

From: stoker_czar_0n@icloud.com
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR 5/10/24 Agenda C6
Date: Tuesday, May 7, 2024 7:22:09 AM

I'm opposed to the BLNR 5/10/24 agenda item C6. These bacteria-infected mosquito releases are a dangerous experiment on our islands. Serious concerns about this plan have not been adequately addressed. The agencies involved in this project have lied about the introduction of foreign organisms into the islands and about the release of female mosquitoes that bite, breed, and spread disease. On Maui, these agencies are also flagrantly deviating from the approved plan, increasing the risks of helicopter fire and accident incidents.

Southern house mosquitoes transmit diseases to people and animals, and pathogen screenings are not being disclosed. *Wolbachia* bacteria can cause mosquitoes to become more capable of spreading diseases. The agencies releasing these lab-altered mosquitoes have admitted that the plan does not include monitoring the effects of the experimental mosquitoes on forest birds. This project has the potential to cause the extinction of the native birds it is meant to protect, and it could impact the health of the people. I demand an environmental impact statement.

Keani Alanui

From: [Barbara Barry](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] No bacteria infected mosquito release on Kauai.
Date: Tuesday, May 7, 2024 3:28:45 AM

Aloha,

I'm opposed to the BLNR 5/10/24 agenda item C6. These bacteria-infected mosquito releases are a dangerous experiment on our islands. Serious concerns about this plan have not been adequately addressed. The agencies involved in this project have lied about the introduction of foreign organisms into the islands and about the release of female mosquitoes that bite, breed, and spread disease. On Maui, these agencies are also flagrantly deviating from the approved plan, increasing the risks of helicopter fire and accident incidents.

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Mahalo,

Ms. Barbara Barry

1220 W Kuiaha Rd

Ha'ikū, Hi 96708

From: [Jana Bogs](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Testimony against BLNR 5/10/24 agenda item C6
Date: Wednesday, May 8, 2024 7:16:09 AM

I'm opposed to the BLNR 5/10/24 agenda item C6. These bacteria-infected mosquito releases are a dangerous experiment on our islands. Serious concerns about this plan have not been adequately addressed. The agencies involved in this project have lied about the introduction of foreign organisms into the islands and about the release of female mosquitoes that bite, breed, and spread disease. On Maui, these agencies are also flagrantly deviating from the approved plan, increasing the risks of helicopter fire and accident incidents.

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Aloha

Jana D. Bogs, MS, PhD (808) 938-9888
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www.BeyondOrganicConsulting.com



From: [ru Carley](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Mosquito release program
Date: Tuesday, May 7, 2024 7:39:22 AM

I'm opposed to the BLNR 5/10/24 agenda item C6. These bacteria-infected mosquito releases are a dangerous experiment on our islands. Serious concerns about this plan have not been adequately addressed. The agencies involved in this project have lied about the introduction of foreign organisms into the islands and about the release of female mosquitoes that bite, breed, and spread disease. On Maui, these agencies are also flagrantly deviating from the approved plan, increasing the risks of helicopter fire and accident incidents.

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[Sent from Yahoo Mail for iPhone](#)

From: [Deva Chappell](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] I'm opposed to the BLNR 5/10/24 agenda item C6.
Date: Tuesday, May 7, 2024 12:22:22 AM

I'm opposed to the BLNR 5/10/24 agenda item C6. These bacteria-infected mosquito releases are a dangerous experiment on our islands. Serious concerns about this plan have not been adequately addressed. The agencies involved in this project have lied about the introduction of foreign organisms into the islands and about the release of female mosquitoes that bite, breed, and spread disease. On Maui, these agencies are also flagrantly deviating from the approved plan, increasing the risks of helicopter fire and accident incidents.

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Thank you,

Dale Ann Chappell

Haiku, Maui

From: [George Chyz](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] I'm opposed to the BLNR 5/10/24 agenda item C6. These bacteria-infected mosquito releases are a dangerous experiment on our islands. Serious concerns about this plan have not been adequately addressed. The agencies involved in this project h...
Date: Tuesday, May 7, 2024 10:34:05 AM

Hi,

I'm strongly opposed to the BLNR 5/10/24 agenda item C6. These bacteria-infected mosquito releases are a reckless experiment on our islands. The agencies involved in this project have lied about the introduction of foreign organisms into the islands and about the release of female mosquitoes that bite, breed, and spread disease. On Maui, these agencies are also flagrantly deviating from the approved plan, increasing the risks of helicopter fire and accidents.

This plan has not adequately addressed many of the potential negative impacts on birds and humans. For example, the southern house mosquitoes transmit diseases to people and animals, but pathogen screenings are not being disclosed. Wolbachia bacteria can cause mosquitoes to become more capable of spreading diseases. The agencies releasing these lab-altered mosquitoes have admitted that the plan does not include monitoring the effects of the experimental mosquitoes on forest birds. This project has the potential to cause the extinction of the native birds it is meant to protect, and it could impact the health of the people. I demand an environmental impact statement.

If this insanity is not terminated and negative impacts result, myself and others will sue the individuals involved for reckless endangerment, negligence, injury and even homicide when and if such impacts occur. You have been notified and warned.

George Chyz

COUNTY COUNCIL

Mel Rapozo, Chair
KipuKai Kualii, Vice Chair
Addison Bulosan
Bernard P. Carvalho, Jr.
Felicia Cowden
Bill DeCosta
Ross Kagawa



OFFICE OF THE COUNTY CLERK

Jade K. Fountain-Tanigawa, County Clerk
Lyndon M. Yoshioka, Deputy County Clerk

Telephone: (808) 241-4188
Facsimile: (808) 241-6349
Email: cokcouncil@kauai.gov

Council Services Division
4396 Rice Street, Suite 209
Lihu'e, Kaua'i, Hawai'i 96766

May 7, 2024

RE: Testimony In Opposition to Agenda Item C-6 Extension of Mosquito Release

Aloha Chair Chang and Land Board Members:

As an individual Kauai County councilmember, I have gained more information about the extension of the release program of bacteria-infected mosquitoes on Kaua'i, to be discussed on May 10, 2024 as Agenda Item C-6.

While I have twice signed Kaua'i Council Resolutions supporting the proposal because I very much champion the protection of our native forest birds, I have learned more information about the possible unintended consequences of a long-term commitment to releasing a volume of bio-adapted mosquitoes into our vulnerable environment and am uncomfortable with the level of environmental monitoring or our ability to retract the impacts of decision.

I no longer support the release of the Wolbachia-infected mosquitoes into our Kaua'i forests until more assurances can be provided. Please do not double the contract amount to \$12 Million and do not extend this project a second year. Vote no on C-6.

Should you have any questions, please feel free to contact me or Council Services staff at 241-4188.

