy responsibility to those who have dwelt here in the past, as well as to our keiki and our keiki's keiki. Let us exercise caution!	
7/24/2023 11:37	I support this	Thank you for your comment
7/24/2023 11:39	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/24/2023 11:40	I STRONGLY SUPPORT AND AGREE	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 11:41	I support the use of the Wolbachia Mosquitoes to reduce the mosquito populations in Kauai. The forest birds in Hawaii are facing extinction. They are being decimated by Avian Malaria that is being transmitted by non native mosquitoes. The 'akikiki will most likely be extinct by 2025. Please allow these techniques to be implemented by DLNR and USFWS to save the 'akikiki. Thanks for your consideration.	Thank you for your comment
7/24/2023 11:45	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/24/2023 11:46	I am a huge advocate for the mosquito suppression actions being taken in order to desperately try to protect and ultimately revive our declining native forest birds. Personally I believe this action is too late for the 'Akikiki, as their numbers in the wild are already in single digits. Therefore I think this action could set a good precedent for other native forest birds in peril such as the 'akeke'e, by being more proactive on measures like this in the future instead of being reactive and enacting these measures before the wild populations of these birds dwindle too low for desperate chance of recovery. This methodology has been well studied, and has had very effective changes in other scenarios. To have a fighting chance for saving these fading Kaua'i birds, this mosquito suppression is a requirement at this stage and hopefully these positive results in other scenarios can translate here as well. The ones who tend to oppose mosquito suppression the loudest have commonly been those far removed from the situation (those who do not live in Kaua'i but speak with the blind authority as if they do; those who have not researched mosquito repression from reputable sources; those tying in political agendas wrongfully into mosquito suppression; etc.) and these straw-man arguments should not stand in the way of protecting endemic species that carry cultural pieces of history with them.	Thank you for your comment

Entry Date	Comment	Responses
	This action should have been taken years ago, but enacting this change would set a good precedent and hopefully prevent future certain extinctions or at least allow the individuals who spent countless hours and all their energy to keep these species alive a fighting chance at keeping valuable wildlife and cultural history alive.	
7/24/2023 11:58	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/24/2023 11:59	I fully endorse the use of Incompatible Insect Technology to control invasive mosquitos to benefit our native forest birds and ultimately human health and well-being. The Environmental Assessment has adequately addressed negative impacts in the area, which will be negligible, especially considering the huge potential payoffs for avian, ecosystem, and human health. My one specific comment is that I do not believe it will be possible to adequately monitor the response of mosquitoes and birds to this intervention if field crews are not allowed to move along new-to-them routes, such as pig trails. Natural resource field crews already routinely go "off trail" to maintain predator and ungulate control grids, and mosquito monitoring crews need the flexibility to do the same. This is not the same thing as "cutting" trails but rather these crews take advantage of existing natural openings and animal trails to do this important work. I hope this kind of movement will not be precluded by the EA.	Concern: 39
7/24/2023 12:03	Considering the damage already done on the native bird population, some type of action needs to be done and I am in support in the protection and conservation against this crisis	Thank you for your comment
7/24/2023 12:05	Birding Hawai'i was one of the most transformative experiences of my life, and these birds are worth protecting. Utilizing IIT in efforts to attempt to save these birds is the best least we can do. IIT is safe to the birds and to the public, and we are on borrowed time to act to save these magnificent creatures.	Thank you for your comment
7/24/2023 12:06	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health	Concern: 1

Entry Date	Comment	Responses
7/24/2023 12:09	Mongoose. Mongoose. Mongoose. Axis Deer. Cane Toad. Pigs. "The Mongoose was introduced to Hawaii in the Late 19th Century in an attempt to control the large rat population in the sugar cane fields.However, since then the mongoose population has grown to large numbers without controlling the rat population and has greatly diminished the population of native ground nesting birds, snails and palms. Hawaii is the most isolated major land mass in the world and that isolation has led to very high rates of endemism. Uniquely adapted endemic species are often sensitive to competition from invasive species and Hawaii has had numerous extinctions (List of extinct animals of the Hawaiian Islands). While not the only cause, introduction of invasive species can be a major cause of population decline and extinction. There are several routes for introduction of non-native species. Some species were accidentally introduced to Hawaii like the rat, fire ants, coqui frog, mosquitos, and asiatic rhinoceros beetle.[1] Some are species brought in for cultivation that spread to wild areas like miconia, pigs, and goats. Some species were intentionally introduced for sport like axis deer and some for pest control like mongoose or cane toad." These are examples of past idiocies.This is a Bad Idea. A Stupid Idea. A Horrible Idea. "I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement."	Concerns: 1, 3, 7, 8, 10, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
7/24/2023 12:18	I fully support the use of the incompatible insect technique in Hawai'i. This method is well tested and has been effectively used in other places to drastically reduce the mosquito populations. Hawai'i has a huge array of incredible endemic birds that enrich the ecosystem and bring beauty to our lives. Humans brought allowed invasive mosquitos into Hawai'i, causing thousands of birds to die from mosquito-carrier diseases. These birds are found nowhere else in the world, so if they are allowed to die off in Hawai'i they will be gone forever. It is our responsibility to protect the remaining bird populations. We need to solve the mosquito problem and save Hawai'i's beautiful and unique endemic birds!	Thank you for your comment
7/24/2023 12:18	Aloha. My wife and I remain strongly OPPOSED to the DLNR plan as it stands. We demand a critical, independent environmental review BEFORE any further action is taken. Like the COVID-19 "vaccines" are in reality bioweapons of mass destruction containing well-hidden dangers made with ingredients designed to install a "SMART", digital and invisible prison making humans walking antennas for 5G and other invisible technologies, the proposed mosquito release seems like it's part of an extinction agenda for humans and animals. We're OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." We demand an independant Environmental Impact Statement. Thank you.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
7/24/2023 12:22	I support Wolbachia IIT to save Hawaiian forest birds because protecting the native bird species is the right thing to do. Native birds already face many other challenges, some of which we have little control over, and without protective action more species will become extinct. The spread of avian malaria can and should be reduced for everyone's sake. There may not be a perfect course of action, but protecting native bird species is the best course. Mahalo,	Thank you for your comment
7/24/2023 12:23	IN SUPPORT OF KAUA‘I MOSQUITO SUPPRESSION	Thank you for your comment
7/24/2023 12:23	please suppress the mosquitos. Mosquito control will help out birds. mosquitos are the number the threat to our forest birds.	Thank you for your comment
7/24/2023 12:25	I’m OPPOSED to this “ Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I expect the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes to complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health before proceeding with this project. If you continue with this without an Environmental Assessment, be prepared to spend some time in jail! What you are doing is illegal and may be considered "Crimes Against Humanity", punishable by death.	Concern: 1
7/24/2023 12:26	Please do all you can to reduce mosquito populations and save the remaining Hawaiian Honeycreepers!	Thank you for your comment
7/24/2023 12:30	As a life-long Hawai‘i resident, I completely support the use the Incompatible Insect Technique (IIT) to reduce mosquito populations on Kaua‘i. We must do all we can to protect these ecologically and culturally important birds from disappearing permanently. Extinction is forever and far too many of our unique Hawaiian flora and fauna have already gone extinct. Anything that can help save our remaining beautiful and unique species here in Hawai‘i from extinction must be utilized. Please do the right thing and protect our manu. Aloha,	Thank you for your comment
7/24/2023 12:35	Release the incompatible insects	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 12:42	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I insist that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is an EXPERIMENT on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). (LOOK AT THE OUTBREAK OF MALARIA IN OTHER STATES WHERE THESE MOSQUITOES HAVE BEEN RELEASED.) Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I insist on an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/24/2023 12:42	I am strongly in support of using the incompatible release technique outlined in this draft for suppressing mosquito populations in Kaua'i. As an ornithologist and conservation biologist, I believe it is absolutely critical that mosquito control is implemented, and I believe this highly effective technique could save multiple species from extinction.	Thank you for your comment
7/24/2023 12:45	I believe that using the Incompatible Insect Technique would be a good way to reduce the invasive mosquito population. As someone who works with birds and has to use anti-avian malaria medication, I think it would be great to reduce the risk of the infection even occurring. This method would be a good non-invasive way to control the mosquitoes. I'm in support of creating methods to prevent the extinction of the native Hawaiian honey creepers. Too many of the species have already gone extinct and we need to do all we can to save the species that are still alive.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 12:46	This email is to send my support for the Wolbachia-incompatible insect technique to be released in Kaua‘i to help decrease the threat of extinction for the last remaining native forest manu. Extinction is forever and this effort may as well be or last stand to keep these manu from this terrible fate. Mahalo nui loa, Native Species Illustrator on Hawai‘i Island & Conservation kumu	Thank you for your comment
7/24/2023 12:47	I’m OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, “Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.” This project is an experiment on Hawaii’s people, wildlife, and ‘āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven’t been considered. Conflicts of interest haven’t been addressed. There’s currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua’i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the “Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua’i.” I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/24/2023 12:47	Why would this be considered safe? I’m OPPOSED to this “ Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1

Entry Date	Comment	Responses
7/24/2023 12:48	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/24/2023 12:48	PLEASE protect our Kaua'i manu 'ōiwi from avian malaria by the suppression of mosquito populations. Release male mosquitos with a naturally occurring bacterial strain that is different than the females in the wild, which prevents viability of offspring, ASAP! MAHALO	Thank you for your comment
7/24/2023 12:50	Aloha, I work deeply in conservation on Maui I'm in full support of the wolbachia release. This is the LAST CHANCE for these birds in there natural habitat. People who are against it have never done anything to help the species of Hawaii, and now stand directly in front of there only chance at survival. So sad that this is even a discussion.	Thank you for your comment
7/24/2023 12:54	To Whom This May Concern, It is unconstitutional for you to proceed with this project, without an EIS. Many concerned inhabitants of this aina would like to comprehend the repercussions of the release of these Wolbachia lab infected mosquitoes. We want an EIS done before the release!! It can't be undone once you release them. Thank you for your attention to this matter. Aloha,	Concern: 1
7/24/2023 13:01	Please support native birds!	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 13:05	I support wolbachia mosquito control! Please save our native birds.	Thank you for your comment
7/24/2023 13:06	Aloha, I am submitting testimony in support of the implementation of the Incompatible Insect Technique on Kauaʻi to protect native species. As so many of Hawaiʻi's native birds have gone extinct already, and with climate change continuing to threaten birds around the world (Audubon Society, 2019; Sekercioğlu et al., 2012) Hawaiʻi needs to be on the forefront of innovative responses to protecting species. According to the Draft EA, IIT has been successfully implemented in 14 countries worldwide, and if utilized on Kauaʻi could protect endangered and threatened Hawaiian honeycreeper species from extinction. As there are little to no other viable options, please consider using the IIT as a tool to suppress the mosquito population and protect Hawaiʻi's precious forest birds from exinction. Mahalo!	Thank you for your comment
7/24/2023 13:06	We need to have many plans implemented simultaneously to protect our native birds. Have we looked into helping the remaining birds to have their own immunity against avian malaria? One such way would be to use the mosquitos that are already biting them to give them the immunity. By inoculating the feral pigs in the area with pig feeders to spread the vaccine amongst the same mosquitos that are biting the pigs. This in turn could help to spread the protective benefits to the native birds. There are encapsulated vaccines that can be eaten by pigs in development. It's used for a different disease for feral and domestic pigs but in theory could be used to spread immunity to other species that the mosquitos are biting. Another way would be to use octenol lures to attract the mosquitos in the desired area to a solution that has the vaccine for avian malaria to be spread to the birds via the inoculated mosquitos.	Concern: 38
7/24/2023 13:10	I support efforts to mitigate the mosquitos that affect the native bird population. Please be aggressive in controlling feral cats, as well. Please insure that we are doing all we can so future generations can enjoy the unique sounds and beauty of these feathered creatures. This is their home, we are all guests passing through.	Thank you for your comment
7/24/2023 13:10	Aloha, I am writing in support of the use of the Incompatible Insect Technique to reduce mosquito populations on Kauaʻi and the environmental assessment that will be done in order to do so. We have a small time-frame left to reduce the number of avian malaria deaths of our native forest bird species before multiple species become extinct and even more become critically endangered. We know our native forest birds have very little resistance to avian malaria so as mosquito populations continue to thrive, in turn our native bird populations dwindle. I believe the steps that DOFAW and USFWS are proposing are our best chance for our native forest birds survival. Mahalo nui loa.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 13:12	See Attached Document for correct display of all images. Testimony 7/24/23 U.S. Department of the Interior Strategy: "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." I OPPOSE an "anticipated FONSI" (Finding Of No Significant Impact) for Environmental Assessment of "Wolbachia-based Suppression of Mosquitoes on Kaua'i" FULL EIS IS ESSENTIAL and statutorily appropriate. – Please prove that DLNR will no longer be (as it was for Maui) an acronym for Department of Let's Not Review. "Scientific studies document serious concerns/risks with lab-infected biopesticide mosquitoes, including: "For arthropods[1], the presence of endosymbiotic bacteria, such as Wolbachia (Rickettsiales: Rickettsiaceae), may complicate management plans and exacerbate the challenges faced by conservation managers. Wolbachia poses a substantial and underappreciated threat to the conservation of arthropods because infection may induce a number of phenotypic effects, most of which are considered deleterious to the host population[2] " , horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming MORE capable of transmitting human/bird diseases, such as avian malaria and West Nile virus." The Hawai'i Environmental Protection Act (HRS 344) and the Environmental Impact Statements (HRS 343) both fall under Title 19 – PUBLIC HEALTH. And yet, the coverage of human health impacts in this EA is dramatically deficient, which may be related to the lack of consultant experience in this area. https://law.justia.com/codes/hawaii/2022/title-19/https://www.capitol.hawaii.gov/hrsall/ChaptersByVolume.aspx?id=6 1. Fundamental scientific error at the outset: WOLBACHIA – "You've never heard of it because it ONLY INFECTS BUGS.." emphasis added. New tool for combating mosquito-borne disease: insect parasite genes, 2/27/17, Vanderbilt, https://www.sciencedaily.com/releases/2017/02/170227120400.htm HOWEVER – "Herein, we describe detection of Wolbachia genes from the blood of a patient subsequently diagnosed with non-Hodgkin's lymphoma (NHL). "The findings suggest the potential for Wolbachia bacteria to infect humans. "Additionally, under experimental conditions, some Wolbachia spp. can infect mammalian cells, even human cells in vitro [[10]]. "Horizontal transmission in insects and among helminths[3] occurs via cell–cell invasion, predation and cannibalism [11, 12], among other possibilities, establishing the potential for horizontal transfer to animals and humans as well. " Detection of Wolbachia genes in a patient with non-Hodgkins lymphoma, 10/28/14, Clinical Microbiology and Infection https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(14)00040-8/fulltext "The recent isolation of Wolbachia pipientis in the continuous cell line Aa23… allowed us to perform extensive characterization of the isolate. Bacterial growth could be obtained … in a human embryonic lung fibroblast monolayer at 28 and 37 degrees C, confirming that its host cell range is broader than was initially thought. https://pubmed.ncbi.nim.nih.gov/14662922/ NOT ONLY HAVE WOLBACHIA GENES ENTERED "NEW – human - TERRITORY," AN UNEXPECTED DISCOVERY, BUT THE MOSQUITO HOST IS ALSO "ADAPTABLE, FAST EVOLVING." One conclusion is that mosquitoes are highly genetically variable, adaptable, fast evolving, and have versatile vectorial competence. Unveiling microevolutionary patterns is fundamental for the design and maintenance of all control programs.	Concerns: 1, 2, 4, 6, 8, 9, 12, 13, 14, 15, 23, 26, 28, 36

Entry Date	Comment	Responses
	https://pubmed.ncbi.nlm.nih.gov/30529448/ 2. Elephant in the Corner: General Population Altered Immune System Status since 2021 - A Small Sample of the Ever-Growing Body of Death/Injury Data. Assertions of "no human health risks" are based on unsound science that has been discredited by the EPA - references cited in both Donna Thompson's and Tina Lia's testimony. In deference to HEPA's mandate for comprehensive analyses, one cannot look at a single isolated factor (Wolbachia genes now found in humans), but must include as many potentially connected, relevant knowns as possible (the better to predict what "MAY" have a significant impact). Still to be determined: Did immune system dysfunction play any role in facilitating the entry of Wolbachia genes into the cancer patient's blood? OR Is a more basic human/bacterium "microevolution" underway, potentially facilitated by decades of governmental bioweapon research with mosquitoes and other insects (a topic discussed later in this testimony – also see Pfizer footnote[4])? IF being immuno-compromised is a factor in the new Human/Wolbachia connection, what IS also known is that a large percentage of humanity has recently been injected with an experimental medical product ("gene therapy") whose unevenly distributed contents/effects (https://howbad.info/), as we are learning months/years later, can be to significantly impair the immune response. Thus, this is expanding the population of immune-compromised individuals (the category of person in whom Wolbachia genes were detected). Looking at landscape-level[5] issues (background human health foundational/interactional issues, against which the contact with Wolbachia and disease organisms will be mediated): Since 2021, within a large percentage of the general population, there has been a dramatic rise in negative post-injection impacts (sharp rise in disabilities and all cause mortality following injections of the experimental gene therapies known as the Covid-19 injection(s)). The following link is a compendium of ever-increasing scientific/medical analyses by 3000+ medical/scientific experts re the Pfizer experimental data, whose release was court-ordered (versus the 75 years Pfizer had hoped to keep it hidden): https://dailyclout.io/category/pfizer-reports/ While the COVID-19 shots are referred to as "vaccines," they do not meet the classical definition of a vaccine. Health authorities actually had to change the definition to accommodate the COVID-19 shots and shut down the argument that, as experimental gene therapies, they may be riskier than traditional vaccines. Meanwhile, based on the FDA's definition of "gene therapy" they're clearly gene therapies, and both Moderna and BioNTech acknowledge this. https://childrenshealthdefense.org/defender/covid-vaccines-gene-therapy-cola/ Our findings reveal a potential molecular mechanism by which the spike protein might impede adaptive immunity and underscore the potential side effects of full-length spike-based vaccines. SARS-CoV-2 spike protein significantly inhibits DNA damage repair, which is required for effective V(D)J recombination in adaptive immunity. https://pubmed.ncbi.nlm.nih.gov/34696485/ For example – one graph revealing that dramatic rise in negative post-injection effects: Edward Dowd (a MAUI resident, by the way, ergo one who could easily be reached for EIS input) has written CAUSE UNKNOWN to document this phenomenon. Black Swan Event - Ed Dowd: 'They Can't Run From This Data' https://rumble.com/v2zz64c-ed-dowd-they-cant-run-from-this-data.html 'Cause Unknown': Former BlackRock Manager Details 'Epidemic of Sudden Deaths' in New Book https://childrenshealthdefense.org/defender/cause-unknown-book-edward-dowd-sudden-deaths-cola/ Comparing gene therapy injections to traditional vaccines – note last column (rate of adverse events per 100,000 doses): "According to European Medicines Agency recommendations, frequent COVID-19 booster shots could adversely affect the immune response… The decrease in immunity can be caused by several factors such as N1-methylpseudouridine, the spike protein, lipid	

