

From: [ALOHA Festival](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Agenda item C-4
Date: Wednesday, May 10, 2023 2:06:40 PM

Agenda item C-4

OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing!

You can't do anything without a proper precautions
Especially when you are taking GMO! Mosquitos!

Stop the madness!
People need to speak up against it and be heard!

You work for us
The People!

From: [Scott Berrett](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: "I am strongly OPPOSED!"
Date: Thursday, May 11, 2023 8:42:43 AM

Dear BLNR.

I OPPOSE the DENIAL OF Hawaii Unites' PETITION FOR A CONTESTED CASE HEARING for the planned BioPesticide Mosquito Experiment on Maui.

You work for the people of Hawaii. But the people of Hawaii do not like the idea of BLNR conducting a MASSIVE foreign mosquito experiment on our islands without adequate safety studies and other safeguards. We question your plan and need BLNR to prove you have done due diligence to OUR satisfaction! This is a decision that will impact all people of Hawaii AND our future generations.

This is a FOREVER DECISION so what is your hurry??

Your science is not perfect. So let's err on the side of even greater caution than ever before regarding yet another potentially invasive species release.

Respect the people, respect our petition for a contested case hearing.

Richard Berrett
808-652-9773

From: [Eric B](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose
Date: Wednesday, May 10, 2023 8:07:06 PM

RE: C-4 Request Denial of the Petition for a Contested Case of Agenda Item C-2, March 24, 2023, "Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the 'Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui' "

I'm **opposed** to the State of Hawai'i Board of Land and Natural Resources' request to deny Hawaii Unites' Petition for a Contested Case Hearing for the planned BioPesticide Mosquito Experiment on Maui. 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.

Mahalo,

Eric Bjerke
Honokaa, HI

From: [Kellyna Campbell](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose
Date: Thursday, May 11, 2023 6:02:51 AM

RE: C-4 Request Denial of the Petition for a Contested Case of Agenda Item C-2, March 24, 2023, “Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the ‘Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui’ ”

I do not agree with the State of Hawai‘i Board of Land and Natural Resources’ request to deny Hawaii Unites’ Petition for a Contested Case Hearing for the planned BioPesticide Mosquito Experiment on Maui. We the People have a right to be involved in the decision-making process for this project. We are requesting an EIS, Environmental Impact Statement, to be done before the release of these mosquitoes. Per your communications department, "In FY23 DLNR has spent approximately \$150,000 in State funds and has received \$2.5 million in Federal funds for this project....Initial pilot releases are planned for May and June 2023." This is not acceptable!! I am asking you to allow Hawaii Unites petition for a contested case hearing and to keep our right to due process in the public. There are many people opposed to your protocol and urgency of this issue.

Please let me hear back from you at your earliest convenience.

Regards,

Kellyna Campbell

From: [Roger Christie](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] I Strongly OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case
Date: Wednesday, May 10, 2023 11:48:42 PM

@@@

Dear People, aloha.

I strongly oppose BLNR's denial of Hawaii Unites' Petition for a contested case hearing.

I would like to help empower you to take a principled stand in this instance and in all others that you might face going forward by introducing you to, or reminding you of ...

The Doctrine of Lesser Magistrates:

“When the superior or higher authority makes laws or decrees contrary to God’s laws or decrees, then the lesser or lower ranking civil authority has both a right and a duty to refuse obedience to the superior authority. If necessary, the lesser authorities even have the right and obligation to actively resist the superior authority.” If the lesser civil authorities do this, they would be “interposing”. Interposition is that “calling of God which causes one to step into the gap—willingly placing oneself between the oppressor and his intended victim”.

<https://ia902309.us.archive.org/29/items/aidshiv/Intelligence/Intelligence%20-%20The%20Doctrine%20of%20the%20Lesser%20Magistrates.pdf>

Thank you for your service to the people of Hawai'i and to our children's children by opposing BLNR's denial of Hawaii Unites' petition for a contested case hearing.

May unexpected blessings and love keep coming to you and from you,

Roger Christie

Hilo, Hawai'i

808 464-3966

@@@

From: [Shaka Doug Corbin](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] No Mosquito Release / Agenda Item C-4
Date: Thursday, May 11, 2023 5:01:53 AM

Dear BLNR Representatives,

I hereby submit my opposition to the release of Genetically Modified Mosquitos on Maui. I'm against releasing them anywhere in the entire state.

Do not approve this without a properly conducted EIS. This could be a very dangerous and detrimental action that could be irreversible. Do not allow it. Do not mess with Mother Nature!

Sincerely,

Doug Corbin
Maui, HI

Sent from my iPhone

From: [C. P.](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Mosquito release
Date: Wednesday, May 10, 2023 9:29:41 PM

Subject: BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose
RE: C-4 Request Denial of the Petition for a Contested Case of Agenda Item C-2,
March 24, 2023, "Request Approval of Final Environmental Assessment and
Authorization for the Chairperson to Issue a Finding of No Significant Impact for the
'Suppression of Invasive Mosquito populations to Reduce Transmission of Avian
Malaria to Threatened and Endangered Forest Birds on East Maui' "

I'm opposed to the State of Hawai'i Board of Land and Natural Resources' request to deny Hawaii Unites' Petition for a Contested Case Hearing for the planned BioPesticide Mosquito Experiment on Maui. 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.

From: [Millicent Cummings](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Testimony for Agenda Item C-4 regarding reckless Experimentation
Date: Thursday, May 11, 2023 4:40:47 AM

Aloha to all concerned!

Upon a firm foundation of sound reasoning and verifiable scientific data, I protest the BLNR's denial of Hawaii Unites' Petition for a Contested Case Hearing regarding the costly and quite possibly dangerous experiment in question.

The false dichotomy of having only 2 choices of either doing nothing to address what ails Hawaii's Endangered Bird population or the experimental release of up to 775,992,000 lab-bred, Biopesticide mosquitos per week on Maui over the course of the next 20 years is simply preposterous. The data is inconclusive regarding the plight of these birds as there are several other possible causes with similar symptoms which would require very different and far less costly mitigation measures.

This false dichotomy would be analogous to assuming someone had cancer without ever having run the required tests to establish such a diagnosis and yet, insisting that the patient undergo 'Emergency' measures that might result in death, like chemotherapy! In this case, however, the proposed so called 'remedy' has the capacity to harm many more creatures in the vicinity of the intended targets (Like humans) which may have multi-generational consequences.

It would behoove the BLNR to recall similar experiments based on similar assumptions like the introduction of Mongoose into our fragile ecosystem to 'remedy' the rat population (whose diet consisted largely of bird eggs) thereby dramatically contributing to their now, Endangered status!

The concerns are too numerous to name here in this testimony, such as possible horizontal gene transfer, accidental release of lab-reared females, bio-pesticide drift and the possibility of mosquitoes becoming even better vectors of avian malaria and/or West Nile Virus. The Maui EA, Environmental Assessment has listed many potential impacts requiring extensive and expensive mitigation measures like wild-land fire ignition by helicopters, spread of even more invasive weeds, noise pollution adversely affecting native wildlife disturbing nesting, mating and roosting, disruptions to native and special status plants, acceleration of erosion and contamination of other species in our food supply.

The 2020 study in BMC, "Wolbachia infection in wild mosquitoes (Diptera: Culicidae): implications for transmission modes and host-endosymbiont associations in Singapore" (Huicong Ding, Huiqing Yeo, Nalini Puniamoorthy) describes the potential for Wolbachia bacteria to spread not only vertically through breeding, but horizontally through parasitism or proximity to infected individuals. Unexpected evolutionary events may also result from using Wolbachia-based IIT".

"By employing a tissue-specific PCR screening method, we were able to observe that the Wolbachia infections were preferentially located in the reproductive tissues, which provides support for vertical transmission as the main mode of infection transmission. However, even if Wolbachia infection is mainly transmitted vertically, this is unlikely to fully explain the observed diversity of Wolbachia and why closely related Wolbachia lineages were found in distantly related mosquito species. Hence, this study also served as an exploratory study which examined mosquito-Wolbachia evolutionary associations across a wide range of host mosquito species through three evolutionary analyses. Overall, we propose that the evolutionary associations between mosquito hosts and Wolbachia are consequences of both vertical and horizontal transmission and various evolutionary events."

The "Mosquito Control Research Using Wolbachia-based Incompatible Insect Technique" is a novel IIT bio-pesticide approach that would obviously require, not just an Environmental Assessment, but a full scope Environmental Impact Study to assure the experiment's necessity or effectiveness. Since this risky experiment involves human disease vectors, (With the potential of over 40 BILLION invasive bio-pesticide mosquitoes released per year on Maui), the informed consent of the public would necessarily be required. Since Public testimony has shown thus far that over 75% of the people here in Hawaii have opposed this plan, it is very curious indeed as to why it proceeds any further.

The potential for the Wolbachia Bacteria to increase pathogen infection, (Not only among Endangered birds but other living creatures), is reason enough for a Contested Case Hearing. An Environmental Impact Statement (EIS) for the proposed "Suppression of Invasive Mosquito Populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui," should reasonably, scientifically, logically and lawfully be completed.

Being that Federal documents have confirmed that the outcome of this experiment is "UNKNOWN" and the experiment has NEVER before been performed in Hawai'i, to proceed WITHOUT a Contested Case Hearing and WITHOUT Public consent while maintaining the validity of the Department of Agriculture's application for an emergency exemption in order to skirt regulatory processes and a full-spectrum, Environmental Impact Statement would be grossly negligent.

We therefore rightfully demand a timely Contested Case Hearing. Sincerely,

Millicent Cummings
Founder of Protectors United
Hilo, HI

From: [Suzan Danforth](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR 5/11/23 item C-4
Date: Thursday, May 11, 2023 7:50:44 AM

I oppose agenda item C-4; the request of the Bureau of Land and Natural Resources to deny the petition of Hawaii Unites for a contested case hearing on the subject of the BioPesticide Mosquito Experiment on Maui.

The people have a right and duty to participate in the process of government. This experimental project may cause irreparable damage to the environment and to animals and people. Allow for a contested case hearing.

Sincerely,
Sužan Danforth

From: [Jessica Friedberg](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Testimony on Agenda Item C-4: OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing!
Date: Tuesday, May 9, 2023 9:17:57 PM

Aloha to whom it may concern,

I am submitting this testimony on Agenda Item C-4: I OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing!

Mahalo!
Jessica DeBoer

From: [Ema Fernandes](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Re: BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose
Date: Wednesday, May 10, 2023 10:10:37 PM

I'm opposed to the State of Hawaii Board of Land and Natural Resources' request to deny Hawaii Unites' Petition for a Contested Case Hearing for the planned BioPesticide Mosquito Experiment on Maui. The public has a right to meaningful participation in the decision making process for this project.

Sincerely,
Ema Fernandes

From: [C Frantzis](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose
Date: Wednesday, May 10, 2023 9:09:25 PM

RE: C-4 Request Denial of the Petition for a Contested Case of Agenda Item C-2, March 24, 2023, "Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the 'Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui' "

I am a former BBC journalist, live TV co-host, Maui homeowner and part-time Maui resident who is STRONGLY OPPOSED to the planned biopesticide mosquito releases on Maui. I demand that a detailed, full-scope Environmental Impact Statement (EIS) is completed documenting the impacts on our native birds, environment, and public health.

Thus, I'm opposed to the State of Hawai'i Board of Land and Natural Resources' request to deny Hawaii Unites' Petition for a Contested Case Hearing for this planned BioPesticide Mosquito Experiment on Maui. 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.

To paraphrase the Dalai Lama: "Anyone who thinks they're too small to make a difference has never shared a bed with a mosquito." Now think what a difference the planned annual release in Maui could make of more than 40 billion lab-raised mosquitoes that have been modified by the addition of the bacteria, Wolbachia. What could possibly go wrong? Humans have already done a fine job of releasing invasive species in Maui. Mongoose to kill the rodents in the sugarcane fields. Diurnal mongoose to kill nocturnal rats and mice. Oops! Then three male and six female Axis deer from South Asia were introduced to Maui in 1959. Now more than 60,000 of them are on the island and have devastated pasture forage and vegetation.

I'm opposed to the request for approval of the Final Environmental Assessment for the planned biopesticide mosquito releases on Maui. 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 statement admits the DBQ project is an experiment on Hawaii's people, wildlife, and 'aina with unknown outcomes. Human disease vectors are involved and informed consent of the public is required. Releasing Wolbachia mosquitoes on Maui is very likely to open a Pandora's Box of serious unintended consequences, causing irreparable harm to the island.

Sufficient research has not been conducted to assess the risks of horizontal transmission, increased pathogen infection, evolutionary events, population replacement, or accidental release of females which would be impossible to avoid. The Final Environmental Assessment attempts to minimize the possibility of Wolbachia bacteria causing mosquitoes to become more capable of spreading diseases like avian malaria and West Nile virus. The significant environmental consequences of the project have not been adequately studied. This plan may actually cause the extinction of endangered native birds, and it could impact human health.

I'm opposed to the authorization for the Chairperson to issue a Finding of No Significant Impact (FONSI). The scope, risks, and experimental nature of the plan require detailed, comprehensive studies and documentation of the impacts to our native birds, wildlife, environment, and public health. I demand an Environmental Impact Statement (EIS).

Yours sincerely,

Caroline Frantzis.

From: [Tim Friesen](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Subject: Agenda item C-4
Date: Wednesday, May 10, 2023 2:43:02 PM

OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing!

Please do not allow untested GMO mosquitos in our islands. Not without a proper Environmental Impact Study to find out the impact of such a decision to be made. The consequences could be disasterous to our indigenous wildlife and to humans.

- Tim James Friesen

From: [Stephen Füssle](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose RE: C-4 Request Denial of the Petition for a Contested Case of Agenda Item C-2, March 24, 2023, "Request Approval of Final Environmental Assessment and Authorization for the Chair...
Date: Thursday, May 11, 2023 6:23:36 AM

Aloha BLNR,

I'm opposed to the State of Hawai'i Board of Land and Natural Resources' request to deny Hawaii Unites' Petition for a Contested Case Hearing for the planned BioPesticide Mosquito Experiment on Maui. 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.

I am personally disgusted that yet again, governing agencies are using Maui residents and wildlife as an experiment, just as you have with Bayer/Monsanto. You have repeatedly ignored the will of the majority of Maui residents in these cases. Please note that not only our family opposes this abomination, but our entire church as well. We should be able to testify in person and also abhor the deceptive nature by which you operate.

Mahalo & God Bless You,

From Stephen A. Füssle's iPhone
Lead Pastor
The Awakening Church
[P.O. Box 330576](#)
[Kahului, HI 96733](#)
Cell: [\(808\) 359-1946](#)
[www.theawakening.org](#)

*"People, the LORD has told you what is good, and this is what he requires of you:
To do what is right [Pono],
To love mercy,
and to walk humbly with your God."*

~ Micah 6:8 ~

From: [Margaret GLATTAUER](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Agenda item C-4
Date: Wednesday, May 10, 2023 12:07:44 PM

Subject: Agenda item C-4

I Oppose BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing!

Please help keep our Aina & People & Birds safe from poisen in the mosquitos!

Mahalo,

Margaret Glattauer,

M.Ed, B.A., N.D., D. D.

Sent from my iPhone

From: [Debra Greene](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose
Date: Thursday, May 11, 2023 7:43:23 AM

Aloha BLNR,

No, please no, please no! RE: C-4 Request Denial of the Petition for a Contested Case of Agenda Item C-2, March 24, 2023, “Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the ‘Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui’ ”

I’m opposed to the State of Hawai‘i Board of Land and Natural Resources’ request to deny Hawaii Unites’ Petition for a Contested Case Hearing for the planned BioPesticide Mosquito Experiment on Maui. 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.

Sincerely,

Debra

Debra Greene, PhD
debra@debragreene.com

From: [gypsie.me](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose
Date: Thursday, May 11, 2023 6:04:52 AM

Aloha Trustees,
We, the Beneficiaries, do not wish for gmo'ed bioengineered mosquitoes or anything of that nature, to be released. Mahalo.

From: [Irina Brecher](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Subject: BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose
Date: Thursday, May 11, 2023 9:09:19 AM

RE: C-4 Request Denial of the Petition for a Contested Case of Agenda Item C-2, March 24, 2023, “Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the ‘Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui’ ”

I’m opposed to the State of Hawai‘i Board of Land and Natural Resources’ request to deny Hawaii Unites’ Petition for a Contested Case Hearing for the planned BioPesticide Mosquito Experiment on Maui. 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.

Sincerely,

Gabriela Hamilton

Kihei, Hawaii

From: [Soul Motion](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Subject: BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose
Date: Thursday, May 11, 2023 9:07:33 AM

RE: C-4 Request **Denial** of the Petition for a Contested Case of Agenda Item C-2, March 24, 2023, “Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the ‘Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui’ ”

I’m opposed to the State of Hawai‘i Board of Land and Natural Resources’ request to deny Hawaii Unites’ Petition for a Contested Case Hearing for the planned BioPesticide Mosquito Experiment on Maui. 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.

Sincerely,

Robert Hamilton

Kihei, HI

From: [Andrew Howansky](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose
Date: Thursday, May 11, 2023 7:45:33 AM

RE: C-4 Request Denial of the Petition for a Contested Case of Agenda Item C-2, March 24, 2023, "Request Approval of Final Environmental Assessment and Authorization for the Chairperson to **Issue a Finding of No Significant Impact** for the 'Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui' "

I am opposed to the State of Hawaii Board of Land and Natural Resources' request to deny Hawaii Unites' Petition for a Contested Case Hearing for the planned BioPesticide Mosquito Experiment on Maui. **We the People have 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.

There has been no lab independent study to prove that the attempt to reduce the transmission of Avian Malaria by these un-vetted processes will succeed and further to prove that there is a problem of Avian Malaria spread in the first place. This is another attempt by our government to overreach its limits that are dictated by the Hawaii State Constitution and by the Federal Constitution that all members of the government are supposed to have taken an Oath to uphold which DO NOT INCLUDE mandating what the people should or should not do and most certainly not putting out something in the environment that can potentially harm humans without proper peer reviewed data to back up the efficacy and safety of the project before the project is released.

Sincerely,

Andy Howansky

--

Andy Howansky
415 Dairy Rd, Suite E, PMB 600
Kahului, HI 96732
808-633-6093
ahowansky@gmail.com

From: [Napuaonalani Hueu](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Testimony for Agenda C4
Date: Wednesday, May 10, 2023 10:14:53 PM

BLNR,

I am writing to convey my firm opposition to the planned Wolbachia Mosquito release on Maui that claims to be a measure for “Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds”. Due to the variables and unknowns of various aspects of this project, it has the potential to cause catastrophic harm to the ecology of this island, it’s flora, fauna and human life.

Maui Forest Bird Recovery Project does not report accurate data on the Native Bird populations and I will share more by way of my testimony on Friday. Please place me on the list to testify. I will be logged on by zoom and prepared to deliver a thorough testimony.

Mahalo,
A. Nāpua Hū’eu

From: [Paul Janes-Brown](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Agenda item c.4.
Date: Tuesday, May 9, 2023 1:32:59 PM

Aloha members of the Board of Land and Natural Resources,
My name is Paul Janes-Brown, I have been a tour guide for Temptation Tours, Inc. on Maui since 2015 and I am the past co-chair of Education for the Hawaii Democrats. I am testifying in opposition to Agenda item C. Division of Forestry and Wildlife #4. “Request Denial of the Petition for a Contested Case of Agenda Item C-2, March 24, 2023, “Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the ‘Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui’ ”.

While I fully support the intention of the agenda item, "the Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui’ ” The lack of an Environmental Impact Statement for this project, not only violates the spirit but also the letter of the law. The issues raised by the petitioner have not been adequately addressed and it would be the height of irresponsibility on the part of this board to deny petitioners’ request.

The project has never been done anywhere and to not adequately study all potential impacts of this well-intentioned experiment is to place the public and the natural environment in unnecessary jeopardy. It is clear the petitioner and the board have common ground, the protection of endangered species. This contested case should be accepted by this board and this matter should be further studied so all aspects of this effort raised by petitioner can be adequately and scientifically addressed. Mahalo for you continued efforts in behalf of our environmental protection.

Me ka ha`aha`a,

Paul Janes-Brown
PO Box 880622
Pukalani, HI 96788-0622
808-572-8000 (LL)
808-268-1740 (Mobile)

From: [Susie Jenkins](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] I OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing!
Date: Tuesday, May 9, 2023 3:52:36 PM

Hawaii Unites has filed a case against the BLNR and DLNR for failing to prepare an Environmental Impact Statement for the BioPesticide Mosquito Experiment.

The fact that this has to go legal is unbelievable. The release of this bio pesticide mosquito is an experiment.

We all care about the birds. But releasing this experimental mosquito without any impact statement is incredibly I'll advised.

Please step back, & stop this.

Where is the money coming from for this project of yours anyway?

Thank you.

C.S. Jenkins

808-443-3330

From: [Lisa Kerman](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Agenda Item C-4
Date: Tuesday, May 9, 2023 9:03:21 PM

To All Concerned,m

I absolutely oppose DLNR's denial of 'Hawaii Unites' petition for a contested case hearing. I demand an EIS to determine if injecting 40 billion mosquitos is in the best interest of life on planet earth. With 708 recent testimonies opposing this and none in favor of it, it has become quite obvious that the wishes of the people of Hawaii are not being taken into account and our voices have been landing on deaf ears. It's time to listen to the population who make up this beautiful and unique state.

Please do the right thing and give the people an unbiased EIS!

Mahalo,
Lisa Kerman
hike2heaven@yahoo.com

Sent from my iPad

From: [loren.lewisohn](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Mosquitos issue
Date: Wednesday, May 10, 2023 12:01:57 PM

OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing!

I am against releasing mosquitos into our environment. I support a comprehensive Environmental Impact Statement being made as a means to better assess the situation before even considering the release of any mosquitos.

Sent from my iPhone

From: [Tina Lia](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose
Date: Wednesday, May 10, 2023 5:44:56 PM
Attachments: [2023_0512_BLNR_Testimony_Attachments.pdf](#)

RE: C-4 Request Denial of the Petition for a Contested Case of Agenda Item C-2, March 24, 2023, “Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the ‘Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui’ ”

We’re opposed to the State of Hawai‘i Board of Land and Natural Resources’ (BLNR) request to deny Hawaii Unites’ Petition for a Contested Case Hearing for the planned BioPesticide Mosquito Experiment on Maui.

Per the University of Hawai‘i’s “Making Your Voice Count: A Citizen Guide to Contested Case Hearings”¹:

“A quasi-judicial hearing is one in which the agency’s procedures resemble a civil trial in court. Known in Hawai‘i as contested case hearings, their purpose is to protect the legal rights of those who will be affected by an agency’s decision. Contested case hearings, which are more formal than public hearings but less formal than court hearings, are governed by strict procedural rules. The overriding purpose of the procedures is to ensure that the best and most relevant information is presented to the decision-making body, thereby assuring that the various and often conflicting legal interests of the parties are considered.”

Public input is crucial with a plan of this magnitude and potential significant impact to the environment. The BLNR, in denying Hawaii Unites’ verbal request for a contested case hearing on 3/24/23, has already denied the public due process. The very fact that this petition for a contested case hearing is on the agenda now serves as documentation that denial of our verbal request was improper.

On behalf of Hawaii Unites, I verbally requested a contested case hearing for agenda item C-2 at the 3/24/23 BLNR meeting². The BLNR then improperly added my request to that day’s agenda and unanimously voted to deny the request without having received or reviewed our petition for a contested case hearing (due within 10 days of the verbal request). In reference to the denial, the BLNR stated that there was “no basis” and that the remedy was to “sue under Chapter 343.”³ The BLNR then immediately proceeded to vote on agenda item C-2, unanimously approving the Final Environmental Assessment (FEA) and issuance of a Finding of No Significant Impact (FONSI) for the BioPesticide Mosquito Experiment.