Mahalo,

Felicia Cowden

Councilmember, Kaua'i County Council
Public Safety & Human Services Committee Chair
Public Works & Veterans Services Committee Vice Chair
4396 Rice Street, Suite 209
Lihu'e, Hawai'i 96766
Cellular: (808) 652-4363

Telephone: (808) 241-4092
Facsimile: (808) 241-6349
E-mail: fcowden@kauai.gov

From: [Carrigan Curtis](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR 5/10/24 agenda item C6
Date: Tuesday, May 7, 2024 7:17:56 AM

To whom it may concern,

I'm opposed to the BLNR 5/10/24 agenda item C6. The bacteria-infected mosquito releases are a dangerous experiment on our islands. Serious concerns about this plan have not been adequately addressed. The agencies involved in this project have not been completely honest about the introduction of foreign organisms into the islands and about the release of female mosquitoes that bite, breed, and spread disease. On Maui, these agencies are also flagrantly deviating from the approved plan, increasing the risks of helicopter fire and accident incidents.

Southern house mosquitoes transmit diseases to people and animals, and pathogen screenings are not being disclosed. *Wolbachia* bacteria can cause mosquitoes to become more capable of spreading diseases. The agencies releasing these lab-altered mosquitoes have admitted that the plan does not include monitoring the effects of the experimental mosquitoes on forest birds. This project has the potential to cause the extinction of the native birds it is meant to protect, and it could impact the health of the people. I demand an environmental impact statement and that continued release of bacteria-infected mosquitos be stopped until there is proof that there will be no negative impact to the health of people, the environment and to forest birds and that monitoring is in place to assure this.

Carrigan Curtis

From: [donna grabow](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Opposing the BLNR 5/10/24 Mosquito Lab experiment
Date: Tuesday, May 7, 2024 7:07:27 AM

I writing to let the Board of Land and Natural Resources know that we don't want the dangerous mosquito experiment in Kauai or anywhere.

BLNR proposed to begin on Kaua'i in the weeks ahead.

The State of Hawai'i and its multi-agency partnership *Birds, Not Mosquitoes* are already releasing **millions of bacteria-infected mosquitoes** in the fragile ecosystems of East Maui.

Despite serious concerns raised by the community about the risks of the project to the health of the island's people and wildlife, pilot study releases began on Kaua'i in October last year. These "Mark Release Recapture" (MRR) studies are exempt?! from the environmental assessment, so **no information is required to be disclosed** about where, when, or how the releases have been happening, or about what type of mosquitoes they've been letting loose into the environment.

Disregarding **this reckless experiment**, project leaders remain faithful to the biotech industry agenda and the funding, with the excuse of calling the invasive lab-altered insects "**the savior mosquitoes.**"

These mosquito releases on Maui and Kaua'i are being presented as health actions, (where have we heard that before?) but the **potential impacts to our health and environment have not even been studied.**

Not only are these projects experimental, but these releases are just the beginning of a much bigger **biotech insect agenda planned for all islands.** The Department of Land and Natural Resources (DLNR) – proposing agency for the projects – has a lab in Hawai'i, and they've been funded to build out their insectary where **they intend to mass produce lab-altered mosquitoes for release on the islands into perpetuity (forever).**

Millions of dollars in federal funding continue to pour in, and these agencies are already making future plans to expand into CRISPR gene-edited mosquitoes (pgSIT).

Sincerely,
Donna Grabow

STOP DANGEROUS BIOTECH MOSQUITO EXPERIMENTS IN HAWAI'I



PROTECT THE 'ĀINA
HawaiiUnites.org



From: [Safia Gravel](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR 5/10/24 agenda item C6.
Date: Tuesday, May 7, 2024 12:00:37 PM

Aloha,

I'm opposed to the BLNR 5/10/24 agenda item C6. Please ensure that gender sorting of any lab mosquitoes is refined to be 100% accurate before any of these mosquitoes are released into the wild. Current sorting methods are not completely accurate. We can not afford to take any of the risks associated with releasing any female mosquitoes into the wild. This could be catastrophic to our wildlife and our human population. Even if the goals of a project are positive, the methods need to be accurate and not allow any margin for such risks.

Mahalo nui loa for protecting us and our precious islands.

Safia Gravel

Hawaii Island

From: [Susan Horie](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR 5/10/24 Agenda item C6
Date: Tuesday, May 7, 2024 4:13:58 PM

I strongly and unequivocally object to agenda item C6. No mosquito release on Kauai or any of the other islands must be done without careful environmental impact studies. Have we not learned lessons about unintended consequences? Have we not learned that actions so easily implemented cannot be easily undone? This proposed headlong rush is dangerous. I demand a careful and thoughtful and well monitored environmental impact study.

Susan Horie

P.O. Box 1936

Honokaa, HI 96727

From: [Nicki](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR 5/10/24 agenda C6
Date: Tuesday, May 7, 2024 7:19:26 AM

I'm opposed to the BLNR 5/10/24 agenda item C6. These bacteria-infected mosquito releases are a dangerous experiment on our islands. Serious concerns about this plan have not been adequately addressed. The agencies involved in this project have lied about the introduction of foreign organisms into the islands and about the release of female mosquitoes that bite, breed, and spread disease. On Maui, these agencies are also flagrantly deviating from the approved plan, increasing the risks of helicopter fire and accident incidents.

Southern house mosquitoes transmit diseases to people and animals, and pathogen screenings are not being disclosed. *Wolbachia* bacteria can cause mosquitoes to become more capable of spreading diseases. The agencies releasing these lab-altered mosquitoes have admitted that the plan does not include monitoring the effects of the experimental mosquitoes on forest birds. This project has the potential to cause the extinction of the native birds it is meant to protect, and it could impact the health of the people. I demand an environmental impact statement.

-Jennn Jacobson

From: [Frantic Ginger Gmail](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR 5/10/24 agenda C6
Date: Tuesday, May 7, 2024 7:20:16 AM

I'm opposed to the BLNR 5/10/24 agenda item C6. These bacteria-infected mosquito releases are a dangerous experiment on our islands. Serious concerns about this plan have not been adequately addressed. The agencies involved in this project have lied about the introduction of foreign organisms into the islands and about the release of female mosquitoes that bite, breed, and spread disease. On Maui, these agencies are also flagrantly deviating from the approved plan, increasing the risks of helicopter fire and accident incidents.

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-Luana Tedesco

From: [Marlies Lee](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Mosquitoes
Date: Tuesday, May 7, 2024 1:14:06 AM

IN NO WAY DO I CONSENT TO THIS!

I'm opposed to the BLNR 5/10/24 agenda item C6. These bacteria-infected mosquito releases are a dangerous experiment on our islands. **Serious concerns** about this plan have not been adequately addressed. The agencies involved in this project have lied about the introduction of foreign organisms into the islands and about the release of female mosquitoes that bite, breed, and spread disease.

NO, Hawaii can't be another test site for experimental mosquito release! NO!

Marlies Lee

Sent from my iPhone

From: [Joan Levy](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] testimony opposing BLNR 5//10/24 agenda item C6
Date: Tuesday, May 7, 2024 12:57:12 AM

Dear BLNR:

I could not be more opposed to this project that releases bacteria infected mosquito into our Hawaii environment.

There is clearly insufficient long term study about the untoward results of this lame brain idea.

And I for one do not feel I, my fellow hawaii citizens, nor the poor birds, not to mention other animals that could be effected, should become a guinea pig while noone really KNOWS what will occur.