Entry Date	Comment	Responses
	nanoparticles, antibody-dependent enhancement, and the original antigenic stimulus. In conclusion, COVID-19 vaccination is a major risk factor for infections in critically ill patients." https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9167431/ Research shows the SARS-CoV-2 spike protein obliterates 90% of the DNA repair mechanism in lymphocytes, white blood cells that help your body fight infection and chronic disease, including cancer. https://childrenshealthdefense.org/defender/covid-boosters-increase-cancer-young-adults-cola/ Two specific microRNAs have been found in people who got the COVID-19 vaccine. These microRNAs interfere with a key part of your immune system, which can make you more prone to infection and chronic disease. https://childrenshealthdefense.org/defender/covid-vaccines-immune-system-neurological-disease-cola/ 3. ENHANCE DISEASE, NOT SUPPRESS? RAPID EVOLUTION? POSSIBLE INTERACTION WITH PERVASIVE PROTEINS/NANOPARTICLES? MOBILOME (Mobile Genetic Elements)? Still under study… "Wolbachia-infected mosquitoes are currently being released into nature to control human disease. However, a worrying trend is emerging whereby Wolbachia infections enhance rather than suppress pathogens in insect vectors." "These data will allow us to estimate how likely Wolbachia-based control strategies are to fail or make things worse, for identifying potential points where Wolbachia-based control is likely to break down in the field, and for planning risk mitigation strategies in the case of unforeseen harmful outcomes." "..a sobering reminder that the pathogen inhibitory effects resulting from Wolbachia infection in some insects cannot and should not be generalized across vector-pathogen systems." https://grantome.com/grant/NIH/R01-AI116636-02 Not only have Wolbachia genes been discovered in humans, BUT ITS MOSQUITO HOST IS ALSO "ADAPTABLE, FAST EVOLVING," which does NOT assure us of "a stable situation whose outcomes can be predicted for decades into the future" (the current trajectory/plan for the release). "One conclusion is that mosquitoes are highly genetically variable, adaptable, fast evolving, and have versatile vectorial competence. "Unveiling microevolutionary patterns is fundamental for the design and maintenance of all control programs." https://pubmed.ncbi.nlm.nih.gov/30529448/ This mosquito has been shown to Create ANOTHER Species of Mosquito through horizontal gene transfer. https://bmcgenomics.biomedcentral.com/articles/10.1186/1471-2164-10-33 Changes in Wolbachia or their host genomes in the same species have now been documented (Hornett et al., 2006; Weeks et al., 2007) and suggest that evolutionary shifts in Wolbachia–host interactions (and their host effects) can be rapid. Wolbachia can therefore mediate rapid evolutionary shifts in host reproductive patterns and fitness effects. https://www.nature.com/articles/hdy200950 Wolbachia is consistently described as "manipulating the host's reproductive system" – "We've known for decades that one of the secrets to Wolbachia's success is that it interferes with host reproduction in order to spread itself through females.. https://www.sciencedaily.com/releases/2017/02/170227120400.htm The secret to the over-achieving bacterium's success is its ability to hijack its hosts' reproduction. https://www.infectioncontroltoday.com/view/new-tool-combating-mosquito-borne-disease-insect-parasite-genes "The reproductive manipulation of hosts by Wolbachia include 1) feminization of infected males (turning genetic males into females), 2) Induced parthenogenesis (reproduction without males), 3) killing of infected males and 4) Cytoplasmic Incompatibility	

Entry Date	Comment	Responses
	(CI), the modification of sperm from infected males resulting in embryonic defects and death when sperm fertilize eggs not similarly infected." https://www.sas.rochester.edu/bio/labs/WerrenLab/WerrenLab-WolbachiaBiology.html MOBILOME – Mobile Genetic Elements – "The widespread intracellular bacterium Wolbachia .. is now more than ever triggering a surge of interest due to recent discoveries broadly related to its mobile genetic elements (its mobilome[6]). Remarkably, Wolbachia is capable of manipulating the reproduction of its host, thereby favoring its own—almost exclusively maternal—spreading." Results from these studies indicate that Wolbachia are much more widely distributed in host tissues than previously appreciated. Furthermore, the distribution of Wolbachia in somatic tissues varied between different Wolbachia/host associations. Some associations showed Wolbachia disseminated throughout most tissues while others appeared to be much more restricted, being predominantly limited to the reproductive tissues. https://www.researchgate.net/publication/13100943_Wolbachia_infections_are_distributed_throughout_insect_somatic_and_germ_line_tissues The significance of Wolbachia infections in insect non-reproductive tissues has recently reemerged with the description of a Wolbachia strain that forms heavy infections in nervous and muscle tissues of Drosophila and drastically reduces the life-span of adult flies (Min and Benzer, 1997). … These examples indicate that early assessments of Wolbachia tissue distribution in insects may have underestimated the extent and significance of somatic infections. https://www.sciencedirect.com/science/article/pii/S0965174898001192?via%3Dihub Recently, it has become apparent that Wolbachia infections influence the fitness of their hosts in diverse ways, by altering patterns of reproduction, resistance to microbial infections and the provision of nutrients (Hedges et al., 2008; Teixeira et al., 2008; Ghedin et al., 2008). How might a bacterium that manipulates host reproduction, with a special affinity for the female, has "mobile genetic elements," and is hostile to males, interact with toxic components of a gene therapy injection - spike protein and lipid nanoparticles - which also accumulate in human reproductive tissues (especially the ovaries, according to a Japanese biodistribution study)? Consider what court-ordered document production revealed about Pfizer's product[7] https://dailyclout.io/miscarriages-in-covid-19-vaccinated-mothers-as-reported-in-vaers/ https://childrenshealthdefense.org/defender/mrna-technology-covid-vaccine-lipid-nanoparticles-accumulate-ovaries/ For one effect of the "gene therapy" on male reproductive tissues, compare these Testicular Tissue Slides, pre & post injection… https://dailyclout.io/report-58-part-2-autopsies-reveal-medical-atrocities-of-genetic-therapies-being-used-against-a-respiratory-virus/ "Small" segue worth mentioning: SUDDEN ADULT DEATH SYNDROME is a term that did not exist prior to the rollout of the Covid-19 injections, prior to the circulation of its ingredients inside the human body. And - as presented by Federal Investigator Donna Thompson: The bacterium the mosquitoes are injected with has been shown to ENHANCE West Nile Virus (WNV) Infection in the Mosquito Culex tarsalis https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0002965 Research has shown Wolbachia can ENHANCE malaria parasite infection in two genera of mosquitoes. [19-21]. https://downloads.regulations.gov/EPA-HQ-OPP-2015-0374-0018/attachment_1.pdf A 2020 study in BMC describes the Potential for Wolbachia bacteria to SPREAD not only vertically through breeding, but horizontally through parasitism or proximity to infected individuals. "Wolbachia infection in wild mosquitoes (Diptera: Culicidae): implications for transmission modes and host-endosymbiont associations in Singapore" (Huicong Ding, Huiqing Yeo, Nalini Puniamoorthy) 4. Social/health issue: Is unchecked immigration introducing new disease threats (some historically enhanced by Wolbachia)?	

Entry Date	Comment	Responses
	The current policy of open borders and the disbursing of tens of thousands of unvetted immigrants throughout the U.S. (including Hawai'i) may well introduce/spread diseases that have hitherto not been seen nationally/locally, which means that studies like the one below might become increasingly relevant to Hawai'i's/U.S.'s populations as well. "Filarial nematodes[8] cause some of the most debilitating diseases in tropical medicine. Recent studies, however, have implicated the parasites' endosymbiotic Wolbachia bacteria, rather than the nematode, as the cause of inflammatory-mediated filarial disease. https://www.researchgate.net/publication/10661175_Wolbachia_in_the_Inflammatory_Pathogenesis_of_Human_Filariasis "Wolbachia have proven to be the Achilles' heel of nastier parasites too. Before Klion and her team showed that doxycycline can be used to treat the annoying worm infections, other doctors learned that it is an effective way to eliminate their nasty cousins, the parasites that cause elephantiasis and river blindness" (kills the adult worms by killing the Wolbachia bacteria on which the adult worms depend in order to survive). https://www.wired.com/2009/10/wormtreatment/ https://onchocercaparasite.wordpress.com/2017/12/01/treatment-and-control/ 5. Cause for CAUTION: the project's research bedfellows and their history. We are reassured by certain experts that this Wolbachia/mosquito experiment is harmless. However, many of these researchers and organizations are funded by the Bill and Melinda Gates Foundation and Wellcome Trust. Gates Foundation involvement with Wolbachia, alteration of mosquitoes, etc.: https://www.gatesfoundation.org/about/committed-grants/2020/09/INV019029 https://www.worldmosquitoprogram.org/en/about-us/our-story Wellcome Trust partnered with Gates multiple times, including for "exploring synergies between human and animal infections." https://www.gatesfoundation.org/about/committed-grants/2014/05/opp1109338 http://www.eliminatedengue.com/progress/index/view/news/1088 Is it possible that a Wolbachia-research organization being generously supported by Gates/Wellcome will tend to find that harmful or unintended consequences are NOT taking place re the object of research (knowing the focus of the study is intended as a future cash cow for the funders)? Gates recently commissioned a study into how much people will pay to use Wolbachia. Arlington, VA—January 31, 2022—Management Sciences for Health (MSH) today announced that it has been awarded a contract to examine what countries are willing to pay to use the Wolbachia pathogen.. The study, funded by the Bill & Melinda Gates Foundation, will analyze the willingness of public and private payers to use the naturally occurring bacteria to control outbreaks of the mosquito-borne diseases https://msh.org/story/management-sciences-for-health-tapped-to-study-costs-to-control-mosquito-borne-disease-outbreaks-in-latin-america-and-asia/ Former editors of medical/scientific journals have described a proliferation of junk/compromised science in recent decades[9] due to industry influence (greed, profits over people, etc.). AND, unfortunately, there is a recent, very public example in the case of the virologists who suddenly altered their testimony on SARS-CoV-2 origins and then received large grants from Fauci.. An article in the BMJ (British Medical Journal) calls out Gates and Wellcome for covering their ultimate agendas (and financial interests) with the cloak of charity and public-spirited research, failing to reveal large conflicts of interest. "Mohga Kamal-Yanni, a policy adviser to UNAIDS and other organisations who recently co-wrote a paper citing problems with the Gates Foundation's influence in the pandemic, says that Wellcome's investments raise critical questions around transparency and accountability.5 "Yet charities such as Gates and Wellcome—and even drug companies—have generally been praised in the news media during the pandemic for their efforts to solve the public health crisis, with relatively little attention paid to their financial interests and with few checks and balances put on their work. https://www.bmj.com/content/372/bmj.n556	

Entry Date	Comment	Responses
	Gates' windfall profits from hawking the Covid-19 injections as something the entire world MUST do, followed by his subsequent incredibly timely sale of his vaccine stocks as the bad side-effects/fraud news started to emerge, are a window into his historical behavior when involved in any particular product. https://childrenshealthdefense.org/defender/bill-gates-pfizer-covid-vaccine-profits/ https://childrenshealthdefense.org/defender/bill-gates-profits-biontech-effectiveness-covid-vaccines/ https://www.gatesphilanthropypartners.org/perspectives/2022-world-mosquito-program https://www.biznews.com/health/2023/01/30/bill-gates-mrna His extensive investments in media assist him in keeping the message about his "work" on target. It's so handy to have your own team of "fact checkers" "correcting" what others report about you. https://www.cjr.org/criticism/gates-foundation-journalism-funding.php A tiny bit of historical/moral/ethical background on the Wellcome Trust (formerly Burroughs Wellcome), uncovered by Tom Fitton of Judicial Watch – human experimentation/murder in a concentration camp: "The omitted evidence by Oxford of Rhodes' 1895 Privy Council appointment directly implicates … in the 2nd Boer War concentration camp atrocities where over 60,000 whites and blacks (incl. over 14,000 mostly white children of French, German and Dutch descent) were murdered in the camps. The omission also implicates the Crown, Privy Council, Henry de Worms (a Rothschild cousin) and the Rothschilds banking fortune in the human vaccine experimentation carried out by Burroughs Wellcome (Wellcome Trust today) in those 2nd Boer War concentration camps.." In 2018, the same Wellcome organization which conducted vaccine experiments in the 2nd Boer War concentration camps researched vaccine confidence (how to encourage uptake of vaccines) just in time for 2021's Covid-19 gene therapy injections, which created dozens of new billionaires[10]. And note how the mantra of "Trust The Science" was subsequently utilized by Official Narrative talking-heads … "..120,000 respondents in 126 countries to assess how societal-level trust in science is related to vaccine confidence. In countries with a high aggregate level of TRUST IN SCIENCE, people are more likely to be confident about vaccination.." (emphasis added) https://pubmed.ncbi.nlm.nih.gov/34002053/ The documents suggest that the US's secretive Defense Advanced Research Projects Agency (DARPA) has become the world's largest funder of "gene drive" research.. https://www.theguardian.com/science/2017/dec/04/us-military-agency-invests-100m-in-genetic-extinction-technologies Gates is also studying how to aggressively push genes into a different biome. What could go wrong when an avowed population-reduction "philanthropist" is/has been associated with (a) Wolbachia and (b) Covid-19 injections and (c) the alarming "gene drive" technology? https://www.forbes.com/sites/matthewherper/2016/06/10/bill-gates-says-gene-drives-to-eradicate-some-mosquito-species-could-be-ready-for-in-two-years/ As Federal Investigator/Subject Matter Specialist Donna Thompson notes in her testimony, the presence of Bill Gates in the Wolbachia research picture is cause for concern. Refer to Donna Thompson's testimony on page 2 through page 4 of her 3/24/23 comments to the BLNR. Bill Gates has been funding Wolbachia research for 20 years, but is apparently playing both sides of the aisle – funding both pro- and con-Wolbachia research, given that Wolbachia is known to be essential to the survival of certain disease organisms that infect humans. (https://www.mdpi.com/2414-6366/4/3/108 - Calibr, a division of Scripps Research has partnered with and the Bill & Melinda Gates Medical Research Institute (Gates MRI)). Federal Investigator Donna Thompson has now submitted, in her current comments, Wolbachia/mosquito information related to antibiotics and the potential for developing antibiotic-resistant-strains of	

Entry Date	Comment	Responses
	organisms, with the obvious potential human/animal health effects. Here is another Gates-funded project in which antibiotics are used for manipulating mosquito gender ratios (with a similar risk of increasing antibiotic-resistant organisms?).. Bill Gates-Funded Biotech Firm Claims GMO Mosquito Project a 'Success,' But Critics Cite Lack of Proof "Oxitec's pilot project in the Florida Keys involves releasing up to 1 billion OX5034 mosquitoes…. "Oxitec said the mosquitoes have a "self-limiting" gene that makes the females dependent on the antibiotic tetracycline. Without the drug, they will die. ".. critics said the experiment so far hasn't stemmed the spread of mosquito-borne illness." https://childrenshealthdefense.org/defender/bill-gates-biotech-gmo-mosquito/ 6. Future Warfare Slide Presentation in 2001 - "Welcome to 2025." Exploring the research into Mosquitoes/Bacteria as a BIOWEAPON. There are no documented biosecurity protocols for these mosquitoes, and plans for pathogen screenings are unknown. "THE EFFECTS OF BIOLOGICAL WEAPONS HAVE LARGELY DISAPPEARED FROM PUBLIC AWARENESS." See below.. Drone delivery is discussed in the EA as the primary method of delivery – "The primary tool proposed for release of mosquitoes on the landscape is drones.." PATENT 8,967,029 B1. https://patents.google.com/patent/US8967029B1/en Toxic Mosquito Aerial Release System Filed November 14, 2014, Received March 3, 2015 Background Art – "Governments have sought after weapons that can be used to deliver chemicals, viral and bacteriological substances for lethal and non-lethal administration to assembled masses of people." Abstract - A device for the aerial release of mosquitoes includes an unmanned aerial vehicle operable by remote control. It carries a container holding a central processing unit and a mosquito breeding bin, which is a self-contained volume housing mosquitoes and a mosquito food having a toxin suitable to be transmitted by mosquito bite after the mosquito consumes the mosquito food. A release tube is connected to the mosquito breeding bin and sized to release mosquitoes from the mosquito breeding bin. A valve is connected to the release tube and is operable by remote control so that when opened, the mosquitoes have an open pathway out of the container through the release tube. The documents suggest that the US's secretive Defense Advanced Research Projects Agency (DARPA) has become the world's largest funder of "gene drive" research.. https://www.theguardian.com/science/2017/dec/04/us-military-agency-invests-100m-in-genetic-extinction-technologies Genetically engineer SKIN BACTERIA to resist mosquito bites? What could possibly go wrong? Could "protection from" also be turned into its opposite – "vulnerability/susceptibility to"? https://www.chemistryworld.com/news/darpa-wants-to-genetically-engineer-soldiers-skin-bacteria-to-protect-them-from-mosquitoes/3010506.article (https://news.fiu.edu/2020/team-awarded-15m-by-darpa-to-develop-skin-microbiome-based-mosquito-repellent	

Entry Date	Comment	Responses
	The authors argue that the insects used to deliver the viral agents might be perceived as "means of delivery" in terms of the (Biological Weapons) Convention. "Because of the broad ban of the Biological Weapons Convention, any biological research of concern must be plausibly justified as serving peaceful purposes. The Insect Allies Program could be seen to violate the Biological Weapons Convention, if the motivations presented by DARPA are not plausible. This is particularly true considering that this kind of technology could easily be used for biological warfare," explains Silja Vöneky, a law professor from Freiburg University. https://www.sciencedaily.com/releases/2018/10/181009102511.htm BACTERIAL "SYRINGES" have now been CUSTOMIZED to ferry drugs into specific types of human cells. "Unclear whether human side-effects will occur"… Researchers have harnessed tiny biological "syringes" bacteria use to carry and inject cargo into cells to ferry drugs into specific types of human and mouse cells, they report this week in Nature. The new strategy improves on current drug delivery such as nanoparticles, which cannot be customized to cells or organs, the team says. "Still, the technology is" (allegedly) "far from being a feasible strategy in humans, STAT reports, because the bacterial syringes did not work for all drugs, and it's unclear whether the approach will cause side effects in humans." https://www.science.org/content/article/biological-syringes-could-change-how-drugs-are-delivered Renee Wegrzyn, PhD, a program manager at the Defense Advanced Research Projects Agency (DARPA), discusses her work on gene editing to combat infectious diseases or counter future enemies that may employ genetically modified insects as weapons with Defense & Aerospace Report Editor Vago Muradian at the DARPA-D60 Symposium in September 2018 to commemorate the agency's 60th anniversary. https://www.youtube.com/watch?v=IlounGf1zK8 The use of "CO-OPTED INSECTS" as part of a new human warfare strategy - this concept was part of a Future Strategic Issues, Future Warfare presentation by NASA scientist Dennis M. Bushnell, at the NASA Langley facility (Langley being CIA, of course) on August 14, 2001. Bushnell Slide Show: https://zerogeoengineering.com/wp-content/uploads/2018/07/dtic.mil-ndia-2001testing-bushnell-3.pdf https://archive.org/details/FutureStrategicIssuesFutureWarfareCirca2025 7. CONFLICTS OF INTEREST HAVE BEEN IGNORED. The basis for bias within the BLNR and within the Agriculture Advisory Committee on Plants and Animals is spelled out in prior testimony of Hawai'i Unites/Tina Lina, Donna Thompson, which catalogues a history of Advisory Committee (and BLNR) members' employment, of historical and current association and allegiances (including, but not limited to, Committee Members being affiliated with agencies who are a part of Birds Not Mosquitoes, which has the firmly stated intention that they WILL USE Wolbachia mosquitoes/biopesticides. Here are the conflicted/biased Committee members whose agency affiliations (e.g., members of Birds Not Mosquitoes, BNM) makes their approval(s) and recommendations suspect: deficient in terms of guaranteeing an impartial review of evidence, of ensuring that foregone conclusions have no place in the deliberations. (1) Dr. Marcia Haws, (2) Cynthia King, (3) Gracelda Simmons, (4) Joshua Fisher, (5) Dr. Samuel Ohu Gon III. Predetermined outcome? (BNM language reveals a bias before hearings/studies were completed) Birds Not Mosquitoes was using the term "WILL USE naturally-occurring bacteria" on its opening webpage, long before the first Environmental Assessment (Maui) was released. When the intention – WILL USE - of the Advisory Committee Members' affiliate agencies is so openly stated, how willing and open-minded are those advisory committee members to finding, on the basis of ALL the evidence, that there is a pronounced need for far more extensive analysis, that caution is appropriate and that an intention might need to be revised? This has led to downplaying serious issues, avoiding other issues entirely, etc. all in an effort to expedite their WILL USE goal. https://www.birdsnotmosquitoes.org/	