On 3/27/23, Hawaii Unites submitted a Sunshine Law Appeal to the State of Hawai‘i Office of Information Practices (OIP)⁴, requesting an investigation by the OIP into the BLNR for their violation of HRS §92-7(d) on 3/24/23. Per HRS §92-7 Notice⁵:

(d) No board shall change the agenda, less than six calendar days prior to the meeting, by adding items thereto without a two-thirds recorded vote of all members to which the board is entitled; provided that no item shall be added to the agenda if it is of reasonably major importance and action thereon by the board will affect a significant number of persons. Items of reasonably major importance not decided at a scheduled meeting shall be considered only at a meeting continued to a reasonable day and time.

In our 3/27/23 Sunshine Law Appeal, Hawaii Unites asserted that the 3/24/23 agenda item C-2 was of reasonably major importance and action thereon by the board will affect a significant number of persons. We noted that our organization, and the public, were denied the right to testify on the improperly added agenda item (our request for a contested case hearing) of major importance to our environment, native birds, wildlife, and public health. Hawaii Unites further stated that the documentation provided by our organization and by other testifiers and commenters regarding risks of the mosquito project had not been adequately studied or addressed, and that it appeared that the BLNR's actions on 3/24/23 were an attempt to avoid discussion of the information provided in testimony.

Per HAR §13-1-29⁶, within the 10-day deadline to submit our petition for a contested case hearing to the BLNR and Department of Land and Natural Resources (DLNR), the petition was mailed and subsequently marked as received by the BLNR/DLNR on 4/3/23⁷.

On 5/1/23, the DLNR ("BLNR") responded to Hawaii Unites' Sunshine Law Appeal⁸. In the DLNR's response, a number of inaccuracies were presented. On 5/5/23, upon receipt of the DLNR's response, I responded on behalf of Hawaii Unites⁹. Clarifications in my response included, but are not limited to, the following:

"At no point during the 3/24/23 BLNR meeting did I ask for the Board to vote on my verbal request for a contested case hearing prior to voting on agenda item C-2. In fact, I specifically asked that the board not vote on agenda item C-2 at all."

"The Board had not yet received our petition for a contested case hearing (due within 10 days of the 3/24/23 verbal request), and therefore had no basis of their own for denying the request. When asked by the Board to state the basis of my request, I was given grossly insufficient time to summarize the detailed subject matter in our petition. At no point during this dialogue with the Board was it made clear that they had improperly added my verbal request for a contested case hearing to the 3/24/23 agenda and were in the process of a vote on the improperly added agenda item. The Board appeared to be uninterested in hearing further details of the request or petition, as it was clear that their intention was to deny the request and petition regardless of the basis."

"The BLNR's response regarding 'Compliance with HRS Chapter 92' references

HAR § 13-1-29 in an attempt to justify their actions. Nowhere in the administrative rules is there justification for their actions. In fact, they have misstated the procedures documented in HAR § 13-1-29.”

Not mentioned by the DLNR in their 5/1/23 response to Hawaii Unites’ Sunshine Law Appeal, but of importance for clarification of the events of the 3/24/23 BLNR meeting, is the fact that the BLNR repeatedly pressured me at that meeting to state that I was in the process of verbally requesting a contested case hearing. Per HAR §13-1-29⁶:

“An oral or written request for a contested case hearing must be made to the board no later than the close of the board meeting at which the subject matter of the request is scheduled for board disposition.”

At the 3/24/23 BLNR meeting, I stated, “On behalf of Hawaii Unites, I’m requesting a contested case hearing for this agenda item C-2.” The BLNR refused to acknowledge my verbal request for a contested case hearing. Following my first request, the BLNR repeatedly questioned me regarding whether or not I was actually requesting a contested case hearing. The BLNR’s repeated use of the word “now” indicated to me that they would not accept my verbal request as valid unless I confirmed that the verbal request was actually being stated at that time. My request was not acknowledged until I stated the words, “On behalf of Hawaii Unites, I’m requesting a contested case hearing for this agenda item C-2 now,” by which I specifically meant, “I am now, at this present moment in time, in the process of the official procedure of verbally requesting a contested case hearing.”

On behalf of Hawaii Unites, I ask that the BLNR act in accordance with the guidelines set forth in the State of Hawai‘i’s statutes and administrative rules to allow for meaningful public participation in the decision-making process. 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.

Mahalo,
Tina Lia
Founder and President
Hawaii Unites
HawaiiUnites.org

REFERENCES:

- 1• “Making Your Voice Count: A Citizen Guide to Contested Case Hearings” (University of Hawai‘i, 2002)
<http://www.hawaii.edu/ohelo/resources/MakingYourVoiceCount.pdf>
- 2• Board of Land and Natural Resources Meeting (3/24/23)
<https://www.youtube.com/watch?v=QoLWs4GLmJ8>
- 3• HRS Chapter 343 Environmental Impact Statements
https://www.capitol.hawaii.gov/hrscurrent/vol06_ch0321-0344/hrs0343/hrs_0343-.htm

(Unofficial) https://dlnr.hawaii.gov/occl/files/2013/07/hrs_343.pdf

4• Hawaii Unites Request for an OIP Investigation into the BLNR for Violation of the Sunshine Law (3/27/23)

https://hawaiiunites.org/wp-content/uploads/2023/03/2023_0327_OIP_Sunshine_Law_Appeal.pdf

5• HRS §92-7 Notice

https://www.capitol.hawaii.gov/hrscurrent/vol02_ch0046-0115/HRS0092/HRS_0092-0007.htm#:~:text=%C2%A792%2D7%20Notice.,meeting%20when%20anticipated%20in%20advance.

6• HAR §13-1-29

<https://casetext.com/regulation/hawaii-administrative-rules/title-13-department-of-land-and-natural-resources/subtitle-1-administration/chapter-1-rules-of-practice-and-procedure/subchapter-5-contested-case-proceedings/section-13-1-29-request-for-hearing>

7• Hawaii Unites Petition for a Contested Case Hearing (4/3/23)

<https://hawaiiunites.org/wp-content/uploads/2023/04/23-04-03-Hawaii-Unites-contested-case-petition-filing.pdf>

8• DLNR Response to Hawaii Unites' Sunshine Law Appeal (5/1/23)

https://hawaiiunites.org/wp-content/uploads/2023/05/2023_0501_DLNR_Response_to_Hawaii_Unites_Sunshine_Law_Appeal.pdf

9• Hawaii Unites Response to DLNR Response to Hawaii Unites' Sunshine Law Appeal (5/5/23)

https://hawaiiunites.org/wp-content/uploads/2023/05/2023_0505_Hawaii_Unites_Response_to_2023_0501_DLNR_Response.pdf



STATE OF HAWAII
BOARD OF LAND AND NATURAL RESOURCES

PETITION FOR A CONTESTED CASE HEARING

RECEIVED
 2023 APR 13 PM 4:04
 DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII
 RECEIVED
 2023 MAR 31 PM 1:02
 DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

OFFICIAL USE ONLY	
Case No.	Date Received
Board Action Date / Item No.	Division/Office

INSTRUCTIONS:

- File (deliver, mail or fax) this form within ten (10) days of the Board Action Date to:
 Department of Land and Natural Resources
 Administrative Proceedings Office
 1151 Punchbowl Street, Room 130
 Honolulu, Hawaii 96813
 Phone: (808) 587-1496, Fax: (808) 587-0390
- DLNR's contested case hearing rules are listed under Chapter 13-1, HAR, and can be obtained from the DLNR Administrative Proceedings Office or at its website (<http://dlnr.hawaii.gov/forms/contested-case-form/>). Please review these rules before filing a petition.
- If you use the electronic version of this form, note that the boxes are expandable to fit in your statements. If you use the hardcopy form and need more space, you may attach additional sheets.
- Pursuant to §13-1-30, HAR, a petition that involves a Conservation District Use Permit must be accompanied with a \$100.00 non-refundable filing fee (payable to "DLNR") or a request for waiver of this fee. A waiver may be granted by the Chairperson based on a petitioner's financial hardship.
- All materials, including this form, shall be submitted in **three (3)** photocopies.

A. PETITIONER		
(If there are multiple petitioners, use one form for each.)		
1. Name Hawaii Unites	2. Contact Person Tina Lia	
3. Address P.O. Box 1773	4. City Kihei	5. State and ZIP HI 96753
6. Email tinalia@live.com	7. Phone (808) 298-6335	8. Fax

B. ATTORNEY (if represented)		
9. Attorney Name	10. Firm Name	
11. Address	12. City	13. State and ZIP
14. Email	15. Phone	16. Fax

C. SUBJECT MATTER	
17. Board Action Being Contested	
18. Board Action Date	19. Item No.
20. Any Specific Statute or Rule That Entitles Petitioner to a Contested Case	
21. Any Specific Property Interest of Petitioner That Is Entitled to Due Process Protection	
22. Any Disagreement Petitioner May Have with an Application before the Board	
23. Any Relief Petitioner Seeks or Deems Itself Entitled to	
24. How Petitioner's Participation in the Proceeding Would Serve the Public Interest	
25. Any Other Information That May Assist the Board in Determining Whether Petitioner Meets the Criteria to Be a Party under Section 13-1-31, HAR	

Check this box if Petitioner is submitting supporting documents with this form.

Check this box if Petitioner will submit additional supporting documents after filing this form.

Tina Lia
 Petitioner or Representative (Print Name)


 Signature

03/30/2023
 Date

PETITION FOR A CONTESTED CASE HEARING
C. SUBJECT MATTER (Supporting Documents)

17. Board Action Being Contested

We are contesting the Board of Land and Natural Resources' approval of Agenda Item C-2, DIVISION OF FORESTRY AND WILDLIFE: Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the "Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui."

18. Board Action Date

March 24, 2023

19. Item No.

C-2

20. Any Specific Statute or Rule That Entitles Petitioner to a Contested Case

Relevant statutes and constitutional provisions covered in this request are: HRS 343; Hawaii Constitution Article XI, section 1, 2, 7, and 9; HRS 92-7; HAR 13-1-29

21. Any Specific Property Interest of Petitioner That Is Entitled to Due Process Protection

Hawaii Unites is a 501(c)(3) nonprofit organization dedicated to the conservation and protection of our environment and natural resources. Our mission is honoring and protecting our sacred connection to the natural world. Formed in 2023, Hawaii Unites launched a petition through Change.org to "Demand an Environmental Impact Statement for the Experimental Mosquito Release on Maui" which has received more than 2,700 signatures. Our nonprofit officers and all petition signatories residing in Hawaii, particularly those in East Maui, are directly affected by the actions of the Board on item C-2, which seeks to approve a landscape-scale biopesticide experiment with a project area covering 64,666 acres of East Maui.

The rights of our officers and signatories relevant to these natural areas are protected by the Hawaii State Constitution and state law. Hawaii Unites' officers and signatories have rights to a clean and healthful environment under article XI, section 9 of the Constitution, which mandates a contested case hearing whenever the State makes binding decisions under "laws relating to environmental quality, including control of pollution and conservation, protection and enhancement of natural resources."

22. Any Disagreement Petitioner May Have with an Application before the Board

Hawaii Unites opposes the approval of the Final Environmental Assessment and the authorization for the Chairperson to issue a Finding of No Significant Impact for the "Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui" because:

- (a) The Final Environmental Assessment lacks adequate detail as required by HEPA.
- (b) The Final Environmental Assessment fails to identify the *Wolbachia* strain planned for use in this project.
- (c) The Final Environmental Assessment fails to identify and describe the mark release recapture study as a proposed action, and this project may have been improperly segmented.
- (d) The Final Environmental Assessment fails to adequately identify the mosquito packages planned for release into the environment, and the effects on the environment from the release of biodegradable packages with an unknown decay rate are not adequately addressed.
- (e) The Final Environmental Assessment fails to identify biosecurity protocols
- (f) The Final Environmental Assessment does not address the concern of accidental pathogen introduction and does not specify required permits for interstate transport of pathogens
- (g) Viewscape impacts, noise disturbances to forest bird breeding and nesting, and significant environmental consequences, including impacts to the untrammeled, natural qualities of the wilderness character, have not been adequately addressed.
- (h) The potential negative impacts of introducing an invasive species to the islands have not been adequately addressed.
- (i) Biopesticide mosquitoes for this project originate from Palmyra Atoll. *Wolbachia* bacteria for the project originates from Kuala Lumpur in Malaysia. At least one strain of *Wolbachia* planned for import in connection with the project does not exist on these islands.
- (j) Landscape level control of *Culex quinquefasciatus* mosquitoes using the Incompatible Insect Technique (IIT) has never been done before.
- (k) The mosquito species planned for use in this project, *Culex quinquefasciatus*, has never been used for a stand-alone IIT field release.
- (l) Peer-reviewed studies confirm that *Wolbachia* bacteria can cause mosquitoes to become more capable of spreading diseases like avian malaria and West Nile virus (bird and human). The Final Environmental Assessment fails to adequately address these risks.
- (m) Tropical disease expert Dr. Lorrin Pang (private citizen) has expressed concerns about horizontal transmission of the lab bacteria to wild mosquitoes and other insect vectors of disease. The Final Environmental Assessment fails to adequately address these concerns.

- (n) Scientific studies document the risks of horizontal transmission, increased pathogen infection, evolutionary events, population replacement, and accidental release of females (who bite and breed). The Final Environmental Assessment fails to adequately address these risks.
- (o) This project has the potential to cause the extinction of endangered native birds, and it could impact human health.
- (p) Impacts to endangered native Hawaiian hoary bats, native dragonflies, and endangered native damselflies have not been adequately studied or addressed in the Final Environmental Assessment.
- (q) Biopesticide wind drift has not been studied and is not addressed in the Final Environmental Assessment.
- (r) Environmental Justice is not adequately addressed in the Final Environmental Assessment. Human health impacts of this project have not been adequately studied, and the proposed action would impact ethnographic resources and traditional cultural practices.
- (s) The Final Environmental Assessment's assertion of released mosquitoes posing no risk to human health is based on unsound science. The 2010 article by Popovici et al. cited in the Final Environmental Assessment has been discredited by the EPA.
- (t) The EPA has not conducted an Environmental Risk Assessment for this mosquito biopesticide to determine the environmental, ecological, and human health risks.
- (u) The Hawaii Department of Agriculture has applied for an EPA Emergency Exemption for use of the mosquitoes without going through regulatory safety processes. The EPA application is still under review, and the biopesticide mosquitoes have not been approved for emergency release.
- (v) A feasibility study has not been conducted to provide a detailed analysis that considers all of the critical aspects of the proposed project in order to determine the likelihood of it succeeding.
- (w) The U.S. Department of the Interior states that "although used world-wide for human health, *Wolbachia* IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown."
- (x) Under the precautionary principle, it is the responsibility of the proponents of this project to establish that the proposed activity will not result in significant harm.
- (y) The subject action will have a significant effect and, therefore, requires the preparation of an Environmental Impact Statement.
- (z) Conflicts of interest have not been disclosed or addressed.

23. Any Relief Petitioner Seeks or Deems Itself Entitled to

Hawaii Unites requests that the approval of the Final Environmental Assessment and the authorization for the Chairperson to issue a Finding of No Significant Impact for the “Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui” be denied. The subject action will have a significant effect and, therefore, requires the preparation of an Environmental Impact Statement.

Hawaii Unites also requests that State of Hawaii Board of Land and Natural Resources Chairperson Dawn N.S. Chang and Board Member Vernon Char recuse themselves from participating in any discussion or voting in this matter, given that they have conflicts of interest per HRS §171-4 (d).

Any action taken by the Board of Land and Natural Resources on this Petition for a Contested Case Hearing prior to receipt of said Petition shall be null and void, as any such action is in violation of the Sunshine Law HRS §92-7 and of HAR §13-1-29. Receipt of this Petition shall serve as notice to the Board of Land and Natural Resources that the Petition remains active. Any action taken by the Board of Land and Natural Resources on the March 24, 2023 Agenda Item C-2, a subject within the adjudicatory jurisdiction of the Board, shall be subsequently null and void.

24. How Petitioner’s Participation in the Proceeding Would Serve the Public Interest

Hawaii Unites has provided peer-reviewed studies documenting the serious risks of the proposed project. We have described the concerns of tropical disease and vector expert Dr. Lorrin Pang. In a contested case hearing, we will provide the Board with additional peer-reviewed studies. We will give a detailed description of Dr. Pang’s concerns regarding horizontal transmission of the introduced bacteria strain, which will include information that has not yet been submitted in previous testimony or comments. We will provide a statement by a retired scientist from the EPA Office of Pesticide Programs strongly advising that a full Environmental Impact Statement be conducted. We will provide documentation of petition signatories and public testimony. Our evidence will demonstrate that the project risks and the concerns of the public in opposition to this proposed experiment have not been adequately studied or addressed. Our participation in a contested case hearing will help to ensure that this Board has all the information it needs to make a decision that fully protects the public’s interests and satisfies the Board’s public trust obligations per the Hawaii State Constitution.

25. Any Other Information That May Assist the Board in Determining Whether Petitioner Meets the Criteria to Be a Party under Section 13-1-31, HAR

Per HAR §13-1-31 (b) (2), Hawaii Unites represents all petition signatories who have some property interest in the land, who lawfully reside on the land, who are adjacent property owners, or who otherwise can demonstrate that they will be so directly and immediately affected by the requested action that their interest in the proceeding is clearly distinguishable from that of the general public.

Per HAR §13-1-31 (c), as a 501(c)(3) nonprofit organization dedicated to the conservation and protection of our environment and natural resources, Hawaii Unites can show a substantial interest in the matter.

From: Li, Bin C bin.c.li@hawaii.gov 
Subject: Re: Hawaii Unites contested case petition
Date: April 3, 2023 at 4:15 PM
To: tinalia@live.com

BL

We just realized that our stamp clock malfunctioned with a wrong date stamped on the filing. Please see this version for the correction. Sorry for the mishap.

Bin C. Li
Department of Land and Natural Resources
Administrative Proceedings Coordinator
1151 Punchbowl St, Rm 131, Honolulu, Hawaii 96813
Phone (808)587-1496, bin.c.li@hawaii.gov

From: Li, Bin C
Sent: Monday, April 3, 2023 2:45 PM
To: tinalia@live.com <tinalia@live.com>
Subject: Hawaii Unites contested case petition

Hi Tina,

Per our phone discussion, please see file for record of your contested case petition filing.

Bin C. Li
Department of Land and Natural Resources
Administrative Proceedings Coordinator
1151 Punchbowl St, Rm 131, Honolulu, Hawaii 96813
Phone (808)587-1496, bin.c.li@hawaii.gov



23-04-03
Hawaii...ing.pdf

From: Tina Lia tinalia@live.com
Subject: Sunshine Law Appeal
Date: March 27, 2023 at 11:05 AM
To: oiip@hawaii.gov

TL

RE: Sunshine Law Appeal

Attn.: Office of Information Practices (OIP)

I'm requesting an investigation by the OIP into the Board of Land and Natural Resources (BLNR) for their violation of the Sunshine Law [HRS §92-7 Notice \(d\)](#) at their meeting on Friday, March 24, 2023.

Per HRS §92-7 Notice:

"(d) No board shall change the agenda, less than six calendar days prior to the meeting, by adding items thereto without a two-thirds recorded vote of all members to which the board is entitled; provided that no item shall be added to the agenda if it is of reasonably major importance and action thereon by the board will affect a significant number of persons. Items of reasonably major importance not decided at a scheduled meeting shall be considered only at a meeting continued to a reasonable day and time."

At the [BLNR meeting on 3/24/23](#), I provided video testimony. In my video testimony, I requested a contested case hearing for agenda item C-2 on behalf of our environmental nonprofit Hawaii Unites. Our organization represents over 2,600 signatories who are demanding an Environmental Impact Statement for the agenda item C-2. [My written testimony](#) on agenda item C-2 includes information and peer-reviewed studies about the serious risks of the proposed project to our environment, native birds, wildlife, and public health. It also includes documentation of procedural errors, specific conflicts of interest, potential interstate transport of pathogens and lack of permitting, failure to receive EPA approval for use of the biopesticide prior to assuring the public of safety, and EPA discreditation of the article cited in the Final Environmental Assessment asserting that the biopesticide poses no risk to human health.


Without having received or viewed my petition for a contested case hearing, which is to be submitted to the BLNR within 10 days of my 3/24/23 request for a hearing, the BLNR added my request for a contested case hearing to the agenda that same day during the 3/24/23 meeting. The BLNR then voted unanimously to deny my request for a hearing.

The BLNR's action of adding my request for a contested case hearing to the agenda at the 3/24/23 meeting is a violation of the Sunshine Law. This agenda item was of a reasonably major importance and action thereon by the board will affect a significant number of persons. The public, including the 2,600-plus signatories our organization represents, was denied the right to testify on this agenda item of major importance to our environment, native birds, wildlife, and public health. Our organization was denied the right to testify on the agenda item and the right to submit documentation supporting the request prior to its addition as an agenda item, including our petition for a contested case hearing.

The project discussed in BLNR 3/24/23 agenda item C-2 has been publicly contested for at least nine months, with overwhelming opposition to the plan moving forward without an Environmental Impact Statement. The documentation that has been provided by myself, our organization, and other testifiers and commenters regarding the risks of the project has not been adequately studied or addressed. It is my belief that the BLNR improperly added my request for a contested case hearing to the agenda on 3/24/23 in order to vote to deny the request and avoid discussion of the very serious information provided in my written testimony on agenda item C-2 (testimony which was never acknowledged or addressed by the BLNR at the meeting).

I ask that the OIP investigate this matter thoroughly, as this BLNR violation of the Sunshine Law has caused an egregious infringement of the public's right to open governmental processes.

Mahalo,
Tina Lia
Founder and President
Hawaii Unites
P.O. Box 1773
Kihei, HI 96753
(808) 298-6335
tinalia@live.com

From: OIP oip@hawaii.gov 
Subject: Re: Notice of Appeal of Sunshine Law Complaint (S APPEAL 23-9)
Date: April 3, 2023 at 2:27 PM
To: tinalia@live.com



Ms. Lia:

Attached is a letter dated April 3, 2023 from the Office of Information Practices regarding your request for assistance from OIP. Also attached are the Appeal Procedures and Responsibility of the Parties.

Please contact our office if you have difficulty opening the attachments.

Thank you,

Office of Information Practices
State of Hawai'i
No. 1 Capitol District Building
250 S. Hotel Street, #107
Honolulu, HI 96813
Ph: (808) 586-1400
Facsimile: (808) 586-1412
Email: oip@hawaii.gov
Website: <http://oip.hawaii.gov>



040323 Ltr to
BLNR.pdf



Appeal
Proced...ies.pdf



JOSH GREEN, M.D.
GOVERNOR

STATE OF HAWAII
OFFICE OF INFORMATION PRACTICES

CHERYL KAKAZU PARK
DIRECTOR

NO. 1 CAPITOL DISTRICT BUILDING
250 SOUTH HOTEL STREET, SUITE 107
HONOLULU, HAWAII 96813
Telephone: (808) 586-1400 FAX: (808) 586-1412
E-MAIL: oiip@hawaii.gov
www.oiip.hawaii.gov

April 3, 2023

VIA EMAIL

Ms. Dawn Chang
Chairperson
Board of Land and Natural Resources

Re: Notice of Appeal of Sunshine Law Complaint (S APPEAL 23-9)

Dear Chair Chang:

The Office of Information Practices (OIP) has received an appeal from Ms. Tina Lia, concerning a meeting held by the Board of Land and Natural Resources (BLNR) on March 24, 2023. Ms. Lia indicated that at the BLNR meeting on March 24, she provided video testimony and requested a contested case hearing for agenda item C-2 on behalf of the environmental nonprofit Hawaii Unites. Ms. Lia also indicated that without having received or viewed her petition for a contested case hearing, which she states is to be submitted to the BLNR within 10 days of her March 24 request for a hearing, the BLNR added her request for a contested case hearing to the agenda during the meeting and voted unanimously to deny her request for a hearing. Specifically, Ms. Lia asks whether the BLNR's action of adding her request for a contested case hearing to the agenda at the March 24, 2023 meeting violated Part I of chapter 92, Hawaii Revised Statutes (Sunshine Law). A copy of Ms. Lia's appeal is enclosed for your information.