You are being fed with inconclusive data and skewed positions about this plan. I have heard that Maui the agencies moving forward are flagrantly deviating from the approved plan which is increasing risks of helicopter fire and accidents. Southern house mosquitoes transmit diseases to people and animals and pathogen screenings are not being disclosed. The agencies releasing these lab-altered mosquitoes have admitted their plan does not include monitoring the effects of the experimental mosquitoes on forest birds.

I know you are wanting to save our native birds but there is no clear evidence that this project will do so. In fact many feel it could have the opposite effect and bring our birds to extinction.and then it's too late for the ineventable "im sorry, we didn't know".

To just dive right into this experimental program without a serious long term EIS is irresponsible. You are here to protect us and our environment. Please don't let this happen.

Hawaii is not the place for biotech experimentation.

Please say NO.

Thank you for standing up for the good of Hawaii.

Sincerely,

Joan Levy,
Kapaa Resident and home owner 31 years
310 Kihapai st, Kapaa, HI 96746
joan@joanlevy.com
8088225488

From: [Tina Lia](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR Meeting 5/10/24 9:00am Testimony Agenda Item C6: Oppose
Date: Monday, May 6, 2024 9:48:31 PM
Attachments: [01 HDOA EPA Application for Section 18 FIFRA Emergency Exemption page 6 of 43.pdf](#)
[02 EPA-HQ-OPP-2022-0896-0267_content Response to Comment 2023 0426_page 13 of 33.pdf](#)
[03 Kauai EA Appendix I Responses to Substantive Public Comments Concern 39 pg 336 of 553.pdf](#)
[04 2023 0620 Dr. Lorrin Pang Statement and CV Hawaii Unites and Lia v BLNR and DLNR Plaintiffs Motion for TRO Preliminary Injunction Filed.pdf](#)

Hawai'i Unites is a nonprofit organization dedicated to the conservation and protection of our environment and natural resources. We are opposed to the BLNR's 5/10/24 agenda item C6 DOFAW "Request for approval to increase the contract amount to \$12 million and extend the contract period from one-year to two-years for the previously approved request for proposals for mosquitoes to facilitate Incompatible Insect Technique (IIT deployment on Kaua'i."

These bacteria-infected mosquito releases are a dangerous experiment on our islands. Serious concerns about this plan have not been adequately addressed. The agencies involved in this project have lied about the introduction of foreign organisms into the islands and about the release of female mosquitoes that bite, breed, and spread disease. On Maui, these agencies are also flagrantly deviating from the approved plan, increasing the risks of helicopter fire and accident incidents.

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Aloha,
Tina Lia
Founder
Hawai'i Unites
HawaiiUnites.org

SECTION 166.20(a)(2): DESCRIPTION OF PESTICIDE REQUESTED

- **Common Chemical Name (Active Ingredients):** *Wolbachia pipientis*, wAlbB (DQB strain)
- **Trade Name:** DQB Males
EPA Reg. No.: Unregistered
- **Confidential Statement of Formula:** Attached to this submission
- **Formulation:**
wAlbB contained in live adult male *Culex quinquefasciatus* mosquitoes (DQB strain)
active ingredient < 0.3%*
*percent (w/w) of adult male mosquitoes
- **Mosquito and Wolbachia source:**

The DQB line of mosquitoes was developed through transfection of *Wolbachia pipientis* wAlbB isolated from *Ae. albopictus* KLP strain mosquitoes originating from Kuala Lumpur, Malaysia into *Culex quinquefasciatus* Palmyra strain mosquitoes originating from Palmyra Atoll. Prior to transfection, the naturally occurring wPip infection was removed from the Palmyra strain through antibiotic treatment using tetracycline and rifampicin as described in Pike & Kingcombe 2009 following the feeding protocol outlined in Dobson and Rattanadechakul 2001. Methods for DQB line generation are substantively similar to those outlined in MRID 51788911 with non-significant changes to account for *Culex* egg morphology. The DQB line was not created using genetic modification and the mosquitoes are not genetically modified organisms.

Table 1. Taxonomic designation of the *Wolbachia* present in the DAB line of *Ae. aegypti*.

Kingdom	Bacteria
Phylum	Proteobacteria
Class	Alphaproteobacteria
Order	Rickettsiales
Family	Rickettsiaceae
Genus	<i>Wolbachia</i>
Species	<i>Pipientis</i>
Clade	Supergroup: B
Strain	DQB: (<u>D</u> ebug) (<i>Culex</i> q uinquefasciatus) (wAlb <u>B</u>) DQB contains

Docket EPA-HQ-OPP-2022-0896

EPA response to 4.2 – The EPA considered the information described in the article, “*Wolbachia*-mediated sterility suppresses *Aedes aegypti* populations in the urban tropics.” (The Project *Wolbachia* – Singapore Consortium 2021 preprint), in its decision-making process. As stated above, the application of DQB Males proposes to only release male *Cx. quinquefasciatus* mosquitoes, which only feed on nectar and do not seek out blood meals. Adequate quality control procedures to ensure that female mosquitoes are not released into the action area are outlined in the manufacturing process submitted to the Agency. The EPA has previously established a maximum allowable contamination rate of 1 female per 250,000 males to result in negligible levels of exposure. The manufacturing process of DQB males indicates that the female contamination rate is expected to be significantly lower, i.e., approximately 1 female per 500,000 males (95% confidence interval of $<2 \times 10^{-6}$).

Upon Agency review, the proposed use of DQB males is authorized for up to one year, with monitoring requirements imposed by the EPA. As a result of this monitoring, cessation of releases within 3km of the positive site must occur if $\geq 10\%$ of *Cx. quinquefasciatus* eggs or larvae sampled from a site are confirmed positive for wAlbB in two consecutive visits. Releases may resume if an additional sterilization method is used (i.e., irradiation of DQB Males) or once $< 10\%$ of *Cx. quinquefasciatus* eggs or larvae are positive for wAlbB during subsequent monitoring.

- 4.3 Several comments asserted that *Wolbachia* can enhance pathogen infection in mosquitoes. The *Wolbachia* bacterium the mosquitoes are injected with has been shown to enhance West Nile Virus (WNV) Infection in the mosquito *Culex tarsalis*. “After inoculation into adult female mosquitoes, *Wolbachia* reached high titers and disseminated widely to numerous tissues including the head, thoracic flight muscles, fat body and ovarian follicles.” “Contrary to other systems, *Wolbachia* did not inhibit WNV in this mosquito. Rather, WNV infection rate was significantly higher in *Wolbachia*-infected mosquitoes compared to controls.” (Dodson et al., 2014)

Another assertion from commenters is that *Wolbachia* can enhance malaria parasite infection in two genera of mosquitoes. The commenters referred to the following studies:

- Hughes, G.L., et al. *Wolbachia* can enhance *Plasmodium* infection in mosquitoes: implications for malaria control? *PLoS Pathog*, 2014. 10: p. e1004182.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4154766/>
- Hughes, G.L., et al. *Wolbachia* strain wAlbB enhances infection by the rodent malaria parasite *Plasmodium berghei* in *Anopheles gambiae* mosquitoes. *Appl Environ Microbiol*, 2012. 78: p. 1491-5.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3294472/>

[Comments 0004, 0018, 0019, 0020, 0023, 0024, 0026, 0027, 0031, 0033, 0034, 0037, 0041, 0042, 0047, 0083, 0087, 0089, 0094, 0096, 0108, 0116, 0120, 0133, 0134, 0138, 0139, 0142, 0146, 0169, 0170, 0181, 0183, 0187, 0189, 0192, 0195, 0216, 0220, 0257, 0259, 0262]

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. Sali, 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](https://doi.org/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>.