Entry Date	Comment	Responses
	Errata on the BNM website: BNM (ergo the agencies that fall under its umbrella) have also failed to update the information on their website, in that there is NO mention of the fact that Wolbachia genes have now been detected in an immuno-compromised human, a fact which, if revealed, might alter the general public's perception of this project. The two BLNR board members with open conflicts of interest are Dawn N.S. Chang and Vernon Char. BLNR guidance requires members to abstain from participation as well as voting, when "any interest, direct or indirect" exists (see below), but Chang and Char declined to recuse themselves. https://dlnr.hawaii.gov/boards-commissions/blnr-board/ BLNR FOLLOWED EXAMPLE OF BIASED ADVISORY COMMITTEE (Agriculture Advisory Committee on Plants and Animals). Granting any deference to the precedent set by an action of a compromised Advisory Committee[11] compounds the error of partiality and bias that is explicitly supposed to be absent from administrative processes. The mandate, the longstanding judicial precedent	
7/24/2023 13:12	I think this is very dangerous experimenting with this type of situation. It's gone bad in the past, there's a chance it could go bad now. I'm very opposed to this Frankenstein approach. There have been issues with malaria outbreaks in Texas, and also problems in Florida with mosquito tampering/genetic code. Please don't do this to Hawaii.	Concerns: 3, 4, 11, 28
7/24/2023 13:13	To whom it may concern, Attached, please find a letter of written testimony from the Finch Research Network which we ask please be distributed to the Department of Land and Natural Resources - Department of Fish and Wildlife for the upcoming meeting covering the Environmental Assessment on Kauai for use of Mosquito suppression techniques. Thank you, Finch Research Network [TEXT COPIED FROM PDF LETTER ATTACHMENT] July 24th, 2023 To the Department of Land and Natural Resources – Division of Forestry and Wildlife, The Finch Research Network, a 501(c)(3) nonprofit dedicated to the study and conservation of finches and their habitats globally, would like to take this time to highlight the severity and importance of the draft Environmental Assessment for Kaua'i Mosquito Suppression you'll be reviewing today regarding Hawai'i's forest bird extinction crisis. We are writing to you today in SUPPORT of this Environmental Assessment and use of Wolbachia to aid in the suppression of mosquitos to assist in the conservation of these species. The Hawaiian honeycreepers are a very diversified group of finches, and as such, have garnered the attention of our organization and members (many of whom are based on the mainland). We are astonished at the rapid pace these species are headed towards extinction, and are working with partners in Hawai'i to ensure these extinctions do not take place. We would like to emphasize the value in the two tools that are being presented on today - both the use of mosquito control through Incompatible Insect Technique, and through captive care of two of the most endangered honeycreepers (the 'akikiki and kiwikiu). These are the only tools left in the so-called tool-box, and if we don't employ them, we are guaranteed to lose these birds forever. Extinctions of Hawaiian birds and birdlife have proceeded at an incredibly rapid pace since contact with Europeans first took place in 1778, and now only 17 of the 50+ species of honeycreepers that used to exist on the island are holding on today. We hope you will not take this matter lightly, and do all you can to help save these birds that are 'ohana, kūpuna, and 'aumākua to Native	Thank you for your comment

Entry Date	Comment	Responses
	Hawaiians. These birds are only found here and nowhere else in the world. We must do what we can to save them before it is too late. Thank you for your work, Finch Research Network https://finchnetwork.org	
7/24/2023 13:17	What are you waiting for....our Native Forest Birds to become extinct. I hear that there's a lot of misinformation flying around out there but the Wolbachia Program is Scientifically supported & has, already, been effectively & safely, implemented in TX & CA. As you debate this the clock is ticking. Pls vote in favor, today Kind Regards	Thank you for your comment
7/24/2023 13:18	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA.Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	
7/24/2023 13:22	Aloha, I am writing to urge the continued procedure of carrying out a full environmental impact statement on the Wolbachia mosquito release plan in opposition to those who would award a FONSI determination. I think that the draft environmental assessment issued by the DLNR/ US Fish and Wildlife/ SWCA Consulting was a very thorough broad assessment, but it is lacking some details in terms of implementation, modeling assumptions, and an overly optimistic sense of confidence in the inevitable success of the plan. I would appreciate your consideration of a few of my concerns. My primary concern is that I felt the EA downplayed the potential for female Wolbachia infections due to the authors' inherent bias toward the success of their plan. In the case of a minutely small rate of Wolbachia-infected female mosquitoes, those infected females will have the ultimate evolutionary advantage over their now infertile competitors. This will completely negate the intended outcome of the project, dooming it to failure and proving it to be a waste of valuable resources. This could happen one of two ways. 1. Insufficient lab safety controls could lead to infected female escapes. In the first appendix under the heading "Unintended release of female mosquitoes", the EA cites Crawford et al 2020 that the risk of releasing a female will be 1 out of 900 million. Nowhere in the body of the report did I notice any intended release rates but I know you intend to implement a potentially perpetual release cycle to ensure the success of the plan. How many hundreds of millions of mosquitoes will be released over time at what cost? What lab will you be depending on to purchase female-free brood? If you plan on setting up biopesticide labs in Hawaii, I presume you will be doing a much more comprehensive EIS. 2. Horizontal transfer of the Wolbachia from male to female mosquitoes could occur during mating. This subject is addressed in the EA draft appendix immediately following the female release risk. Even if there were only an infinitesimally small risk of infecting females to pass on the infection to the next generation of offspring, how many infected female generations would be needed before they just replace the uninfected population? It is an inevitability that over some period of time you will have replaced the uninfected population in your release zone with an infected one while your plan is to induce sterility. The understated implication of the whole concept of Wolbachia induced cytoplasmic incompatibility, if we imagine one step beyond the current implementation to the probable outcome, is that you are creating selection pressure to advantage the group you want to suppress. The EA mentions that this plan is not new and so initial results exist from some of the countries where it has been tried showing mosquito population reduction of 90%. Do you think those remaining 10% could consist of some infected females and eventually a more fit population of mosquitoes will return to something approaching their prior carrying capacity still able to spread malaria but with a new hitchiker Wolbachia on board? That brings me to my next concern. This seems to be, by necessity, just another neverending government program that we all end up paying for regardless of its performance. The EA was extremely vague regarding the foreseeable future development of the project. Will you release mosquitoes on a regular basis from now until the fall of the empire? If your project fails due to a growing population of infected compatible mates to carry on the avian malaria crisis will you admit defeat or will you pivot to some other poorly thought out homerun swing? Once you set up your base operation here for mosquito release, will the public be allowed access to audit your operation? If the program fails, how much money will the government have diverted from more productive ends? The final concern that I wanted to share is this. I believe many of the underlying assumptions are either lacking sufficient data or based on predictive modeling which is irrelevant speculation. First, why do we believe that anyone can tell us what the weather is going to do in a year or a decade? Suppose the climate ended up five degrees cooler on average in 2033. Would the mosquito population retreat to the lowlands or evolve and continue to sicken and kill birds with malaria? Perhaps the birds would also start to nest at lower elevation sites. Who knows? These types of natural climactic shifts and occasional upheavals have occurred throughout	Concerns: 1, 6, 9, 11, 12, 14, 26, 27, 33

Entry Date	Comment	Responses
	time forcing all species to adapt or perish. Perhaps the small percentage of Akeke'e and Akikiki that remain are the individuals with immune resistance to the malaria and they can confer that immunity to their progeny. Suppose you are successful in eliminating the southern house mosquito in the whole NW region of the island and then one typhoon comes and blows the load of lowland mosquitos beyond their natural range up-hill into the forest. You see how many factors this proposal just doesn't address?y I'm all for protecting our precious manu and the amazing botanical wonders that they proliferate. I have just seen repeatedly how new technologies get thrust onto the public and the ecosystem with very little notice or request for consent from those it could affect. Open air introductions of a slew of toxic chemicals now poison our water and air. GMO seeds have made our commodity foods practically inedible. If I could snap my fingers and make the mosquitoes go away maybe I would, but I would be forced to weigh the risk/reward of unintended consequences that are beyond my current comprehension. Your plan still has too many holes to float. I highly recommend you carry out a full Environmental Impact Assessment. Respectfully	
7/24/2023 13:26	I support mosquito suppression efforts in Kaua'i to save our native forest birds from extinction.	Thank you for your comment
7/24/2023 13:30	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
7/24/2023 13:33	I wholeheartedly SUPPORT the Kaua'i Wolbachia Incompatible Insect Technique (IIT) Environmental Assessment (EA). It is alarming, the rate at which we are losing native Hawaiian forest birds. We have already lost so many. Do not let our last surviving endemic forest birds disappear from Hawai'i, and the world, forever. Avian malaria spread by invasive mosquitoes (Culex quinquefasciatus) cannot be allowed to extirpate our precious endangered native forest birds across the archipelago. Specifically, extant Kaua'i honeycreepers have experienced drastic (>90%) population declines exacerbated by climate warming which result in the spread of mosquitoes into high elevation forest reserves that were previously too cold for mosquitoes and avian malaria. Currently, there are hardly any forest refuges left that are safe from mosquitoes carrying this devastating disease. No doubt, many things have caused our endemic birds to decline in number over recent decades (& human history here), but malaria will cause extinction of these diverse fauna if nothing is done (and indeed, if climate change does not continue on its current trajectory). 'Akikiki are at risk of extinction by 2025, and 'akeke'e could go extinct as soon as 2034. They cannot afford any unnecessary delays to successful mosquito and avian malaria suppression. Extinction is forever. You will not get a do-over. No matter how pristine Hawai‘i’s native forests are, they are not safe for forest birds if they have mosquitoes spreading avian malaria. The transinfection of mosquitos with the maternally-inherited, endosymbiotic bacteria Wolbachia is an extremely promising biocontrol approach. Unlike traditional pesticides, Wolbachia IIT is a safe and species-specific form of landscape-scale mosquito control. Wolbachia IIT has been used successfully in other parts of the world to suppress mosquitoes (and the diseases they carry) with no negative impacts to people or the environment. Elsewhere in the United States, this mosquito control technique has been approved and used for several other mosquito species (Aedes albopictus in California and Kentucky; Ae. aegypti in California, Texas, and Florida, with amendments to add Puerto Rico and the U.S. Virgin Islands; and Ae. polynesiensis in American Samoa). The fundamental purpose of an EA is to determine if a project will cause significant negative effects that would require the preparation of an Environmental Impact Statement (EIS). The Wolbachia IIT EA for Kaua'i (and East Maui) is supported by decades of peer-reviewed science. It concluded that no significant negative environmental or cultural impacts will occur. To quote Dr. Chris Farmer of American Bird Conservancy, "We are racing time, and successful application of this management tool will prevent the extinction of multiple species of invaluable and irreplaceable honeycreepers. They are integral components of our forests, indicating overall ecosystem health and serving as pollinators, seed dispersers, and predators. Their beauty, behaviors, and spiritual connotations are woven into mele, hula, and ‘ōlelo no‘eau, and iconic Hawaiian materials created through featherwork. These birds are found nowhere else in the world, and we have a kuleana to protect them." I, along with countless other citizens and experts, SUPPORT the Kaua'i Wolbachia IIT EA to save our forest birds. Mahalo for your consideration and the opportunity to provide comment,	Thank you for your comment
7/24/2023 13:43	Please protect the native species and suppress the mosquito invasion. Thank you. Mahalo	Thank you for your comment
7/24/2023 13:49	I do not support releasing any injected mosquitoes, period.	Thank you for your comment
7/24/2023 13:54	Aloha, my name is and I am a student currently earning a B.S in Environmental Science in Hawai'i. I support the use of the Incompatible Insect Technique to reduce misquoto populations with every ounce of my being. This is our best shot at saving the akiki and other endangered Hawaiian honeycreepers from extinction. Right now we have the chance to prevent these culturally and biologically important bird from being lost forever. Please, I am begging you, make it so.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 14:02	I fully support the use of the IIT for controlling the populations of avian-malaria-carrying mosquitoes. As a resident of Hawai‘i Island who, for the time being, lives off-island, the diversity and maintenance of the native birds of the islands is very important to me and I believe that we should use all of the tools at our disposal to ensure the continued survival of our birds. The IIT technique is safe and has been shown to work in other systems. There are no new species introductions to the islands using this technique. I fully support the use of IIT and I look forward to a brighter and more bird-filled future!	Thank you for your comment
7/24/2023 14:06	Please protect the birds and allow for IIT to reduce the mosquito populations threatening their existence!	Thank you for your comment
7/24/2023 14:13	Aloha, I am writing in support of the native Hawaiian birds on Kauai. I am in support of the Incompatible Insect Technique. We can’t afford to lose any more native Hawaiian birds.	Thank you for your comment
7/24/2023 14:22	support our endemic birds, please pursue the control of mosquitoes on Kaua‘i to stop the spread of mosquito-borne disease.	Thank you for your comment
7/24/2023 14:22	I support the Wolbachia IIT as a tool to help save our native forest birds because it’s supported by science and has the ability to suppress mosquito populations which are known to carry avian malaria. We have lost many of our native forest birds to this disease and without actions like this, our critically endangered birds on Kaua‘i like the ‘Akikiki and ‘Akeke‘e will become extinct in the next few years. Please approve this assessment and the tools necessary to save our native forest birds! Mahalo nui!	Thank you for your comment
7/24/2023 14:28	I fully support the use of this proven technique to support the native birds of Hawaii and their protection. They are also living “residents” of the state and the invasive mosquito populations are driving them to extinction. We need to protect the birds that are left and this approach has showed no ill effect on people; in other countries it’s actually used to help keep people safe too!	Thank you for your comment
7/24/2023 14:29	I strongly support the Department of Land and Natural Resources (DLNR) and U.S. Fish and Wildlife Service (USFWS) proposal of using the Incompatible Insect Technique (IIT) to reduce mosquito populations within approximately 59,204 acres of forest reserves, state parks, and private lands in the Kōke‘e and Alaka‘i areas of Kaua‘i. This effort would suppress mosquitoes known to transmit diseases to native forest birds in critical higher-elevation native forest habitat. Please vote to protect the native Hawaiian honeycreepers and other native birds from the mosquitoes known to transmit disease and threaten extinction. Please act NOW to protect our precious native birds! Support the DLNR and USFWS recommendation to use IIT to reduce the mosquitoes population that threatens our native birds’ survival. Mahalo!	Thank you for your comment
7/24/2023 14:29	Mosquitoes are not only bothersome to us humans, they are spreading lethal diseases to our birds and are an invasive species to Hawaii. While mosquitos run rampant, we have a priceless ecological resource in our Hawaiian ecosystem that we have failed to protect for decades. I support IIT, incompatible insect technique, to save Hawaiian birds.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 14:30	Please require FULL EIS. A finding of FONSI is ridiculously inappropriate, scientifically inaccurate, and simply lazy, as it fails to include obviously relevant concerns. I have emailed further testimony to mosquitocontrol@hawaii.gov. Scientific studies document serious concerns/risks with lab-infected biopesticide mosquitoes, including: o "For arthropods , the presence of endosymbiotic bacteria, such as Wolbachia (Rickettsiales: Rickettsiaceae), may complicate management plans and exacerbate the challenges faced by conservation managers. Wolbachia poses a substantial and underappreciated threat to the conservation of arthropods because infection may induce a number of phenotypic effects, most of which are considered deleterious to the host population " o horizontal transmission of the introduced bacteria strain, o increased pathogen infection in mosquitoes, o irreversible evolutionary events, o population replacement, o accidental release of lab-reared females, o creation of lab-strain females in the wild, o horizontal gene transfer, o biopesticide wind drift, and o mosquitoes becoming MORE capable of transmitting human/bird diseases, such as avian malaria and West Nile virus." Fundamental scientific error at the outset: WOLBACHIA – "You've never heard of it because it ONLY INFECTS BUGS.." emphasis added. New tool for combating mosquito-borne disease: insect parasite genes, 2/27/17, Vanderbilt, https://www.sciencedaily.com/releases/2017/02/170227120400.htm HOWEVER – "Herein, we describe detection of Wolbachia genes from the blood of a patient subsequently diagnosed with non-Hodgkin's lymphoma (NHL). "The findings suggest the potential for Wolbachia bacteria to infect humans. "Additionally, under experimental conditions, some Wolbachia spp. can infect mammalian cells, even human cells in vitro [[10]]. "Horizontal transmission in insects and among helminths occurs via cell–cell invasion, predation and cannibalism [11, 12], among other possibilities, establishing the potential for horizontal transfer to animals and humans as well." Detection of Wolbachia genes in a patient with non-Hodgkins lymphoma, 10/28/14, Clinical Microbiology and Infection https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(14)00040-8/fulltext "The recent isolation of Wolbachia pipientis in the continuous cell line Aa23… allowed us to perform extensive characterization of the isolate. Bacterial growth could be obtained … in a human embryonic lung fibroblast monolayer at 28 and 37 degrees C, confirming that its host cell range is broader than was initially thought. https://pubmed.ncbi.nim.nih.gov/14662922/ NOT ONLY HAVE WOLBACHIA GENES ENTERED "NEW – human - TERRITORY," AN UNEXPECTED DISCOVERY, BUT THE MOSQUITO HOST IS ALSO "ADAPTABLE, FAST EVOLVING." One conclusion is that mosquitoes are highly genetically variable, adaptable, fast evolving, and have versatile vectorial competence. Unveiling microevolutionary patterns is fundamental for the design and maintenance of all control programs. https://pubmed.ncbi.nlm.nih.gov/30529448/ "Wolbachia-infected mosquitoes are currently being released into nature to control human disease. However, a worrying trend is emerging whereby Wolbachia infections enhance rather than suppress pathogens in insect vectors." "These data will allow us to estimate how likely Wolbachia-based control strategies are to fail or make things worse, for identifying potential points where Wolbachia-based control is likely to break down in the field, and for planning risk mitigation strategies in the case of unforeseen harmful outcomes." "..a sobering reminder that the pathogen inhibitory effects resulting from Wolbachia infection in some insects cannot and should not be generalized across vector-pathogen systems." https://grantome.com/grant/NIH/R01-AI116636-02 Not only have Wolbachia genes been discovered in humans, BUT ITS MOSQUITO HOST IS ALSO "ADAPTABLE, FAST	