BLNR response to this appeal is BLNR opportunity to provide justification for the BLNR's action of adding her request for a contested case hearing to the agenda at the March 24, 2023 meeting or any additional information that BLNR would like OIP to consider for this appeal. Within ten business days of receipt of this notice, please provide OIP with a written statement that includes the information listed in the attached summary of appeal procedures. Please remember that OIP is required to interpret the Sunshine Law to favor openness and to disfavor closed meeting provisions. Hawaii Revised Statutes (HRS) § 92-1 (2012). For this reason, when a member of the public complains to OIP that a board's action was not in compliance with the Sunshine Law, the board has the burden to justify any departure from the law's general requirement of openness to OIP.

Please provide OIP with unaltered copies of the for the BLNR's March 24, 2023 meeting agenda and minutes for our use in reviewing this appeal. We would appreciate receiving the copies of these documents no later than ten business days from receipt of this notice.¹

BLNR and Ms. Lia, by copy of this notice, are informed that OIP appeals are informal proceedings. Parties are not required to provide each other with copies of their submissions to OIP unless so ordered by OIP. With the exception of records provided for OIP's *in camera* review, OIP will, upon request, provide copies of a submission by a party to other parties without notice to the submitting party. Submissions to OIP are generally considered public records subject to the exceptions to disclosure at section 92F-13, HRS. If a party's submission to OIP contains what the party believes to be nonpublic information, it should indicate on the submission what the nonpublic information is.

Please be advised that any person may file a lawsuit to require compliance with or to prevent a violation of the Sunshine Law, HRS § 92-12(c) (2012).

Please be aware that OIP is currently operating with a backlog of cases, so it will take time to resolve this appeal. Moreover, OIP's decision for this appeal will be limited to a finding as to whether BLNR violated the Sunshine Law. Even if OIP determines that the Sunshine Law had been violated, OIP does not have the power to enforce its decisions by voiding BLNR's final action(s).

Only the court may void a final action of a board that was taken in violation of the open meeting or notice requirements of the Sunshine Law, HRS § 92-11 (2012). While any person may file a lawsuit to require compliance with or to prevent a violation of the Sunshine Law, a suit to void any final action must be commenced within ninety days of the action, HRS §§ 92-11, -12 (2012). After determining whether the Sunshine Law was or will be violated, the court may also order payment of reasonable attorney's fees and costs to the prevailing party, HRS § 92-12(c).

Note that the ninety-day deadline to file a lawsuit is not tolled while an appeal is pending with OIP. This appeal refers to a violation that allegedly occurred at a meeting on March 24, 2023. Please be aware that if Ms. Lia wants to have any final action taken by BLNR voided, she has ninety days from March 24, 2023 to file a timely court action.

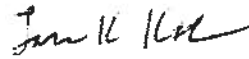
This letter also serves as notice that OIP is not representing anyone in this appeal. OIP's role herein is as a neutral third party.

¹ OIP acknowledges that BLNR has 40 days to prepare meeting minutes and that minutes for the March 24 meeting may not be available in ten business days. If this is the case, please let OIP know and we will accept the minutes after 40 days. BLNR may also provide a video of the meeting if one is available with a notation as to where the relevant discussion starts.

Ms. Dawn Chang
April 3, 2023
Page 3

Thank you for your attention to this matter. If you have any questions or would like to discuss this, please do not hesitate to contact the undersigned attorney.

Very truly yours,

A handwritten signature in black ink, appearing to read "Lori Kato".

Lori Kato
Staff Attorney

LKK:rt
Enclosure

cc: Ms. Tina Lia (w/o enclosure)



JOSH GREEN, M.D.
GOVERNOR

STATE OF HAWAII
OFFICE OF INFORMATION PRACTICES

CHERYL KAKAZU PARK
DIRECTOR

NO. 1 CAPITOL DISTRICT BUILDING
250 SOUTH HOTEL STREET, SUITE 107
HONOLULU, HAWAII 96813
Telephone: (808) 586-1400 FAX: (808) 586-1412
E-MAIL: oiip@hawaii.gov
www.oiip.hawaii.gov

Appeal Procedures and Responsibilities of the Parties

This statement of appeal procedures provides an informational summary of the applicable procedures and the parties' responsibilities in an appeal before OIP pursuant to chapter 2-73, Hawaii's Administrative Rules (HAR). The procedures described here are more fully set out in chapter 2-73 itself, which controls in the event of any inconsistency between its language and the language of this informational summary.

A party may contact OIP to request an extension of a deadline.

1. Agency response (HAR §§ 2-73-14 and -15)

The agency's written response is due ten business days after it receives the notice of appeal from OIP. Its written response must include:

- (1) a concise statement of the factual background;
- (2) An explanation of the agency's position, including its justification for the actions complained of, with citations to the specific statutory sections and other law supporting the agency's position;
- (3) Any evidence necessary to support the agency's argument; and
- (4) Contact information for the agency officer or employee who is authorized to respond and make representations on behalf of the agency concerning the appeal.

If checked, the agency's response must include, for OIP's *in camera* review, an unredacted copy of

	the records to which access was denied
X	the agenda and minutes of the relevant meeting
	other records:

Where the agency claims that a record is protected by the attorney-client privilege, the agency may request to submit to OIP the record in redacted form in order to preserve this privilege. OIP will

generally allow such a request where the application of the claimed privilege can be determined by review of the redacted record.

2. Other submissions to OIP (HAR § 2-73-15)

In addition to the information and materials submitted as part of the appeal, OIP may ask the person who filed the appeal, or any other parties participating in the appeal, to submit a written statement or statements. If OIP does so, OIP will also let all the parties know when the statement is due, whether there are any requirements as to the form it takes or what it includes, and when any response by the agency or other parties is due.

OIP can consider information or materials submitted by any person, not just parties to the appeal. However, if someone other than the person who filed the appeal and the responding agency wants to participate in the appeal as a party or in some other way, that person must submit a written request and must explain the reason for the request, and OIP will then determine whether to allow such participation.

Because an appeal before OIP is an informal proceeding, a party's or third person's communication with OIP can be *ex parte*, *i.e.*, outside the presence of the other party or parties. However, OIP does have the option to require the parties to copy each other on submissions.

3. OIP's Decision (HAR §§ 2-73-15, -17, -18, and -19)

OIP's written decision on the appeal will be sent to all parties when it is issued. There is no specific deadline set for OIP's decision on an appeal. If the parties have not received either a decision on the appeal or a notice of dismissal from OIP as discussed below, then this appeal is still pending.

A party can request that OIP reconsider its decision. The deadline to request reconsideration is ten business days after the date the decision was issued. If a party misses the deadline for reconsideration or if OIP declines to reconsider the opinion, the party still has the option of appealing the decision to court. Section 92F-43, Hawai'i Revised Statutes (HRS), sets out the standard for an agency's appeal of an OIP decision. For a record requester or Sunshine Law complainant, appeal to court is provided by section 92F-15, HRS (denial of general record request), section 92F-27, HRS (denial of a personal record request), or sections 92-11 and -12, HRS (Sunshine Law complaint).

In some instances, OIP may issue a notice to all parties dismissing all or part of an appeal, instead of issuing a written decision. The circumstances in which OIP can dismiss an appeal are listed in section 2-73-18. OIP may also ask (but will not require) the parties to mediate the appeal, or an issue within the appeal, as an alternative means to resolve the appeal.

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA



STATE OF HAWAII | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA

P.O. BOX 621
HONOLULU, HAWAII 96809

May 1, 2023

DAWN N.S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT
LAURA H.E. KAAKUA
FIRST DEPUTY
M. KALEO MANUEL
DEPUTY DIRECTOR - WATER
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE
MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES
ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

VIA EMAIL

Lori Kato
Staff Attorney
Office of Information Practices

RE: Notice of Appeal of Sunshine Law Complaint (S APPEAL 23-9)

Dear Ms. Kato:

Please see the Board of Land and Natural Resources' response to the Sunshine Law Complaint from Tina Lia (S APPEAL 23-9) below.

Factual Background

On March 24, 2023, the Board of Land and Natural Resources ("Board") held a Board meeting pursuant to Haw. Rev. Stat. ("HRS") Chapter 92. The specific agenda item at issue was C-2: Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the "Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui" ("C-2"). The agenda is attached as Exhibit "1." The Board heard testimony on C-2 pursuant to HRS § 92-3. Ms. Lia submitted written testimony, attached hereto as Exhibit "2," and also provided oral testimony, beginning in at 1:18:04 in the audio file available at the link provided in Exhibit "3." At the end of her oral testimony, Ms. Lia requested a contested case hearing. Ex. 3 at 1:19:52. The Chair paused testimony and asked Ms. Lia to clarify if she was requesting the Board decide her

contested case hearing request prior to voting, and Ms. Lia confirmed she was requesting the Board vote on her oral request prior to voting. *Id.* at 1:20:20-1:20:36. The Chair asked Ms. Lia to clarify the basis for her contested case hearing request. *Id.* at 2:16:37. Board Member Yoon moved to deny Ms. Lia's oral request for contested case hearing because she failed to give a basis for her request. *Id.* at 2:18:22. The Board then voted to deny her oral request for contested case hearing. *Id.* at 2:19:57. Ms. Lia filed a written petition for contested case hearing on April 3, 2023, attached hereto as Exhibit "4." The Board has not yet decided the written petition.

Compliance with HRS Chapter 92

When a person makes an oral request for contested case hearing during a Chapter 92 meeting prior to decisionmaking, the Board stops the meeting to determine whether or not the person is entitled to the contested case hearing. Haw. Admin. R. ("HAR") § 13-1-29(a). The Board is not required hold a hearing prior to deciding if the request should be granted. HAR § 13-1-29.1. If the Board denies the contested hearing request, the person may follow-up in writing within 10-calendar days to request a contested case hearing. HAR § 13-1-29(a). That written petition is generally placed on a future agenda and the Board generally decides whether to grant the request based on the written petition and any testimony submitted (written or oral) for that meeting. But the Board is not required to hold a hearing. HAR § 13-1-29.1. Here, Ms. Lia made an oral request. The Board stopped the meeting and voted to deny her oral request. Ms. Lia followed up in writing within 10-business days with her written petition. The Board will decide that written request under a new agenda item at a future meeting.

Evidence

Exhibit "1" is a true and correct copy of the agenda containing item C-2 from the March 24, 2023, Board meeting.

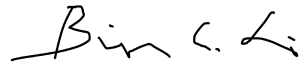
Exhibit "2" is a true and correct copy of Tina Lia's written testimony on item C-2 from the March 24, 2023, Board meeting.

Exhibit “3” is a true and correct copy of the link to the official meeting minutes for the March 24, 2023, Board meeting.

Exhibit “4” is a true and correct copy of the written petition for contested case hearing filed by Tina Lia on April 3, 2023.

If you have any further questions, please contact me at (808)587-1496 or bin.c.li@hawaii.gov. Thank you.

Sincerely,

A handwritten signature in black ink that reads "Bin C. Li". The signature is written in a cursive style with a large initial "B" and a distinct "C" and "L".

Bin C. Li
Administrative Proceedings Coordinator

cc: Dawn N.S. Chang, Chairperson, Board of Land and Natural Resources
Lainie Berry, Wildlife Manager, Department of Land and Natural Resources
Miranda C. Steed, Deputy Attorney General

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA



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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

AGENDA FOR THE MEETING OF THE BOARD OF LAND AND NATURAL RESOURCES

DATE: MARCH 24, 2023
TIME: 9:15 AM
LOCATION: In person at 1151 Punchbowl St, Room 132
(Kalanimoku Building) online via ZOOM, livestream
via YouTube

Board members, staff, applicants, and testifiers can choose to participate either in-person, via ZOOM or by telephone. Members of the public are encouraged to wear a mask if attending in-person.

Meeting materials are available for public review in advance of the meeting at:
<http://www.dlnr.hawaii.gov/meetings>

The meeting will be livestreamed at:
<http://youtube.com/c/boardoflandandnaturalresourcesdlnr>

To provide in person testimony:
Attend live at 1151 Punchbowl St. Room 132 (Kalanimoku Building), Honolulu, Hawaii

To provide video testimony:
Send your request to blnr.testimony@hawaii.gov
Include your name and the agenda item on which you would like to testify. Once your request has been received, you will receive an email with the Zoom link. Requests may be made during the meeting.

To provide oral testimony by telephone: : +1 669 900 6833

Meeting ID: 840 8093 2937

Passcode: 0LB2Gu

Note: To unmute, press *6.

Written Testimony:

Interested persons can submit written testimony in advance of each meeting that will be distributed to Board Members prior to the meeting. Submit written testimony to blnr.testimony@hawaii.gov or via postal mail to the Board of Land and Natural Resources at P.O. Box 621, Honolulu, Hawaii

96809. *We request written testimony be submitted no later than 24 hours prior to the meeting to ensure time for Board Member review. Late written testimony will be retained as part of the record and distributed to Board Members as soon as practicable, but we cannot ensure that Board Members will receive it with sufficient time for review prior to decision-making.*

The Board may go into Executive Session pursuant to Section 92-5(a)(4), Hawaii Revised, Statutes, in order to consult with its attorney on questions and issues pertaining to the Board's powers, duties, privileges, immunities, and liabilities.

Individuals requiring special assistance or auxiliary aids or services (e.g., sign language interpreter), please contact staff at least 72 hours prior to the meeting at 808.587.0404 so that arrangements can be made.

In some of the matters before the Board, a person may wish to request a contested case hearing. If such a request is made before the Board's decision, then the Board will consider the request first - before considering the merits of the item before it. A person who wants a contested case may also wait until the Board decides the issue, then request the contested case after the decision. It is up to you. Any request must be made in writing within ten days. If no request for contested case is made, the Board will make a decision. The Department will treat the decision as final and proceed accordingly.

A. SUMMARY MINUTES

1. Approval of the January 13, 2023, Summary Meeting Minutes.

C. DIVISION OF FORESTRY AND WILDLIFE

1. Request Approval to Negotiate and Sign a Contract(s) between Department of Land and Natural Resources Division of Forestry and Wildlife, for the Management of the Department of Land and Natural Resources Hawai'i Island Trail Stewards Program.
2. Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the "Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui".
3. Acceptance of Hearing Master's Report, Set Aside Lands as Forest Reserves, Natural Area Reserves, and Wildlife Sanctuaries Statewide:

FOREST RESERVES ON:

KAUAI: (4) 4-4-001:002, (4) 5-6-002:001

OAHU: (1) 4-8-013:013, (1) 6-9-001:004, (1) 9-1-017:158, (1) 9-9-010:052
and (1) 9-9-011:002

MAUI: (2) 1-1-001:001, (2) 1-1-001:021, (2) 1-1-001:031, (2) 1-1-001:052,
(2) 1-1-002:005, (2) 1-1-002:006, (2) 1-1-008:001, (2) 1-1-008:005,
(2) 1-2-001:039, (2) 1-3-003:017, (2) 1-3-006:007, (2) 1-4-011:003,
(2) 1-4-011:004, (2) 1-4-012:019, (2) 1-5-002:004, (2) 1-5-008:004,
(2) 1-5-010:008, (2) 1-5-011:007, (2) 1-5-011:012, (2) 1-5-011:014,
(2) 1-5-011:015, (2) 1-5-011:029, (2) 1-6-002:009, (2) 1-7-002:011,
(2) 1-7-002:044, (2) 1-7-003:013, (2) 2-4-016:001, (2) 2-9-001:020,
(2) 2-9-001:033, (2) 2-9-002:012, (2) 2-9-010:008, (2) 2-9-010:009,
(2) 2-9-010:012, (2) 2-9-010:021, (2) 2-9-010:022, (2) 2-9-011:008,
(2) 2-9-011:013, (2) 2-9-013:004, (2) 2-9-013:012, (2) 2-9-013:014,
(2) 2-9-013:016, (2) 2-9-013:017, (2) 2-9-013:018, (2) 2-9-013:020,
(2) 3-1-001:001, (2) 3-1-001:021, (2) 3-1-001:029, (2) 3-1-006:003,
(2) 3-6-001:014 (por), (2) 4-4-004:002, (2) 4-4-004:006, (2) 4-4-
004:009, (2) 4-4-004:011, (2) 4-4-004:019, (2) 4-4-007:006, (2) 4-5-
021:004, (2) 4-5-021:023, (2) 4-8-001:001 (por), (2) 4-8-002:002, (2)
4-8-002:008, (2) 4-8-002:039, (2) 4-8-003:008 (por), (2) 4-8-003:040,

HAWAII: (3) 2-4-008:035, (3) 5-1-001:006, (3) 8-7-014:015, (3) 4-4:014:004,
(3) 6-2:001:003 (por), and (3) 9-6-007:002

NATURAL AREA RESERVES ON:

MOLOKAI: (2) 6-1-001:002 (por)

MAUI: (2) 1-3-003:026, (2) 1-3-005:002, (2) 1-3-003:001, (2) 1-8-001:005,
(2) 2-1-003:050 (por), (2) 2-1-004:075, (2) 2-1-004:110, (2) 2-1-
006:010, (2) 2-1-006:077, (2) 2-1-006:078

WILDLIFE SANCTUARIES ON:

MAUI: (2) 3-1-001:014 and (2) 3-1-002:011

D. LAND DIVISION

1. Approve Evaluation Committee's Recommendation for Selection of Proposal Submitted by Savio SB Growth Venture LLC in Response to Request for Qualifications / Request for Proposals for Lease of Improved Public Lands; Issuance of Right-of-Entry Permit to Savio SB Growth Venture LLC for Purposes of Assessing the Physical Condition of the Property and Preparing Construction Documents; Waiakea, South Hilo, Hawaii, Tax Map Key: (3) 2-1-005:020.

2. Denial of Petition for Contested Case Hearing filed by 69 Railroad, LLC on September 30, 2022, Regarding the Board Action of September 23, 2022 Agenda Item D-2, Approved as Amended: *Amend Prior Board Action of February 11, 2022, Item D-2, Approved as Amended, Consent to Sublease General Lease No. S-3624, 69 Railroad, LLC, Lessee, to Self Storage Hilo LLC, Covan World-Wide Moving, Incorporated, C.A.R.S.S. LLC, Provision Solar, Inc., Tracey Gapol, Charles Wagner & Erin Wagner, Hawaii Behavioral Health, LLC, Whitney & Arnessa Iranon, Mr. & Mrs. Charles and Erin Wagner, McCully Works, Inc., and Lamar Pacheco, Sublessees, Waiakea, South Hilo, Hawaii, Tax Map Key: (3) 2-1-012:026.*

Authorize the Chairperson to Approve and Execute a Development Agreement for a 30-Year Extension of Lease Term and to Execute the Lease Extension Document, General Lease No. S-3624, 69 Railroad, LLC, Lessee; Waiakea, South Hilo, Hawaii, Tax Map Key: (3) 2 -1-012: 026.

Approve Mediated Settlement of Rent Reopening Dispute Pursuant to Mediation Agreement for the Periods of 2026-2046, General Lease No. S-3624, 69 Railroad, LLC, Lessee; Waiakea, South Hilo, Hawaii, Tax Map Key: (3) 2 -1-012: 026.

The purposes of the amendments are to: (a) provide for the updating of certain lease extension terms and the development agreement for the 30-year extended lease term, and (b) extend the time for completion of improvements required under development agreement and lease extension from approximately 10 ½ months after the Board approval of February 11, 2022 to 18 months after the execution of the development agreement.

Pursuant to Section 92-5(a) (4), Hawaii Revised Statutes (HRS), the Board may go into Executive Session in order to consult with its attorney on questions and issues pertaining to the Board's powers, duties, privileges, immunities and liabilities.

3. Issuance of Right-of-Entry Permit to Hawaii Explosives & Pyrotechnics, Inc. for Private Event Aerial Fireworks Display at Duke Kahanamoku Lagoon on April 18, 2023, Waikiki, Honolulu, Oahu, Tax Map Key: (1) 2-3-037: portion of 021.
4. Issuance of Direct Lease to Maunalua Fishpond Heritage Center for Conservation, Biological and Cultural Revitalization, Education and Scientific Research Purposes, Honolulu, Oahu, Tax Map Key: (1) 3-7-002:018 and 077.
5. Issuance of Direct Lease to Hui o Hau`ula for Community Services and Activities Purposes; Koolauloa, Oahu, Tax Map Key: (1) 5-4-014:003.

6. Report on Board of Land and Natural Resources' Questions to the Department of Agriculture and Hawaii Land & Livestock LLC Relating to the Cancellation of Governor's Executive Order No. 4584 to the Department of Agriculture for Agriculture Purposes, Honouliuli, Ewa, Oahu, Tax Map Key: (1) 9-1-031:001.
7. Grant of Perpetual Non-Exclusive Easement to the City and County of Honolulu on behalf of the Honolulu Authority for Rapid Transportation (HART) for Elevated Guideway Purposes; After-the-Fact Approval of Annual Renewal of Right-of-Entry to HART for Each Year Since the Board Approval of the Initial Issuance of the Right-of-Entry at Board's Meeting of February 10, 2012, Item D-6, Waipahu, Ewa, Oahu, Tax Map Key: (1) 9-4-008: Portion of 025.

F. DIVISION OF AQUATIC RESOURCES

1. Request for Approval of Policy for Using the Division of Aquatic Resources Logo on Informational Signs.

K. OFFICE OF CONSERVATION AND COASTAL LANDS

1. Denial of Contested Case Request HA 23-1 by Laulani Teale regarding the Approval of the Mauna Kea Comprehensive Management Plan 2022 Supplement: Management Actions Update located at the Mauna Kea Science Reserve, Ka'ohe, Hāmakua, Hawai'i Tax Map Keys: (3) 4-4-015:009, (3) 4-4-015:0012, and (3) 4-4-015:001.

The Board may go into Executive Session pursuant to Section 92-5(a)(4), Hawaii Revised Statutes, in order to consult with its attorney on questions and issues pertaining to the Board's powers, duties, privileges, immunities, and liabilities.

NON-ACTION ITEM

2. Informational Briefing by the City and County of Honolulu Department of Parks and Recreation regarding the Carrying Capacity Studies for the Hanauma Bay Nature Preserve located at the Hanauma Bay Nature Preserve, O'ahu Tax Map Keys: (1) 3-9-012:002, (1) 3-9-012:010, (1) 3-9-012:012, (1) 3-9-012:014, (1) 3-9-012:016, and adjacent Submerged Lands.
3. Request to Amend Condition #12 of Conservation District Use Permit (CDUP) OA-2957 regarding Reporting Requirements for the Carrying Capacity Studies by the City and County of Honolulu Department of Parks and Recreation at the Hanauma Bay Nature Preserve located at Hanauma Bay Nature Preserve, O'ahu Tax Map Keys: (1)

3-9-012:002, (1) 3-9-012:010, (1) 3-9-012:012, (1) 3-9-012:014, (1) 3-9-012:016, and adjacent Submerged Lands.