MARGARET WILLE & ASSOCIATES LLLC
Margaret Wille #8522
Timothy Vandevveer #11005
P.O. Box 6398
Kamuela, Hawai'i 96743
MW: (808) 854-6931
TV: (808) 388-0660
mw@mwlawhawaii.com
tim@mwlawhawaii.com

Attorneys for Plaintiffs
Hawai'i Unites and Tina Lia

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IN THE CIRCUIT COURT OF THE FIRST CIRCUIT

STATE OF HAWAI'I

HAWAI'I UNITES, a 501(c)(3) nonprofit
corporation; TINA LIA, an individual,

Plaintiffs,

v.

BOARD OF LAND AND NATURAL
RESOURCES, STATE OF HAWAI'I, and
DEPARTMENT OF LAND AND
NATURAL RESOURCES, STATE OF
HAWAI'I,

Defendants.

Civil No. 1CCV-23-0000594 (JMT)
(Environmental Court)

**PLAINTIFFS' MOTION FOR
TEMPORARY RESTRAINING
ORDER AND PRELIMINARY
INJUNCTION; MEMORANDUM IN
SUPPORT OF MOTION;
DECLARATION OF COUNSEL;
DECLARATION OF TINA LIA;
DECLARATION OF DR. LORRIN W.
PANG; EXHIBITS 1-11; NOTICE OF
HEARING; CERTIFICATE OF
SERVICE**

HEARING MOTION

Judge: Hon. John M. Tonaki
Hearing Date: July 21, 2023
Hearing Time: 9:00 a.m.

MARGARET WILLE & ASSOCIATES LLLC
Margaret Wille #8522
Timothy Vandev eer #11005
P.O. Box 6398
Kamuela, Hawai'i 96743
MW: (808) 854-6931
TV: (808) 388-0660
mw@mwlawhawaii.com
tim@mwlawhawaii.com

Attorneys for Plaintiffs
Hawai'i Unites and Tina Lia

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FIRST CIRCUIT
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IN THE CIRCUIT COURT OF THE FIRST CIRCUIT

STATE OF HAWAI'I

HAWAI'I UNITES, a 501(c)(3) nonprofit
corporation; TINA LIA, an individual,

Plaintiffs,

v.

BOARD OF LAND AND NATURAL
RESOURCES, STATE OF HAWAI'I, and
DEPARTMENT OF LAND AND
NATURAL RESOURCES, STATE OF
HAWAI'I,

Defendants.

Civil No. 1CCV-23-0000594 (JMT)
(Environmental Court)

DECLARATION OF
DR. LORRIN W. PANG

DECLARATION OF DR. LORRIN W. PANG

I, DR. LORRIN W. PANG, under pain of perjury and law, do hereby state and declare as follows:

1. I am a resident of the County of Maui in the State of Hawai‘i.
2. I am over the age of eighteen (18).
3. I believe that the intent to save rare birds is sound and if the action called “Suppression of Invasive Mosquito Populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui” (“the Action”) goes as planned, this would be a valuable tool for future interventions. However, with new life forms coming to the islands, there is too much potential for unexpected, dangerous, irreversible “evolutionary” events. This is especially true when the new organisms cannot be contained to their target ecosystem.
4. I have been compiling studies documenting horizontal *Wolbachia* bacterial spread, and I’m concerned about the potential for significant adverse outcomes of the Action.
5. The evidence of horizontal spread of *Wolbachia* bacteria (documented in peer-reviewed studies) 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 intra-cellular systems for several months. Horizontal transmission of the *Wolbachia* bacteria can occur through mating, shared feeding sites, and serial predation of larva in standing water breeding sites. Studies that downplay the possibility of horizontal transmission based on *aedes aegypti* mosquitoes are flawed references because *aedes aegypti* are resistant to *Wolbachia*.
6. Peer-reviewed studies have shown *Wolbachia* bacteria in mosquitoes to cause increased pathogen infection and to cause mosquitoes to become more capable of spreading diseases such as avian malaria and West Nile virus. West Nile virus can infect birds and humans. This project has the potential to cause the extinction of endangered native birds, and it could impact human health.
7. The final EA for the Action failed to address biopesticide wind drift – the movement of biopesticide mosquitoes through wind to unintended areas. Mosquitoes carried on the wind into and out of the release sites of the project area have not been factored into the math model or the overall plan.
8. The final EA for the Action failed to adequately address the potential for the release of biopesticide mosquitoes to cause unexpected evolutionary events and population replacement.

AUTHENTICATION

1. Attached hereto as **Exhibit 9** is a true and correct copy of my CV/Resume.
2. Attached hereto as **Exhibit 10** is a true and correct copy of a statement further detailing my concerns regarding the action called "Suppression of Invasive Mosquito Populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui".
3. Attached hereto as **Exhibit 11** is a true and correct copy of an undated draft research article that I co-authored with other scientists entitled "Barriers with valve mechanisms are predicted to protect crops from Rat Lungworm disease transmitted by slug hosts" highlighting how population changes are often determined by pathways set up in parallel, not just sequentially; that models must be set up by the initial assumptions with the math derivations of the formula to follow; that the models must predict intuitively the changes in populations when extreme limits are reached (steady state and non-steady state); that tracking units of the parameters of the math expression is a very useful practice in complicated models. Because this draft article is awaiting publication and the copyright does not belong to me, I asked that it be filed under seal.

FURTHER DECLARANT SAYETH NAUGHT

This Declaration is based upon my personal knowledge or as otherwise indicated, and I am competent to testify as to the truth of the statements contained herein.

DATED: Wailuku, Hawai'i, June 18, 2023.

Signed: _____


Dr. Lorrin W. Pang

CURRICULUM VITAE 2018

Name: Lorrin Wayie Pang

Military Rank: Lt. Colonel, Medical Corp (Retired)
Walter Reed Army Institute of Research

Date/Birthplace: 30 March 1953
Honolulu, Hawaii

Wife's Name: Kathleen K. Shida Pang

Children Two daughters

Education/Training: 1971-75 Princeton University, BS
Chemistry, Cum Laude

1975-79 Tulane Medical School, MD

1976-79 Tulane School of Public Health
MPH in Tropical Medicine

1979-80 Federal University of Brazil;
Recife, Pernambuco, Post Graduate
Studies in Pathology and Infectious Diseases

1980-81 Letterman Army Hospital, San
San Francisco, CA, Medicine Intern

1981-82 Walter Reed Army Institute of
Research, Washington DC, Preventive
Medicine Residency

Positions Held: 1982-87 Epidemiologist, AFRIMS (Walter Reed
Inst. Overseas Laboratory) Bangkok, Thailand

1987-90 Chief, Preventive Medicine Service,
Tripler Army Medical Center, Honolulu, Hawaii

1987-89 Clinical Associate Professor, School of Public Health,
University of Hawaii, Honolulu, Hawaii

1990-92 Medical Officer, Malaria Unit,
World Health Organization, Geneva, Switzerland.