Entry Date	Comment	Responses
	EVOLVING," which does NOT assure us of "a stable situation whose outcomes can be predicted for decades into the future" (the current trajectory/plan for the release). "One conclusion is that mosquitoes are highly genetically variable, adaptable, fast evolving, and have versatile vectorial competence. "Unveiling microevolutionary patterns is fundamental for the design and maintenance of all control programs." https://pubmed.ncbi.nlm.nih.gov/30529448/ This mosquito has been shown to Create ANOTHER Species of Mosquito through horizontal gene transfer. https://bmcgenomics.biomedcentral.com/articles/10.1186/1471-2164-10-33 Changes in Wolbachia or their host genomes in the same species have now been documented (Hornett et al., 2006; Weeks et al., 2007) and suggest that evolutionary shifts in Wolbachia–host interactions (and their host effects) can be rapid. Wolbachia can therefore mediate rapid evolutionary shifts in host reproductive patterns and fitness effects. https://www.nature.com/articles/hdy200950 MOBILOME – Mobile Genetic Elements – "The widespread intracellular bacterium Wolbachia .. is now more than ever triggering a surge of interest due to recent discoveries broadly related to its mobile genetic elements (its mobilome). Results from these studies indicate that Wolbachia are much more widely distributed in host tissues than previously appreciated. Furthermore, the distribution of Wolbachia in somatic tissues varied between different Wolbachia/host associations. Some associations showed Wolbachia disseminated throughout most tissues while others appeared to be much more restricted, being predominantly limited to the reproductive tissues. https://www.researchgate.net/publication/13100943_Wolbachia_infections_are_distributed_throughout_insect_somatic_and_germ_line_tissues The significance of Wolbachia infections in insect non-reproductive tissues has recently reemerged with the description of a Wolbachia strain that forms heavy infections in nervous and muscle tissues of Drosophila and drastically reduces the life-span of adult flies (Min and Benzer, 1997). … These examples indicate that early assessments of Wolbachia tissue distribution in insects may have underestimated the extent and significance of somatic infections. https://www.sciencedirect.com/science/article/pii/S0965174898001192?via%3Dihub Recently, it has become apparent that Wolbachia infections influence the fitness of their hosts in diverse ways, by altering patterns of reproduction, resistance to microbial infections and the provision of nutrients (Hedges et al., 2008; Teixeira et al., 2008; Ghedin et al., 2008). How might a bacterium that manipulates host reproduction, with a special affinity for the female, has "mobile genetic elements," and is hostile to males, interact with toxic components of a gene therapy injection - spike protein and lipid nanoparticles - which also accumulate in human reproductive tissues (especially the ovaries, according to a Japanese biodistribution study)? The bacterium the mosquitoes are injected with has been shown to ENHANCE West Nile Virus (WNV) Infection in the Mosquito Culex tarsalis https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0002965 Research has shown Wolbachia can ENHANCE malaria parasite infection in two genera of mosquitoes. [19-21]. https://downloads.regulations.gov/EPA-HQ-OPP-2015-0374-0018/attachment_1.pdf A 2020 study in BMC describes the Potential for Wolbachia bacteria to SPREAD not only vertically through breeding, but horizontally through parasitism or proximity to infected individuals. "Wolbachia infection in wild mosquitoes (Diptera: Culicidae): implications for transmission modes and host-endosymbiont associations in Singapore" (Huicong Ding, Huiqing Yeo, Nalini Puniamoorthy "Filarial nematodes cause some of the most debilitating diseases in tropical medicine. Recent studies, however, have implicated the parasites' endosymbiotic Wolbachia bacteria, rather than the nematode, as the cause of inflammatory-mediated filarial disease. https://www.researchgate.net/publication/10661175_Wolbachia_in_the_Inflammatory_Pathogenesis_of_Human_Filariasis "Wolbachia have proven to be the Achilles' heel of nastier parasites too. Before Klion and her team showed that doxycycline can be used to treat the annoying worm infections, other doctors learned that it is an effective way to eliminate their nasty cousins, the parasites that cause elephantiasis and river blindness" (kills the adult worms by killing the Wolbachia bacteria on which the adult worms depend in order to survive). https://www.wired.com/2009/10/wormtreatment/ https://onchocercaparasite.wordpress.com/2017/12/01/treatment-and-control/ Issues with Gates involvement in Wolbachia research: Is it possible that a Wolbachia-research organization being generously supported by Gates/Wellcome will tend to find that harmful or unintended consequences are NOT taking place re the object of	

Entry Date	Comment	Responses
	research (knowing the focus of the study is intended as a future cash cow for the funders)? Gates recently commissioned a study into how much people will pay to use Wolbachia. The study, funded by the Bill & Melinda Gates Foundation, will analyze the willingness of public and private payers to use the naturally occurring bacteria to control outbreaks of the mosquito-borne diseases https://msh.org/story/management-sciences-for-health-tapped-to-study-costs-to-control-mosquito-borne-disease-outbreaks-in-latin-america-and-asia/ An article in the BMJ (British Medical Journal) calls out Gates and Wellcome for covering their ultimate agendas (and financial interests) with the cloak of charity and public-spirited research, failing to reveal large conflicts of interest. https://www.bmj.com/content/372/bmj.n556 Population reduction enthusiast Gates is also studying how to aggressively push genes into a different biome. Wolbachia, Covid-19 gene therapy injections, and now gene drive technology. Hmm	
7/24/2023 14:45	I support wolbachia IIT	Thank you for your comment
7/24/2023 14:49	I support wolbachia IIT for the protection of native birds on Kaua‘i.	Thank you for your comment
7/24/2023 14:50	I am in favor of using the Incompatible Insect Technique to achieve landscape level mosquito control on Kaua’i to save the rapidly declining native forest birds from avian malaria!	Thank you for your comment
7/24/2023 14:51	Aloha kākou. I work with native species in Hawai‘i. While I have been an ally to native birds since beginning my work here, it was not until recently I truly understood the importance of protecting native forest birds. As a conservationist, I already understood the dangers of eliminating native species from an ecosystem. It was not until hearing the mo‘olelo of citizens from around the islands, I began to grasp the cultural and spiritual impact the extinction of these birds could cause. I have had the honor of speaking with many kūpuna who remember when the forest birds were many. I have heard them speak of the slow reduction of native birdsong and seen tears pour from their eyes as they spoke about the last times some of those songs were heard. I got to witness those who mālama Kaua‘i come together to plead for the defense of their native forest birds in a beautiful mele, in which they resurrected the names of birds long past and recited the names of birds whose futures rely on this effort. I recently visited the Bishop museum. Native forest bird feathers adorn their halls, but most of the birds featured in these ornate displays are endangered, or already extinct. These birds should not be reduced to displays in a museum. Future generations should not be introduced to their ancestors through glass walls. They should be learning about the birds from their kūpuna. They should be able to visit wahi pana and see ‘akikiki and ‘i‘iwi flying through the trees. They should be able to hear their songs in the forest and not through a speaker system. Those who remember when native birds were plenty and have raised their voices for their well-being should have more opportunities to interact with them in this lifetime. We must protect these birds for the past, present and future generations. Forest birds are not just an important part of native Hawaiian ecosystems, but also of native Hawaiian culture and soul. If we want to strive for true aloha, we must move forward with mosquito suppression.	Thank you for your comment
7/24/2023 14:54	It’s up to us to be good stewards of our environment and conserve as best we can remaining endangered species. It is absolutely necessary to implement mosquito control and prevent the outbreak of avian malaria.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 14:55	Please go forth with the IIT release if possible for the sake of the people and animals of Kauai. Hesitance to support this action is likely due to misunderstanding of the ecosystem fragility and impacts of the intervention	Thank you for your comment
7/24/2023 14:56	I support mosquito suppression. It is critical for the survival of the endemic birds in Hawaii.	Thank you for your comment
7/24/2023 14:57	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and the residents' health.	Concern: 1
7/24/2023 15:00	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/24/2023 15:09	Any and all who choose to participate in releasing bio weapons aka lab modified mosquitoes is committing sin and violating a plethora of international laws treaties and God's Law. Carefully consider stopping the insanity you are about to unfold. Like the mongoose, frogs and other invasive species intentionally introduced to these islands, the damage can not be undone. If you truly believe mosquitoes are the thing to do. Watch bill gates mosquito Ted talk! Then have a mind to thing for yourself.	Concerns: 3, 10

Entry Date	Comment	Responses
7/24/2023 15:09	It is critical to protect native species. Without them, it can have cascading negative effects on the entire ecosystem. IIT method has gone through rigorous testing to ensure it does not negatively impact humans or other wildlife. Please approve this effort to save native bird species in Hawai’i.	Thank you for your comment
7/24/2023 15:11	I am absolutely in favor of Mosquito Suppression on Kaua'i, a chance to save some of Earth’s most endangered animals.	Thank you for your comment
7/24/2023 15:12	I am in support to use IIT in order to further bird conservation efforts in Hawaii. Biodiversity and preventing extinction is extremely important in this day and age, especially in the times of climate change. Please consider the use of this technique to save native birds.	Thank you for your comment
7/24/2023 15:15	Hello, I am a student at Duke University’s Nicholas School of the Environment. Mosquito control is critical to saving these species of native Hawaiian birds. Please help us protect these birds!	Thank you for your comment
7/24/2023 15:17	I strongly OPPOSE to this “ Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concern: 1
7/24/2023 15:19	I support the Kaua‘i mosquito suppression project, I think the IIT is a useful tool to combat the mosquito populations and save our native birds.	Thank you for your comment
7/24/2023 15:40	To Whom It May Concern: Aloha kākou... This letter is written in support of the actions proposed in the Draft Environmental Assessment: Kaua‘i Mosquito Suppression : The Incompatible Insect Technique (IIT) that uses Wolbachia, a naturally-occurring bacteria to help suppress mosquito populations on Kaua‘i. I‘m astonished and emotionally affected to learn that many species of Kaua‘i forest birds are endangered and close to extinction due to avian malaria. I‘m in support of the IIT. In my opinion, this is an opportunity that must be attempted before these birds are lost forever. I am a resident of Anahola ahupua‘a on the mokupini of Kaua‘i. These opinions are my personal opinions and do not reflect any opinions of my employer. Please feel free to contact me with any questions. Sincerely	Thank you for your comment
7/24/2023 15:42	Oppose!!!	Thank you for your comment
7/24/2023 15:42	I’m a resident of Hawai’i Island and I strongly support this mosquito suppression initiative to help protect native birds.	Thank you for your comment
7/24/2023 15:44	Don't mess with nature. Do not release lab injected mosquitoes into the environment, no one knows the impact it could have on humans and other animals.	Concerns: 2, 19

Entry Date	Comment	Responses
7/24/2023 15:50	[TEXT COPIED FROM PDF ATTACHMENT] 24 July 2023 Dear Hawaiʻi Department of Land and Natural Resources and US Fish and Wildlife Service, American Bird Conservancy (ABC) strongly supports the proposed action to use Wolbachia bacteria and the Incompatible Insect Technique (IIT) to suppress southern house mosquitoes on Kauaʻi. American Bird Conservancy's mission is to protect wild birds and their habitats. We have been active in Hawaiʻi for over 15 years, working to protect and restore bird populations across the state, nearly all of which are on the US Endangered Species list. We work on endangered birds across the western hemisphere and the situation in Hawaiʻi presents the most significant bird extinction threat we have encountered. If action is not taken quickly to suppress invasive Culex mosquitoes, several species will go extinct statewide in the next few years and a total of 12 species are likely to follow in the coming decade or two. These extinctions are imminent on Kauaʻi this is a true emergency. ABC has been a leader in the Birds, Not Mosquitoes partnership, actively engaging community leaders, elected officials, and other stakeholders; there is both broad support and strong demand that we find and implement a solution quickly to prevent the loss of these biologically and culturally important species. The extensive testing and safe implementation of this technique for human health provides a foundation and invaluable opportunity to implement a similar solution for a conservation purpose. Wolbachia-based IIT mosquito control programs for human health have been approved for Ae. albopictus in California and Kentucky, Ae. aegypti in California, Texas, and Florida, with amendments to add Puerto Rico and the U.S. Virgin Islands, and Ae. polynesiensis in American Samoa. This Environmental Assessment is incredibly in-depth and detailed, while still being flexible enough to allow for the best possible treatment approaches. This is a strength because it will allow the implementation partners to suppress mosquitoes at the landscape-scale needed, and also allow adaptive treatment responses depending on the initial results. Appendix A is also a very thorough treatment of other possible alternatives, and why they were not considered further. The section on "Other Potential Environmental Impacts" (pg. A6-A9) is very helpful and addresses many of the common concerns with the Wolbachia-IIT approach, especially regarding accidental release of females and horizontal transfer of Wolbachia and why these are incredibly unlikely and improbable events. It is so important for the public to understand these questions about how the process works, that we encourage DLNR and USFWS to reorganize this material and incorporate it into the main body of the EA. The No-Action alternative's cost will be extinctions of multiple bird species, weakening of ecosystems and resilience, and possible declines in other native species that depend on the birds. The extinction of ʻakekeʻe and ʻakikiki, and extirpation of ʻiʻiwi, are described in Section 4.1.2 (pg. 33), but the timeline of "the next decade" is to cautious. There are only five ʻakikiki left in the wild, so their continued survival is highly unlikely, much less persisting to the next decade. ʻAkekeʻe and ʻiʻiwi are also declining faster than projected, so are running out of time. There are some ʻakikiki in a captive propagation program, but ʻakekeʻe are not as suitable and their best hope for survival is to remain in the wild protected from mosquitoes and avian disease. Although they are not formally listed by the federal or state government, both ʻanianiau and Kauaʻi ʻamakihi are rapidly declining (Paxton et al. 2016, 2020). These species are now difficult to find in the forests on the AlakaʻI Plateau, and could go extinct before there is even sufficient time to list them. Conversely, that this management action could "prevent the global extinction of these species and allow their populations to expand within suitable habitat on Kauaʻi" needs to be amplified throughout the EA. The IIT management action will protect all six honeycreepers on Kauaʻi, and hopefully allow their populations to increase and recover. The results of the No Action alternative need to be more explicit throughout the EA. Many of the discussions of the No-Action alternative do not sufficiently consider and explicitly state that no action will lead to multiple species extinctions (up to four species of birds), with another two extirpations (ʻiʻiwi and ʻapapane); rather they say things would remain the same or similar to existing conditions. The urgent need and clear stakes should be clearly stated throughout the EA. Something that needs to be incorporated into the evaluation is that the current rate of climate change has exceeded most previous predictions and models. This means that mosquitoes and the malaria parasite have been able to successfully move into the Alakaʻi Plateau quicker than expected. This has allowed the mosquitoes to breed and transmit malaria for longer periods and at higher densities than previously expected. This combination of factors suggest that the timeline to deploy mosquito control is rapidly shortening. We have run out of time for	Thank you for your comment