M. OTHERS

1. Issuance of a Revocable Permit for Commercial Use of a T-Hangar for Storage of Aircraft and a Maintenance Hangar to Support a Member-Based Aeronautical Flying Club, Belle Pacific Air, L.L.C., Daniel K. Inouye International Airport, Tax Map Key: (1) 1-1-076: Portion of 020
2. Issuance of a Revocable Permit for Aircraft Parking, Novictor Aviation LLC, Daniel K. Inouye International Airport, Tax Map Key: (1) 1-1-076: Portion of 023.
3. Issuance of a Revocable Permit for Paved, Improved Land to Store Above-Ground Storage Tanks to Provide Fuel to Airport Tenants, Signature Flight Support LLC, Daniel K. Inouye International Airport, Tax Map Key: (1) 1-1-003:001 (Portion).
4. Issuance of a Revocable Permit for Paved, Improved Land for U.S. Postal Mail Sortation and Ground Equipment Staging in Support of its Fixed-Based Operation, Signature Flight Support LLC, Daniel K. Inouye International Airport, Tax Map Key: (1) 1-1-072: 011 (Portion).
5. Issuance of Revocable Permit for Paved, Open Equipment Parking to Support Ground Handling Operations, Signature Flight Support LLC, Daniel K. Inouye International Airport, Tax Map Key: (1) 1-1-072: 069 (Portion) and (1) 1-1-072: 070.
6. Issuance of a Revocable Permit for the Installation of Six (6) Avigilon Cameras at Gates E1, E3, E5, E6, E7 and E9 as Part of its Airline Operations, Southwest Airlines Co., Daniel K. Inouye International Airport, Tax Map Key: (1) 1-1-003: Portion 050 .
7. Issuance of a Revocable Permit for Aircraft Parking, Buddy R. Wilson, Lihue Airport, Tax Map Key: (4) 3-5-001: Portion of 008.
8. Issuance of a Revocable Permit for Commercial Use of a T-Hangar for Storage of Aircraft and a Maintenance Hangar to Support an Aeronautical Maintenance Business, PMX Aviation Services LLC, Daniel K. Inouye International Airport, Tax Map Key: (1) 1-1-076: Portion of 020.
9. Request for Authorization to Issue three Month-to-Month Revocable Permits to McCabe, Hamilton & Renny Company, Limited, for a Maintenance Shop, two Office Trailers, and a Work Area, situated at Pier 5, Kalaeloa Barbers Point Harbor, Island of Oahu, Tax Map Key Nos. (1) 9-1-014: Portion of 024, (1) 9-1-014:Portion of 036, and (1) 9-1-014: Portion of 062 (P), Governor's Executive Order No. 3383.

10. Request for Authorization to Conduct Public Auction for 65-year Lease for use of the former Hawaii Maritime Center and surrounding area, situated at Pier 7, to occupy and use the premises for a Museum and related facilities, with a Harbor and Wharfage Operation Component and Pier Space Availability for Harbor and Wharfage Operations, Honolulu Harbor, Island of Oahu, Tax Map Key Nos. (1) 2-1-001: Portion of 057 and (1) 2-1-001: Portion of 058 , Governor's Executive Order No. 3542; and Issuance of a Month-to-Month Revocable Permit (RP) to be replaced with an executed Lease.

From: [Tina Lia](#)
To: [DLNR.BLNR.Testimony](#)
Cc: [DLNR.CO.PublicDLNR](#)
Subject: [EXTERNAL] BLNR Meeting 3/24/23 9:15am Testimony Agenda Item C-2: Oppose
Date: Wednesday, March 22, 2023 11:21:23 PM
Attachments: [2023_0324_Testimony_Tina_Lia_Attachments.pdf](#)

RE: C-2 Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the “Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui”

We’re opposed to the request for approval of the Final Environmental Assessment for the planned biopesticide mosquito releases on Maui. This project is an experiment on our island home, and the outcome is admittedly unknown. The Final Environmental Assessment¹ does not adequately address the serious risks of this plan or the concerns of the public.

Sufficient research has not been conducted to assess the risks of horizontal transmission^{2,3,4}, increased pathogen infection⁵, evolutionary events², population replacement⁶, or accidental release of females⁶. The Final Environmental Assessment attempts to minimize the possibility of *Wolbachia* bacteria causing mosquitoes to become more capable of spreading diseases like avian malaria⁵ and West Nile virus⁷. Scientific studies document these risks.

An Environmental Risk Assessment for this biopesticide has not been conducted by the EPA to determine the environmental, ecological, and human health risks; and the significant environmental consequences of the project have not been adequately studied. **This plan may actually cause the extinction of endangered native birds, and it could impact human health.**

Landscape level control of *Culex quinquefasciatus* mosquitoes using this Incompatible Insect Technique (IIT) has never been done before. Even with *Aedes* mosquitoes, the largest project area was 724 acres⁸. Federal documentation connected to this project confirms that “although used world-wide for human health, *Wolbachia* IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.”⁹ Additionally, the species planned for use in this project, *Culex quinquefasciatus*, has never been used for a stand-alone IIT field release.⁸ It is inaccurate to state that *Wolbachia* IIT is being used for mosquito suppression globally. The majority of countries using *Wolbachia* mosquitoes through the World Mosquito Program¹⁰ are using the method of population replacement, not suppression¹¹. These are two entirely different techniques.

This project may have also been improperly segmented per HAR § 11-200-7¹² (replaced 2019). The revised rule, HAR § 11-200.1-10¹³ – Multiple or phased actions, provides:

A group of actions shall be treated as a single action when:

- (1) The component actions are phases or increments of a larger total program;
- (2) An individual action is a necessary precedent to a larger action;
- (3) An individual action represents a commitment to a larger action; or
- (4) The actions in question are essentially identical and a single EA or EIS will adequately address the impacts of each individual action and those of the group of actions as a whole.

On June 17, 2022, Board of Land and Natural Resources Chairperson Suzanne D. Case signed an exemption notice for “Mosquito Control Research Using *Wolbachia*-based Incompatible Insect Technique.”¹⁴ The Final Environmental Assessment, dated March 24, 2023, states that the Department of Land and Natural Resources filed the exemption notice “to conduct limited import of male mosquitoes for preliminary transport trials and mark release recapture studies.”¹

The Hawaii Environmental Policy Act (HEPA) Citizen’s Guide (2014)¹⁵ states: “A proposed action must be described in its entirety and cannot be broken up into component parts, which if each is taken separately, may have minimal impact on the environment. Segmenting a project generally is forbidden.” Because the project has been improperly segmented in this way, there have been no details or analysis of the preliminary trials or the mark release recapture studies. There has been no disclosure as to what type of mosquito is being transported, where the mosquitoes are being transported from, and whether or not the mosquitoes are being tested for pathogens prior to transport. We demand that all actions of the mosquito project – including trial imports, mark release recapture studies, and field releases – be addressed in one Environmental Impact Statement.

The Advisory Committee on Plants and Animals’ recommendation to approve import and release of *Culex quinquefasciatus* mosquitoes¹⁶ should be null and void due to the conflicts of interest of committee members pursuant to HRS 84-14¹⁷. The Ethics Guide for State Board and Commission Members¹⁸ states that members must not take official action affecting a business in which they have “financial interest.” “Financial interest” in a business includes “employment.” Whether a business can be a government agency is unstated. The following members of the Advisory Committee on Plants and Animals unanimously voted (7/0) on June 9, 2022 to recommend approval of the import permit¹⁶:

- Darcy Oishi, Committee Chairperson, Hawaii Department of Agriculture (HDOA)
- Dr. Maria Haws, Professor of Aquaculture, Pacific Aquaculture & Coastal Research Center, University of Hawaii at Hilo
- Cynthia King, Entomologist, Division of Forestry & Wildlife, Department of Land & Natural Resources (DLNR), Ex Officio Member Designated Representative

- Gracelda Simmons, Environmental Management Program Manager, Hawaii Department of Health, Ex Officio Member Designated Representative
- Thomas Eisen, Planner, Environmental Review Program, Department of Business, Economic Development and Tourism, Ex Officio Member Designated Representative
- Joshua Fisher, Wildlife Biologist, U. S. Fish and Wildlife Service (USFWS)
- Dr. Samuel Ohu Gon III, Senior Scientist and Cultural Advisor, The Nature Conservancy – Hawaii (TNC)

Of the seven voting members' agencies, only those of Thomas Eisen and Darcy Oishi are not partner agencies in *Birds, Not Mosquitoes*. As employees of partner agencies, Dr. Maria Haws (University of Hawaii), Cynthia King (DLNR), Gracelda Simmons (Hawaii Department of Health), Joshua Fisher (USFWS), and Dr. Samuel Ohu Gon III (TNC) all have conflicts of interest.

Both Dr. Samuel Ohu Gon III¹⁹ and Cynthia King²⁰ are also members of the *Birds, Not Mosquitoes* steering committee. The purpose of the steering committee, as stated in the National Fish and Wildlife Foundation Hawaii Conservation Business Plan²¹, includes coordinating permits for this project. These are additional conflicts of interest, particularly for Dr. Samuel Ohu Gon III, who, with his vote, has taken official action affecting a business in which he has financial interest.

The Final Environmental Assessment (EA) does not address the concern of accidental pathogen introduction. The U.S. Department of the Interior Strategy for Preventing the Extinction of Hawaiian Forest Birds⁹ confirms that The Nature Conservancy has contracted with mosquito lab Verily Life Sciences. There is no mention of this contract in the EA. No documented assurances have been made that Verily Life Sciences will be testing mosquitoes for human diseases or avian diseases to ensure that they are pathogen-free prior to shipping to Hawaii.

As this project involves the interstate transport of *Culex* mosquitoes, a known vector of poultry diseases, we are concerned about impacts to local poultry farms and egg production in Hawaii. Has the USDA inspected the Verily Life Sciences insectary? There is no mention in the EA of a USDA permit (e.g., OV VS 16-6 permit from APHIS) for the interstate transport of poultry pathogen vectors by a California shipper. The USDA Animal and Plant Health Inspection Service (APHIS)²² states:

“The Veterinary Services, Organisms and Vectors (OV) Permitting Unit regulates the importation into the United States, and interstate transportation, of organisms and vectors of **pathogenic diseases** of livestock and **poultry**.

The Code of Federal Regulations, in 9 CFR, §122.2²³, mandates that ‘**no organisms or vectors shall be imported into the United States or transported from one State or Territory or the District of Columbia to another State or**

Territory or the District of Columbia **without a permit.**' ”

Given that interstate transport of the vector (live *Culex*) is occurring from Maui to Verily Life Sciences' lab in South San Francisco, California²⁴, and those *Culex* may contain a highly contagious poultry pathogen, namely avian pox virus²⁵, this movement needs a federal permit. Additionally, the return trip from California to Hawaii²⁴ would require a federal permit. Lab mosquitoes are blood-fed from sources that are not identified in the EA, potentially including bird blood. These mosquitoes could be transporting avian pathogens back to Hawaii.

Even though male mosquitoes don't bite, male *Culex* mosquitoes are known to spread viruses to female mosquitoes through mating (e.g., St. Louis encephalitis virus²⁶), as has been shown for dengue virus in *Aedes albopictus*²⁷.

The EA's assertion that released mosquitoes pose no risk to human health is based on unsound science. The 2010 article by Popovici et al.²⁸ cited in the EA has been discredited by the EPA. The EPA Human Studies Review Board met in 2018²⁹, 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?”³⁰

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.”³⁰

The Hawaii Department of Agriculture has applied for an EPA Emergency Exemption⁸ for use of the mosquitoes without going through regulatory safety processes. The EPA application is still under review, and the biopesticide mosquitoes have not been approved for emergency release. The Board of Land and Natural Resources cannot approve this Final Environmental Assessment and declare before the public that there is a Finding of No Significant Impact (FONSI) when there is still a possibility that the EPA will deny the Emergency Exemption due to safety concerns. This biopesticide cannot be approved for release when its safety is still under review by the EPA.

Additional concerns not adequately addressed in the Final Environmental Assessment: lack of adequate detail as required by HEPA¹⁵; failure to identify the *Wolbachia* strain planned for use in this project; failure to identify and describe the mark release recapture study as a proposed action; failure to adequately identify the mosquito packages planned for release into the environment; failure to adequately address the effects on the environment from the release of biodegradable packages with an unknown decay rate; failure to identify biosecurity protocols; failure to

adequately address viewscape impacts, noise disturbances to forest bird breeding and nesting, and significant environmental consequences, including impacts to the untrammled, natural qualities of the wilderness character; failure to adequately address the potential negative impacts of introducing an invasive species to the islands; failure to identify the origin of biopesticide mosquitoes for this project as Palmyra Atoll⁸; failure to identify the origin of *Wolbachia* bacteria for the project as Kuala Lumpur in Malaysia⁸; failure to identify the strain of *Wolbachia* bacteria planned for import in connection with this project that does not exist on these islands^{31,32}; failure to address the concerns of tropical disease and vector expert Dr. Lorrin Pang (private citizen) regarding the serious risks of this project³³; failure to adequately study or address the impacts to endangered native Hawaiian hoary bats, native dragonflies, and endangered native damselflies; failure to study and address biopesticide wind drift; failure to adequately address Environmental Justice (human health impacts of this project have not been adequately studied, and the proposed action would impact ethnographic resources and traditional cultural practices); failure to conduct a feasibility study to provide a detailed analysis that considers all of the critical aspects of the proposed project in order to determine the likelihood of it succeeding; and failure to establish, under the precautionary principle, that the proposed activity will not result in significant harm.

Further, per HRS §171-4 (d)³⁴, BLNR Chair Dawn N.S. Chang and Board Member Vernon Char must recuse themselves from participating in any discussion or voting in this matter, given that they have clear conflicts of interest. Chang is employed by the DLNR³⁵, a lead agency in the mosquito project. Char is employed by a law firm³⁶ whose clients include The Nature Conservancy³⁷, another lead partner in the project.

Hawaii Unites has launched a petition to "Demand an Environmental Impact Statement for the Experimental Mosquito Release on Maui"³⁸ which has received more than 2,500 signatures. We have yet to receive a response from any of the decision makers.

We're opposed to the authorization for the Chairperson to issue a Finding of No Significant Impact (FONSI). The scope, risks, and experimental nature of the plan require detailed, comprehensive studies and documentation of the impacts to our native birds, wildlife, environment, and public health. The subject action will have a significant effect. **We demand an Environmental Impact Statement (EIS).**

Mahalo,
Tina Lia
Founder and President
Hawaii Unites
HawaiiUnites.org

REFERENCES:

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compares <https://www.worldmosquitoprogram.org/en/learn/how-our-method-compares>

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- 4. Hawaii Environmental Policy Act (HEPA) Citizen's Guide (2014) https://files.hawaii.gov/dbedt/erp/OEQC_Guidance/2014-GUIDE-HEPA-Citizens-Guide.pdf
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- 6. HRS 84-14 https://www.capitol.hawaii.gov/hrscurrent/vol02_ch0046-0115/HRS0084/HRS_0084-0014.htm
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- 9. Facebook: Birds, Not Mosquitoes: Get to know Birds, Not Mosquitoes (4/22/22) <https://www.facebook.com/BirdsNotMosquitoes/photos/a.106335221571876/315991167272946/>
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- ii. 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>
- iii. Sexual transmission of dengue viruses by *Aedes albopictus* – L. Rosen (NIH National Library of Medicine, 9/1987) <https://pubmed.ncbi.nlm.nih.gov/3661831/>
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- vi. April 24-26, 2018 EPA Human Studies Review Board Meeting Report https://www.epa.gov/sites/default/files/2018-07/documents/final_hsrp_report_from_april_2018.pdf
- vii. HDOA Request to Import Southern House Mosquitoes for Immediate Field Release (6/9/22) <https://hdoa.hawaii.gov/wp-content/uploads/2018/05/DLNR-Culex-quinquefasciatus-PA-All-Docs.pdf>
- viii. University of Hawaii at Mānoa Request to: (1) Determine if the Establishment of the Southern House Mosquito, *Culex quinquefasciatus*, a Vector of Avian Influenza in Hawaii, Constitutes an Ecological Disaster;... (4) Determine the Probable Impact on the Environment if the Southern House Mosquito, *Culex quinquefasciatus*, an Unlisted Insect, Inoculated with a Foreign Wolbachia Bacteria Species, is Accidentally Released;... (6/8/21) https://hdoa.hawaii.gov/wp-content/uploads/2018/05/HDOA-Mosquito-Request-PA_Final-6.8.21.pdf
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- x. Hawaii Revised Statutes HRS §171-4 https://www.capitol.hawaii.gov/hrscurrent/vol03_ch0121-0200d/HRS0171/HRS_0171-0004.htm
- xi. Dawn N.S. Chang Financial Disclosure filed

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i. Vernon Char Financial Disclosure filed

6/1/22 <https://hawaiiethics.my.site.com/public/s/hsecm-fd-public/a0i6R00000TQdsNQAT/fd2022010431>

j. Char Sakamoto Ishii Lum & Ching Attorneys at Law (Present and Former Clients: The Nature Conservancy) <http://lawcsilc.com/Clients.html>

k. Petition: Demand an Environmental Impact Statement for the Experimental Mosquito Release on Maui https://www.change.org/Maui_Mosquito_Experiment_EIS

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

Within *Culex quinquefasciatus*, the strain of incompatible bacterium will be *Wolbachia wAlbA*, *Wolbachia wAlbB*, or *Wolbachia wPip4*. These *Wolbachia* bacterium are not present within the corresponding species of Hawaii's established mosquito population. The presence of this bacterium will make these males sexually incompatible with the wild, established female mosquitoes. Once imported, the male, sexually incompatible males will be released according to EPA and HDOA label directions to suppress the population of the established mosquito populations. Based on the prior use of this technology in California, Florida, and Kentucky, there are no data to suggest releases of these male mosquitoes to have a negative impact on agriculture, the environment, or public health and safety. Existing wild-type bacteria strain that may be imported is wPipV, which is already found on all of the main Hawaiian islands.

DISCUSSION:

1. Persons Responsible:

DLNR Chairperson, Suzanne Case
DOFAW Administrator, David Smith
DOFAW Entomologist, Cynthia King
Department of Land and Natural Resources – Oahu
1151 Punchbowl Street, Honolulu, HI 96813

DLNR-DOFAW, Hawaii Invertebrate Program Captive Propagation Facility -
Oahu
779 Ulukahiki Street, Kailua, Honolulu, HI 96813, (808) 266-7989

DLNR Waimano Baseyard – Oahu
2680 Waimano Home Road, Pearl City, HI 96782, (808) 266-7989

Kaua'i Branch Manager, Sheri Mann, Division of Forestry & Wildlife, 3060 Eiwa
Street Rm. 306, Lihue, HI 96766. (808) 274-3433

O'ahu Branch, Division of Forestry & Wildlife, 2135 Makiki Heights Drive,
Honolulu, HI 96822. (808) 973-9778

Maui (& Moloka'i) Branch, Division of Forestry & Wildlife, 1955 Main Street,
Room 301, Wailuku, HI 96793. (808) 984-8100

Hawai'i Branch, Division of Forestry & Wildlife, 19 E. Kawili Street, Hilo, HI
96720. (808) 974-4221

2. Locations and Safeguards:

All mosquitoes for import will originate from Hawaii biotypes collected from

- *Wolbachia albopictus A (wAlbA)* imported in *C. quinquefasciatus*. In Hawaii, this strain already exists in *Aedes albopictus*.
- *Wolbachia albopictus B (wAlbB)* imported in *C. quinquefasciatus*. In Hawaii, this strain already exists in *Aedes albopictus*.
- *Wolbachia wPip4* imported in *C. quinquefasciatus*. This strain does not currently exist in Hawaii. It naturally exists in parts of Europe, Asia, the Middle East, and Africa, and is bidirectionally incompatible with strain *wPip5*. Strain *wPip5* is the most common strain in *C. quinquefasciatus* in Hawaii (Atkinson, C. T., W. Watcher-Weatherwax, and D. A. LaPointe. (2016) Genetic diversity of *Wolbachia* endosymbionts in *C. quinquefasciatus* from Hawaii, Midway Atoll and American Samoa. Technical Report HCSU-074).

Once imported, we will rear the imported mosquitoes to the maximum capacity of our facilities. Male mosquitoes with one or more of the imported strains (*wAlbA* / *wAlbB* / *wPip4*) could then be used for incompatible crosses to females that carry *wPip5*. The attached letter from the DLNR describes how there is an ecological disaster occurring (*i.e.* Hawaii's native birds going extinct). The imported mosquito[es] are intended for release (only males are intended for release) to mitigate this disaster. Based on the prior use of this technology in California, Florida, and Kentucky, we do not expect releases of these male mosquitoes to have a negative impact on agriculture, the environment, or public health and safety.

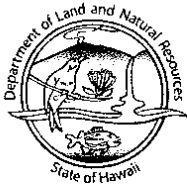
PQB NOTES: *In addition to this request, the applicants have submitted a request to import the aforementioned species of unlisted Wolbachia bacteria. The import request for the Wolbachia species was submitted to the PQB Advisory Subcommittee on Bacteria for review and recommendation. The Advisory Subcommittee on Bacteria unanimously deemed these Wolbachia species to be low risk, and recommended approval of the import request via a letter of authorization. Hawaii Administrative Rules §4-71A-25(b) states: "An unlisted microorganism that is determined by the department to be a low risk microorganism may be allowed import by a letter of authorization issued by the Chief without advisory committee review or board approval."*

DISCUSSION:

1. Persons Responsible:

- 1) Floyd A. Reed, UHM, 2538 McCarthy Mall, Edmondson Hall 216, Honolulu, Hawaii 96822, (808) 956-6489.
- 2) Matthew Medeiros, University of Hawaii at Mānoa, 1993 East-West Road, Honolulu, Hawaii 96822 Ph: (808) 956-8187

DAVID Y. IGE
GOVERNOR OF
HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

EXEMPTION NOTICE

Regarding the preparation of an environmental assessment under the authority of
Chapter 343, HRS and Section 11-200.1-17, HAR

Project Title:	Mosquito Control Research Using <i>Wolbachia</i> -based Incompatible Insect Technique
Project Location:	Maui (2) 2-3-005:004: Waikamoi Preserve (2) 2-4-016:004: Waikamoi Preserve (2) 1-2-004:013: Hanawi Natural Area Reserve (2) 2-3-005:001: Haleakala National Park (2) 1-8-001:007: Haleakala National Park (2) 1-3-001:003: Haleakala National Park (2) 1-7-004:016: Haleakala National Park (2) 1-6-001:001: Haleakala National Park (2) 1-6-001:002: Haleakala National Park (2) 1-2-010:001: Haleakala National Park Kauai (4) 1-4-001:003: Alakai Wilderness Preserve (4) 1-4-001:013: Kokee State Park
Chapter 343 Trigger(s):	Use of State Funds and Lands
Project Description:	<p>The main objective of this project is to initiate research to inform incompatible insect technique applications for the control of invasive <i>Culex quinquefasciatus</i> mosquitoes which are the primary vector of avian malaria. The disease threatens the survival of remaining endangered forest bird species where they persist in high elevation montane forest habitat on Maui and Kauai.</p> <p>Male mosquitoes which have been given an incompatible strain of <i>Wolbachia</i> bacteria are to be released on the landscape, and upon release those males will breed with wild female mosquitoes. As a result of those pairings, the wild female mosquitoes will lay eggs which will not hatch, and no offspring will be produced. When releases of incompatible male mosquitoes are completed consecutively, the approach results in the suppression of mosquito populations at a landscape-scale. If releases are halted, mosquito</p>

	<p>populations will gradually return to pre-release levels as wild female and male mosquitoes migrate back into the treated area from surrounding forest habitat. Initial research will contribute to EPA registration of male <i>Culex quinquefasciatus</i> mosquitoes with <i>Wolbachia</i> as a biopesticide, as well as determine the minimum number of male mosquitoes that must be released in each area to ensure population suppression.</p> <p>This project may be funded by Federal sources.</p>
Consulted Parties:	U.S. Fish and Wildlife Service
Authorization:	November 13, 2015, Land Board submittal (C-6). Delegation of Authority to the Chairperson or their authorized representative to declare exempt from the preparation of an Environmental Assessment those Department actions which are included in the Department-wide exemption list when the Board of Land and Natural Resources has delegated the authority to conduct those actions.
Exemption Class & Description:	<p>Exemption Classes:</p> <p>General Exemption Type 5 <i>Basic data collection, research, experimental management, and resource and infrastructure testing and evaluation activities that do not result in a serious or major disturbance to an environmental resource.</i></p> <p>PART 1</p> <p>13. Research that the Department declares is designed specifically to monitor, conserve, or enhance native species or native species' habitat. 16. Research to identify, monitor, control, or eradicate introduced species.</p> <p>Date of Agency Exemption List: November 10, 2020.</p>
Determination:	The Department of Land and Natural Resources declares that this project will likely have minimal or no significant impact on the environment and is therefore exempt from the preparation of an environmental assessment under the above exemption classes.