1992-97 Clinician/Epidemiologist,
Walter Reed Institute of Research
Overseas Laboratory, Brazil.

1994-95 Adviser to Pan American Health
Organization (Meningitis Vaccine)

1985-05 Adviser to World Health/UNDP
Organization (Tropical Disease Research Unit: Chagas
Disease, Leishmaniasis, Malaria, Clinical Trials),
2000 malaria program changed to United Nations Global
Fund (for work in Central America)

1997-00 Chief, Department of Bacteriology and Molecular Genetics,
AFRIMS,
Walter Reed Institute of Research
Overseas Laboratory, Bangkok, Thailand.

1997-00 Faculty of Tropical Medicine,
Mahidol University, Bangkok, Thailand.

2000-Present District Health Officer, Maui County
State of Hawaii

2002-04 Consultant Glaxo Smith Kline Pharmaceuticals-

2013 Consultant DNDI (Drugs for Neglected Disease Initiative,
affiliate of Doctors without Borders)

2013 Visiting Professor of Medicine, Federal University of
Brasilia, Brazil

2013-Present Reviewer of grants for US Congress (CDMRP, Congress
Directed Medical Research Program)

Awards: Army Achievement Medal, 1982, 1996
Army Research and Development Medal, 1987
Army Meritorious Service Medal, 1990, 1997

Certification: Medical License State of Louisiana, 1980- 2000
Hawaii State License, 2000-present
Board Certification in Preventive Medicine, 1990

2002 Discovery Channel feature covering dengue outbreak and eradication on Maui

2006-8 listed on Americas Best Doctors list (3% of nation's doctors)

Publications Peer Reviewed Journals:

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15. Pang LW, Limsomwong N, Singharaj P, Canfield CJ. Malaria prophylaxis with proguanil and sulfisoxazole in children living in a malaria endemic area. *Bull WHO* 1989;67(1):51-8.
16. Childs GE, Boudreau EF, Milhous WK, Wimonwattatee T, Pooyindee N, Pang LW, Davidson DE. A comparison of the *in vitro* activities of amodiaquine and desethylamodiaquine against isolates of *Plasmodium falciparum*. *Am J Trop Med Hyg* 1989;40:7-11.
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doi:10.4269/ajtmh.21-1053
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76. Pre-procedural testing improves estimated COVID-19 prevalence and trends
View ORCID ProfileGenevieve C. Pang, View ORCID ProfileAmy T. Hou, Krizhna L. Bayudan, Ethan A. Frank, Jennifer Pastiglione, Lorrin W. Pang doi:
<https://doi.org/10.1101/2022.04.13.22273200><https://www.medrxiv.org/content/10.1101/2022.04.13.22273200v1>.
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Comment to Paxlovid failure.
78. Summary article airport testing.
79. Rat Lung barrier valve effect.

Statement: Dr. Lorrin Pang, Private Citizen

BACKGROUND

I am a tropical disease and vector expert speaking as a private citizen on this matter. I've authored over 75 publications in peer-reviewed medical journals covering a broad range of studies such as malaria, dengue, rabies, rat lungworm, and COVID. I've been an advisor and voting member of the U.S. Congress Medical Research Program for the past several years, serving on committees for infectious diseases – many of which are mosquito-borne. From 1985-2005, I worked with the World Health Organization (WHO) and Walter Reed Institute's Malaria Program, focusing on global malaria control efforts through interventions combining diagnostics, chemotherapeutics, vector control, and vaccine development. As a public health leader on the islands, I've mitigated mosquito-borne illnesses – including dengue and Zika – for over two decades. I was honored for my life-saving intervention in Hawaii's dengue fever outbreak.

I've attached a confidential submission for publication which highlights some of the items discussed below: That population changes are often determined by pathways set up in parallel, not just sequentially; that models must be set up by the initial assumptions with the math derivations of the formula to follow; that the models must predict intuitively the changes in populations when extreme limits are reached (steady state and non-steady state); that tracking units of the parameters of the math expression is a very useful practice in complicated models.

(CV attached; confidential research article attached)

CONCERNS

Horizontal Transmission: Non-Sexual

A primary concern is non-sexual horizontal transmission of the introduced *Wolbachia* strains between the introduced biopesticide mosquitoes and the existing wild mosquitoes. Imported *Wolbachia* bacterium strain *wAlbB* has been disclosed as the strain for use in this biopesticide. Additional strains *wAlbA* and *wPip4* are also planned for import in connection with this project. These newly introduced strains (referred to here as "X") are not currently present within the corresponding *Culex quinquefasciatus* species of Hawaii's established mosquito population.

I have been compiling studies documenting horizontal *Wolbachia* bacterial spread, and I'm concerned about the potential for significant adverse outcomes of the state's proposal. The intent to save rare birds is sound. If the project goes as planned, this would be a valuable tool for future interventions. However, with new life forms coming to the islands, there is too much potential for unexpected, dangerous, irreversible "evolutionary" events. This is especially true when the new organisms cannot be contained to their target ecosystem. Already there are published papers pointing out the real threat of horizontal spread of the novel *Wolbachia* beyond the male *Culex* mosquito. The papers cover two general areas – the widespread detection of *Wolbachia* across so many diverse types of insects, and more recently, the growing number of reports of mechanisms of how this might occur. First, we all must agree that unintended horizontal spread of the imported strain(s) to, say, female *Culex*, *Aedes* mosquitoes, or other insect vectors of diseases

would be a catastrophe, and probably irreversible. Hawaii has a bad history of invasive species entering and spreading unabated, including their spread of infectious diseases.

A recent study out of Singapore¹ describes *Wolbachia* bacteria strain “evolutionary associations” between mosquito hosts. The results of this mechanism widespread into diverse insect populations are not known. It may start with a few horizontal transfers to female mosquitoes. After that, the mating *Wolbachia*-X-compatible pair will quickly produce viable X offspring and spread the X bacteria strain (the term for this is “sweep”). If that were to happen here, the full capacity of those offspring to transmit disease would be unknown. This type of spread and sweep could also affect other insects, not just the targeted mosquito.

The possibility of unintentionally producing X-infected females in the wild has not been adequately addressed. The introduced *Wolbachia* strain can spread horizontally as a life form to other mosquitos (including *Aedes* – vectors of human disease) and perhaps create that *Wolbachia* female *Culex*, which everyone is bending over backwards to avoid via lab contamination.

There is a big difference between the standard Sterile Insect Technique (SIT) strategies used in the past that were based on radiation or chemicals, and the relatively new Incompatible Insect Technique (IIT). The mathematical models may be similar for estimating threshold criteria to affect mosquito population dynamics, but standard methods of sterility are not bacterial life forms that might escape horizontally and amplify in other ecological niches. While sterility models can predict the thresholds needed to exterminate a species (in this case insects), the radiation sterility factor (standard SIT) does not behave the same as a life form (*Wolbachia* bacteria). There may be different modeling between radiation and *Wolbachia* “sterility” for the male mosquitoes, depending on male mosquito fitness – but more importantly, for the unintended female *Culex* to which the *Wolbachia* X spreads horizontally. How is this supposed to be self-contained? Horizontal spread has the potential to be a disaster that cannot be recalled. The bacterium is a life form, and you might not be able to turn back the clock by simply shutting off the male mosquito “fountains.”