Entry Date	Comment	Responses
	‘akikiki, and have even less time than projected to save ‘akeke‘e, ‘anianiau, and Kaua‘i ‘amakihi, and protect the other birds. we suggest this factor should be included in the overall consideration of deploying Wolbachia IIT. There are a handful of areas where the EA could be more clear or there is some confusion between different sections: · On the top of pg. 13, the EA correctly states “no organisms (mosquito or Wolbachia) used in this proposed project are novel to Hawai‘i”, however on pg. A1 (Table A1) it incorrectly talks about the “risk of novel strains of Wolbachia being transmitted…” (underlining added). The table should be changed to correctly describe that the Wolbachia strain is already present in Hawai‘i. · The main body of the EA briefly discusses how the technique works and the importance of only releasing males (pg. 12), but it is not until A6-A7 that it discusses what happens if a female is released. The ecology of what happens is critical to people understanding the process, so suggest the material in Appendix A be incorporated into the main body. The description of bidirectional incompatibility is also to brief (pg. A7). This is a complicated and important topic, so the explanation should be expanded. Also the management response to detecting Culex quinquefasciatus with wAlbB in the wild should be expanded. · The sorting techniques used by Crawford et al. (2020; pg. A7) resulted in the risk of releasing a female Aedes aegypti mosquito of 1 out of 900 million released, which could be explicitly stated. The methods for sorting Culex quinquefasciatus are highly precise, thus using a more recent sorting estimate for Culex would better help evaluate the risk. · In discussing Horizontal Transfer of Wolbachia (pg. A8), wAlbA is included. While it is indeed present in the wild Aedes albopictus of Hawai‘i, it will not be in the Culex released. Including it in the discussion here is slightly confusing, and maybe even misleading, as it suggests that it might be in the male Culex mosquitoes released. We are racing time, and successful application of this IIT tool will prevent the extinction of multiple species of invaluable and irreplaceable honeycreepers on Kaua‘i. American Bird Conservancy applauds the efforts of the Department of Land and Natural Resources and US Fish and Wildlife Service to save these birds and protect our ecosystems, and strongly urges approval of this Environmental Assessment so that land managers can move forward with these actions to save the honeycreepers on Kaua‘i. Mahalo nui loa, Hawai‘i Program Director and Outreach Manager	
7/24/2023 15:51	I support the IIT for control of mosquito borne infections. Thank you.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 15:52	Dear Chair, Vice Chair, and members of the committee, I live in Makiki, Oahu, and I am testifying today in support of Board approval of the Kauai Wolbachia Incompatible Insect Technique (IIT) Environmental Assessment (EA), and Board authorization of the Chairperson to issue a finding of no significant impact (FONSI). As a very concerned citizen and former resident of Kauai county, I urge you to consider saving these few remaining native forest birds that we have left in the Alaka‘i. I have personally worked with three of the species that are currently most threatened with extinction in the next few years, the ‘Akikiki, the ‘Akeke‘e and Puaiohi. I hand reared many of the birds while working for the Hawai‘i Endangered Bird Program, and in collaboration with the Kauai Forest Bird Recovery Project. While the breeding centers on Maui and Big Island have seen some successes, they have also had to deal with great losses including the Kiwikiu release in 2019, where all of the birds, except for one, succumbed to avian malaria. Wolbachia is a safe and species specific form of landscape-scale mosquito control. It has been used successfully in other parts of the world to suppress mosquitoes and the diseases they carry with no negative impacts to people or the environment. If action is not taken to suppress mosquitoes and avian malaria in forest bird habitat as soon as possible, we will lose these birds to extinction forever. Thank you for this opportunity to testify	Thank you for your comment
7/24/2023 15:54	Please please please save our wonderful, beautiful, rare birds from being attacked by the avian mosquitos! Do Everything you can! Mahalo	Thank you for your comment
7/24/2023 15:54	Dear Chair, Vice Chair, and members of the committee, I live in Makiki, Oahu, and I am testifying today in support of Board approval of the Kauai Wolbachia Incompatible Insect Technique (IIT) Environmental Assessment (EA), and Board authorization of the Chairperson to issue a finding of no significant impact (FONSI). As a very concerned citizen and former resident of Kauai county, I urge you to consider saving these few remaining native forest birds that we have left in the Alaka‘i. I have personally worked with three of the species that are currently most threatened with extinction in the next few years, the ‘Akikiki, the ‘Akeke‘e and Puaiohi. I hand reared many of the birds while working for the Hawai‘i Endangered Bird Program, and in collaboration with the Kauai Forest Bird Recovery Project. While the breeding centers on Maui and Big Island have seen some successes, they have also had to deal with great losses including the Kiwikiu release in 2019, where all of the birds, except for one, succumbed to avian malaria. Wolbachia is a safe and species specific form of landscape-scale mosquito control. It has been used successfully in other parts of the world to suppress mosquitoes and the diseases they carry with no negative impacts to people or the environment. If action is not taken to suppress mosquitoes and avian malaria in forest bird habitat as soon as possible, we will lose these birds to extinction forever. Thank you for this opportunity to testify.	Thank you for your comment
7/24/2023 15:56	I demand that the DLNR and relevant gov. agencies require a detailed and transparent environmental impact assessment before implementing mosquito control project proposed on Kauia..	Concerns: 1
7/24/2023 16:02	I support the native birds!!! Mahalo,	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 16:03	Please please vote to save the birds. I work in native forest restoration and it is incredible to be able to contribute to saving the habitat of the native birds on Hawai'i. I only hope that this effort can help the birds of Kauaʻi. This is something good we can do as humans to help salvage the ecosystems we have deteriorated. Also, it will not only help the birds, but it will also help humans. There never used to be mosquitos in Hawai'i, and we can help return it back to that state. Mahalo.	Thank you for your comment
7/24/2023 16:13	I am strongly in favor of using IIT in the effort to save endangered forest birds on Kaua'i and in the rest of the Hawaiian islands. This is a technique that I have imagined as a possible conservation strategy since gene drive anti-mosquito technologies were first tested, and I am very optimistic that it may alleviate the incredible disease stress on some the country's most critically endangered animals. Testing & monitoring releases for viability and safety is of course a priority, and I am optimistic that these quality controls will be performed to the best ability to ensure both public safety and wildlife preservation. Again, I am very strongly in favor of the use of this technique to conserve Hawaiian birds, and am very optimistic about its efficacy.	Thank you for your comment
7/24/2023 16:17	Please release the incompatible mosquitoes to give the endangered birds a chance to survive.	Thank you for your comment
7/24/2023 16:22	I am in full support of Incompatible Insect Technique to reduce mosquito populations. We are quite literally watching extinction happen before our eyes and this is the best and most promising path forward.	Thank you for your comment
7/24/2023 16:23	This is still in test face. Itisu acceptable to release these mosquitos. It will kill birds since also females will be released. It's impossible to avoid that. This might kill more birds and will bread disease under birds and humans!!! This is unacceptable. This has to stop no matter what. This has to be asked to the people first. No hidden agendas or information. Transparency is required! This is absolutely a very dangerous experiment. Unless the goal is to make money in the long run, kill more birds and cause disease for birds and people and then offer vaccines with side effects causing more trouble then doing any good.	Concerns: 2, 9, 11, 12, 19
7/24/2023 16:24	I fully support the IIT technique in attempt to reduce mosquito populations. This action is us critical for us as kānaka 'ōiwi. E ola mau na manu!	Thank you for your comment
7/24/2023 16:24	The protection of species and the native ecosystem of Hawaii must be a concern of ours as Americans and as humans. The existence of authentic native land is so rare in our nation and must be protected.	Thank you for your comment
7/24/2023 16:26	Please, the birds on Hawaii desperately need your attention, and enameling feral cats are among the worst thing that can be done. Please, help these critically endangered birds!!!!!!	Thank you for your comment
7/24/2023 16:30	I am writing to express my support for using the Incompatible Insect Technique (IIT) to reduce mosquito populations in Kauaʻi. So many of Hawaiʻi's native birds are on the brink of extinction due to avian malaria, so we must act now to save them. Releasing Wolbachia-incompatible male southern house mosquitoes in Kauaʻi will have a minimal negative impact on the environment, unlike the mosquito elimination options of insecticides (which can harm birds) or lethal traps (which are not practical across a large landscape). Humans introduced the mosquitos that are killing native honeycreepers, so I hope humans will do the right thing and give these native birds a chance at survival by using IIT to reduce mosquitos and avian malaria.	Thank you for your comment
7/24/2023 16:33	I strongly support the use of the Incompatible Insect Technique (IIT) to reduce mosquito populations on Kauaʻi.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 16:36	In a slowly dying flora and fauna, mainly brought in by human activity, it is our responsibility to nurture and conserve every species we can.	Thank you for your comment
7/24/2023 16:44	To sit still and not take action to save Hawaiian birds is borderline criminal. Time is perhaps more important in Hawaiian conservation than it is in the conservation of nearly any other habitat in any other country. Native animals are disappearing at an absolutely alarming rate and to sit back and not use every possible weapon against extinction we have would be shameful. The passivity would actively contribute towards the extinction of hawaiian birds. This is of course not the only action we have to take to prevent the further extinction of Hawaiian animals. An emphasis on the recovery of many habitats on the Hawaiian Islands, especially over the interest of land developers, is necessary to a complete conservation plan as well as action taken against ROD (although it is my relatively uninformed perception that action is being taken against ROD already) and action taken to fight against climate change. The path of conservation in the Hawaiian Islands is long and arduous, but this is a relatively simple and important step	Thank you for your comment
7/24/2023 16:50	I am writing in support of the proposed efforts to suppress mosquitos on Kaua'i. This is a critical effort to help prevent the extinction of native Hawaiian honeycreepers using methods that have demonstrated potential.	Thank you for your comment
7/24/2023 16:50	I agree with the use of IIT to help the native bird population. Thank you for providing the thorough documentation above. I believe this approach shall have a minimal negative impact on the environment and prevent avian malaria. These birds are national treasures that cannot be revived if they become extinct. Future generations deserve to see them in the wild, not taxidermied or on a computer screen.	Thank you for your comment
7/24/2023 16:52	I support the Kaua'i mosquito suppression program using Incompatible Insect Technique, because it's now or never to stop the extinction of the akikiki. We've lost so many of Hawai'i's incredible and unique species, especially honeycreepers, and Hawai'i and the world are poorer for it. In the face of climate change and a rapidly warming planet the situation is only going to get worse and more dire for other honeycreepers regardless of what happens with the akikiki.	Thank you for your comment
7/24/2023 16:54	Mosquitos are being used as human disease vectors all over the world. Importing new species to our Aina is a horrible idea. Please do not make things worse with this ill-conceived project.	Concerns: 2, 10

Entry Date	Comment	Responses
7/24/2023 16:56	Here in Hawaii, the jewel in the crown of the USA, might we soon be fighting off swarms of Frankenstein mosquitoes mass-produced in a DLNR lab that is already in existence in the state, worrying about getting seriously ill from insect bites? We've heard recent news reports about cases of human malaria in Texas and Florida, the first time the potentially fatal mosquito-borne disease has been locally acquired in the United States in 20 years. Is this because in the last few years, Texas and Florida have both released Oxitec GMO mosquitoes as well as lab-infected Wolbachia mosquitoes similar to the ones being released now in Maui and planned for release in Kauai? With the State of Hawai'i's multi-agency partnership "Birds, Not Mosquitoes" pushing for the use of these infected mosquitoes throughout the island chain, we have every reason for alarm. In fact, "Birds, Not Mosquitoes" is an ironic title for the project as it is likely to increase rather than reduce the numbers of mosquitoes on the islands and even worse, hasten the extinction of the endangered Hawaiian birds it is claiming to save. I am a former BBC journalist and part-time resident of Hawaii who is OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. Tropical disease expert Dr. Lorrin Pang (speaking as a private citizen) has shared his concerns about this Wolbachia mosquito project: "…with new life forms coming to the islands, there is too much potential for unexpected, dangerous, irreversible 'evolutionary' events. Proponents may be right that this intervention will save the native birds in the short-term, but long-term consequences to other island ecologies and to these same native birds may ultimately be detrimental … The damage may be impossible to recall or repair, like the effect we've seen with so many other invasive species in Hawaii." This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Although officially claiming that only non-biting male lab-produced mosquitoes will be released, the agencies' own documents admit that females who bite and spread disease will be released – it's impossible to avoid that. EPA guidelines allow for over 3,000 females weekly to be let loose in East Maui alone, with most likely the same figures for Kauai. Just one female can produce 160,000 more females in her eight-week lifespan. Southern house mosquitoes have never been used for Wolbachia stand-alone field release, and the 59,204 acre project area is over 81 times the size of the largest Wolbachia mosquito release of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and it has not been disclosed what, if any pathogen screenings will be done. Project documents do not describe any metrics for ascertaining the success of the program, and the plan is for mosquito releases to go on in perpetuity. Assertions of no human health risks are based on unsound science discredited by the EPA. Proponents have officially claimed The Wolbachia mosquito project is being done solely to save Hawaiian birds. However, when you dig deeply into various related documents, it is clear that the bird program in effect a Trojan Horse, hiding a much wider scope of additional aspects to the plan. The public has been misled to believe that these mosquitoes are only being used to address avian malaria in remote forest landscapes. The truth is that, according to project documents, approvals are already in place for ground release "to control mosquitoes of public health concern." The Department of Health is running their own program targeting human health with these mosquitoes. No information about the details of their plan has been disclosed to the public. The environmental	Concerns: 2, 4, 12, 19, 28, 31

Entry Date	Comment	Responses
	nonprofit Hawaii Unites recently discovered that the State of Hawai'i's Department of Land and Natural Resources (DLNR) already has a secret mosquito lab here on the islands. They've been funded by unknown sources to build out the insectary where they intend to mass produce 400,000 lab-infected mosquitoes every month for release throughout Hawai'i. Not only are they planning to produce billions of dangerous Wolbachia-infected mosquitoes, but they have lied to the public about their intent to release genetically modified (GMO) mosquitoes. The DLNR will actually be producing GMO mosquitoes here in their Hawai'i lab using pgSIT (precision guided sterile insect technique) CRISPR technology, once research and development are complete. Documents unearthed by Hawaii Unites, describe gene drives, synthetic biology control tools, and even CRISPR genetic modification of forest birds in the bigger picture plan. Let me repeat that - instead of preserving existing Hawaiian birds, there are plans to replace them with genetically modified versions. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	
7/24/2023 16:59	Save native birds!!! Kill the mosquitos!! I support wolbachia IIT.	Thank you for your comment
7/24/2023 16:59	I wholeheartedly support the use of the Incompatible Insect Technique to suppress the populations of mosquitoes that are more likely to carry diseases that harm our native birds. What is a Hawaiian forest without Hawaiian birds? Thee cost of inaction to our land and culture is too high.	Thank you for your comment
7/24/2023 17:03	To whom it may concern, I am strongly in support of mosquito control on the island of Kauai, and all of Hawai'i for that matter. Our native birds must be protected and the science is clear that Wolbaccia is a safe and effective management practice for preventing total extinction. Thanks	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 17:06	[TEXT FROM PDF LETTER INCLUDED AS EMAIL ATTACHEMNT] July 24, 2023 Hawai‘i State Department of Land and Natural Resources Division of Forestry and Wildlife Attn: Mosquito Control Project 1151 Punchbowl Street, Room 325 Honolulu, HI 96813 RE: The Nature Conservancy Comments on the Draft Environmental Assessment for Use of Wolbachia-based Incompatible Insect Technique for the Suppression of Nonnative Southern House Mosquito Populations on Kaua‘i. Aloha, Mahalo for the opportunity to comment on this document. We appreciate the high level of detail and thoughtfulness that went into the development of this Draft Environmental Assessment (DEA). The Nature Conservancy (TNC) supports this DEA. The need to protect Kaua‘i’s forest birds is urgent. The ‘akikiki (Oreomystis bairdi) is in a dire situation, potentially down to single digit-number population in the wild. Last breeding season, it was predicted the ‘akikiki would have 2-5 years left before reaching this critical point; however, an especially bad mosquito season followed and biologists observed dead forest birds “falling from the skies and littering the trails.” Native forest birds, like the ‘akikiki, are dying from avian malaria and avian pox spread by the invasive Southern House Mosquito (Culex quinquefasciatus). This is the only mosquito species in Hawai‘i which transmits these deadly diseases, carrying them from bird to bird through infected bites. Only female mosquitoes bite, males do not, which is part of what makes the management strategy proposed in the DEA, the Incompatible Insect Technique (IIT), feasible. The other key element is that only mosquitoes with the same strain of Wolbachia can produce viable eggs, meaning that male mosquitoes with an incompatible strain of Wolbachia can be released to breed with wild females to decrease the population without adding any additional biters into the system. The IIT approach to mosquito suppression is a promising method, which does not involve any insecticides, chemicals or toxins, which can be used across a large and remote landscape. This technique was developed to control mosquitoes which spread diseases negatively impacting humans, meaning it has met the highest standards of scrutiny and passed all approvals. Our native forest birds are not just beautiful, charismatic, and vital members of the ecosystem, the manu nahele are family members to the Hawaiian people and they deserve the same level of care and support that we provide to our ailing kupuna. The time for urgent care is now and TNC supports the implementation of this promising tool, hopefully in time to protect the last remaining ‘akikiki and offer a chance for future generations to recover. There are eight species of native forest birds on Kaua‘i that stand to benefit from this work. Please approve this Draft Environmental Assessment and protect our native birds from this threat.	Thank you for your comment
7/24/2023 17:08	This is important and should be done to help these unique birds!	Thank you for your comment
7/24/2023 17:12	This strategy is our only, final hope to save akikiki and akeke'e from certain extinction. We have an environmental, ecological, ethical, and moral obligation to implement IIT on Kaua'i as aggressively and as soon as possible. This needs to happen now, and it needs to work. I cannot adequately express the urgency of this situation.	Thank you for your comment
7/24/2023 17:13	This is our last chance to save akikiki and akeke'e from certain extinction. You need to do it.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 17:14	Aloha, I am submitting comments on the Draft Environmental Assessment for use of the Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua‘i. The Draft Environmental Assessment demonstrates a high degree of scientific rigor and thoroughness in regard to the proposed action. Honeycreepers are a unique group of forest birds found only in Hawai‘i, which once had more than 50 species. Today, only 17 species remain, some with fewer than 500 individuals left. Without immediate action, several species of Honeycreepers will become extinct in the next ten years, and at least one is projected to go extinct potentially this year or next. Avian malaria, a disease transmitted by invasive southern house mosquitoes, is driving the extinction of our forest birds. Furthermore, as the climate warms, mosquitoes carrying avian malaria are moving upslope into the last refugia for Hawai‘i’s forest birds. The Incompatible Insect Technique can suppress mosquito populations and help save our native forest birds. Our native Honeycreepers are foundational to the culture, forests, and ecosystems of Hawai’i. We have already lost dozens of forest bird species due to avian diseases transmitted by non-native mosquitoes, among them iconic species like the Kaua’i ‘ō’ō, featured in mahiole and ‘ahu ‘ula, and the spectacular Kaua’i ‘akialoa, a pollinator of ‘ōhi’a lehua and insect eater. We are grieving the loss of their song, the loss of their beauty and the loss of their presence. As pollinators, seed dispersers, and insect eaters, our native birds are essential for our forests and without action or delayed action, these species have no chance of survival. The incompatible insect technique or mosquito birth control provides us with a glimmer of hope and opportunity to save the last remaining Honeycreepers from extinction. This method has been used successfully worldwide for vector control for human diseases and gives us a powerful tool to address the main cause for the decline of our Honeycreepers: avian malaria transmitted by the Southern House Mosquito. Neither the disease nor the vector is native to the Hawaiian islands and the mosquitoes have invaded the highest elevation of our island, decimating our Honeycreeper populations every day. Our forest birds evolved in a mosquito-free Hawai’i and a single bite of an infected mosquito can be enough to kill an ‘i’iwi. The question to consider for our forests and for our ecosystem: How many more native forest bird species can we afford to lose, before the environmental impact will lead to the collapse of our native Hawaiian forests and watersheds? Mahalo for reading my comments, "Now we face the question whether a still higher ‘standard of living’ is worth its cost in things natural, wild and free.” -- Aldo Leopold, 1949	Thank you for your comment
7/24/2023 17:15	I am NOT in favor of the release of these mosquitos on Kauai or anywhere else in Hawaii! We have too many invasive species that were introduced in the name of fixing something else or that accidentally were introduced that failed horribly! Buffo frogs, Mongoose, coqui frogs etc. Please stop! We need to do studies to determine the long-term effects of introducing these mosquitos into our eco system! What are the effects to humans and what are the effects to other species! Please STOP and do research and quit haphazardly doing things that can destroy or harm our animals and beautiful Aina. You have no idea what this could do to all of us!!!!!	Concerns: 2, 3, 5, 9, 19
7/24/2023 17:18	I’m OPPOSED to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i” Environmental Assessment.The possible risks and outcomes from this experiment are unknown, and once these mosquitoes are released into the wild, it will be impossible to undo any damage caused by them. Both for the health of the environment and our public health, we cannot afford to take this chance. Therefore, I am demanding that the. State of Hawaii complete a full Environmental Impact Statement to determine whether or not to go forward with this project.	Concerns: 1, 2, 5