DES

Suzanne D. Case

Jun 17, 2022

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

Date

Signature:



2

Email: david.g.smith@hawaii.gov

From: Fretz, Scott scott.fretz@hawaii.gov
Subject: RE: MRR Study: Makawao Forest Reserve
Date: February 9, 2023 at 2:30 PM
To: Tina Lia tinalia@live.com



Aloha Ms. Lia:

Thank you for your follow up inquiry. You are correct that an exemption was filed for the MRR study. However, after further review and scheduling, it is our intention to carry out the MRR study as part of the actions described and analyzed in the EA. The MRR study will be done using IIT mosquitoes, as described in the EA.

Scott

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From: Tina Lia <tinalia@live.com>
Sent: Thursday, February 2, 2023 3:04 PM
To: Fretz, Scott <scott.fretz@hawaii.gov>
Subject: [EXTERNAL] MRR Study: Makawao Forest Reserve

Aloha Dr. Fretz,

Thank you for your message explaining that the DLNR does not intend to initiate the mark-release-recapture (MRR) study until the EA has received final approval. It had been my understanding that the MRR study was not part of the proposed action in the EA. It was not mentioned nor described as part of the proposed action. Rather, the EA states that "DLNR filed an **exemption notice** regarding the preparation of an environmental assessment under the authority of Chapter 343, Hawaii Revised Statutes (HRS) and Section 11-200.1-17. HAR, to conduct limited import of male mosquitoes for preliminary transport trials and **mark release recapture studies**."

When I asked about the MRR study at the virtual public meeting for the EA on January 5, 2023, Chris Warren said that the study would happen in the western project area. The project area map shows Makawao Forest Reserve to be the westernmost parcel.

Following is the question I posed and the response (26:25 marker):

Q: (Tina Lia) "Regarding the mark-release-recapture study mentioned in the environmental assessment, why is the study necessary, and when and where will it be occurring? Will incompatible mosquitoes be released as a part of that study?"

A: (Chris Warren) "Yeah, that's great. You know, the mark-release-recapture study is part of the initial field trials, and we would learn really critical things during those trials that would make sure that this method is as efficient as it possibly can be. And at the moment, **we are discussing not using IIT mosquitoes for this at all**. It would be, you

know, again only male mosquitoes released in a small area, likely in the **western portion of the project area** that is more readily accessible but still away from places that people access on a regular basis."

I found his answer concerning because the release of compatible male mosquitoes, rather than the incompatible ones, is something that is not mentioned or evaluated in the EA. Providing potential male mates could increase the mosquito population, which could have adverse impacts to forest birds. This is at odds with the EA which specifically states, "This project would release only male mosquitoes with a different strain of *Wolbachia* bacteria to that occurring in southern house mosquitoes in East Maui."

Could you please clarify which is the environmental review document that covers the mark-release-recapture study? Is it the EA exemption notice or the draft EA? The draft EA makes it seem that the exemption notice covers the MRR study, but your answer implies that the MRR study is covered by the EA. Also, the EA is only for the release of incompatible mosquitoes, whereas compatible mosquitoes are being discussed for release in the western project area as part of the MMR.

Thank you for taking the time to respond to these concerns.

Aloha,
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On Feb 2, 2023, at 11:06 AM, Fretz, Scott <scott.fretz@hawaii.gov> wrote:

Aloha Ms. Lia:

Thank you for your inquiry. The actions proposed for the mark-release-recapture study are covered in the Environmental Assessment (EA) that was published on December 23, 2022. We do not intend to initiate the study until the EA has received final approval. Therefore, no decisions have been made regarding the Makawao Forest Reserve as a study site.

Scott

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From: Tina Lia <tinalia@live.com>
Sent: Monday, January 30, 2023 1:39 PM
To: Fretz, Scott <scott.fretz@hawaii.gov>
Subject: [EXTERNAL] MRR Study: Makawao Forest Reserve

Aloha Mr. Fretz,

I'm writing inquire about the Mark-Release-Recapture (MRR) study for the State of Hawaii's multi-agency *Birds, Not Mosquitoes* project "Mosquito Control Research Using Wolbachia-based Incompatible Insect Technique." Can you confirm that the Makawao Forest Reserve is a release site for the MRR study? If so, have signs been posted notifying the public of the MRR study being conducted?


Mahalo,
Tina Lia
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RESEARCH

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Wolbachia infection in wild mosquitoes (Diptera: Culicidae): implications for transmission modes and host-endosymbiont associations in Singapore

Huicong Ding[†], Huiqing Yeo[†] and Nalini Puniamoorthy^{*†} 

Abstract

Background: *Wolbachia* are intracellular bacterial endosymbionts found in most insect lineages. In mosquitoes, the influence of these endosymbionts on host reproduction and arboviral transmission has spurred numerous studies aimed at using *Wolbachia* infection as a vector control technique. However, there are several knowledge gaps in the literature and little is known about natural *Wolbachia* infection across species, their transmission modes, or associations between various *Wolbachia* lineages and their hosts. This study aims to address these gaps by exploring mosquito-*Wolbachia* associations and their evolutionary implications.

Methods: We conducted tissue-specific polymerase chain reaction screening for *Wolbachia* infection in the leg, gut and reproductive tissues of wild mosquitoes from Singapore using the *Wolbachia* surface protein gene (*wsp*) molecular marker. Mosquito-*Wolbachia* associations were explored using three methods—tanglegram, distance-based, and event-based methods—and by inferred instances of vertical transmission and host shifts.

Results: Adult mosquitoes (271 specimens) representing 14 genera and 40 species were screened for *Wolbachia*. Overall, 21 species (51.2%) were found positive for *Wolbachia*, including five in the genus *Aedes* and five in the genus *Culex*. To our knowledge, *Wolbachia* infections have not been previously reported in seven of these 21 species: *Aedes* nr. *fumidus*, *Aedes annandalei*, *Uranotaenia obscura*, *Uranotaenia trilineata*, *Verrallina butleri*, *Verrallina* sp. and *Zeugomyia gracilis*. *Wolbachia* were predominantly detected in the reproductive tissues, which is an indication of vertical transmission. However, *Wolbachia* infection rates varied widely within a mosquito host species. There was no clear signal of cophylogeny between the mosquito hosts and the 12 putative *Wolbachia* strains observed in this study. Host shift events were also observed.

Conclusions: Our results suggest that the mosquito-*Wolbachia* relationship is complex and that combinations of transmission modes and multiple evolutionary events likely explain the observed distribution of *Wolbachia* diversity across mosquito hosts. These findings have implications for a better understanding of the diversity and ecology of *Wolbachia* and for their utility as biocontrol agents.

Keywords: *Wolbachia*, *Wolbachia* surface protein gene, Reproductive endosymbiont, Tissue-specific polymerase chain reaction, Transmission modes, Host-endosymbiont association

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Background

Wolbachia are intracellular endosymbiotic bacteria that alter host reproduction [1]. They are widespread in arthropods, infecting a wide range of insect, crustacean, and nematode species [2, 3]. In some cases, *Wolbachia* exist in a mutualistic relationship with their hosts [4–6]. However, *Wolbachia* are most often recognised as reproductive manipulators that bias the sex ratio of the host offspring towards the production of more infected females [7, 8]. This reproductive manipulation is commonly achieved through four phenotypes—male killing [9], feminisation [10, 11], parthenogenesis [12, 13], and cytoplasmic incompatibility [14, 15]—which increase the endosymbiont's reproductive success [16]. Owing to their strong influence on host reproduction, an increasing amount of research is being dedicated to exploring the impacts of reproductive endosymbionts on host population dynamics and evolution [17, 18], especially in medically important insects such as mosquitoes. The promising use of *Wolbachia* to alter both mosquito reproduction [19] and arboviral transmission [20] has prompted the deployment of novel *Wolbachia*-infected mosquitoes for population replacement and suppression [21].

Several countries, including Singapore, have started to employ *Wolbachia* as biocontrol agents of mosquitoes by releasing infected mosquitoes [22–24]. However, the presence of naturally occurring endosymbionts in wild mosquito populations has not been adequately assessed. The release of mosquitoes artificially infected with *Wolbachia* might have a profound impact on closely interacting wild mosquito populations through various transmission modes. For instance, horizontal transmission of an introduced *Wolbachia* strain may result in manipulation of the reproductive biology of non-target species, which could potentially result in an unintentional population crash, opening up niches for other vector species [25]. Another possible effect of this type of biocontrol method is the increased likelihood of co-infections with other naturally occurring *Wolbachia* strains or other endosymbionts, such as *Cardinium*, *Rickettsia*, and *Spiroplasma*. These co-infections may result in a synergistic effect on mosquito host fitness and future transmission of endosymbionts [26–29]. Without a detailed characterisation of *Wolbachia* prevalence and diversity among wild mosquitoes, the ecological risk of releasing artificially infected mosquitoes might be overlooked. Therefore, bearing the precautionary principle in mind, it is important to investigate the natural occurrences of *Wolbachia*.

There is also a need to discern the main mode of infection transmission among mosquitoes. Although *Wolbachia* are mainly thought to be vertically transmitted [15, 30], there have been accounts of horizontal

transmissions into wild populations through parasitism [31, 32], or through proximity to infected individuals [33]. *Wolbachia* may not be strictly localised in germline tissues, as they have also been detected in somatic tissues such as the gastrointestinal tract and haemolymph [34–36]. The detection of *Wolbachia* in the gastrointestinal tract suggests that they could be horizontally transmitted through uptake from the environment or host sharing [34, 37, 38], whereas their detection in non-gastrointestinal somatic tissues, such as those of jointed appendages, could indicate horizontal bacterial genome integration into the host genome [36]. Currently, detection of *Wolbachia* in mosquitoes is mostly achieved through conventional polymerase chain reaction (PCR) methods using DNA extracted from an entire individual or its abdomen [39–47]. This limits our ability to identify the site of endosymbiont infection within an individual (tissue tropism). Tissue-specific screening of *Wolbachia* is necessary to provide insights and infer the extent of vertical and horizontal transmission.

It has been proposed that host mitochondrial DNA (mtDNA) and *Wolbachia* are maternally co-transmitted within the cytoplasm [17, 48], which suggests a congruency between host mtDNA and *Wolbachia* phylogenies—a consequence of cytoplasmic hitchhiking driven by endosymbiont transmission [17]. In insect systems such as bedbugs where vertical transmission has been established to be the main mode of transmission, *Wolbachia* exhibit clear patterns of cophylogeny with their hosts, with few instances of host shifting or multiple infections within a single host species [49, 50]. In contrast, cophylogeny is not apparent among nematodes and bees, and numerous acquisitions of *Wolbachia* infections through horizontal transmission as well as losses have been shown in these diversified host lineages [51, 52]. The modes of *Wolbachia* transmission among mosquitoes have not been well established, nor has the extent of multiple infections within mosquito hosts or host shifting of these bacteria.

There is presently no comprehensive analysis of the evolutionary associations between *Wolbachia* and their mosquito host species. An understanding of host-endosymbiont associations will not only further our ability to discern the mode of transmission which influences *Wolbachia* diversity, but will also allow for an evaluation of *Wolbachia* host specificity, speciation, and their ability to establish in new hosts. All of this is key to understanding the diversity and ecology of *Wolbachia*, and their utility in biocontrol methods.

This study has three major research objectives. First, to examine the prevalence and diversity of *Wolbachia* among wild mosquitoes from Singapore. Second, to determine the tissue tropism of *Wolbachia* infection

in mosquitoes using a tissue-specific PCR screening method. Finally, to reconstruct the evolutionary associations between *Wolbachia* and their mosquito hosts to provide a basis for an understanding of host-endosymbiont evolution.

Methods

Adult mosquito collection and identification

Mosquito samples were collected from 12 localities across Singapore between March 2018 and November 2019 (Fig. 1a). Three methods were employed to collect the samples: CO₂-baited Centers for Disease Control and Prevention traps, sweep-netting using hand-held fan traps, and larval sampling [53]. For the latter, dipping was carried out at streams and ponds and pipettes were used to collect larvae from various microhabitats, including tree holes, plant axils, and artificial containers. Thereafter, the field-collected larvae were reared to adults in an incubator maintained at 26 °C and 70% relative humidity, under a 12:12-h (day:night) photoperiod. Larvae were fed with pulverised fish food (TetraMin Granules) daily. Mosquitoes were identified using relevant taxonomic keys and descriptions [54–59]. A subset of individuals from commonly sampled species was selected and preserved in phosphate-buffered saline solution at – 80 °C for subsequent dissection step.

Tissue-specific dissection

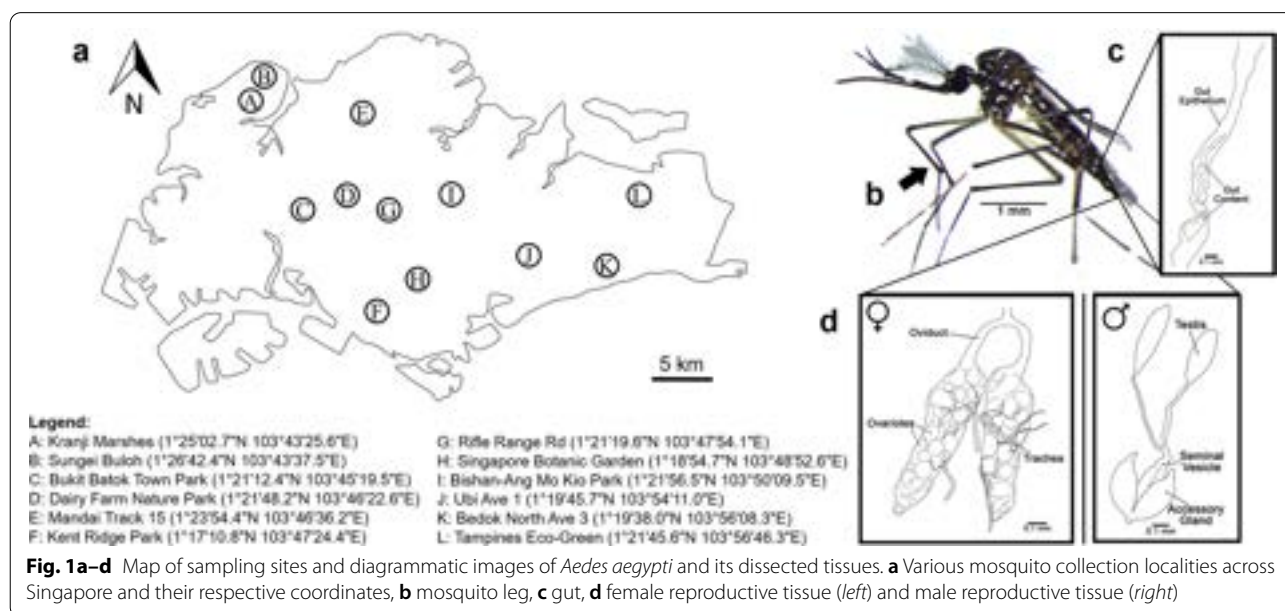
Tissue-specific dissection was carried out on each adult mosquito sample to isolate the leg, gut, and reproductive tissues (Fig. 1b–d). To prevent the contamination of tissues with bacteria on the external surface of the

mosquito, the leg was removed first before isolating the gut and reproductive tissues. All dissection equipment and microscope slides were thoroughly wiped with 70% ethanol before commencing dissection of the next sample. Dissected tissues were individually placed into a 96-well plate on ice to prevent DNA degradation.

DNA extraction, PCR amplification, and sequencing

DNA extraction of each dissected tissue was performed using 7 µl of QuickExtract DNA Extraction Solution (Lucigen, Madison, USA) in a thermocycler (Eppendorf, Hamburg, Germany) with the following protocol: 65 °C for 18 min, followed by 98 °C for 2 min, ending with cooling on ice for at least 10 min. All dissected tissues were screened for *Wolbachia* infections following single-primer PCR protocols described by Martin et al. [26] with slight modifications to the cycle conditions. The *Wolbachia* surface protein gene (*wsp*) general primers, *wsp*81F (5'-TGGTCCAATAAGTGATGAAGAAAC TAGCT-3') and *wsp*691R (5'-AAAAATTAACGCTA CTCCAGCTTCTGCAC-3'), were used in this study [60]. In addition, a fragment of the cytochrome c oxidase subunit I (*cox1*) gene of the mosquito hosts was also amplified using primers LCO1498 (5'-GGTCAACAA ATCATAAAGATATTGG-3') and HCO2198 (5'-TAA ACTTCAGGGTGACCAAAAAATCA-3') [61]. This served to confirm host identity and acted as an internal control. We used DNA from known *Wolbachia*-infected *Nasonia* specimens as positive controls for this study.

All PCR procedures were performed in reaction mixtures consisting of 12.5 µl of GoTaq G2 Green Mastermix (Promega, Madison, USA), 1 µl of 1 mg ml⁻¹ bovine



serum albumin, 0.184 μ l of 25 mM magnesium chloride, 1.5 μ l of extracted DNA, and 1.5 μ l each of 5 μ M *wsp* forward and reverse primers for *Wolbachia* PCR screens or 1.0 μ l each of 5 μ M LCO1498 and HCO2198 primers for *cox1* PCRs. Double-distilled water was used to top up the reaction mixture to a final volume of 25 μ l. PCR amplification of positive and negative controls was also conducted simultaneously.

PCR conditions were as follow: 94 °C for 5 min, followed by 35 cycles of 95 °C for 30s, 55 °C for 45s, and 72 °C for 1 min, with a final elongation step of 72 °C for 10 min. Amplicons were separated by gel electrophoresis on 2% agarose gel stained with GelRed (Biotium, Fremont, USA) and visualised under a ultraviolet transilluminator (Syngene, Cambridge, UK). PCR products were purified using SureClean Plus (Bioline, London, UK) following the manufacturer's protocol. Samples were sequenced by First Base Laboratories (Axil Scientific, Singapore), using a 3730XL DNA Analyzer (Applied Biosystems, Waltham, USA). Obtained sequences were edited and aligned using Geneious Prime (version 2019.2.3) (<https://geneious.com>). Similarities with publicly available sequences were assessed using the Basic Local Alignment Search Tool (BLAST) [62].

Statistical analyses

To test if there were significant differences in *Wolbachia* infection across the different mosquito tissues, Cochran's Q-test was carried out. As a follow-up, McNemar's post hoc test was employed to identify the tissue pairs that differed significantly in infection. Individuals for which the internal control (*cox1* gene) was not amplified successfully for any of the three dissected tissues were excluded from this statistical analysis. The effect of sex on host infection was also tested using binary logistics regression with sex as a categorical dependent variable and infection outcome as a binary independent variable. Logistic regression was conducted on a subset that only included species that had a roughly similar representation of both sexes, i.e. for every species included, the number of individuals of the less common sex was proportionally at least 60% of the number of individuals of the more common sex. This was to prevent a biased analysis due to a dataset with unequal representation of the sexes. Statistical significance was determined as $P < 0.05$. All statistical analyses were performed in R version 3.6.2 [63] with packages *nonpar* [64], *rcompanion* [65], and *ISLR* [66].

Sequence analyses

Multiple alignment of consensus sequences was carried out using the ClustalW algorithm with default settings (gap penalty = 15, gap extension penalty =

6.66) [67], in software MEGA X [68]. Mosquito *cox1* sequences generated in this study were aligned with 61 reference *cox1* barcodes of identified local mosquitoes from Chan et al. [53]. For *wsp* sequences, the generated sequences were aligned with 54 available *wsp* sequences of known *Wolbachia* strains obtained from GenBank [69]. Short sequence reads (< 500 base pairs) were excluded.

Neighbour-joining (NJ) phylogenetic trees for mosquito hosts and *Wolbachia* were reconstructed using the sequenced *cox1* gene fragment and the *wsp* gene, respectively. *cox1* sequences from previous publications were not included because a comparison of the genetic relationships between the hosts was not the aim of this research. Instead, 54 *wsp* sequences from GenBank were included in the construction of the *Wolbachia* NJ tree. The NJ tree reconstruction was performed with the Kimura two-parameter model as the nucleotide substitution model in MEGA X [68]. Internal gaps were treated as indels and terminal gaps as missing for *wsp* sequences. Bootstrap probabilities were estimated by generating 1000 bootstrap replicates. We designated two biting midge species, *Culicoides asiana* (KJ162955.1) and *Culicoides wadai* (KT352425.1), as outgroups for the host NJ tree construction. Due to the lack of an appropriate endosymbiont outgroup [51], the *Wolbachia* NJ tree was midpoint rooted.

When possible, *Wolbachia* strains were classified into supergroups and putative strains using 97% bootstrap probability as a threshold [60]. *Wolbachia* surface protein sequences that did not have 97% bootstrap support were evaluated on a case-by-case basis. For example, sequences which clustered closely together and had a relatively high support value (> 90%) were deemed as originating from the same putative strain.

Putative strains which were infectious to only one host species were categorized as 'specialists' and those which infected two or more hosts as 'generalists'. Then, the standardised phylogenetic host specificity (SPS) score of each generalist strain was calculated by adapting the method outlined by Poulin et al. [70] and Kembel et al. [71]. SPS measures the degree of phylogenetic relatedness among host species infected by the same endosymbiont strain. It also tests for significance by comparing it with null models generated with 999 replicates of random host-endosymbiont associations. A positive SPS value with a high P -value ($P > 0.95$) indicates a high degree of host flexibility where *Wolbachia* infect hosts which are phylogenetically even. A negative SPS value with low P -value ($P < 0.05$) suggests a low degree of host flexibility where the infected hosts are phylogenetically clustered together. SPS scores were calculated using R package *picante* [71].

Evolutionary analyses of the mosquito-*Wolbachia* relationship

Three distinct methods were used to explore the evolutionary associations between mosquito hosts and their *Wolbachia* endosymbionts. The analyses were carried out using pruned phylogenies where each species is represented by a single individual.

First, using the software TreeMap 3.0 [72], a tanglegram was created between host and endosymbiont NJ trees to visualise mosquito-*Wolbachia* associations. A tanglegram is useful as a pictorial representation of the interactions between two phylogenies [73]. TreeMap also seeks to minimise the entanglement between the two trees to provide a clearer visualisation of the phylogenetic relationship between host and endosymbiont [72].