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 intra-cellular systems for several months.² Two additional studies clearly document widespread horizontal transmission of *Wolbachia*. The first focuses on predatory wasps spreading the bacteria through contaminated mouth parts when feeding serially on target insects such as aphids³. More research into which predators, like the damselfly and dragonfly, sequentially feed on both male and female mosquitoes is needed to determine how this may affect Maui’s ecosystems. This scenario might play out in either the predator of adults feeding on adult mosquitoes (X-infected and wild), or the X-infected predator of larvae feeding on wild mosquito larvae in common breeding sites. The second study looks at ant colonies spreading *Wolbachia* through the gastrointestinal (GI) tract when the ants feed on their fungus gardens.² What about shared sugar feeding sites for X-infected male and wild adult male and female mosquitoes? The sparser the sugar sites, the more communal interaction they will have. I find these studies of horizontal transfer across species of insects highly concerning. Even if this project achieved miraculous blocking of avian malaria to the native birds, what else would it do?

Studies that downplay the possibility of horizontal transmission based on *aedes aegypti* mosquitoes are flawed references because *aedes aegypti* are resistant to *Wolbachia*.

Horizontal Transmission: Venereal

An additional concern is the possibility of sexual/venereal horizontal transmission of the introduced bacteria through mosquitoes mating. This pathway is not well published and requires more study⁴, specifically with the *Culex q.* mosquitoes planned for use in this project. While the proponents of the project claim that horizontal transmission only occurs on an evolutionary scale with a very slow spread, there are examples showing that it may occur during a short duration of weeks and then months. X-infected male mosquitoes may transmit the introduced strain to wild females through blood, mucous, and semen during mating. Granted, if this occurs via venereal route in the wild female mosquito, the first half of their life their matings will be sterile. However, after this their matings will produce offspring of both sexes and soon will “sweep” the population with the introduced *Wolbachia* strain.

There is a paper in *Nature*⁵ by Frydman et al. studying a fruit fly lab model of entry into the germline from somatic tissue in about a week or two. Germ cells just touching somatic cells within the female mosquito’s body can pick up the bacteria. Whether or not accidentally released X-infected females and wild males would have sterile mating outcomes would become irrelevant at this stage. Even if the introduction of X-infected males was stopped, the initial mating with females X-infected through horizontal transmission (and compatible through entry of the bacteria into the female germline) would produce viable offspring of both sexes of X-infected mosquitoes.

Vertical Transmission Suppressed: Horizontal Transmission Increased

When vertical transmission of the *Wolbachia* bacteria is suppressed, horizontal transmission of the bacteria can increase.⁶ The *Wolbachia* is trying to survive. If vertical transmission is blocked, the bacteria maintain horizontal transmission until the host is fertile again, then they return to vertical transmission. During the time that the bacteria is challenged by the inability to transmit vertically, it may spread horizontally to other mosquitoes, spiders, fruit flies, and other insects (including insect vectors of disease).

A related topic is beginning to be examined in the science community. Human pathogens (i.e., Zika and dengue viruses) used to be thought of as “dead-end” infections in male mosquitoes who may have become infected through horizontal transmission mechanisms. Males don’t bite humans to expand the virus in human hosts. However, it is now of concern that these viral pockets in male mosquitoes, though relatively rare, serve as back-up reservoirs to reinoculate females when the female-mosquito/human cycle breaks down. For example, if all humans get a virus and mass immunity puts the cycle on “hold” until enough non-immune humans are born or transient immunity is lost, the female mosquitoes will tap into the viral back-up reservoir via horizontal transmission.

Proponents of the use of this biopesticide argue that horizontal transmission, venereal or otherwise, is so rare that it can be ignored in the math models. They extrapolate from the models

where cytoplasmic incompatibility (CI) is not operating for sterilization of matings, for example in the sweep model. Much of the spread of *Wolbachia* is vertical (V). Let us say that for every *Wolbachia* spread, 99.9% are via vertical spread and only 0.1% are horizontal (H). Let us pick a unit population where 100K new mosquitoes become infected with *Wolbachia* via sex. Of this 100K, only 100 would have become infected with the bacteria through H and the rest through V. But in the CI application, none get it through V and still females are inoculated somatically through the H mechanism of mating. This 100 may move quickly to the germline cells, but does the bacteria remain only in 100, or can it expand through lack of competition to fill the niche that the V transfers would have occupied? Was there competition between V and H descending lines; and if there is no longer a V line (due to CI), will H females expand?

Even when there is successful vertical transmission, there is horizontal transmission to non-germ cells such as neural tissue, which changes the behavior of the host to support what is in the germ cells. The bacterium is altruistic and helps sister cells to dominate as a safety backup, sacrificing the individual self for the sake of the larger group. This is useful because the larger group does have some common genes which the individual shares. When the two systems (V and H) are running predominantly vertical transmission with some relatively minor horizontal transmission, the horizontal is a back-up system to reinoculate the vertical system if the vertical system ever fails. This horizontal system is relatively small compared to the vertical system but is rather important in many systems including *Wolbachia*. If the CI process shuts down vertical transmission, the horizontal system is still running, and it may grow because that lineage does not compete with a vertical system which has been blocked by sterility.

With the *Wolbachia*, when the vertical production is plentiful, the horizontal movement will seem inconsequential, often a dead end; but once the vertical system collapses (through CI or through natural sterility of the insect – for instance, through mosquito HIV), the horizontal system in males will still be there and can restart the vertical system again when it moves to the germ cells in females. With the use of this biopesticide, the sterility might not stop completely, but the horizontal system will still act to save the *Wolbachia* line in males by making females that will expand the strain line vertically. All of the sacrificed horizontal transmission when the vertical system operates will be useful to reinoculate the system when CI passes or is “low.”

Math Model: Choke Points and Rate Limiting Step

The math model for this project does not seem to account for choke points. If only a certain number of larvae from compatible mosquitoes will survive due to availability of, say, food sources in standing water breeding sites, then any reduction in viable offspring due to incompatibility may not significantly affect the number of surviving larvae. The viable larvae will compete for microbes to eat, and only a specific number of larvae will have enough food to survive (rate determining step). That number may remain relatively constant based on volume of food-source microbes, and the non-viable offspring of incompatible mosquitoes may have no effect, or limited effect, on the survival rate of larvae in the breeding site overall.

Determination of efficacy of the biopesticide might be based on a flawed set up of the math model. The question is, do things affecting a population occur in sequence or in parallel; and if we treat them like resistors on an electrical circuit, isn't the rate limiting step like a capacitor

somewhere in the circuitry? A very restrictive rate limiting step such as the paucity of microbial food in breeding water severely limiting the number of larvae reaching the adult stage would cause the reproduction/sterility interventions to be ineffective. Even if the proportions of X-infected male mosquitoes released were increased, there would be very little impact.