Entry Date	Comment	Responses
7/24/2023 17:22	I am in strong objection to this premature BioPesticide Wolbachia Mosquito experīemt. Please follow basic established laws and conduct an Environmental Impact Statement before commencing on this most outrageous proposal. There are many unexplored forest management practices that wi help the survival of our native birds. This Wolbachia infected mosquito will cause harm to insects, animals and humans. Stop the madness. Sincerely	Concerns: 1, 2, 7, 19
7/24/2023 17:27	Aloha. Aloha, Aloha, I am Co-Founder of SEOM,a known whistleblower, as well as a speaker on biological warfare and weaponized weather systems and other tactical agents meant to undermine freedoms and sovereignty of native beings. I testified at last hearing, and introduced verified documentation how the "birds not bugs" is a PR stunt. Militaries around the globe have denounced the "bio engineered mosquitos" as a WMD. Even in the papers from 2001 (A NASA-Langely-Darpa) document, as well as subsequent patents obtained in 2015, show the stated warfare reasons for the technology of Biowarfare through a mosquito infection release system. In addition, as I sit on the WCH, we are exceptionally concerned about the subsequent lawyers meetings and the choice of the DLNR and others to ignore the very serious legitimate facts brought before.In doing this, you have put; including but not limited to, the land, the people and the animals at great and foreseeable risk. We know altruistic groups, caring people, passionate people in service ...all too often are unwitting puppets for another nefarious agenda. The benefit of the doubt should always be given. Now you have been made aware. The choice of bioweapons makers to slip this into a necessary bill is purposeful and insulting for all who care for the culture and the aina. You have only now. The world is watching Hawaii. Will you do the right thing and say "no more?" Please wake up. This is a war for the food supply and the islands. The third (in the actual release documents) release point is to infect humans. That is not a typo. Out of sheer care for you, the keiki and this sacred aina, are some of us trying and fighting so hard to help you see.	Concerns: 2, 19
7/24/2023 17:30	I support this project and trust my friend(s) working on this project to do good work and protect the birds!	Thank you for your comment
7/24/2023 18:02	To whom it concerns, I'm a Hawaii resident, and I support the Incompatible Insect Technique to reduce mosquito populations on Kauai. The safety of our forest birds is paramount.	Thank you for your comment
7/24/2023 18:03	I am writing to express my support for the Incompatible Insect Technique (IIT) to control mosquito populations on Kaua'i and protect rapidly declining forest bird species from avian malaria. One species in particular, the Akeke'e, is on the brink of extinction and desperately needs support to ensure its survival.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 18:04	I’m opposed to this “Wolbachia-based Suppression of Mosquitoes on Kaua’i”. I demand that the State of Hawaii and its multi-agency partnership Birds Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This is very concerning. More information, more research and more public discussion and more transparency is needed.	Concerns: 1, 9
7/24/2023 18:08	I think any effort to suppress the mosquito populations on Kaua’i is a good idea. My first trip into the Alakai Wilderness six years ago I saw many native endemic bird species. Today those sighting are rare. It is with a heavy heart that I know these efforts while valiant and still worthwhile will be too late to save several species. I support	Thank you for your comment
7/24/2023 18:10	I fully support the use of IIT as a tool to protect the remaining forest birds of Hawai‘i. Utilizing scientifically developed methods to address the challenges facing these birds represents the only available chance we have for their survival. The extinctions we are witnessing are not natural; they are the result of human-caused disruptions to their ecology, both pre and postcolonial. We bear responsibility for this problem and should, at the very least, attempt to fix it. Regrettably, it seems too late for the ‘Akikiki. This species is functionally extinct in the wild, which is truly heartbreaking for anyone who has had a personal connection with these birds. The same can certainly be said for those once who knew the Nukupu’u, ‘Akialoa, or ‘Ō‘ō. To possess a potential solution and yet deny it to these birds out of fear would be selfish. Preserving all of the biodiversity left on this planet is worth the effort, but I cannot imagine a more valuable slice of evolutionary beauty to hold onto than the Hawaiian honeycreepers and their allies. Let us confront our responsibility and make dedicated efforts to protect these magnificent birds and their habitats. Their preservation is crucial, and in doing so, we demonstrate our commitment to the ecological balance of our shared world.	Thank you for your comment
7/24/2023 18:11	Leave our islands ALONE! Do NOT introduced these pests!	Thank you for your comment
7/24/2023 18:15	I support this project.	Thank you for your comment
7/24/2023 18:26	to risk losing even one more native species of bird because of the hesitation of others - hesitation that science has deemed unwarranted - would be a true tragedy. i fully support the project and all efforts to control avian malaria.	Thank you for your comment
7/24/2023 18:28	I support the Mosquito Reduction Plan on Kaua'i. Enough native birds have already been lost!! Please implement this plan asap!! Thank you	Thank you for your comment
7/24/2023 18:29	I support wolbachia IIT because i believe that our precious native forest birds are in need of this critical help to give them the best fighting chance to combat avian malaria. Humans introduced this problem and this disease. I believe it is our duty to do what we can to at least give them the bare minimum chance to survive. wolbachia Is the best option we have and time is running out to save these species.	Thank you for your comment
7/24/2023 18:31	I support the project to use incompatible males to suppress disease carrying mosquitos on Kaua'i for the purpose of protecting native bird populations.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 18:34	I support IIT, and believe the science demonstrates it is a valid method for mosquito control in Kauai.	Thank you for your comment
7/24/2023 18:48	The Hawaiian Honeycreepers are a vitally important part of Hawaiian cultural heritage, and they continue to inspire people despite the extinction of the majority of them. Enough is enough. We have the means to safely attempt mosquito population control at the landscape level and such a brief (and perhaps already too short, sadly) window of opportunity left in which to use it to hopefully save the 'akikiki and other forest birds endemic to Hawai'i and Kaua'i in particular. These amazing birds are perishing through no fault of their own. They are perishing through the fault (even if unintentional), of humans, and we have the responsibility to care for and prevent the deaths of our avian brothers and sisters when we can. In the Incompatible Insect Technique, we have a proven safe tool that represents the last hope for many of these birds, and we owe it to them to use it. And if the moral imperative to care for our endemic Honeycreepers weren't incentive enough, we should remember that these birds hold a special place in the hearts and traditions and history of the people of Hawai'i, and are a source of positive, productive tourism (and money from the tourist industry) from those who are drawn to their astonishing beauty and biological diversity. The draft proposal clearly outlines why the Incompatible Insect Technique is the only real option at this time, as well as why it is safe for the wildlife and the people of Kaua'i. I dream of a day when the forests of Kaua'i will once again ring with the sounds of the remaining Honeycreepers and other endemic birds--a future only possible by implementing the proposed plan for suppressing the population of mosquitoes that can carry and transmit avian malaria.	Thank you for your comment
7/24/2023 18:50	NO NO NO to Frankenstein mosquitoes in Hawaii. It is diabolical! It is also in the face to the a'ina and God Almighty.	Thank you for your comment
7/24/2023 19:00	I am a resident of Hawaii since 1974. I am against the release of these mosquitoes. I do not think the Hawaiian islands should be blanketed with these mosquitoes for the next 20 years or longer. I believe it is a dangerous experiment, as we know there will be females in every release.	Concerns: 11, 12
7/24/2023 19:02	To whom it may concern: As a person raised on Kauai, who has witnessed tremendous changes in the environment since the 80s as decades pass, I urge you to support the use of Wolbachia to curtail the spread of avian malaria. We need to work to preserve biodiversity. The many past extinctions of Hawaii forest birds are a shame on us. Please do what you can to shift the trajectory of loss that we face.	Thank you for your comment
7/24/2023 19:06	Aloha, I am born and raised from Papakolea Homestead on the island of Oahu. I have spent the last 15 years of my professional career working directly with Endangered Species. As the Team Field Supervisor for the Natural Resource Crew I have seen first hand the depletion of our native species. I am in full support of the Wolbachia IIT in Kauai.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 19:07	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 2, 4, 7, 11, 23, 26
7/24/2023 19:09	I support the IIT TECHNIQUE. Mahalo	Thank you for your comment
7/24/2023 19:13	To whom it may concern: Raised on Kauai, I have witnessed tremendous and largely negative changes in the environment since the 80s. I urge you to support the use of Wolbachia to curtail the spread of avian malaria. We need to work to preserve biodiversity. The many past extinctions of Hawaii forest birds is on our hands. Please do what you can to shift the trajectory of loss that we face.	Thank you for your comment
7/24/2023 19:31	I appose this experiment with mosquitoes. It is not necessary and the dangers are not known	Concerns: 9, 11
7/24/2023 19:32	I support this project to protect our native birds!	Thank you for your comment
7/24/2023 19:40	I support mosquito control.	Thank you for your comment
7/24/2023 19:46	I am against any release of mosquitoes, male or female. Haven't we learned common sense from previous releases from human interaction? Release mongoose to rid a problem, they become a bigger nuisance, harder to get rid of. I have zero confidence in the powers that be to solve this problem, but confident they will make conditions worse. Let nature take its natural course.	Concern: 3
7/24/2023 19:51	Aloha, I strongly support the mosquito release planned to save our native forest birds. Have read about the process involved and am very happy that there is an EIS. It certainly seems that there is a good chance of increasing our native bird population by reducing or eliminating the disease carrying mosquito population. Thanks for giving our native forest birds a chance to live and to thrive.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 20:09	When I was volunteering in the Alakai many years ago, an akikiki perched on a branch a foot above my head and watched me. It was always a delight to see family groups else where in the forest. I have since watched the akikiki and iiwi disappearing from the forest. I think the mosquito suppression plan is well thought out and our only real hope for saving these gems of evolution. I fully support this plan.	Thank you for your comment
7/24/2023 20:13	"SAVE THE HUMANS", is how this mosquito release experiment is being sold in other parts of the world. In Hawaii the humans are fine so it is sold as, "SAVE THE BIRDS." I think you need to more carefully consider how error prone and/or misleading the corporate "science" we have relied on is proving to be. (I.e. DDT, Dioxin, RoundUp, to name just a few examples.) NEW DISEASES FOR HAWAII? Oddly enough, outbreaks of malaria were relatively unknown in Texas and Florida for the past 20 years UNTIL a similar mosquito release program happened there. (FACT CHECK: Any implied connection between the Florida malaria cases, and the biotech firm Oxetic funded by Bill Gates' foundation, has been debunked relying heavily on unsworn statements obtained from representatives of Oxetic and the Bill and Melinda Gates Foundation. https://apnews.com/article/fact-check-bill-gates-oxitec-mosquitoes-malaria-cases-106569617546) So you don't want to complete a proper Environmental Impact Statement? Ok then, sure lets try ONE island, IF the people of that island agree to it and just see how it goes. BUT NO, YOU (our trusted stewards of the Aina) want to to expose ALL islands in the same manner without opportunity for a long term environmental assessment? That almost sounds like the plot for a new Bond movie! I jest. However... Mosquitoes are known to carry a host of pestilence lethal to humans. And of course there are other "uses" for mosquitoes a Bond villain might find intriguing. But mosquitoes being known carriers of pestilence alone should be enough for Hawaii NOT to gamble on experimental and risk prone selective breeding science. Right? If you insist on proceeding as things stand, your actions may be determined to be unlawful and/or immoral thus proper accountability to the people dictates that two more things must be placed in the public record. 1. A complete list of the names of all people and organizations who profit financially from this experiment now and in the future, including from the sale of solutions to problems that may arise as a result of this experiment. We want to know all who are being paid at all times. 2. A complete list of the names of individuals and organizations here in Hawaii and elsewhere whom the people of Hawaii can hold socially, civilly and criminally liable for subjecting the people of Hawaii unknowingly and/or unwillingly to an experiment with potentially lethal consequences. STOP NOW. If you are sincerely working in Hawaii's best interest ALONE, then work in good faith to gain the consent of the people. Do the right thing which is, at a minimum, the Environmental Assessment BEFORE you subject Hawaii to that from which you admit there being no failsafe and no return. Are you listening? Malama aina. Malama ohana. Malama pono.	Concerns: 1, 2, 9, 11, 26, 28
7/24/2023 20:14	Heven't we damaged nature enough already? Your rational for more mosquitoes is disgusting. Lets bring in more mongoose to control the rats! Stop with mosquito experiments in Hawaii	Concerns: 3, 9

Entry Date	Comment	Responses
7/24/2023 20:20	I support the IIT efforts and see it as the last option we have to save these birds. Good luck	Thank you for your comment
7/24/2023 20:21	This project is not wanted by our community and is playing god with the delicate ecosystem of the high lands. The report is very thin on the downstream effects of such a release. Please stop this plan right now.	Thank you for your comment
7/24/2023 20:27	m testifying in strong support of the effort to use wolbachia gut bacteria to control the mosquito population and save endangered native birds. We spent 2 years talking about "following the science" regarding COVID-19 and here is an opportunity to follow the science to protect biodiversity on our planet. The impact of not moving forward is extinction for several species, and extinction is irreversible.	Thank you for your comment
7/24/2023 20:29	As a private citizen, I support birds, not mosquitos. I'm not a resident of Kaua'i, but here on Molokai, I don't think there's been a confirmed sighting of 'i'iwi in the last 10 years. And that's supposed to be a common native bird! I hate to see Kaua'i get to where our island is because their protection was delayed- a few million dollars and many dead birds later to arrive at "coulda, woulda, shoulda." We know enough to take the next steps, and that is for decisive action for our native birds. If we lose them, how long will it be before we lose the forest that supplies our drinking water?	Thank you for your comment
7/24/2023 20:47	Please help save our almost extinct birds!!	Thank you for your comment
7/24/2023 21:01	In full support of mosquito control for protection from of native bird species from diseases spread by these invasive insects. Encourage those making decisions to listen to those who are directly involved in the work and the substantial evidence for safe and effective methods to produce sterile mosquitoes to reduce their populations around native bird populations. Mahalo for the chance to comment in support of native bird species!	Thank you for your comment
7/24/2023 21:02	I support suppression of mosquitos	Thank you for your comment
7/24/2023 21:06	I am in full support of the proposal to control mosquitos on Kauai. During my 23 years on Kauai I have witnessed the decline in native bird populations. It is alarming and I believe we need to take measures to try to save more native bird species from extinction.	Thank you for your comment
7/24/2023 21:26	Please allow mosquito control to go forward to save the critically endangered birds. This method has been tested and proven effective; it's our last best chance to avoid extinction of our precious irreplaceable manu. My ohana completely supports this initiative.	Thank you for your comment
7/24/2023 21:40	I'm a kauai resident and trail hiking guide. I just heard about this campaign. Please please please do everything in your power to save the native forest birds! They are so important to me and to this land. It's madness not to be doing all we can. Thank you so much.	Thank you for your comment
7/24/2023 21:42	Mosquitos suck. Native birds fly and should continue to fly in perpetuity. Implement the IIT to reduce the mosquito population.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 21:43	Kia ora, I am writing to you from Aotearoa New Zealand in support of landscape level mosquito control in order to protect rare and endangered species of birds in Hawaii. Something that our respective island environments have in common is their isolated position from other land masses that has allowed for the evolution of unique species to evolve and flourish. The honeycreeper family of Hawaii is one of these iconic kinds of birds, like the kiwi is ours. What is concerning is that after colonisation by humans, these birds and other species have been allowed to become endangered and in some cases go extinct. Extinction is still not off the cards for many of these species, and one of the most pressing threats to species such as honey creepers is avian malaria carried by the invasive southern house mosquito. I work at Zealandia Te Māra a Tāne, a predator proofed fence ecosanctuary that was the first of its kind in the world. The task when it was orginally conceived was seemingly impossible, costly and unpopular to some locals, but after completing the fence and working to support our endangered native species inside the birdlife boomed, and this wasn't just in our area, but across the entire of Wellington city. It has contributed to improved well being, connection with nature, and even a rise in house prices! I suggest that you are in a not so unsimilar situation, where the survival of species is on the line and drastic and perhaps unpopular methods are being discussed around the table. I would have you consider electing not to take action in using the Incompatible Insect Technique the irreversible loss of native species and biodiversity will continue, effecting the wider environment, the cultural knowledge and traditions of kanaka maoli in relation to these species, and eco-tourism (a growing sector). Ultimately what you will be deciding is the legacy passed down to the next generations of Hawaii. Will you allow your grandchildren the opportunity to see an 'i'iwi in the wild? Or in a glass museum case? And which outcome would you want to tell them you had a part in?	Thank you for your comment
7/24/2023 21:53	To Whom It May Concern: I agree with we need more studies and am gravely concerned. I'm strongly OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "WolbachiaIIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release. The 59,204-acre Kaua'i project area and the 64,666-acre Maui project area would be the largest Wolbachia mosquito releases of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. (***Continued***) Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34

Entry Date	Comment	Responses
	There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	
7/24/2023 21:54	I'm OPPOSED to this "Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitoes come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. Per the U.S. Department of the Interior Strategy, "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." This project is an experiment on Hawaii's people, wildlife, and 'āina. The outcome is admittedly unknown. Human disease vectors are involved, and the informed consent of the public is required. Southern house mosquitoes have never been used for Wolbachia stand-alone field release. The 59,204-acre Kaua'i project area and the 64,666-acre Maui project area would be the largest Wolbachia mosquito releases of any kind globally to date. Southern house mosquitoes transmit diseases to humans, birds, and other animals. There are no documented biosecurity protocols for these mosquitoes, and pathogen screenings are unknown. Assertions of no human health risks are based on unsound science discredited by the EPA. Who will take responsibility if something goes wrong – the federal government, the State of Hawaii, agency partners, private landowners? The scope, risks, and experimental nature of this plan require a detailed EIS. Safer alternatives haven't been considered. Conflicts of interest haven't been addressed. There's currently a case in environmental court seeking a ruling to require an EIS for these mosquito releases on Maui. This Kaua'i project cannot be allowed to move forward while the need for further study of the serious risks of these mosquitoes is still being litigated in court. I do not accept the Anticipated Finding of No Significant Impact (DEA-AFONSI) for the "Environmental Assessment for use of Wolbachia-based Incompatible Insect Technique for the suppression of nonnative southern house mosquito populations on Kaua'i." I demand an Environmental Impact Statement.	Concerns: 1, 7, 8, 11, 12, 13, 14, 15, 23, 27, 28, 34
7/24/2023 21:58	I fully support the efforts to control mosquitos in order to save our birds. The birds will disappear if action is not taken. Many birds are already gone. How can we NOT do this????	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 22:01	i opposed releasing infected mosquitoes without careful study to assure the safety of the release. Theory and tested realty are very different. i object to an untested mosquito release!! i demand responsibility to assure civilian safety!!	Concern: 9
7/24/2023 22:06	I fully support the mosquito suppression program. It is the only chance the native forest birds have left. Let's continue the fight to keep the fragments of Kauai's unique ecosystem intact, one species at a time.	Thank you for your comment
7/24/2023 22:15	I am writing in strong support of wolbachia IIT to control mosquitoes on Kaua'i. This EA is thorough, and outlines why this important management strategy is the safest, most effective, and most likely to succeed in protecting native birds.	Thank you for your comment
7/24/2023 22:19	I fully support the use of IIT to eradicate non-native mosquitoes on Kauai. Our native birds are in extreme danger, and it is our responsibility as a people to help them. The IIT is a safe and well researched method of reducing mosquito populations and poses no threat to wildlife, the ecosystem, or to humans. In fact, eradicating mosquitoes on Kauai will help to restore balance to the local ecosystem because mosquitoes are not from here. The plants and animals here evolved a complex interconnected system without mosquitoes and the diseases that are carried by them. After adapting and evolving here for millions of years without the threat of mosquito borne diseases, our birds were wholly unprepared for a sudden introduction of mosquitoes brought here by recent European colonizers. Before colonization, the forests were alive with the songs of millions of honeycreepers. Now the forests are eerily quiet. Avian malaria can kill a Hawaiian honeycreeper after just one bite from an infected mosquito. Many plants who relied on the birds for pollination and seed dispersal now go unvisited, and create no more young. In this way our forests will diminish and along with them the unique spirit of the land. If you look around you might notice that the only birds you see are the ones imported from the world's busiest cities: pigeons, mynas, house sparrows, white-eyes. These birds evolved with mosquitoes and avian malaria and can survive the infection. I have seen the akikiki and the akeke'e. I have followed them and found their nests. I have watched them hunt for insects and raise their young. I have held them in my hands and smelled their scent. Have you ever smelled the scent of a honeycreeper? I've heard their songs echo through the mists of the Alaka'i. Now when I walk the miles back in to Halehaha and Halepa'akai, I can't find them. The places where I knew a family of akikiki lived are empty, and the other birds are becoming rare too. There is a pattern here and we need to do something before we lose everything. Please take action. Please listen to the ecologists and ornithologists and passionate scientists who want to save the birds. By helping the birds we help our selves. If we stop to listen to the conspiracy theorists, the people proud of their ignorance and fear, the birds will wink out of existence and it will be too late. Look around, do you want to live in a Hawaii filled with mosquitoes and pigeons and invasive weeds? Or a Hawaii filled with Hawaiian birds and Hawaiian forest plants? What kind of world do you want your children to grow up in? What will you say when your grandchildren ask what people did when the birds started going extinct?	Thank you for your comment
7/24/2023 22:30	Save the native endemic birds with the Kauai Mosquito Suppression program.	Thank you for your comment
7/24/2023 22:50	Dept. of Land and Natural Resources I am writing with my very strong opposition to any release of lab generated , experimental mosquitoes on Kauai or any other island. This is not good science. It has not been studied for an environmental impact and should not be allowed. Please stop this insanity !	Concerns: 1, 9, 11
7/24/2023 23:07	Not sure if I'm too late on this but please save our Native Hawaiian birds on brink of extinction from the mosquitoes on Kaua'i.	Thank you for your comment