Second, ParaFit Global test, a distance-based method, was employed to quantitatively estimate congruence between the host and endosymbiont phylogenetic trees by comparing genetic distances among infected host species and the *Wolbachia* strains [74]. The null hypothesis for this test states that the associations between host and endosymbiont trees are random, whereas the alternative hypothesis suggests that there are strong associations between hosts and parasites, which are indicated by phylogenetic distances. Significance was tested by comparing the observed associations between host and endosymbiont with randomised associations generated with 5000 permutations. The respective host-endosymbiont associations which contributed significantly to the ParaFit Global statistics were also identified by performing a Parafit Link test. ParaFit tests were performed with the Cailliez correction to correct for negative eigenvalues generated [75] using R package ape [76].

Third, an event-based analysis was performed in Jane 4.0 [77] to map out potential evolutionary events of the endosymbiont in relation to the host phylogeny [78]. Five evolutionary events were considered: co-speciation (host and endosymbiont speciate simultaneously), duplication (intra-host speciation), duplication with host shift (endosymbiont host shifts), loss (host speciates but endosymbiont fails to establish in one of the new lineages), failure to diverge (host speciates and endosymbiont remains in both lineages). As each event is expected to have differing likelihoods, default cost values were attached to each of the events. Jane 4.0 determined the best reconstruction of evolutionary events by minimising the overall cost. The following cost-scheme regime was used with 100 generations and a population size of 300: co-speciation = 0, duplication = 1, duplication with host shift = 2, loss = 1, and failure to diverge = 1 [79]. As a follow-up, random tip mapping (randomisation of host-endosymbiont associations) was carried out for 50 iterations, to determine if the overall cost of reconstruction was significantly lower

than expected by chance. If 5% or fewer of the random solutions have costs lower than the reconstructed coevolution phylogeny, there is support for the coevolution of the hosts and endosymbionts through co-speciation.

Results

Prevalence of *Wolbachia* in wild-caught mosquitoes

A total of 271 adult mosquitoes, representing 40 species and 14 genera, were collected from 12 localities in Singapore (Fig. 1a). Overall, infection prevalence was moderate with 119 out of 271 (43.9%) individuals screening positive for *Wolbachia* (Table 1). In total, 21 (51.2%) species were positive for *Wolbachia*. According to our knowledge, *Wolbachia* infection in seven of these species is reported here for the first time (Table 1). *Wolbachia* were detected in all genera except for *Aedeomyia*, *Anopheles* and *Mimomyia* (i.e. 11 out of 14 genera; 78.6%). Five out of the seven *Aedes* species collected (71.4%) were positive for *Wolbachia*, while in the genus *Culex*, five out of 16 species (31.3%) were positive. Some of the screened species in the genera *Aedes* and *Culex* that were positive for *Wolbachia*, such as *Aedes albopictus* and *Culex quinquefasciatus*, are medically important vector species.

The infection rates varied across the mosquito species. Notably, there was variation in the percentage of infection between species that are epidemiologically related. For instance, *Wolbachia* infection was not detected in *Aedes aegypti*. However, infection was moderately high (56.8%) for *Aedes albopictus*. There was also a difference in the infection rate of two closely related species, *Culex pseudovishnui* (86.4%) and *Culex vishnui* (0%) [53].

Locality did not seem to play a role in the *Wolbachia* infection of mosquito hosts. Among species that have a wide range across Singapore, the percentage of infection was consistent in populations across different habitats. For example, the infection percentage was consistently high for *Cx. pseudovishnui*, while consistently low for *Malaya genurostris*. Based on our results, species identity was a better predictor of infection status than locality.

Based on a data subset containing 153 individuals (45.8% males) representing 12 mosquito species, sex was a significant explanatory variable, and there was a significantly lower infection prevalence in males than females (odds ratio 0.434; binary logistics regression: $Z = -2.48$, $df = 151$, $P = 0.013$).

Tissue tropism of *Wolbachia* infection in mosquitoes

Among the 159 successfully amplified *cox1* sequences, *Wolbachia* infection was mainly observed in the reproductive tissues. Among the reproductive tissues of 159 dissected individuals, 42.1% ($n = 67$) were infected. Percentage infection was lower in the gut (5.7%, $n = 9$) and leg (3.1%, $n = 5$) tissues. The difference in

Table 1 Percentage infection of *Wolbachia* in 40 mosquito species collected from 12 Singapore localities

Mosquito species	Localities												Total	Infection (%)	Supergroup
	BN	BA	BB	DF	KR	KJ	M	RR	SBG	SBL	T	U			
<i>Aedeomyia catastica</i>	-	0/1	-	-	-	-	-	-	-	-	-	-	0/1	0.0	-
<i>Aedes aegypti</i>	0/1	-	-	-	-	-	-	-	-	-	-	0/13	0/14	0.0	-
<i>Aedes albolineatus</i>	-	-	-	-	-	-	0/3	-	-	-	-	-	0/3	0.0	-
<i>Aedes albopictus</i>	-	-	-	6/10	6/10	3/6	6/11	-	-	-	-	-	21/37	56.8	A, B
<i>Aedes annandalei</i> ^a	-	-	-	-	3/4	-	8/9	-	-	-	-	-	11/13	84.6	A
<i>Aedes nr. fumidus</i> ^a	-	-	-	-	-	-	-	-	-	6/10	-	-	6/10	60.0	A
<i>Aedes gardnerii</i>	-	-	-	-	-	-	1/1	-	-	-	-	-	1/1	100.0	A
<i>Aedes malayensis</i>	-	-	-	1/2	13/16	0/2	-	-	-	-	-	-	14/20	70.0	A
<i>Anopheles barbirostris</i> complex	-	-	-	0/2	-	-	0/2	-	-	-	-	-	0/4	0.0	-
<i>Anopheles lesteri</i>	-	-	-	-	-	0/2	-	-	-	-	-	-	0/2	0.0	-
<i>Anopheles sinensis</i>	-	0/12	-	-	-	-	-	-	-	-	-	-	0/12	0.0	-
<i>Armigeres kesseli</i>	-	-	-	-	3/3	-	-	-	-	-	-	-	3/3	100.0	B
<i>Coquillettidia crassipes</i>	-	-	-	2/2	6/7	4/4	-	-	-	-	-	-	12/13	92.3	B
<i>Culex (Lophoceromyia) spp.</i> ^c	-	-	-	-	0/1	0/2	1/9	-	-	-	0/2	-	1/14	7.1	B
<i>Culex bitaeniorhynchus</i>	-	-	-	-	0/1	-	-	-	-	-	-	-	0/1	0.0	-
<i>Culex brevipalpis</i>	-	-	-	0/1	-	-	0/2	-	-	-	-	-	0/3	0.0	-
<i>Culex nigropunctatus</i>	-	-	-	-	-	0/1	0/2	-	-	-	-	-	0/3	0.0	-
<i>Culex pseudovishnui</i>	-	-	-	-	11/12	-	4/4	-	3/5	1/1	-	-	19/22	86.4	B
<i>Culex quinquefasciatus</i>	-	5/8	-	-	-	-	-	-	-	-	-	-	5/8	62.5	B
<i>Culex sitiens</i>	-	-	-	-	-	-	-	-	-	2/4	-	-	2/4	50.0	B
<i>Culex sp.</i>	-	-	-	-	-	-	0/2	-	-	-	-	-	0/2	0.0	-
<i>Culex tritaeniorhynchus</i>	-	-	-	-	-	2/5	-	-	-	0/1	0/1	-	2/7	28.6	UC ^b
<i>Culex vishnui</i>	-	-	-	-	-	-	0/2	-	-	-	0/3	-	0/5	0.0	-
<i>Malaya genurostris</i>	-	-	2/4	-	0/1	4/13	-	-	0/1	-	-	-	6/19	31.6	B
<i>Mansonia dives</i>	-	-	-	-	-	-	0/2	-	-	-	-	-	0/2	0.0	-
<i>Mansonia indiana</i>	-	-	-	-	-	3/3	-	-	-	-	-	-	3/3	100.0	B
<i>Mimomyia luzonensis</i>	-	-	-	-	-	0/1	-	-	-	-	-	-	0/1	0.0	-
<i>Tripteroides sp.</i>	-	-	-	-	0/7	-	½	-	-	-	-	-	1/9	11.1	UC ^b
<i>Uranotaenia obscura</i> ^a	-	-	-	2/4	-	-	2/2	1/1	-	-	-	-	5/7	71.4	A
<i>Uranotaenia sp.</i>	-	-	-	1/2	-	-	-	-	-	-	-	-	1/2	50.0	A
<i>Uranotaenia trilineata</i> ^a	-	-	-	-	-	-	1/1	-	-	-	-	-	1/1	100.0	B
<i>Verrallina butleri</i> ^a	-	-	-	-	-	1/1	-	-	-	-	-	-	1/1	100.0	UC ^b
<i>Verrallina sp.</i> ^a	-	-	-	-	-	-	-	1/5	-	-	-	-	1/5	20.0	UC ^b
<i>Zeugomyia gracilis</i> ^a	-	-	-	1/2	-	-	1/13	1/4	-	-	-	-	3/19	15.8	B
Total	0/1	5/21	2/4	13/25	42/62	17/40	25/67	3/10	3/6	9/16	0/6	0/13	119/271	43.9	

BN Bedok North Avenue 3, BA Bishan-Ang Mo Kio Park, BB Bukit Batok Town Park, DF Dairy Farm Nature Park, KR Kent Ridge Park, KJ Kranji Marshes, M Mandai Track 15, RR Rifle Range Road, SBG Singapore Botanic Garden, SBL Sungei-Buloh, T Tampines Eco-Green, U Ubi Avenue 1

^a Species in which, according to our knowledge, *Wolbachia* infection has not been previously reported

^b *Wolbachia* infections that were unclassified (UC) with respect to supergroup [60] because their DNA sequences were either too short (< 400 base pairs), or there were alignment issues during the phylogenetic analyses

^c *Culex (Lophoceromyia)* comprises seven unique species, which were not identified here

percentage infection across the three dissected tissues was statistically significant (Cochran's Q-test: $Q = 109.5$, $df = 2$, $P < 0.0001$). The percentage of infection in the reproductive tissues was significantly higher than in the gut (McNemar's post hoc test: $P < 0.0001$) and

leg tissues (McNemar's post hoc test: $P < 0.0001$), but the difference in percentage of infection between the gut and leg tissues was not significant (McNemar's post hoc test: $P = 1.0$). Notably, the amplicon size of *wsp* in the gut and leg tissues tended to be shorter than 400 base pairs.

Wolbachia diversity among mosquito fauna from Singapore

Following Zhou et al. [60], all *wsp* sequences obtained in this study can be broadly classified into A and B *Wolbachia* supergroups. Out of 21 infected species, six were infected with supergroup A, ten with supergroup B, and one species, *Ae. albopictus*, was infected with both supergroups (Fig. 2). Infection of the remaining four species (*Culex tritaeniorhynchus*, *Tripteroides* sp., *Verrallina butleri*, and *Verrallina* sp.) was unclassified due to short sequences (< 400 base pairs) or sequence alignment issues during sequences analyses. The analysed *wsp* sequences were also clustered into 12 putative strains: ‘Wol 1’ to ‘Wol 12’. Four (Wol 1, Wol 2, Wol 3, and Wol 8) out of the 12 putative strains could be matched to previously typed strains [60, 80]. *Wolbachia* strains from this study are also closely related to those isolated from other insect groups (Fig. 2). For instance, Wol 9 and Wol 10 are closely related to the *Wolbachia* strains harboured by *Drosophila* spp. (bootstrap value > 99%).

Host specificity of Wolbachia strains

The degree of host specificity varied across the 12 putative strains. Seven out of the 12 strains (Wol 2, Wol 4, Wol 5, Wol 6, Wol 8, Wol 10, and Wol 12) were considered as specialists. These strains were host specific and were only detected in one host species each (Fig. 3). The remaining five strains were considered as generalists as they were found in more than one host. Amongst the generalists, Wol 3 was found in the highest number of host species, i.e. three, *Coquillettidia crassipes*, *Mansonia indiana*, and *Culex sitiens*. The SPS scores revealed that Wol 1 had the lowest degree of host flexibility (SPS test: $Z = -1.41, P = 0.049$). Wol 7 had the highest degree of host flexibility, but this was not statistically significant (SPS test: $Z = 0.07, P = 0.779$) (Table 2).

Evolutionary relationship between mosquitoes and Wolbachia

We recorded 18 counts of mosquito-*Wolbachia* associations in wild-caught mosquitoes from Singapore. A visualisation of these associations using a tanglegram showed patterns of broad associations (Fig. 3). For instance, the clade which consists of *Aedes* species was observed to be mostly associated with *Wolbachia* supergroup A. In contrast, other species, especially the clade representing various *Culex* species, had numerous associations with *Wolbachia* supergroup B.

The distance-based quantitative test showed that mosquito and *Wolbachia* phylogenies were weakly congruent at the global level (ParaFit Global test: ParaFit Global = 0.006, $P = 0.048$). Among the numerous

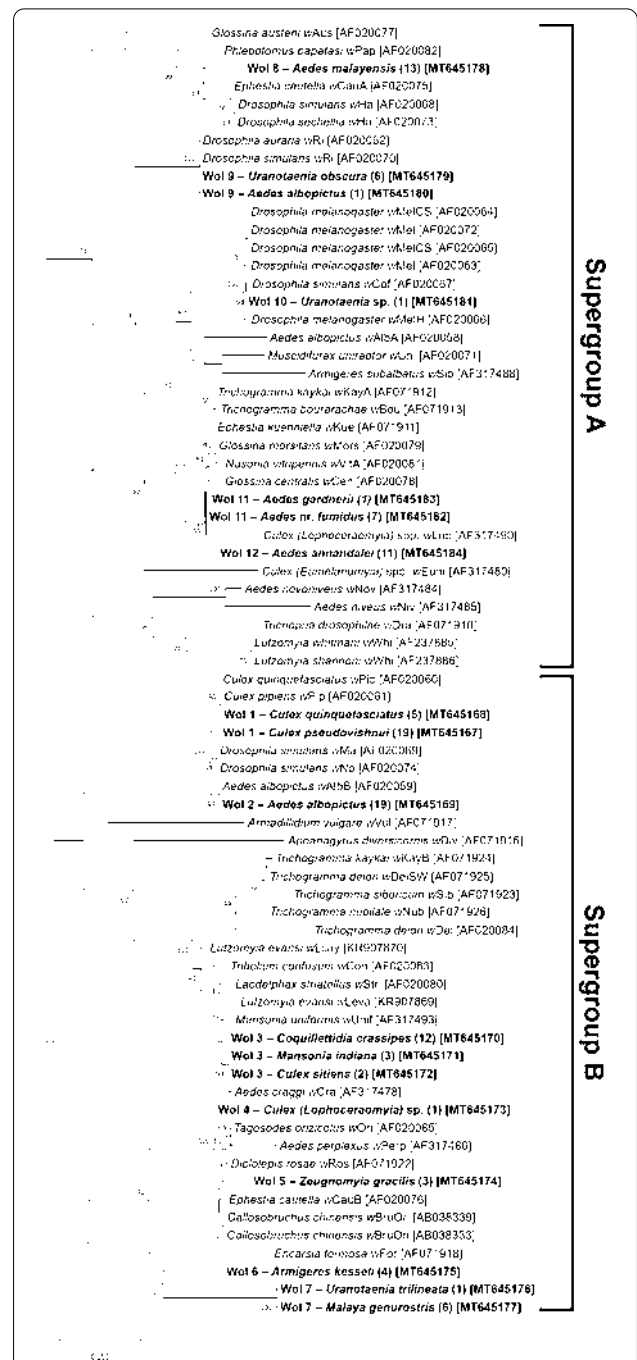


Fig. 2 *Wolbachia* neighbour-joining (NJ) tree constructed with the *Wolbachia* surface protein gene (*wsp*). All analysed sequences generated from this study (**bold**) were broadly classified into *Wolbachia* supergroups A or B and clustered into 12 putative strains (‘Wol 1’–‘Wol 12’). The number of sequences of each putative strain is indicated *within parentheses*. Also included are 54 sequences obtained from GenBank. Taxa are labelled as the host from which the *Wolbachia* strain was isolated, followed by the strain name. The NJ tree was mid rooted due to a lack of appropriate outgroups [45]. Bootstrap probability (generated with 1000 replicates) higher than 50% is indicated on the tree. Genbank accession number of each sequence is indicated *within brackets*

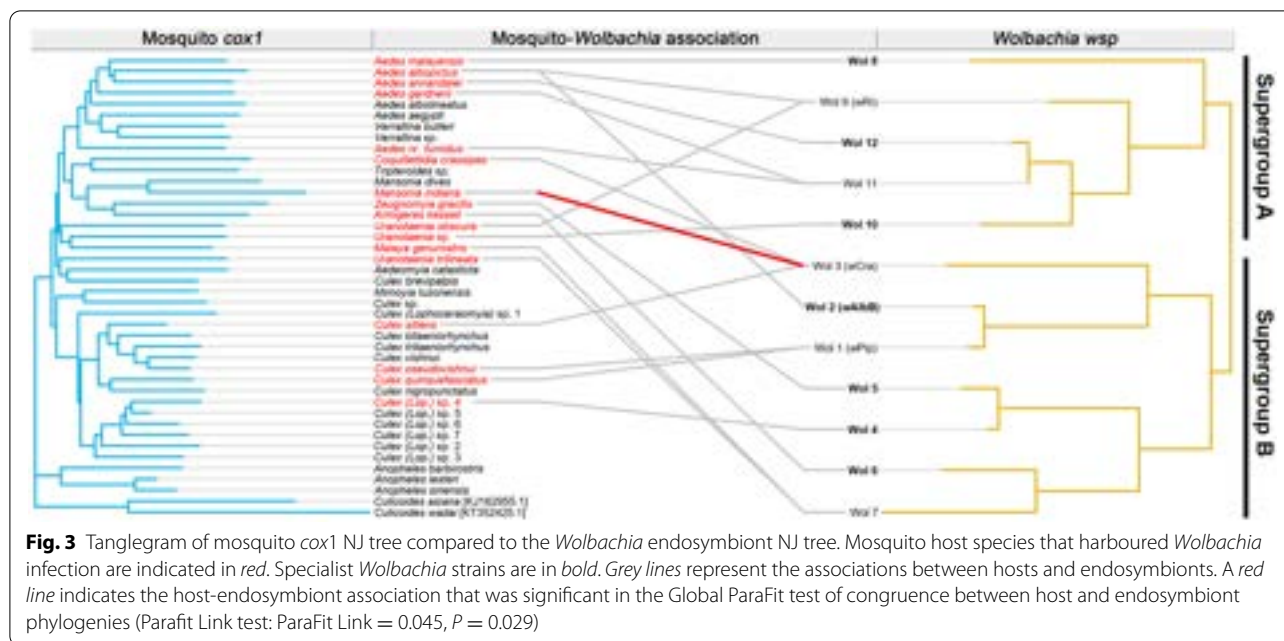


Table 2 Standardised phylogenetic host-specificity (SPS) scores of putative *Wolbachia* generalists

Putative <i>Wolbachia</i> strain	No. of infected hosts	Phylogenetic host-specificity score	SPS score	<i>P</i> -value
Wol 1	2	0.281	- 1.41	0.049*
Wol 3	3	0.391	- 0.162	0.421
Wol 7	2	0.281	0.068	0.779
Wol 9	2	0.281	- 0.234	0.249
Wol 11	2	0.281	- 0.817	0.157

* $P < 0.05$

host-endosymbiont links, only the association between *Mansonia indiana* and Wol 3 was statistically significant (ParaFit Link test: ParaFit Link = 0.045, $P = 0.029$) (Fig. 3).

The event-based analysis between mosquito and *Wolbachia* phylogenies resulted in a reconstructed output of one co-speciation event, three counts of duplication, seven counts of duplication with host shift, 29 losses, and six counts of failure to diverge, amounting to a total cost of 52 (Fig. 4). Interestingly, the number of duplications with a host shift and losses was much greater than co-speciation events. Notably, multiple host shift events tend to follow after loss events occurring earlier in the evolutionary history of the endosymbiont. For example, we see instances of consecutive host shifts to new hosts that were not previously infected (Fig. 4, red arrows). Additionally, based on random tip mapping, 14% of the random

solutions had lower costs than the reconstructed output. Overall, there was support for multiple host shift events and losses of *Wolbachia* among the mosquitoes, and no clear signal for mosquito-*Wolbachia* cophylogeny.

Discussion

Detection of *Wolbachia* infection and distribution in wild mosquitoes

In this study, the PCR-based *Wolbachia* screening method had a high positive detection rate with 86.3% of all sequenced amplicons having successful BLAST matches to *Wolbachia*. This suggests that the conventional PCR method used is adequate for *Wolbachia* detection. Even if the study had been carried out without the additional DNA sequencing step, observed amplicon bands would likely have indicated true positives.

Our results indicate that *Wolbachia* are widespread across members of the family Culicidae. To our knowledge, *Wolbachia* infections have not been previously reported in seven of the mosquito species collected in this study. Overall, the percentage infection of screened individuals was 43.9%, which was largely congruent with percentages reported in past studies from the Oriental region, i.e. 31% infection in Malaysia [81], 26.4% in Sri Lanka [39], and 61.6% in Thailand [82]. At the species level, previous studies reported *Wolbachia* infection in 40% of all tested mosquito species in India [83], 18.2% in Sri Lanka [39], 51.7% in Taiwan [84], and between 28.1% and 37.8% in Thailand [82, 85]. Our study showed that 51.2% of all tested species were infected with *Wolbachia*,

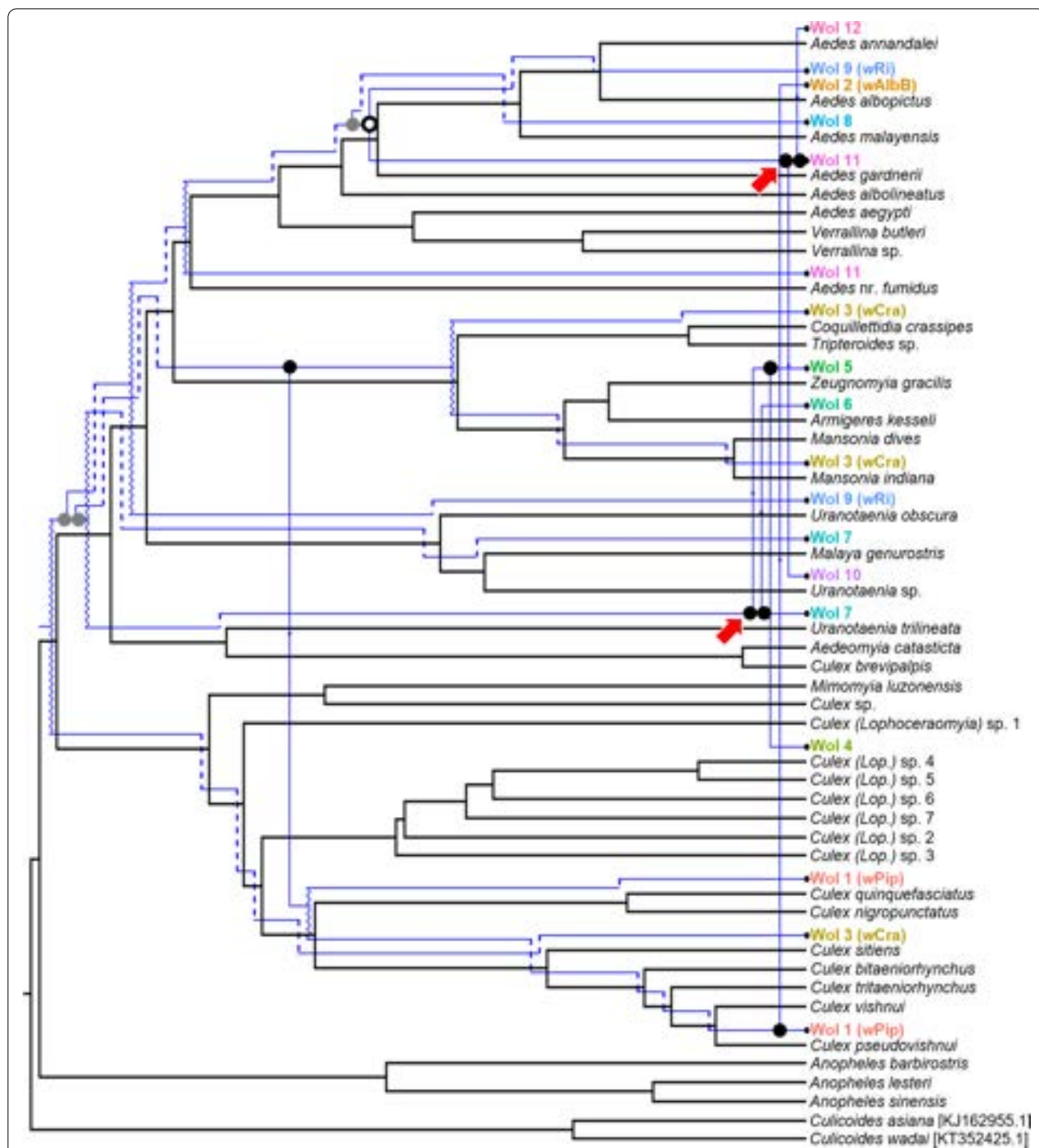


Fig. 4 Least-cost evolutionary reconstruction between mosquito (black) and *Wolbachia* (blue) phylogenies achieved using Jane 4.0. In total, one co-speciation event (open circle), three counts of duplication (grey dot), seven counts of duplication with host shift (black dot with an arrow pointing outwards), 29 losses (dotted line), and six counts of failure to diverge (squiggly line) were mapped out. Red arrows indicate periods where multiple host shifts occurred in succession

which is generally higher than the percentage reported in most studies. This was likely due to the broad range of species tested, including those from the genera *Malaya*,

Verrallina, and *Zeugomyia* [85]. It is also possible that infection prevalence may vary across geographical regions.