Math Model: Biopesticide Wind Drift

Further diluting the math model basic assumptions is the factor of wind drift. Mosquitoes carried on the wind into and out of the release sites of the project area have not been factored into the math model or the overall plan. Lowland male (and female) wild mosquitoes can travel by wind drift up from lowlands to the project area and dilute the intervention mating pool, affecting the efficacy goal of 90% lab-reared male matings. This rapid drift could dilute the proportion of novel *Wolbachia*-infected male mosquitoes.

Considering these factors, the mark-release-recapture study to estimate whether more or less mosquitoes would be released could be open to interpretation. In human trials, empirical data from feasibility analysis precedes formal studies. We go over numbers from human subjects and use the control group to draw conclusions. If this biopesticide mosquito project is to draw on historical controls, the cause-and-effect interpretation will have many ecological confounders and will risk the ecologic fallacy. If this possibility is inevitable, these conditions should be stated now.

Superinfection: Multiple Strains

Mosquitoes and other insects can be infected with more than one strain of *Wolbachia* bacteria at the same time. This is called “superinfection.” *Culex q.* mosquitoes are very susceptible to many strains of *Wolbachia*. Superinfection in *Culex q.* has not been studied for this project. Superinfection could affect cytoplasmic incompatibility, horizontal transmission, evolutionary events, and population replacement.

Wolbachia: Increased Pathogen Infection and Disease-Spreading Capability

Peer-reviewed studies have shown *Wolbachia* bacteria to cause increased pathogen infection in mosquitoes⁸ and to cause mosquitoes to become more capable of transmitting both avian malaria⁸ and West Nile virus (avian and human)⁹. More study is needed in this area, specifically study of the *Culex quinquefasciatus* mosquito and the *wAlbB*, *wAlbA*, and *wPip4* *Wolbachia* strains, along with any combinations (superinfections) of bacteria strains planned for use in this project. Increased pathogen infection and increased disease-spreading capability could be detrimental to the endangered native bird populations, other animals, insects, humans, and subsequently the ecosystems as a whole.

Novel Experiment

This biopesticide mosquito release is an experiment. *Culex q.* has never been used for cytoplasmic incompatibility stand-alone field release. Scientists advising on this project have not studied horizontal transmission or movement of *Wolbachia* from somatic cells to germ cells in

Culex q. Wolbachia-infected mosquitoes are more widely released globally for population replacement, not suppression. Efficacy studies are focused on the population replacement method. The population suppression method has not been sufficiently studied. The potential collateral damage from the use of this biopesticide is unknown.

Alternatives: Not Considered

Alternative approaches to mitigating avian malaria have not been considered, including treatment of avian malaria in the mosquito phase through antimalarial drug feeding (i.e., primaquine and ivermectin) in rabbits and/or battery-powered warm artificial blood packs containing the antimalarial drugs. The range of blood-feeding females is a lot wider than extrapolated from sugar feedings of males.

CONCLUSION

While I have chosen to address each mechanism separately, all mechanisms interact with each other. There has been insufficient study in each area of concern and in the combination of mechanisms. The precautionary principle calls for further study of the probability of efficacy and the potential for collateral damage. The use of this novel biopesticide requires a feasibility study, independent of the proposal itself, analyzing and considering all of the critical aspects of the proposed project in order to determine the likelihood of it succeeding. Though I have been presented with the math model, I would like to see the basic assumptions factored in prior to the derivation of the actual expressions/conclusions. I would like to see incorporation of choke points and rate limiting factors, wind drift and expansion of horizontal transfer reservoirs if/when vertical transmission is blocked. Mitigation measures must be established to assure that side-effects would be contained. Detailed study in each area of concern, separately and together, is needed.

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. When one realizes the latter, the damage may be impossible to recall or repair, like the effects we've seen with so many other invasive species in Hawaii.

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From: [Extra Gmail](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR 5/10/24 agenda C6
Date: Tuesday, May 7, 2024 7:18:50 AM

I'm opposed to the BLNR 5/10/24 agenda item C6. These bacteria-infected mosquito releases are a dangerous experiment on our islands. Serious concerns about this plan have not been adequately addressed. The agencies involved in this project have lied about the introduction of foreign organisms into the islands and about the release of female mosquitoes that bite, breed, and spread disease. On Maui, these agencies are also flagrantly deviating from the approved plan, increasing the risks of helicopter fire and accident incidents.

Southern house mosquitoes transmit diseases to people and animals, and pathogen screenings are not being disclosed. *Wolbachia* bacteria can cause mosquitoes to become more capable of spreading diseases. The agencies releasing these lab-altered mosquitoes have admitted that the plan does not include monitoring the effects of the experimental mosquitoes on forest birds. This project has the potential to cause the extinction of the native birds it is meant to protect, and it could impact the health of the people. I demand an environmental impact statement.

Pedro Martinez

From: [Steve O'Neill](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR testimony
Date: Monday, May 6, 2024 11:12:01 PM

BLNR

I'm opposed to the BLNR 5/10/24 agenda item C6. These bacteria-infected mosquito releases are a dangerous experiment on our islands. Serious concerns about this plan have not been adequately addressed. The agencies involved in this project have lied about the introduction of foreign organisms into the islands and about the release of female mosquitoes that bite, breed, and spread disease. On Maui, these agencies are also flagrantly deviating from the approved plan, increasing the risks of helicopter fire and accident incidents.

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Regards, Steve and Linda O'Neill

From: [Tammy Ash Perkins](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Agenda item C6
Date: Tuesday, May 7, 2024 10:22:24 AM

To whom it may concern;

The agencies involved in this project have lied to you. Bacteria infected mosquito releases are a dangerous experiment on our people. These releases pose deadly impacts that have not been studied. We need to leave nature alone to work itself out. The DLNR an BLNR have sold us out. Do the right thing (Pono) by protecting our islands and our people from this biotech disaster. It's time to stand up against these rogue agencies before it's too late. I am deeply opposed to this project.

Me Ke Aloha
Tammy Perkins
Makawao, HI 96768

Sent with [Proton Mail](#) secure email.

From: [Ann Pitcaithley](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Opposition to BLNR agenda item C6
Date: Tuesday, May 7, 2024 5:30:11 AM

I'm opposed to the BLNR 5/10/24 agenda item C6. These bacteria-infected mosquito releases are a dangerous experiment on our islands. Serious concerns about this plan have not been adequately addressed. The agencies involved in this project have lied about the introduction of foreign organisms into the islands and about the release of female mosquitoes that bite, breed, and spread disease. On Maui, these agencies are also flagrantly deviating from the approved plan, increasing the risks of helicopter fire and accident incidents.

Southern house mosquitoes transmit diseases to people and animals, and pathogen screenings are not being disclosed. *Wolbachia* bacteria can cause mosquitoes to become more capable of spreading diseases. The agencies releasing these lab-altered mosquitoes have admitted that the plan does not include monitoring the effects of the experimental mosquitoes on forest birds. This project has the potential to cause the extinction of the native birds it is meant to protect, and it could impact the health of the people. I demand an environmental impact statement.