Entry Date	Comment	Responses
7/24/2023 23:14	To whom it may concern; I am thoroughly convinced, after seeing Bryn's Research, that IIT, incompatible insect technique, is a viable program for the preservation of Kauai's forest bird population. With the decimation of so many of our native forest species, and the perilous proximity of 17 species of honey creeper alone, to extinction, and their present rapid acceleration to their demise, this appears to be the single viable method to arrest their complete decimation. This is a timely idea with a very short time frame for implementation. Now we must act or suffer. Incompatible insect releases have been utilized, with success across the globe. This IIT protocol has little to no downside, as mosquitos, being newly introduced to Hawaii have no longstanding biological niche that needs protecting, and the honeycreeper has little to no immunity to these deadly diseases such as Avian Malaria an Avian Pox, carried by the female mosquitos. Please do not delay in allowing this mosquito release to move forward. Our forest birds are at stake.	Thank you for your comment
7/24/2023 23:38	Allowing the use of the IIT approach for invasive mosquito population control is likely one of the last opportunities available to save a number of vital native honeycreeper species from extinction, including the 'akikiki and the 'akeke'e. This approach has been used successfully a number of times to control outbreaks of mosquito born diseases in humans, and can be an essential tool in conservation biology. It's successful use in Hawai'i and in Kaua'i gives the native bird populations a chance to recover from avian malaria as well as opening up opportunities to control potential future outbreaks of deadly human diseases in Hawaii as well.	Thank you for your comment
7/24/2023 23:53	Please read reconsider the Wolbachia mosquito release. 1. Mosquitoes and Gates Foundation Florida and Texas had the first cases of mosquito borne malaria in the US in 20 years. This was after lab altered mosquito releases in both Florida and Texas. Gates foundation funded GMO mosquitoes for Florida and Texas. Gates foundation has a world wolbachia mosquito program. wolbachia mosquitoes were released in Florida. 2: Polio and Gates Foundation The US was declared polio free. Vaccine derived polio appeared in the US. The vaccine derived polio is from the live virus oral polio vaccine used in 3rd world countries. The live virus oral vaccine has been discontinued in the US and replaced with the injected vaccine. The injected vaccine does not spread a live virus. The Gates foundation funded the oral live virus vaccination programs being cheaper than the injected vaccine in India and Africa. The end result is many children paralyzed in India and Africa and a resurgence of vaccine derived polio. Lakh is an Indian word for 100,000, 4.9 lakh = 490,000. https://www.thehindu.com/news/cities/Delhi/vaccine-induced-paralysis-calls-for-action-says-study/article24740588.ece https://journal-neo.org/2020/09/28/gates-vaccine-spreads-polio-across-africa/ https://www.npr.org/sections/goatsandsoda/2017/06/28/534403083/mutant-strains-of-polio-vaccine-now-cause-more-paralysis-than-wild-polio A picture of an oral polio vaccine used on the Gates Foundation website. https://www.gatesfoundation.org/our-work/programs/global-development/polio 3. Covid vaccines and the Gates Foundation The Gates Foundation is the main proponent and investor in the Covid vaccines. This is like how Gates monopolized computer software, Gates is monopolized global health.	Concerns: 4, 26, 28

Entry Date	Comment	Responses
	(***Continued***) https://www.corbettreport.com/gates/ More people died from Covid in 2021 than in 2020 in the US. The vaccines started in late December of 2020 and the 1st recorded case in the US was late January of 2020. https://www.statesman.com/story/news/politics/politifact/2022/01/16/fact-check-did-more-people-die-covid-19-2021-than-2020/8858993002/ In 17 other countries there was a marked increase of covid after the vaccine. In initially low COVID death countries, the change was dramatic. https://childrenshealthdefense.org/defender/covid-vaccine-deaths-cause-unknown/. This because after a while the vaccine produced antibodies actually help the virus. This is called Antibody Dependent Enhancement. This was a known risk and the reason why a vaccine for other corona viruses were not developed. https://pubmed.ncbi.nlm.nih.gov/33113270/ In the FDA Emergency Use Authorization: "...vaccine-associated enhanced respiratory disease as an important potential risk." https://www.fda.gov/media/144416/download If you look at figure 2 of this study, the more doses taken, the more incidence of COVID. https://academic.oup.com/ofid/article-pdf/10/6/ofad209/50502965/ofad209.pdf The mRNA and viral vector technologies are gene therapies untested in vaccines. The viral vector technology was only used once before in the Ebola vaccine. Since Ebola is so deadly the vaccine wasn't trial tested. The gene therapy in vaccines added to the danger. Pfizer has the least near term deaths per vaccination, then Moderna, then J&J. We have the most information on the Pfizer vaccine. The Pfizer vaccine trials:In the Pfizer 16 and older trial more people died and got sick with the vaccine overall. But less people got sick and died with COVID. Reducing overall sickness and death overall should be end goal, not just reducing COVID sickness and death. In the 12-15 year old trial, 12 year old girl Maddie de Garay loss the use of her legs, is wheel chair bound and has to eat through a feeding tube. She was only one of a 1,005 vaccinated. She was hospitalized within 24 hours of receiving the vaccine. Pfizer's report said as her symptoms were just abdominal pain. https://rumble.com/vqx3kb-the-pfizer-inoculations-do-more-harm-than-good.html https://www.canadiancovidcarealliance.org/wp-content/uploads/2021/12/The-COVID-19-Inoculations-More-Harm-Than-Good-REV-Dec-16-2021.pdf The FDA approved the dangerous vaccines because they are corrupted by big pharma. The FDA gets 75% of its drug related funding from big pharma. The former FDA top commissioner Stephan Hahn is now working for Moderna's venture capital investor. The previous FDA Scott Gottlieb commissioner is now on Pfizer's board. Former FDA deputy director Curtis Wright IV helped Purdue Pharma market the opioids as less addictive. Wright than went to work for Purdue Pharma about a year after he left the FDA. https://www.forbes.com/sites/johnlamattina/2018/06/28/the-biopharmaceutical-industry-provides-75-of-the-fdas-drug-review-budget-is-this-a-problem/?sh=1f6faf1a49ec Rasmussen Poll: More Than 1-in-4 Think Someone They Know Died From COVID-19 Vaccines. https://www.rasmussenreports.com/public_content/politics/public_surveys/crosstabs_2_vaccine_deaths_december_28_30_2022 The US COVID vaccine rollout was in December 2020. Edward Dowd, "From February 2021 to March 2022, millennials (born 1981-96) experienced the equivalent of a Vietnam war, with more than 60,000 excess deaths. The Vietnam war took 12 years to kill the same number of healthy young people we've just seen die in 12 months." "The vaccination rate, particularly among working people, rose extremely fast in a short amount of time. I would soon confirm that being employed in 2021 was actually detrimental to your health." Dowd, Ed. "Cause Unknown": The Epidemic of Sudden Deaths in 2021 & 2022	

Entry Date	Comment	Responses
	(***Continued***) https://www.amazon.com/Cause-Epidemic-Sudden-Childrens-Defense/dp/1510776397/ref=sr_1_1?crid=3GSKCVMWG0VB&keywords=Dowd%2C+Ed.+%22Cause+Unknown%22%3A+The+Epidemic+of+Sudden+Deaths+in+2021+%26+2022&qid=1674533131&s=books&sprefix=dowd%2C+ed.+cause+unknown+the+epidemic+of+sudden+deaths+in+2021+%26+2022+%2Cstripbooks%2C778&sr=1-1 4. The Gates Foundation squashed ivermectin as an early Covid treatment world wide. Early treatment of any disease is a pillar of healthcare. It doesn't make sense to let Covid get worse until your lips turn blue from lack of oxygen and then go to the hospital. Repurposing existing drugs to treat Covid could have saved millions of lives. There are many studies showing ivermectin effective in treating Covid. https://c19ivm.org/ If an early treatment to Covid was officially recognized, the vaccines couldn't get an Emergency Use Authorizations because their be a viable alternative. The big pharma would not get billions in profits. That's why corrupted media and public health officials disparaged ivermectin costing millions of lives. Also the Gates Foundation wouldn't get over 20 to 1 return on their vaccine related investments. How the Gates Foundation squashed ivermectin worldwide at the World Health Organization through Andrew Hill's study. https://www.bitchute.com/video/aDVPtTTgE2O2/	
7/24/2023 23:59	Save our endemic species! The use of IIT is probably one of the best and last reasonable options we have to save our forest birds without spending a huge amount of money. Please support the use of this!	Thank you for your comment
7/25/2023 6:30	Do not allow this ! We have a beautiful island that should not be used to test poison	Thank you for your comment
7/25/2023 6:58	*I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.* For complete sample testimony click here I have seen male mosquitoes released in Italy near perugia and they currently have an over-population of these mosquitoes. Some basic questions would be: how do mosquitoes serve the bat species, who are the main pollinators of fruit trees? Or rather if there were more bats, could that be a better idea for a natural life cycle to happen? A larger perspective needs to be had, based on the failures with other introduced species "eg. mongoose" and rather than a mono vision "kill this to save that" looking at the effects on the entire eco system and if a more "nature made" solution is possible.	Concerns: 1, 3, 7, 12, 18, 19
7/25/2023 9:50	In response to the kahea of The Department of Land and Natural Resources (DLNR) and U.S. Fish and Wildlife Service (USFWS) propose using the Incompatible Insect Technique (IIT) to reduce mosquito populations within approximately 59,204 acres of forest reserves, state parks, and private lands in the Kōke'e and Alaka'i areas of Kaua'i. This project is intended to suppress mosquitoes known to transmit diseases to native forest birds in critical higher-elevation native forest habitat. I command this agency along with all affiliated agencies including corporate entities and individuals involved to provide water data, maps dating back to 1810, all metes and bounds, trails, roadways, springs, waterways, and projects that have taken place in the past 150 years within and surrounding the subject property Their interest in said proposal: In order for any kanaka person, members of the public to partake in any input one must be clear and have the ability to ascertain what is happening. Also, please provide all data, field studies of the previous or ongoing usage of information concerning IIT. Names of those who are a driving force behind this project and those who in a long term interest will be held responsible for the upkeep, funding, and maintenance of such project	Concerns: 9, 11, 26

Entry Date	Comment	Responses
	(***Continued***) Provide the public access to all records: I humbly command that the Department of Land and Natural Resources under the Direction of the Board of Land and Natural Resources provide an accurate chain of title for the purpose of protecting private property as such maps to prove the true metes and bounds and title held by individuals who claimed stewardship within and surrounding the project areas. There is no trust between the people and the government due to years of mismanagement with our lands as stated November 23 1993 United States Public Law 103-150. The "Apology Resolution". Passed by Congress and signed by President William J. Clinton, November 23, 1993. A joint resolution to acknowledge the 100th anniversary of the January 17, 1893 overthrow of the Kingdom of Hawaii, and to offer an apology to Native Hawaiians on behalf of the United States for the overthrow of the Kingdom of Hawaii. Again, verbiage. If you understand the difference between Kanaka Maoli vs Native Hawaiian you'll understand why this bill works in the way it does. Whereas, the indigenous Hawaiian people never directly relinquished their claims to their inherent sovereignty as a people or over their national lands to the United States, either through their monarchy or through a plebiscite or referendum. Whereas, the health and well-being of the Native Hawaiian people is intrinsically tied to their deep feelings and attachment to the land; Whereas, the long-range economic and social changes in Hawaii over the nineteenth and early twentieth centuries have been devastating to the population and to the health and well-being of the Hawaiian people; Whereas, the Native Hawaiian people are determined to preserve, develop and transmit to future generations their ancestral territory, and their cultural identity in accordance with their own spiritual and traditional beliefs, customs, practices, language, and social institutions; Whereas, on January 14, 1893... the United States Minister assigned to the sovereign and independent Kingdom of Hawaii conspired with a small group of non-Hawaiian residents of the Kingdom of Hawaii, including citizens of the United States, to overthrow the indigenous and lawful Government of Hawaii; Kingdom Law 1846, Kanaka Maoli Haawina 5, Pauku 1&3 Compiled Laws 1846 Hawaiian quasi-public institution is a direct violation of the laws of occupation, whereby the United States was and continues to be obligated to administer the laws of the occupied State—the Hawaiian Kingdom. This requirement comes under Article 43 of the 1907 Hague Convention, IV, and Article 64 of the 1949 Geneva Convention, IV. To further this statement of no trust with government: I am not anti-government, anti-military, or anti-American. I never imagined there were any real "domestic enemies." The following is a partial example of the activities of those "domestic enemies." In 1997, the Pittsburgh Post Gazette exposed the "Tuskeegee Experiment." It was conducted for forty years, from 1932 to 1972. According to the Associated Press, "The government withheld treatment from 399 black men with syphilis so they could study how it spreads and kills." That's not an "experiment;" that's genocide, it is wrong and violates everything the country stands for. 6,000. Americans were sickened, deformed or killed as a result of The UNITED STATES Government's "Tuskeegee experiment" to study how syphilis kills. President Clinton didn't bother to acknowledge their suffering. In 1977 during the Senatorial Select Committee on Intelligence hearings (reported in "Project MK-Ultra; the CIA's Program of Research in Behavior Modification"), the CIA revealed that over forty universities and institutions were involved in extensive testing and experimentation using covert drugs on unwitting citizens at all social levels. In 1977, the University of Maryland newspaper reported that during the 1950s and 1960s, forty-four colleges, fifteen research foundations, twelve hospitals, and three prisons knowingly participated in MK Ultra experiments, but people that were experimented upon were never informed or asked to consent to be "guinea pigs." Project MK Ultra was one of the biggest military experiments (there were one hundred forty-nine sub-projects) and lasted for years. It included human drug and biological testing by the Department of Defense (DOD) under the direction of the CIA over entire American communities. The Bureau of Narcotics and even the IRS participated in MK Ultra. When you see these government documents, they are more frightening than the rumors because our government actually admits to participating in these experiments. In 1950, the UNITED STATES government released bacteria – "serratia marcesens" – that cause pneumonia and urinary tract infections into the San Francisco Bay. The bacteria were "aerosolized" by the surf and blown inland to study how effective an offensive biological weapon would be against the people of San Francisco. According to the report, it blew fifty miles inland. People died as a result of that experiment. Incidentally, the amount of "serratia marcesens" still remaining in San Francisco is three times the national average. It follows that we can legitimately ask how much of the syphilis that we have in the South today is a direct	

Entry Date	Comment	Responses
	(***Continued***) result of conducting the Tuskeegee experiment for forty years when they could have stopped it? How much of today's other diseases are a result of government "experiments"? Is it possible, as some have published, that AIDS is a product of one of these government experiments? At the U.S. Army Biological Weapons Research facility at Fort Dietrich, Maryland, "weaponized" mosquitoes were developed. They actually grew viruses inside mosquitoes, placed the mosquitoes in balloons, released the balloons from aircraft over American communities and infected people. They had to infect people to tell how far the disease went and how far it would spread. How many of today's diseases are direct results of those experiments? Tuskegee was not a one-time anecdote; it's just the tip of an iceberg that indicates they're still doing experiments on the American people. Another experiment was done in 1966 at Kessler Air Force Base. In 1966, 12,000 recruits at Kessler received the "micro plasma vaccine." Obviously another experiment. "MK Ultra" considered various means of controlling human behavior; it was literally a mind control project. "MK Action" was funded with CIA money through the Geschicter Foundation at Georgetown University. In the 1977 congressional hearing, Dr. Geschicter testified that during the Vietnamese War, the CIA didn't know if various Vietnamese nationals were double agents. Therefore, the CIA included a material in the anti-cholera vaccine given to pro-American Vietnamese, which made them glow when they were exposed to an ultraviolet light and helped identify those who rejoined the Viet Cong. This may be a clever wartime strategy, but it illustrates that as early as the 1960s, our government used vaccinations for purposes other than the prevention of disease The 1977 Senate Hearing report (Biological Testing Involving Human Subjects by the Department of Defense) actually says that unwitting American people were involved in open air testing. For example, it says, "The Army was using live organisms which we know can infect human beings." The Food and Drug Administration allowed it; entire cities were involved in the testing of these biological agents. The government even placed biological warfare agents in the New York City subway to see how many people would be infected. They did the same thing in Pennsylvania's Kittatinny and Tuscarora turnpike tunnels. You would drive through and receive aerosolized bacteriological agents. Pennsylvania's Kittatinny and Tuscarora turnpike tunnels. You would drive through and receive aerosolized bacteriological agents. "MK Naomi" – a biological project from the 1950s through 1969 which exposed six entire towns (including Ft. McClellan, Alabama; San Francisco, California; Ft. Wayne, Indiana; Minneapolis, Minnesota; and St. Louis, Missouri) to biological warfare agents dropped out of aircraft to see how many people would become ill. They say MK Naomi ended in 1969. Why should I believe them? On page 160 of the 1977 "Human Drug Testing by the CIA" Senate report (S. 1893), they discussed "EA3167" – a compound they could rub up against you and it would absorb into your skin and kill you. They tested it in Pennsylvania and Kentucky prisons. It was applied to the skin through some type of adhesive tape. They also did this on military and civilian people without telling them what they were exposed to or getting their informed consent. As if anyone would volunteer! The primary excuse for nearly going to war again with Iraq in February, 1998, was the suspicion that Iraq had been conducting biological experiments on its own prisoners. If those experiments are evil for Iraq, how then can they be legal, moral or ethical, in the United States of America? Have you clones of hydrocarbon base gone completely insane? In 1997 Congressional hearings, the Army admitted conducting these experiments but argued, "We just didn't tell you about it because nobody was hurt and there was no problem." No problem? There is a serious problem with this outrageous conduct. Title 50, Chapter 32, Section 1520, permits the government to experiment on us with biological and chemical agents. Thanks to a treacherous Treasonous Congress, it is now legal for the DOD or their contractors to experiment with biological and chemical agents on the American people. The only proviso Congress imposes on them is that at least two unspecified local officials be notified within the subject community, and they could be the garbage collector or the water meter reader.Once that major communication event occurs, the test can begin within 30 days. But we are not told; our children aren't told. No problem?	