Wolbachia detection in three medically important mosquito genera, *Culex*, *Anopheles*, and *Aedes*, was highly consistent with that of past studies. These genera are responsible for the transmission of vector-borne diseases such as filariasis, malaria and arboviral diseases [86]. Within the genus *Culex*, *Wolbachia* infection has been reported to be variable across its member species [39, 46, 82, 84]. In this study, infections were observed only in five out of 16 *Culex* species. We noticed moderately high *Wolbachia* infection in *Cx. quinquefasciatus* (62.5%), which is a member of the *Culex pipiens* complex responsible for the transmission of filariasis in Singapore [86, 87]. Surprisingly, no *Wolbachia* infection was observed in *Cx. vishnui*—which has been found to harbour Japanese encephalitis virus in Southeast Asia [89]—although it is closely related to *Cx. pseudovishnui* [88] in which the rate of *Wolbachia* infection was high. However, studies in India and Thailand showed a reverse pattern, with *Wolbachia* infection present in *Cx. vishnui* but not in *Cx. pseudovishnui* [39, 85]. As the two species are morphologically similar [53], DNA barcoding was conducted to aid morphological identification, and thus avoid any misidentification. The results lend further support to possible variation in infection prevalence between geographically distant populations.

We did not detect *Wolbachia* in any of the wild-caught *Anopheles* species (18 individuals representing three species), many of which are potential malaria vectors [86]. This is largely consistent with previous reports from different countries [39, 90, 91]. The absence of *Wolbachia* in *Anopheles* mosquitoes is thought to be due to the unsuitability of *Anopheles* reproductive tissues for *Wolbachia* establishment [84, 85]. However, there have been recent reports of *Wolbachia* detected in wild *Anopheles* mosquitoes from West Africa [42, 92, 93] and Malaysia [94]. Knowledge of natural *Wolbachia* infections in *Anopheles* mosquitoes is important for malaria control strategies [93], hence more wild-caught *Anopheles* samples should be screened in Singapore to determine more accurately their infection status.

Wolbachia were not detected in *Ae. aegypti*, the primary vector of dengue in Southeast Asia [87]. Conversely, *Wolbachia* infection was moderately high in the secondary vector *Ae. albopictus*. These results are highly consistent with those of past studies, which reported an absence of infection in wild *Ae. aegypti* [21, 95], but found stable infection in wild *Ae. albopictus* [96]. Although *Ae. aegypti* and *Ae. albopictus* belong to the same subgenus, *Stegomyia*, and occupy similar ecological niches [97], they are rarely found in the same locality, [43, 98, 99], as also observed in this study. This could imply a certain degree of competitive exclusion between the two species, preventing them from occupying the same

space. There is evidence that symbionts may influence a host's resource acquisition and specificity, which may ultimately lead to competitive exclusion between closely related host species with differing symbiont infections [100, 101]. However, research on *Wolbachia*-induced competitive exclusion is scarce except for a few studies on heterogonic gall wasps [102], grasshoppers [103], and gall-inducing aphids [104]. Given the widespread influence of *Wolbachia*, future research should explore potential cases of *Wolbachia*-induced competitive exclusion between closely related species of mosquitoes as this may have major implications for an understanding of their symbioses and speciation.

Additionally, although *Ae. aegypti* is frequently artificially infected with *Wolbachia* for biocontrol purposes [105–109], our findings suggest that infected *Ae. aegypti* might not be stably maintained in the wild. This may be advantageous for vector population suppression as the cytoplasmic-incompatibility effect of any artificially introduced *Wolbachia* strain will likely be fully manifested in the uninfected native population [21]. However, this also implies that this type of biocontrol method may have low long-term effectiveness if the infection cannot be naturally sustained in the wild population. The detection of natural *Wolbachia* infection in wild *Ae. aegypti*, therefore, has huge implications for vector control programmes [21]. Not only does it inform the selection of a suitable *Wolbachia* strain prior to its field release, but it can also be used to gauge the long-term effectiveness of a specific vector control programme.

Interestingly, the sex of the mosquitoes had an effect on their *Wolbachia* infection status. This could be an artefact of various *Wolbachia*-induced reproductive phenotypes, such as parthenogenetic and male-killing ones, resulting in offspring that are largely female [15]. If this were true, over multiple generations with vertical *Wolbachia* transmission, one should observe an increasing proportion of females that are infected. Hence, the phenomenon observed here could be a consequence of reproductive manipulation by *Wolbachia* and vertical transmission.

While we were unable to statistically test for the effects of locality on infection status due to uneven and small sample sizes of the respective species across different localities, our results suggest that mosquitoes found in localities across Singapore have roughly equal chances of harbouring *Wolbachia*. This also suggests that underlying physiological factors and phylogenetic relatedness in mosquitoes contribute more to their infection by *Wolbachia* than the habitat in which they are found.

The reproductive effect of *Wolbachia* can be masked or enhanced by other reproductive endosymbionts such as *Cardinium*, *Rickettsia*, and *Spiroplasma* [7, 26–29]. Unfortunately, we were unable to detect these

endosymbionts due to a high degree of false positives with the PCR-based screening methods used here (Additional file 1). This was likely due to using primers that are not optimised for screening mosquito-specific endosymbionts [110–112]. As a result, co-infections with various reproductive endosymbionts, which would have provided greater insights into the synergistic effects of co-infections on mosquito evolution, could not be identified among the wild mosquitoes examined here. There is, hence, a need to develop and optimise alternative screening methods, such as multilocus sequence typing (MLST) techniques, especially for the detection of *Cardinium*, *Rickettsia*, and *Spiroplasma* in mosquitoes.

Tissue tropism of *Wolbachia* infection in mosquitoes

Wolbachia were detected mainly in the reproductive tissues, which agrees with results from studies across multiple insect groups [15, 84, 113], and suggests that *Wolbachia* are mainly vertically transmitted. Interestingly, through the course of this study, there was significant variation in reproductive traits (testis and ovary length) across and within species. These reproductive traits did not vary significantly with *Wolbachia* infection status, even after accounting for phylogenetic relatedness (see Additional file 2).

Infection in the gut and leg tissues was detected, albeit infrequently. This is not surprising, as previous studies have also detected *Wolbachia* in those tissues [34–36, 114]. Interestingly, the nucleotide sequences from gut and leg infections tend to be shorter in length. Considering that *Wolbachia* are unlikely to survive extracellularly for a long period of time [35], the small amplicon size suggests potential horizontal integration of the *Wolbachia* genome into the host genome for a few species. This phenomenon has been observed in several *Wolbachia* hosts [115, 116], and mosquito species such as *Ae. aegypti* and *Cx. quinquefasciatus* [117, 118]. A recent study showed that horizontal integration of the *Wolbachia* genome into the host genome can have implications for sex determination and evolution. This is evident in the common pillbug *Armadillidium vulgare*, and results in the formation of a new sex chromosome [119]. Researchers have also proposed that horizontal gene transfer between an endosymbiont and host can result in evolutionary innovation where new functional genes arise in both host and bacteria [117, 118].

Future research should explore the relative importance of each transmission method with relation to host-endosymbiont ecology and evolution. Tissue-specific screening methods such as those used here can be used in other arthropods, especially when the mode of transmission is not clear. Currently, most *Wolbachia* screening is conducted on ground specimens

or specimens in their entirety [39–41]. In these cases, researchers are unable to determine tissue tropism of *Wolbachia* infection, which could provide clues to its mode of transmission. Thus, adopting tissue-specific screening methods would enable researchers to verify or refute the commonly reported assumption that *Wolbachia* is transmitted vertically [15, 30].

Diversity and host-specificity of *Wolbachia* strains

Not only does the *wsp* molecular marker allow successful detection of *Wolbachia* infection across numerous taxa, it also enables strain genotyping and evolutionary comparison between detected *Wolbachia* strains [60]. In this study, *Wolbachia wsp* sequences were clustered into 12 putative *Wolbachia* strains falling within supergroup A or B. This is consistent with the results of previous studies that looked at *Wolbachia* infections in mosquitoes [39, 80, 85]. Each mosquito host species was only infected by strains belonging to supergroups A or B, with the exception of *Ae. albopictus*, which harboured both. Infection with more than one strain (superinfection of wild *Ae. albopictus* with *Wolbachia* supergroups A and B) has been previously reported, and this phenomenon was commonly observed to be fixed in the examined populations due to strong cytoplasmic incompatibility effects [120, 121]. This suggests stable vertical transmission of both strains in *Ae. albopictus*. Additionally, only four out of 12 putative strains were identified as previously typed *Wolbachia* strains reported by Zhou et al. [60] and Ruang-Areerate et al. [80]—Wol 1, Wol 2, Wol 3, and Wol 8 were identified as *wPip*, *wAlbB*, *wCra*, and *wRi* strain, respectively.

Host specificity is thought to be a characteristic of the ancestral *Wolbachia* strain, with host flexibility reported mainly in *Wolbachia* supergroups A and B [122]. In our study, we found a combination of specialists and generalists, with more of the former. A study of mosquitoes from Taiwan showed a similar pattern [84]. In beetles, a mixture of *Wolbachia* supergroup A host-specific and host-flexible strains within a population has also been reported [49]. While our estimates of specialists and generalists might vary with greater sampling effort, the higher numbers of specialists observed can be explained by the process of reciprocal selection between host and endosymbiont over evolutionary time [123]. This is also known as Red Queen dynamics, where the endosymbiont constantly adapts to its host to ensure continued establishment in the same host [124]. An alternative, generalist strategy can also be maintained in a population. It ensures survival in an environment where resources (i.e. hosts) are rarely found [123]. However, there are generally more instances of

host specialists than generalists across numerous parasitic and endosymbiotic taxa [125–127].

The SPS scores revealed that host flexibility among the generalists varied greatly. Understanding *Wolbachia* host specificity has huge implications, especially for the optimisation of *Wolbachia* biocontrol strategies. Not only should researchers select strains that can effectively limit pathogen replication [128], they should also select strains for their host specificity. This is not possible without the screening of a wide variety of species or closely related species, which was achieved in this study. Using a host-specific strain will decrease the likelihood of host shift to non-target species, and thereby minimise the overall ecological risk of a strategy.

Evolutionary relationships between mosquitoes and *Wolbachia*

Host-*Wolbachia* relationships are often understudied and limited to a few taxa [52]. Studies have shown that the evolutionary associations between *Wolbachia* and their insect hosts do vary across taxa [49–52, 129]. Likewise, our exploratory analyses of mosquito hosts and their *Wolbachia* infection support such a complex relationship, with neither co-speciation nor host shifting fully accounting for evolutionary association in these lineages.

Based on the tanglegram, a broad association pattern between mosquitoes and *Wolbachia* strains was observed (Fig. 3). *Aedes* mosquitoes tended to be associated with *Wolbachia* supergroup A, while other mosquito species, particularly of the genus *Culex*, were largely associated with *Wolbachia* supergroup B. This showed that closely related *Wolbachia* strains are likely to establish themselves in related hosts. There might have been radiation of *Wolbachia* in these clades after their respective initial establishment. Nevertheless, the observed variations in host-endosymbiont associations make us question the mosquito-*Wolbachia* association pattern.

The ParaFit analysis showed weak support for congruency between host and endosymbiont phylogenies. Among the 18 host-*Wolbachia* associations, only the link between *Mansonia indiana* and Wol 3 showed a significant association (Fig. 3). This was interesting considering that Wol 3 was largely host flexible. Given that this was the only significant association, it is worth carrying out further genus-specific study on *Mansonia* spp. to elucidate coevolutionary patterns within a group of closely related mosquito species. It is possible that the degree to which *Wolbachia* co-evolve with their mosquito hosts varies across different taxonomic levels [74]. The analyses carried out thus far suggest that mosquito-*Wolbachia* associations are likely random at higher taxonomic levels, and that mosquito-*Wolbachia* co-speciation occurs at

finer phylogenetic resolution (i.e. similar to patterns seen in diffuse coevolution).

The event-based analysis performed in Jane 4.0 (Fig. 4) indicated that co-speciation events were infrequent as compared to other evolutionary events. We noticed a greater proportion of host shifts and numerous losses. Interestingly, the least cost coevolutionary reconstruction indicated multiple consecutive host shifts occurring near the tips of the cladogram. This suggests that co-speciation does not fully explain the evolutionary associations between mosquito hosts and *Wolbachia*. Instead, recent host shifting through horizontal transmission seems to promote *Wolbachia* diversification. This lends greater support to the idea that horizontal transmission between distantly related species is possible [32, 33, 130].

Furthermore, losses, which represent endosymbiont extinction events that occurred upon host speciation, seem to dominate the evolutionary history of *Wolbachia*. Extinction events are believed to be frequent in host-endosymbiont systems [123], due to either evolution of resistance in the host or declining host population size, which result in the inability of highly specialised endosymbionts to establish themselves [131, 132]. Additionally, losses could potentially influence endosymbiont evolution through the creation of vacant niches [131]. The observed losses followed by host shifts in the mosquito-*Wolbachia* relationship are possible consequences of vacant niche exploitation by generalists. Perhaps this enabled successful endosymbiont invasion due to minimal intra-strain competition. If this were true, horizontal *Wolbachia* transmission and losses may play a bigger role in accounting for *Wolbachia* diversity than previously thought.

As this was an exploratory study, we were unable to determine the exact mechanism behind the diversity and evolutionary associations of *Wolbachia*. The presence of numerous specialists could be a sign of mosquito-*Wolbachia* coevolution since coevolution is fundamentally reciprocal selection between host and endosymbiont which gives rise to micro-evolutionary changes [133]. The numerous host shifts and losses might have, however, blurred the effects of vertical transmission over a long evolutionary period [52]. Thus, co-speciation might have occurred within smaller clades of *Wolbachia* and mosquitoes, but at higher taxa levels, horizontal transmission and loss events are more likely the prominent force driving *Wolbachia* evolution.

Strengths, limitations, and future directions

The three distinct methods employed here to explore evolutionary associations have both strengths and limitations. The tanglegram allows for clear visualisation of host-endosymbiont association without taking into

account any evolutionary relationships, but there have been calls for careful interpretation of the results generated using this method as the degree of entanglement may not necessarily represent phylogenetic congruence [134]. The Global ParaFit test seeks to address this limitation by testing for global congruency with an unbiased, statistical approach [74]. The event-based method enables the evaluation of potential evolutionary events that might have occurred throughout an endosymbiont's evolutionary history such as co-speciation, duplication, and host shifting. This last method, however, cannot fully differentiate a topological congruence from an evolutionary event [135]. Without knowledge of the time of divergence for both symbiont and host, a co-phylogenetic pattern may be better explained by ecological factors (as compared to co-speciation) given that bacterial lineages often evolve faster than their hosts [136, 137], and the high likelihood of host shifts among closely related species [133].

The *Wolbachia wsp* gene has been shown to provide well-resolved phylogenies [60], and this study provides an exploratory snapshot of the evolutionary associations between mosquito hosts and their *Wolbachia* endosymbionts. There is, of course, a potential caveat, since only a single gene was used to construct the respective phylogenetic trees. To obtain a more accurate phylogeny, future studies could adopt MLST [17, 51], or whole-genome shotgun sequencing [52]. The former could potentially characterise putative *Wolbachia* strains that cannot be distinguished with *wsp* gene primers.

Notwithstanding their limitations, the employment of various analytical methods allows for a comprehensive examination of the evolutionary associations between *Wolbachia* and mosquito hosts which are presently lacking in the literature. The scope of future studies that examine the evolution of medically important vector species could be narrowed to the Aedini tribe, as this would provide greater statistical power for the examination of mosquito-endosymbiont associations.

Conclusion

To our knowledge, this is the first study to examine *Wolbachia* infections in wild mosquitoes in Singapore. We detected 12 putative strains of *Wolbachia* among 40 mosquito species, and recorded infections in seven species for which, to our knowledge, *Wolbachia* infections have not been previously reported. By employing a tissue-specific PCR screening method, we were able to observe that the *Wolbachia* infections were preferentially located in the reproductive tissues, which provides support for vertical transmission as the main mode of infection transmission. However, even if *Wolbachia* infection is mainly transmitted vertically, this is

unlikely to fully explain the observed diversity of *Wolbachia* and why closely related *Wolbachia* lineages were found in distantly related mosquito species. Hence, this study also served as an exploratory study which examined mosquito-*Wolbachia* evolutionary associations across a wide range of host mosquito species through three evolutionary analyses. Overall, we propose that the evolutionary associations between mosquito hosts and *Wolbachia* are consequences of both vertical and horizontal transmission and various evolutionary events.

Supplementary information

Supplementary information accompanies this paper at <https://doi.org/10.1186/s13071-020-04466-8>.

Additional file 1: Table S1. Polymerase chain reaction (PCR) screening of *Cardinium*, *Rickettsia*, and *Spiroplasma* in wild mosquitoes from Singapore.

Additional file 2: Figure S1. Weighted reproductive tissue length across various mosquito species.

Abbreviations

BLAST: Basic Local Alignment Search Tool; *cox1*: Cytochrome c oxidase subunit I gene; MLST: Multilocus sequence typing; mtDNA: Mitochondrial DNA; NJ: Neighbour joining; PCR: Polymerase chain reaction; SPS: Standardised phylogenetic host specificity; *wsp*: *Wolbachia* surface protein gene.

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Authors' contributions

HY and NP designed the research. HD and HY collected the mosquitoes from the field. HY identified the mosquito samples. HD performed the DNA extraction and PCR. HD and HY carried out the sequence analyses. HD, HY, and NP interpreted the results and wrote the manuscript. All the authors read and approved the final draft of the manuscript.

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Availability of data and materials

The datasets generated and/or analysed during this study are available in the Dryad repository, <https://doi.org/10.5061/dryad.zs7h44j63>. Sequence data that support the findings of this study have been deposited in Genbank with the accession codes MT645167–MT645184.

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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Opinion

Wolbachia Can Enhance *Plasmodium* Infection in Mosquitoes: Implications for Malaria Control?

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The symbiotic bacterium *Wolbachia* is an attractive agent for vector-borne pathogen control. It has long been studied for its ability to manipulate host reproduction and spread into arthropod populations [1]. These properties, coupled with the recently identified ability to inhibit diverse pathogens [2–6], open avenues for its use in controlling vector-borne disease. Numerous *Wolbachia*-based control strategies are being investigated (reviewed in [7–9]), with some studies having progressed to field trials [10,11]. However, a worrying trend is emerging whereby *Wolbachia* infections have been demonstrated to enhance rather than suppress pathogens in some systems [12–18]. *Plasmodium* parasites, which are the causal agent of malaria, seem particularly prone to *Wolbachia*-mediated pathogen enhancement [13–16].

Wolbachia-based strategies have been proposed to control malaria [19]. *Anopheles* mosquitoes (the vectors of human malaria parasites) are not naturally infected by *Wolbachia* [20,21], but artificial transfer of this bacterium between species can be accomplished in the laboratory (reviewed in [22]). Pathogen interference phenotypes appear to be most prominent when *Wolbachia* is transferred into a novel host [16,23]. Given that *Anopheles* are for the most part naturally uninfected by *Wolbachia* (but see [24]), they can be considered an open niche for infection and a prime mosquito genus for *Wolbachia*-based control strategies. However, the main impediment for developing a control strategy is the difficulty in creating a stable artificial infection in *Anopheles* [19]. While examining *Plasmodium* interference in a stably infected host is the gold standard, a more convenient system is to transiently infect mosquitoes by intrathoracic microinjection. Using this system, the infection persists during the lifetime of the transinfected individual but is not transmitted to its offspring. Transient infection allows the rapid assessment of *Wolbachia*-host interactions without the need for generating stable artificial infections [5]. It is uncertain how representative transient infec-

tions are of stable inherited associations; however, similarities in tissues tropism and fitness costs incurred upon the host between stable and transiently infected *Anopheles* mosquitoes are evident [5,14,25]. Furthermore, both types of infection have been shown to inhibit the human malaria parasite *Plasmodium falciparum* [5,25]. However, studies using transient infection models have found that *Wolbachia* can enhance certain *Plasmodium* species [13,14].

The *Plasmodium* interference phenotype is therefore not universal, but context dependent. While *P. falciparum* is suppressed by the *wAlbB* strain of *Wolbachia* from *Aedes albopictus* [5,25], transient infections have shown the opposite effect on rodent malaria parasites. *Anopheles gambiae* transiently infected with *wAlbB* exhibited enhanced *P. berghei* development at the oocyst stage [14]. Similarly, *wAlbB* increased the number of *P. yoelii* oocysts in *An. stephensi*, although the phenotype was modulated by temperature [13]. At a temperature optimal for parasite development, *Wolbachia* increased parasite intensity compared to uninfected controls, but at warmer temperatures, *Wolbachia* inhibited *Plasmodium* development [13].