Thank you, Ann Pitcaithley, Maui

From: [Juhl Rayne](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] opposed to BLNR 5/10/24 agenda item C6.
Date: Wednesday, May 8, 2024 11:42:19 AM

aloha,

I'm greatly opposed to the BLNR 5/10/24 agenda item C6. These bacteria-infected mosquito releases are a dangerous experiment on our islands. Serious concerns about this plan have not been adequately addressed. The agencies involved in this project have lied about the introduction of foreign organisms into the islands and about the release of female mosquitoes that bite, breed, and spread disease. On Maui, these agencies are also flagrantly deviating from the approved plan, increasing the risks of helicopter fire and accident incidents.

Southern house mosquitoes transmit diseases to people and animals, and pathogen screenings are not being disclosed. *Wolbachia* bacteria can cause mosquitoes to become more capable of spreading diseases. The agencies releasing these lab-altered mosquitoes have admitted that the plan does not include monitoring the effects of the experimental mosquitoes on forest birds. This project has the potential to cause the extinction of the native birds it is meant to protect, and it could impact the health of the people. I demand an environmental impact statement.

thank you,

Juhl Rayne

808-937-3013

From: [Robbie Roosen](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] DO NOT RELEASE FOREIGN MOSQUITOS ON KAUAI
Date: Tuesday, May 7, 2024 9:01:47 AM

Many reasons not to release a new breed of mosquitos

1. Temperatures have been DECREASING in Hawaii mountains for decades. So the claim that endemic mosquitos are moving to higher altitudes is phony.
2. Similar releases in other parts of the world have led to increases in disease among humans.
3. There would be no monitoring of results of this reckless action, so perpetrators will never take blame for expected damage to our aina.
4. Kauai escaped the mongoose invasion. Time to show good sense on this issue.
5. In future, you will be held liable for criminal penalties for degrading our environment.

Aloha Aina,

Robert G. Roosen, PhD
Owner/Director
Rainbow Observatory

From: [Brady Stewart](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] wolbachia mosquito program
Date: Wednesday, May 8, 2024 8:48:07 AM

I am writing to urge you to vote no on the proposed budget increase in line item c6. This would expand the scope of a project which has not been properly vetted for its safety or efficacy. The release into the wild of non-native organisms is a plan which is fraught with potentially disastrous consequences and the public has not been adequately informed to consent to such an ill conceived program. Instead, following the standard technocrat playbook for open air biotech experiments, this plan has been sold to the public through media propaganda which never discusses the potential risks.

Are you, as board members voting on the fate of our delicate island ecosystem, even informed enough on the science involved to make an accurate risk assessment? Are you so blinded by your concern for our endemic avian species that you will try anything no matter the risk to save them; even if it means your experimental project could become the proximate cause for their ultimate extinction? Can you name another locale where this incompatible insect technique has worked successfully? Are you aware that it has never even been attempted before with the *Culex quinquefasciatus* mosquito?

Furthermore, how many accidental releases of infected females from the sex sorting process is deemed an acceptable risk? Once infected females exist in the environment (whether through accidental release or horizontal transmission) they will have a competitive breeding advantage since their bacterial infection will no longer be incompatible with the infected males. This will over time lead to a population replacement of wolbachia uninfected mosquitoes by the infected variety.

What metrics will be recorded and analyzed to assess the success or failure of the experiment? If success is possible, how will you know it has been achieved or will the project just continue in perpetuity until there are no more honeycreepers surviving? There does not appear to be any achievable endgoal to signal the conclusion of the project. Rather it appears to be a program to add permanent job positions to your department at taxpayer expense. It resembles something like offering a terminally ill patient a bevy of pharmaceuticals to manage their symptoms rather than a procedure to reverse or eliminate the condition.

What will the screening process look like for ensuring imported mosquito populations are not carrying zoonotic pathogens that would be transferrable to humans? In addition to avian malaria, the southern house mosquito is known to be a vector for West Nile virus and Zika virus among others.

Another important factor which is conveniently overlooked in the marketing of your quixotic crusade to fight avian malaria is the Hawaii Department of Health's plan to control mosquitoes of public health concern. Why has the Hawaii Board of Agriculture approved the import of not only *Culex* but also 2 species of *Aedes* mosquitoes? Why has their agenda not been more openly discussed? Could they be waiting for the avian malaria experiment to establish insectaries in Hawaii and acclimate the public to the idea of mosquito releases as cover to execute a separate program employing different methods? This could entail the release of insects sterilized through irradiation or chemical means, but it could also include the release of genetically modified insects or synthetic biology into our ecosystem. In regions where Oxitec GM mosquitoes have been released to control pathogens of public health concern, there have been documented increases in malaria among the local populations.

According to the World Mosquito Program "there is no field evidence that [the incompatible insect technique] can reduce the risk of mosquito-borne diseases." Additionally, the U.S. Department of the Interior has stated "Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown." Don't forget the lesson of unintended consequences demonstrated by the introduction of the mongoose to Hawaii. You could be held responsible for an environmental disaster of a scope and scale beyond that of the mongoose. Please reconsider making Kauai ground zero for novel biotech experimentation.

Thank you for your mindful consideration of my concerns,
Brady Stewart

From: [Nicki Gmail](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR 5/10/24 agenda item C6
Date: Tuesday, May 7, 2024 7:19:48 AM

I'm opposed to the BLNR 5/10/24 agenda item C6. These bacteria-infected mosquito releases are a dangerous experiment on our islands. Serious concerns about this plan have not been adequately addressed. The agencies involved in this project have lied about the introduction of foreign organisms into the islands and about the release of female mosquitoes that bite, breed, and spread disease. On Maui, these agencies are also flagrantly deviating from the approved plan, increasing the risks of helicopter fire and accident incidents.

Southern house mosquitoes transmit diseases to people and animals, and pathogen screenings are not being disclosed. *Wolbachia* bacteria can cause mosquitoes to become more capable of spreading diseases. The agencies releasing these lab-altered mosquitoes have admitted that the plan does not include monitoring the effects of the experimental mosquitoes on forest birds. This project has the potential to cause the extinction of the native birds it is meant to protect, and it could impact the health of the people. I demand an environmental impact statement.

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Nicki Tedesco

[YouTube](#)

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[All Links \(Venmo/PayPay/Tour\)](#)

From: [Lynne Wood](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Stop mosquitoes!
Date: Monday, May 6, 2024 10:13:48 PM

Pleaseee stop the releasing of these bad mosquitoes!

[Yahoo Mail: Search, Organize, Conquer](#)

From: [Carol Yokoyama](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] OPPOSE Bacteria-infected Mosquitoes on Kaua'i
Date: Tuesday, May 7, 2024 8:53:04 PM

Aloha Board,

Please oppose BLNR 5/10/2024 agenda item C6. These bacteria-infected mosquito releases are a dangerous experiment on our Islands. Are you able to provide to the people of Hawaii the risks and impacts that this project would have on the health of the people of Hawaii, how it could affect our pets and other wildlife, and effects it may have on our delicate ecosystem and land and water?

This dangerous plan raises serious concerns that have not been addressed. Just remember that this plan can have irreversible impacts that can affect not only us, but our future generations, our ecosystem, our aina and water. Therefore, we need an environmental impact statement .

Please stop the dangerous biotech mosquito experiments in Hawaii.

Mahalo for your time.

Carol D. Yokoyama