Entry Date	Comment	Responses
	(***Continued***) Through government oversight and regulations it is done now with our food with Pesticides, herbicides, RBST, GMO's, Fluorides, Estrogen sterilization agent coatings on the inside of nearly every can used to can common everyday foods, then we wonder why men need viagra just to get an erection and why we have a much higher percentage of unmanly men, and manly women. Harm is done with Pharmaceutical Drugs, Vaccines, and Heavy Metals. All these things change our very Gnomes. Our DNA. Today we are poisoned by spraying of our air, food, water, doctor's dealing legal death drugs, all at the blessing of government. Despicable! Shame on you. This is but a few of the many reasons, (all would fill many volumes) that I, a God fearing Living Soul must sever my relationship with the UNITED STATES (Corporation) government, to ease the heavy burden on my soul these foul deeds have laden it with. The water has gotten far too hot for me and is evaporating under the boil. "And after these things I saw another angel come down from heaven, having great power; and the earth was lightened with his glory. And he cried mightily with a strong voice, saying, 'Babylon the great is fallen, is fallen, and is become the habitation of devils, and the hold of every foul spirit, and a cage of every unclean and hateful bird. For all nations have drunk of the wine of the wrath of her fornication, and the kings of the earth have committed fornication with her, and the merchants of the earth are waxed rich through the abundance of her delicacies.' And I heard another voice from heaven, saying, 'Come out of her, my people, that ye be not partakers of her sins, and that ye receive not her plagues. For her sins have reached unto heaven, and God hath remembered her iniquities.'" – Revelation 18: 1-5 . As one of God's people, I must now also leave Babylon the Great and not partake of her sins any longer lest I receive her plagues, for her sins have reached unto Heaven, and God will remember her iniquities. May God have mercy on the United States! Unlawful Conversion Unlawful conversion of our identities and our assets has been the entire aim of the Territorial United States/Municipal United States Tag Team. We've had the British Enemy pretending to be our friend on one side, and the out-of-control Vatican Thugs on the other, conspiring together against us and against virtually everyone else's lawful government, too, because the same evils have been visited on a many other countries including most of Europe, Australia, New Zealand, Japan, India, Canada, Mexico.... and the list goes on. Unlawful conversion of our Trade Names redefining them as Foreign Situs Trusts. Unlawful conversion of our American state national standing to that of mere corporate US "citizens". Unlawful conversion of our land patents to titles and leases held under color of law. Unlawful conversion of our private property to public assets. Unlawful conversion of our government on the land to a government on the sea. Unlawful conversion of the copyrights and trademarks we are owed. Unlawful conversion of our private bank accounts to public "personal" accounts. Unlawful conversion of our States to "State of States" and "STATE OF STATES". Unlawful conversion of our public courts to private corporate tribunals. Unlawful conversion of private civilian assets to public trust assets. Unlawful conversion of American Common Law to English Common Law. Unlawful conversion of public records to private registrations. Unlawful conversion of our right to elect to mere voting privileges. Hawaiian Kingdom Law: Must abide by the laws of the land the first, and foundational Hawaii Revised Statute. HRS §1-1 Common law of the State; exceptions. Contains the door to Hawaiian Kingdom Law: '…except as…fixed by Hawaiian judicial precedent, or established by Hawaiian usage…' HRS §1-1 Common law of the State; exceptions. Traces its legislative intent directly to the law to Queen Liliuokalani wanted to protect 'the autonomy and absolute independence of this Kingdom', in 1892. The Supreme court in Hawaii indicated on June 22, 1977.that '"Hawaiian usage" must predate November 25, 1892.' (58 H. 106, 566 P.2d 725.) Prior to November 25, 1892, the laws of the Hawaiian Islands included, but not limited to: The Complied Laws of the Hawaiian Kingdom (1884), The Penal Codes of the Hawaiian Kingdom (1869), The Civil Codes of the Hawaiian Kingdom (1859), The Statute Laws of the Hawaiian Kingdom (1841) s9 All of the English version of these lac by/ can be found at www.llmc.com, click on "open access", then search "Hawaiian Kingdom", there get you will find virtually all of the laws mentioned above, including but not limited to legislative records, Supreme Court decisions "fixed by Hawaiian judicial precedent, or established by Hawaiian usage".	

Entry Date	Comment	Responses
	(***Continued***) Some of the more important laws that are "established by Hawaiian National usage", included but are not limited to: 'The laws are obligatory upon all persons, whether subjects of this kingdom, or citizens or subjects of any foreign State, while within the limits of this kingdom, except so far as exception is made by the laws of nations in respect to Ambassadors or others. The property of all such persons, while such property is within the territorial jurisdiction of this kingdom, is also subject to the laws. The Civil Codes of the Hawaiian Islands (1859), Chapter II OF THE EFFECTS OF LAWS, SECTION 6. 'An alien, whether his native country be at war or at peace with this kingdom, owes allegiance to this kingdom during his residence therein, and during such residence, is capable of committing treason against this kingdom. [Penal Codes of the Hawaiian Islands (1869), Article VI. Treason, Section 3. 'All laws now in force in this Kingdom, shall continue and remain in full effect, until altered or repealed by the Legislature; such parts only excepted as are repugnant to this Constitution. All laws heretofore enacted or that may hereafter be enacted, which are contrary to this Constitution, shall be null and void.' ARTICLE 79. Constitution of the Hawaiian Kingdom. 1887. To: Joe Biden As: The PRESIDENT OF THE UNITED STATES, 1600 Pennsylvania Ave. Washington, District of Columbia To: Antony Blinken As: The SECRETARY OF STATE OF THE UNITED STATES,2201 C Street NW. Washington, District of Columbia 20520 To: Merrick Garland As: The ATTORNEY GENERAL OF THE UNITED STATES U.S. Department of Justice 950 Pennsylvania Avenue, NW, Washington, District of Columbia 20530-0001 To: Anne E. Lopez As: The ATTORNEY GENERAL of STATE OF HAWAII, 425 Queen St., Honolulu, HI 96813 Notice to Agent[s] is Notice to Principle[s], and Notice to Principle[s] is Notice to Agent[s] Kupuna of my mo'opuna Ike manawa When in the Course of human Events, it becomes necessary for one People to dissolve the Political Bands which have connected them with another, and to assume, among the Powers of the Earth, the separate and equal Station to which the Laws of Nature and of Nature's God entitle them, a decent Respect to the Opinions of Mankind requires that they should declare the causes which impel them to the Separation. We hold these Truths to be self-evident, that all Men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty, and the Pursuit of Happiness--That to secure these Rights, Governments are instituted among Men, deriving their just Powers from the Consent of the Governed, that whenever any Form of Government becomes destructive of these Ends, it is the Right of the People to alter or to abolish it, and to institute new Government, laying its Foundation on such Principles and organizing its Powers in such Form, as to them shall seem most likely to effect their Safety and Happiness, Prudence, indeed, will dictate that Governments long established should not be changed for light and transient Causes; and accordingly, all Experience hath shown, that Mankind are more disposed to suffer, while Evils are sufferable, than to right themselves by abolishing the Forms to which they are accustomed. But when a long Train of Abuses and Usurpations, pursuing invariably the same Object, evinces a Design to reduce them under absolute Despotism, it is their Right, it is their Duty, to throw off such Government, and to provide new Guards for their future Security. Such has been the patient sufferance of these Colonies; and such is now the Necessity which constrains them to alter their former Systems of Government. The History of the present (UNITED STATES Corp) is a History of repeated Injuries and Usurpations, all having in direct Object the Establishment of an absolute Tyranny over these States. To prove this, let Facts be submitted to a candid World. So here shall I, Stand... This shall serve as notice to certify that I; A Living Soul, so called by my Father and Mother since born, Roslyn Nicole Manawaiakea; of the genealogy of Malama; Kumulipo, was born 24th of November, in the year 1983, in the Sovereign Hawaiian State. Noho Ao Hawaii, I presently live upon the land of Hawaii:Kamehameha established Unified Monarchial Government for the	

Entry Date	Comment	Responses
	(***Continued***) Hawaiian Islands, the United States of America, secured the assurance of U.S. President Tyler on December 19, 1842 of its recognition of Hawaiian independence, and then proceeded to meet Sir George Simpson in Europe and secure formal recognition by Great Britain and France. On March 17, 1843, King Louis-Phillipe of France recognizes Hawaiian independence at the urging of King Leopold of Belgium, and on April 1, 1843, Lord Aberdeen on behalf of Her Britannic Majesty Queen Victoria, assured the Hawaiian delegation that "Her Majesty's Government was willing and had determined to recognize the independence of the Sandwich Islands under their present sovereign." On November 28, 1843, at the Court of London, the British and French Governments entered into a formal agreement of the recognition of Hawaiian independence. "Her Majesty the Queen of the United Kingdom of Great Britain and Ireland, and His Majesty the King of the French, taking into consideration the existence in the Sandwich Islands (Hawaiian Islands) of a government capable of providing for the regularity of its relations with foreign nations, have thought it right to engage, reciprocally, to consider the Sandwich Islands as an Independent State, and never to take possession, neither directly or under the title of Protectorate, or under any other form, of any part of the territory of which they are composed. The undersigned, Her Majesty's Principal Secretary of State of Foreign Affairs, and the Ambassador Extraordinary of His Majesty the King of the French, at the Court of London, being furnished with the necessary powers, hereby declare, in consequence, that their said Majesties take reciprocally that engagement. In witness whereof the undersigned have signed the present declaration, and have affixed thereto the seal of their arms. Done in duplicate at London, the 28th day of November, in the year of our Lord, 1843. I am not a Resident, Employee or Citizen of the UNITED STATES Government (Corporation), whose situs is Washington, the District of Columbia. My relationship to that Federal entity as far as jurisdiction is that of a non-resident alien to the Corporate United States Government. Also known as an American State National, or Bloodline American. Lawehala USC 28 Section 91 defines the Judicial District of "Hawaii", can anyone show me where the Hawaiian Islands are included within that district? Because I asked the Hawaii Secretary of State, The US Secretary of State, Both Attorney Generals and NONE can answer the question. YOU CANT BUILD A HOUSE WHERE ONE ALREADY STANDS. "Hawaii constitutes one judicial district which includes the Midway Islands, Wake Island, Johnston Island, Sand Island, Kingman Reef, Palmyra Island, Baker Island, Howland Island, Jarvis Island, Canton Island, and Enderbury Island: Provided, That the inclusion of Canton and Enderbury Islands in such judicial district shall in no way be construed to be prejudicial to the claims of the United Kingdom to said Islands in accordance with the agreement of April 6, 1939, between the Governments of the United States and of the United Kingdom to set up a regime for their use in common. I am a free and natural kanaka, kanaka maoli, kanaka oiwi, kane, described by the Lord God 'I'O as a Living Soul, living under God's law and God's grace alone. I have assumed among the Powers of the Earth, granted by the Lord God Almighty, the Separate and Equal Station to which the Laws of Nature and Nature's God entitle me. Giving me dominion over all things. Therefore, in order to secure the Blessing of Liberty to my posterity and myself, to re-acquire my Birthright as a member of the Sovereign Body of "We the People," I hereby Asseverate, Repudiate and Revoke my Citizenship, if any ever existed, with the Legal fiction known as (***Continued***) the "UNITED STATES" Government (Corporation), USA Inc, and any and all subsidiary corporations both known (STATE, COUNTY, CITY,) and unknown under its control. Maxim of Law: No man can renounce the country in which he was born, nor abjure the obligation of his allegiance. Co. LItt. 129. Sed vide Allegiance; Expatriation; Naturalization. (The Nation State Republic is the country state in which you were born and it cannot be renounced, by anybody or anyone). I further rescind any and all feudal contracts with that Federal government, its agencies and with the State of Hawaii and its agencies, the County of Kauai and its agencies. I rescind the Social Security number, fraudulently issued upon me by the government before the age of 18, as such I was legally incompetent to enter into a legal contract with the	

Entry Date	Comment	Responses
	government. The government by obfuscation of facts and misinformation led me to believe at that time that I was required to secure a Social Security Account number in order to gain employment, which is simply not true. The government agent who obligated me to the Social Security System knew or should have known that there existed serious liabilities to anyone who accepted a Social Security Number. That Agent had a fiduciary responsibility to inform me of the true nature of the Social Security Trust Account and the obligations and liabilities that the Trust involved. By the government's silence on the matter, the government established, by fraud, a Constructive Trust Agreement with me which must be vitiated. Since receiving that Account, I have through my religious instruction come to the belief that the Social Security number may be what is referred to in the Holy Bible, Book of Revelation 13:16-18 and 14:9-10, as the mark of the beast or at the least its precursor. For me to participate in that program and continue to use that number may place my eternal soul in jeopardy. This I will not and cannot do. The money which has been paid into that Socialist Security system within my lifetime, including the monies paid by my employers' demand, is hereby made demand for full reimbursement to me. I also now understand that my SS number or CUSIP was used, via fraud while under the extreme duress of child birth, using my mother as an informant to give me up to STATE without full and honest disclosure was bonded and insured since my birth. And at present those funds are being used by multiple Corporations including multiple Life insurance policies. I demand that those bonds and policies be redeemed for real monies and if any debts are proved against me those debts withheld as payment in full that I may be made whole and the balance paid to me in real money. US Postal Money Orders, gold or silver shall suffice. I do not wish, nor am I permitted by God, to make myself a ward of the State, as would be the case if I accepted the Social Security benefits. I demand the same treatment that was given to the people of the Philippines who were participants in the Social Security Trust and who choose Citizenship of the Philippines over that of the United States. As the Social Security program is not a feudal contract, in that Congress gave no property rights to a Social Security Trust Account, I demand the contract be voided and all monies returned, as would be the case for any fraudulent contract or Constructive Trust Agreement. The United States Government Corporation should not enrich its self from the Fruits of a Poisonous Tree. I emphatically deny that I have ever filed for bankruptcy protection with any degree of complete understanding and honest disclosure. Nor have I ever given my Power of Attorney to anyone or to the State of Hawaii or any of the union states or territories of the UNITED STATES (Corporation) government for the purpose of instituting a bankruptcy action in my name with any degree whatsoever of complete understanding, full and honest disclosure or without great duress. Nor granting that my Labor and or my Property of whatever kind, or wherever situated, be held as collateral in any bankruptcy proceeding of the State or Federal governments. Nor any scheme, using my labor and property as collateral, to support or fund a fiat money scheme of the Federal Reserve Bank, Inc. and/ or the State of Hawaii, and/or Federal UNITED STATES Government. Since time immemorial, My family first arrived these shores kahakai, and now many, many generations of family will suffer the anxiety of their spirit as a result of my having chosen to recognize the malignant and treasonous misconduct of this government against "we the people" and speak out against it. With this I shall speak oiaio in protection of Ko Hawaii Pae Āina Malama, Palekana Na Manu May the truth be revealed in revelation Without Prejudice - Without Recourse	

Entry Date	Comment	Responses
7/25/2023 13:46	Aloha, I am emailing to express my support for the implementation of an infertile insect technique to control the non-native mosquito populations of the Hawaiian islands. I personally believe this to be one of our last, best chances to arrest the precipitous decline of Hawaii's native avifauna--an incredible resource of not only singular biological interest, but also of profound cultural and historical value. These birds comprise a vital part of the very fabric of the 'aina dating back millenia, and are a source of joy and wonder to all who walk it even today. These bird species represent a truly unique instance of adaptive radiation, but not one of them has evolved to contend with these invasive pests that threaten their very survival as species. As stewards of the land, I feel it is our duty as a society to do everything we can to reverse the damage done by our introductions of damaging species. This method presents an opportunity to fulfil the duty espoused by the state for years--to protect our land, its creatures, and to safeguard the health and beauty of our ecosystems for the generations that follow. These bird species are currently at risk from a number of threats, including loss of habitat, climate change, and the encroachment of invasive species. Therefore time is of the essence--we must act now to protect these important members of our community, as we would jump into action for any of our own. Though these problems are both insidious and challenging to solve, thanks to years of research and thousands of dedicated, conservation-minded scientists, policymakers and citizens, we are poised to affect real change. Previous research has laid the groundwork for successfully removing these unwelcome insects, and Hawaii can here champion the use of cutting-edge methods while employing hundreds of its very own people. Please, make the right choice for Hawaii's incredible birds, its unique ecosystems, and its proud and responsible citizens. Support Wolbachia infertile insect technique! Thank you for your consideration	Thank you for your comment
7/26/2023 7:37	The birds must be protected. Eradicate the destructive mosquitos!	Thank you for your comment
7/24/2023 9:47	Hello, I am a student of mechanical and biological engineering, and I firmly support the Wolbachia mosquito program, please save Hawaii's native birds. The bacteria is already present, this just helps lessen the load.	Thank you for your comment
7/24/2023 14:41	I'm OPPOSED to this " Wolbachia-based Suppression of Mosquitoes on Kaua'i" Environmental Assessment. I demand that the State of Hawaii and its multi-agency partnership Birds, Not Mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health.	Concerns: 1
7/24/2023 23:24	Aloha. The native forest birds are dying and close to extinction because they are being infected by mosquito-borne diseases such as avian malaria and avian pox. The numbers of wild forest birds are plummeting. In this MOSQUITO RELEASE PROGRAM, only male mosquitoes that are incapable of producing viable offspring with our disease carrying females are released. This will greatly reduce the size of future mosquito generation and it is only then that the native wild birds will have a chance to live and to thrive. THIS PROGRAM MAY BE OUR ONLY HOPE TO KEEP WILD BIRDS ALIVE IN OUR FORESTS. WE MUST SAVE OUR NATIVE FOREST BIRDS FROM EXTINCTION! Please support this MOSQUITO RELEASE PROGRAM! Thank you, Kapa'a, Kauai	Thank you for your comment

Entry Date	Comment	Responses
	I'm OPPOSED to this Wolbachia-based suppression of mosquitoes on Kaua'I environmental assessment. I demand that the State of Hawaii and its multiagency partnership Birds, not mosquitoes complete a detailed, full scope Environmental Impact Statement (EIS) documenting the impacts to our native birds, environment, and public health. This planned project is a dangerous experiment on the land, birds, wildlife, and people of these islands. The lab-infected biopesticide mosquitos come with many risks, including horizontal transmission of the introduced bacteria strain, increased pathogen infection in mosquitoes, irreversible evolutionary events, population replacement, accidental release of lab-reared females, creation of lab-strain females in the wild, horizontal gene transfer, biopesticide wind drift, and mosquitoes becoming more capable of transmitting avian malaria and West Nile virus (human and bird). Scientific studies document these concerns. I demand an Environmental Impact Statement.	Concerns: 1, 8, 11, 12, 13, 14, 15, 28
	And native birds should fly for as long as they can. Implement the IIT to reduce mosquito populations. E ola mau i nā Manu ʻōiwi.	Thank you for your comment
	Aloha, I was born and raised on Kaua'i and have concern for the native birds of my ancestors. My tutu and her neighbors used to have small ponds with mosquito fish which helped to minimize local mosquito populations in the area. The ponds did not require filtration as they had plants to filter the water naturally, the fish would repopulate on their own and never grew more than 2 inches so upkeep was minimal. Wanted to submit this as a potential solution for the issue here and save our manu. If we're able to get government or local funding, let's offer residents in wet areas of Kaua'i installation of these small ponds with mosquito fish and plants. Happy to discuss the idea further and develop budget/logistical plans to support the initiatives. Mahalo	Concern: 24