While *P. falciparum* is a major parasite in sub-Saharan Africa, four other parasites also cause human malaria worldwide: *P. malariae*, *P. ovale*, *P. knowlesi*, and *P. vivax* (the etiological agent of the most prevalent form of relapsing malaria). To our knowledge, the effect of *Wolbachia* on these other human *Plasmodium* parasites

is unknown. The question is relevant for two reasons. First, the precedent that a particular *Wolbachia* strain can inhibit one parasite yet enhance another has already been documented [5,14], indicating that effects on parasites can be species-specific. Troublingly, *P. malariae*, *P. ovale*, *P. knowlesi*, and *P. vivax* are phylogenetically more closely related to rodent malaria parasites, which are enhanced by *Wolbachia* infections [13,14], than they are to *P. falciparum* (Figure 1) [26,27]. Second, many human *Plasmodium* parasites occur in sympatry and are transmitted by the same vectors. A case in point is *P. falciparum* and *P. vivax*, both of which occur in sympatry over large stretches of the Asian continent where they are both transmitted by *An. stephensi* [28,29]. Any potential control strategy devised in regions where more than one parasite species occurs needs to thoroughly investigate the effect of *Wolbachia* on all parasite species transmitted by the vector, as well as other pathogens such as filarial worms or arboviruses (both as single infections and in the context of coinfections) to ensure that *Wolbachia*-infected mosquitoes do not inadvertently enhance transmission of secondary pathogens.

While difficult, forecasting the long-term evolutionary response in this tripartite relationship between *Wolbachia*, *Plasmodium*, and *Anopheles* is very important. Natural *Wolbachia*-mosquito associations in which the symbiont and the host have tightly coevolved exist and may provide powerful models for studying the long-term evolutionary effects of *Wolbachia*

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Wolbachia association with host

- ⊙ Natural infection
- Stable artificial infection
- ◆ Transient infection

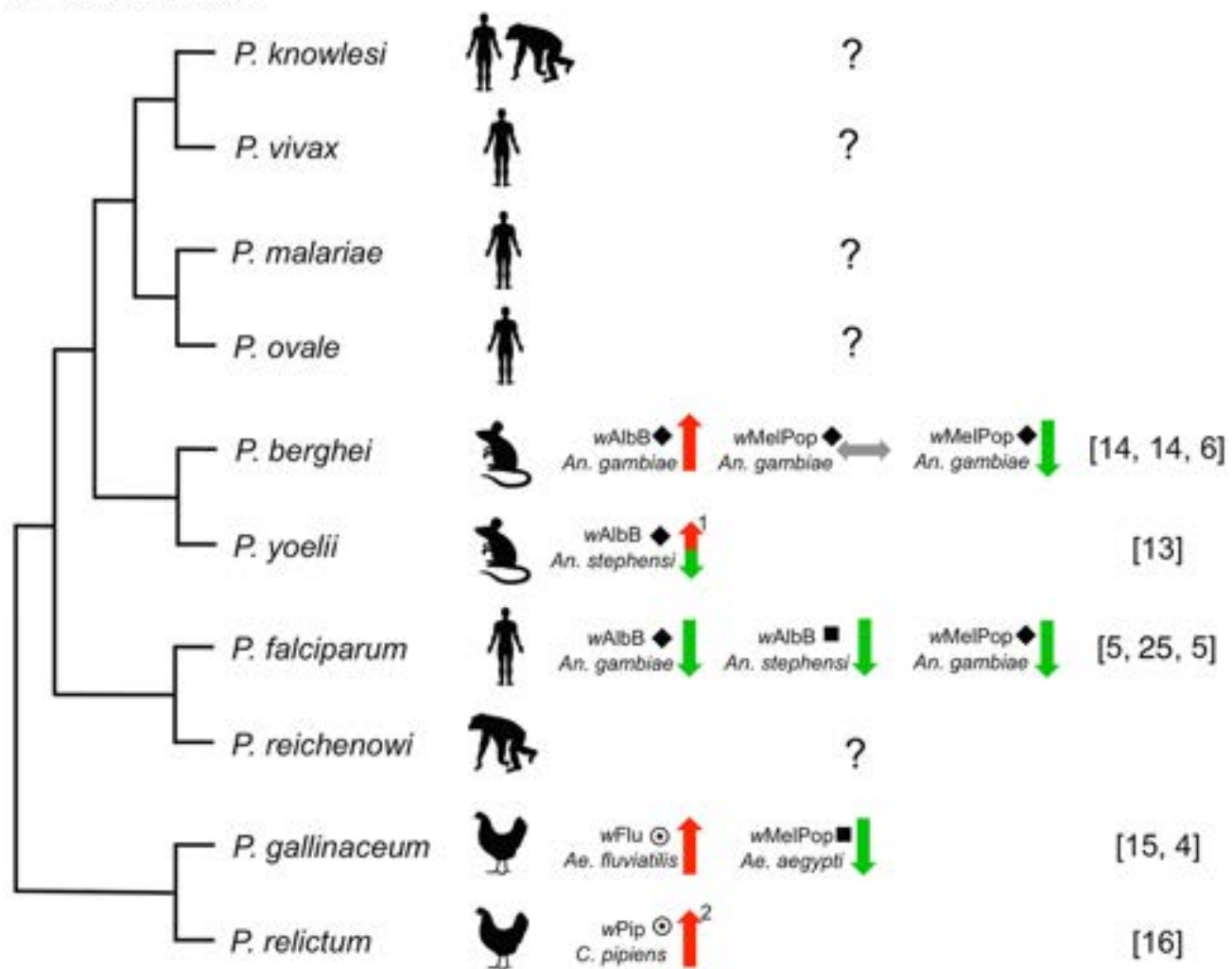


Figure 1. Representative phylogenetic dendrogram of *Plasmodium* parasites, their vertebrate hosts, and the influence of *Wolbachia* infection on parasite development within the mosquito vector. The protective effect of *Wolbachia* is variable and dependent on the *Wolbachia* strain and the insect host background, suggesting that complex tripartite interactions influence the effect on *Plasmodium*. The type of association between *Wolbachia* with the vector may also influence *Plasmodium*. Only one human malaria parasite (*P. falciparum*) has been assessed, while the effect of *Wolbachia* infection on the other four human parasites is unknown. Arrows indicate suppression (green), enhancement (red), or no effect (grey) of *Plasmodium*. The type of association within the host is depicted by symbols (target: natural infection, square: stable artificial infection, diamond: transient artificial infection). Numbers indicate: (1) the phenotype is temperature sensitive, (2) *Wolbachia* infection also increases insect life span [31], which has implications for pathogen transmission. Phylogeny was reconstructed based on work from Carlton et al. [26] and Martinsen et al. [27].

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infections. The evidence currently available suggests that natural *Wolbachia* infections can also enhance malaria parasite development within the mosquito. *Aedes fluviatilis* naturally infected with the wFlu *Wolbachia* strain had a significantly higher number of *P. gallinaceum* oocysts compared to an *Ae. fluviatilis* line which had been cleared of the *Wolbachia* infection [15]. *Ae. fluviatilis* is not,

however, a natural vector of *P. gallinaceum*, and it is well known that the outcome of experiments using such laboratory models can differ significantly from those of natural mosquito-*Plasmodium* combinations (e.g., Boete [30]). Recent studies carried out in *Culex pipiens* mosquitoes, which are naturally infected with the wPip *Wolbachia* strain and transmit the avian malaria parasite *P.*

relictum, have also demonstrated *Plasmodium* enhancement. In this natural system, *Wolbachia* protects the mosquito host against the detrimental fitness effects incurred by *Plasmodium* infection [31] and increases the susceptibility of *C. pipiens* to *P. relictum*, with wPip-infected mosquitoes having a higher prevalence of *Plasmodium* sporozoites in the salivary glands [16]. These studies show that the

Plasmodium-inhibiting properties of *Wolbachia* are far from universal; certain mosquito–*Wolbachia*–*Plasmodium* combinations and experimental conditions transform *Wolbachia*-infected mosquitoes into better vectors of malaria parasites. This is worrisome for the general implementation of *Wolbachia*-based control strategies.

Given that *Wolbachia*-based control strategies will use stable transinfected mosquitoes, the key question is whether stable and natural infections will behave in the same way. The stable transfer of *Wolbachia* into the host likely alters many aspects of host homeostasis, as evidenced by the novel phenotypes induced by infection [32–34], and as such, these associations likely differ from natural associations where *Wolbachia* and its host have coevolved. Another question is whether stable artificial infections will evolve over time. Theory and empirical studies show that these maternally transmitted bacteria will tend to evolve towards mutualistic associations with their host [35–38]. However, the evolutionary outcomes of pathogen interference or enhancement are harder to predict. A more complete mechanistic understanding of how *Wolbachia* infection modulates *Plasmodium* parasites is critical to address these important evolutionary questions and to evaluate if they are likely to occur in timescales relevant for disease control.

To date, two stable artificial *Wolbachia* transinfections have been assessed for their

effect on *Plasmodium*. First, an *Aedes aegypti* line infected with *wMelPop* had inhibited *P. gallinaceum* infection [4]; *Ae. aegypti* is not, however, the natural vector of this parasite. Second, and more recently, the *wAlbB* strain was stably transferred into *An. stephensi*, one of the main vectors of human malaria in Asia [25]. This groundbreaking work demonstrated that stable artificial infections in epidemiologically relevant malaria vectors are feasible, and that *P. falciparum* can be inhibited by *Wolbachia* within its natural vector. If the severe fitness effects induced by *Wolbachia* in *Anopheles* can be overcome [25], then this approach is highly promising.

The work by Bian and colleagues [25] dramatically enhances the prospect for the use of *Wolbachia* in a malaria control strategy, but many questions still remain. What are the effects of *Wolbachia* on the other four species of *Plasmodium* parasites that infect humans? How relevant are transient infection models? Do some strains of *Wolbachia* enhance pathogens in a field context? What are the long-term evolutionary consequences of novel *Wolbachia*-host associations on *Plasmodium* development within the insect host? What are the mechanisms behind pathogen interference and enhancement of *Wolbachia* on *Plasmodium* parasites, and are the mechanisms of enhancement seen in rodent and avian model systems relevant to human malaria parasites? How influential are environmental variables on

pathogen inhibition phenotypes? While many of these questions may be difficult to answer in the short term, assessing the relevance of transient infections would seem within the grasp of the scientific community. Although challenging, understanding the evolutionary consequences of novel *Wolbachia* associations on pathogen transmission and identifying the mechanisms behind *Wolbachia* modulation of *Plasmodium* is critical for developing effective control strategies and assessing their long-term feasibility. Insights from non-*Anopheline* systems where *Wolbachia* naturally infects the vector may be useful in this regard [16,31,39].

In conclusion, *Wolbachia*-based control of vector-borne pathogens is a promising novel strategy that has many advantages over other conventional and contemporary control methods. The development of a stable infection in *Anopheles* means the prospect of *Wolbachia*-based control of malaria can now be entertained [25], but many important questions need to be resolved before this idea can become a reality. While the concerns raised here focus on *Plasmodium*, these issues are relevant for *Wolbachia* control of any vector-borne pathogen [18]; we suggest that transinfected mosquitoes intended for release into nature should be assessed for inhibition (or lack thereof) of all relevant pathogens circulating in the system.

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[https://files.hawaii.gov/dlnr/meeting/audio/
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Exhibit “3”



STATE OF HAWAII
BOARD OF LAND AND NATURAL RESOURCES

PETITION FOR A CONTESTED CASE HEARING

OFFICIAL USE ONLY	
Case No.	Date Received
Board Action Date / Item No.	Division/Office

INSTRUCTIONS:

- File (deliver, mail or fax) this form within ten (10) days of the Board Action Date to:
 Department of Land and Natural Resources
 Administrative Proceedings Office
 1151 Punchbowl Street, Room 130
 Honolulu, Hawaii 96813
 Phone: (808) 587-1496, Fax: (808) 587-0390
- DLNR's contested case hearing rules are listed under Chapter 13-1, HAR, and can be obtained from the DLNR Administrative Proceedings Office or at its website (<http://dlnr.hawaii.gov/forms/contested-case-form/>). Please review these rules before filing a petition.
- If you use the electronic version of this form, note that the boxes are expandable to fit in your statements. If you use the hardcopy form and need more space, you may attach additional sheets.
- Pursuant to §13-1-30, HAR, a petition that involves a Conservation District Use Permit must be accompanied with a \$100.00 non-refundable filing fee (payable to "DLNR") or a request for waiver of this fee. A waiver may be granted by the Chairperson based on a petitioner's financial hardship.
- All materials, including this form, shall be submitted in **three (3)** photocopies.

RECEIVED
 2023 MAR 31 PM 1:02
 DEPT. OF LAND & NATURAL RESOURCES
 STATE OF HAWAII

A. PETITIONER		
(If there are multiple petitioners, use one form for each.)		
1. Name Hawaii Unites	2. Contact Person Tina Lia	
3. Address P.O. Box 1773	4. City Kihei	5. State and ZIP HI 96753
6. Email tinalia@live.com	7. Phone (808) 298-6335	8. Fax

B. ATTORNEY (if represented)		
9. Attorney Name	10. Firm Name	
11. Address	12. City	13. State and ZIP
14. Email	15. Phone	16. Fax

C. SUBJECT MATTER

17. Board Action Being Contested

18. Board Action Date

19. Item No.

20. Any Specific Statute or Rule That Entitles Petitioner to a Contested Case

21. Any Specific Property Interest of Petitioner That Is Entitled to Due Process Protection

22. Any Disagreement Petitioner May Have with an Application before the Board

23. Any Relief Petitioner Seeks or Deems Itself Entitled to

24. How Petitioner's Participation in the Proceeding Would Serve the Public Interest

25. Any Other Information That May Assist the Board in Determining Whether Petitioner Meets the Criteria to Be a Party under Section 13-1-31, HAR

Check this box if Petitioner is submitting supporting documents with this form.

Check this box if Petitioner will submit additional supporting documents after filing this form.

Tina Lia
Petitioner or Representative (Print Name)


Signature

03/30/2023
Date

PETITION FOR A CONTESTED CASE HEARING
C. SUBJECT MATTER (Supporting Documents)

17. Board Action Being Contested

We are contesting the Board of Land and Natural Resources' approval of Agenda Item C-2, DIVISION OF FORESTRY AND WILDLIFE: Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the "Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui."

18. Board Action Date

March 24, 2023

19. Item No.

C-2

20. Any Specific Statute or Rule That Entitles Petitioner to a Contested Case

Relevant statutes and constitutional provisions covered in this request are: HRS 343; Hawaii Constitution Article XI, section 1, 2, 7, and 9; HRS 92-7; HAR 13-1-29

21. Any Specific Property Interest of Petitioner That Is Entitled to Due Process Protection

Hawaii Unites is a 501(c)(3) nonprofit organization dedicated to the conservation and protection of our environment and natural resources. Our mission is honoring and protecting our sacred connection to the natural world. Formed in 2023, Hawaii Unites launched a petition through Change.org to "Demand an Environmental Impact Statement for the Experimental Mosquito Release on Maui" which has received more than 2,700 signatures. Our nonprofit officers and all petition signatories residing in Hawaii, particularly those in East Maui, are directly affected by the actions of the Board on item C-2, which seeks to approve a landscape-scale biopesticide experiment with a project area covering 64,666 acres of East Maui.

The rights of our officers and signatories relevant to these natural areas are protected by the Hawaii State Constitution and state law. Hawaii Unites' officers and signatories have rights to a clean and healthful environment under article XI, section 9 of the Constitution, which mandates a contested case hearing whenever the State makes binding decisions under "laws relating to environmental quality, including control of pollution and conservation, protection and enhancement of natural resources."

22. Any Disagreement Petitioner May Have with an Application before the Board

Hawaii Unites opposes the approval of the Final Environmental Assessment and the authorization for the Chairperson to issue a Finding of No Significant Impact for the "Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui" because:

- (a) The Final Environmental Assessment lacks adequate detail as required by HEPA.
- (b) The Final Environmental Assessment fails to identify the *Wolbachia* strain planned for use in this project.
- (c) The Final Environmental Assessment fails to identify and describe the mark release recapture study as a proposed action, and this project may have been improperly segmented.
- (d) The Final Environmental Assessment fails to adequately identify the mosquito packages planned for release into the environment, and the effects on the environment from the release of biodegradable packages with an unknown decay rate are not adequately addressed.
- (e) The Final Environmental Assessment fails to identify biosecurity protocols
- (f) The Final Environmental Assessment does not address the concern of accidental pathogen introduction and does not specify required permits for interstate transport of pathogens
- (g) Viewscape impacts, noise disturbances to forest bird breeding and nesting, and significant environmental consequences, including impacts to the untrammled, natural qualities of the wilderness character, have not been adequately addressed.
- (h) The potential negative impacts of introducing an invasive species to the islands have not been adequately addressed.
- (i) Biopesticide mosquitoes for this project originate from Palmyra Atoll. *Wolbachia* bacteria for the project originates from Kuala Lumpur in Malaysia. At least one strain of *Wolbachia* planned for import in connection with the project does not exist on these islands.
- (j) Landscape level control of *Culex quinquefasciatus* mosquitoes using the Incompatible Insect Technique (IIT) has never been done before.
- (k) The mosquito species planned for use in this project, *Culex quinquefasciatus*, has never been used for a stand-alone IIT field release.
- (l) Peer-reviewed studies confirm that *Wolbachia* bacteria can cause mosquitoes to become more capable of spreading diseases like avian malaria and West Nile virus (bird and human). The Final Environmental Assessment fails to adequately address these risks.
- (m) Tropical disease expert Dr. Lorrin Pang (private citizen) has expressed concerns about horizontal transmission of the lab bacteria to wild mosquitoes and other insect vectors of disease. The Final Environmental Assessment fails to adequately address these concerns.

- (n) Scientific studies document the risks of horizontal transmission, increased pathogen infection, evolutionary events, population replacement, and accidental release of females (who bite and breed). The Final Environmental Assessment fails to adequately address these risks.
- (o) This project has the potential to cause the extinction of endangered native birds, and it could impact human health.
- (p) Impacts to endangered native Hawaiian hoary bats, native dragonflies, and endangered native damselflies have not been adequately studied or addressed in the Final Environmental Assessment.
- (q) Biopesticide wind drift has not been studied and is not addressed in the Final Environmental Assessment.
- (r) Environmental Justice is not adequately addressed in the Final Environmental Assessment. Human health impacts of this project have not been adequately studied, and the proposed action would impact ethnographic resources and traditional cultural practices.
- (s) The Final Environmental Assessment's assertion of released mosquitoes posing no risk to human health is based on unsound science. The 2010 article by Popovici et al. cited in the Final Environmental Assessment has been discredited by the EPA.
- (t) The EPA has not conducted an Environmental Risk Assessment for this mosquito biopesticide to determine the environmental, ecological, and human health risks.
- (u) The Hawaii Department of Agriculture has applied for an EPA Emergency Exemption for use of the mosquitoes without going through regulatory safety processes. The EPA application is still under review, and the biopesticide mosquitoes have not been approved for emergency release.
- (v) A feasibility study has not been conducted to provide a detailed analysis that considers all of the critical aspects of the proposed project in order to determine the likelihood of it succeeding.
- (w) The U.S. Department of the Interior states that "although used world-wide for human health, *Wolbachia* IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown."
- (x) Under the precautionary principle, it is the responsibility of the proponents of this project to establish that the proposed activity will not result in significant harm.
- (y) The subject action will have a significant effect and, therefore, requires the preparation of an Environmental Impact Statement.
- (z) Conflicts of interest have not been disclosed or addressed.

23. Any Relief Petitioner Seeks or Deems Itself Entitled to

Hawaii Unites requests that the approval of the Final Environmental Assessment and the authorization for the Chairperson to issue a Finding of No Significant Impact for the “Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui” be denied. The subject action will have a significant effect and, therefore, requires the preparation of an Environmental Impact Statement.

Hawaii Unites also requests that State of Hawaii Board of Land and Natural Resources Chairperson Dawn N.S. Chang and Board Member Vernon Char recuse themselves from participating in any discussion or voting in this matter, given that they have conflicts of interest per HRS §171-4 (d).

Any action taken by the Board of Land and Natural Resources on this Petition for a Contested Case Hearing prior to receipt of said Petition shall be null and void, as any such action is in violation of the Sunshine Law HRS §92-7 and of HAR §13-1-29. Receipt of this Petition shall serve as notice to the Board of Land and Natural Resources that the Petition remains active. Any action taken by the Board of Land and Natural Resources on the March 24, 2023 Agenda Item C-2, a subject within the adjudicatory jurisdiction of the Board, shall be subsequently null and void.

24. How Petitioner’s Participation in the Proceeding Would Serve the Public Interest

Hawaii Unites has provided peer-reviewed studies documenting the serious risks of the proposed project. We have described the concerns of tropical disease and vector expert Dr. Lorrin Pang. In a contested case hearing, we will provide the Board with additional peer-reviewed studies. We will give a detailed description of Dr. Pang’s concerns regarding horizontal transmission of the introduced bacteria strain, which will include information that has not yet been submitted in previous testimony or comments. We will provide a statement by a retired scientist from the EPA Office of Pesticide Programs strongly advising that a full Environmental Impact Statement be conducted. We will provide documentation of petition signatories and public testimony. Our evidence will demonstrate that the project risks and the concerns of the public in opposition to this proposed experiment have not been adequately studied or addressed. Our participation in a contested case hearing will help to ensure that this Board has all the information it needs to make a decision that fully protects the public’s interests and satisfies the Board’s public trust obligations per the Hawaii State Constitution.

25. Any Other Information That May Assist the Board in Determining Whether Petitioner Meets the Criteria to Be a Party under Section 13-1-31, HAR

Per HAR §13-1-31 (b) (2), Hawaii Unites represents all petition signatories who have some property interest in the land, who lawfully reside on the land, who are adjacent property owners, or who otherwise can demonstrate that they will be so directly and immediately affected by the requested action that their interest in the proceeding is clearly distinguishable from that of the general public.

Per HAR §13-1-31 (c), as a 501(c)(3) nonprofit organization dedicated to the conservation and protection of our environment and natural resources, Hawaii Unites can show a substantial interest in the matter.

From: Tina Lia tinalia@live.com 
Subject: Re: Notice of Appeal of Sunshine Law Complaint (S APPEAL 23-9)
Date: May 5, 2023 at 1:41 PM
To: OIP oip@hawaii.gov

TL

Aloha Lori Kato,

Thank you for your message. I have read the BLNR's response, and would like to clarify these items:

1. The BLNR response states: "At the end of her oral testimony, Ms. Lia requested a contested case hearing. Ex. 3 at 1:19:52. The Chair paused testimony and asked Ms. Lia to clarify if she was requesting the Board decide her contested case hearing request prior to voting, and Ms. Lia confirmed she was requesting the Board vote on her oral request prior to voting. *Id.* at 1:20:20-1:20:36." At no point during the 3/24/23 BLNR meeting did I ask for the Board to vote on my verbal request for a contested case hearing prior to voting on agenda item C-2. In fact, I specifically asked that the board not vote on agenda item C-2 at all. The Board's statement here is a blatant misrepresentation of the facts.
2. The BLNR response states: "The Chair asked Ms. Lia to clarify the basis for her contested case hearing request. *Id.* at 2:16:37. Board Member Yoon moved to deny Ms. Lia's oral request for contested case hearing because she failed to give a basis for her request. *Id.* at 2:18:22." The Board had not yet received our petition for a contested case hearing (due within 10 days of the 3/24/23 verbal request), and therefore had no basis of their own for denying the request. When asked by the Board to state the basis of my request, I was given grossly insufficient time to summarize the detailed subject matter in our petition. At no point during this dialogue with the Board was it made clear that they had improperly added my verbal request for a contested case hearing to the 3/24/23 agenda and were in the process of a vote on the improperly added agenda item. The Board appeared to be uninterested in hearing further details of the request or petition, as it was clear that their intention was to deny the request and petition regardless of the basis.
3. The BLNR's response regarding "Compliance with HRS Chapter 92" references HAR § 13-1-29 in an attempt to justify their actions. Nowhere in the administrative rules is there justification for their actions. In fact, they have misstated the procedures documented in HAR § 13-1-29.
4. Our petition for a contested case hearing is on the agenda for the 5/12/23 BLNR meeting (item C-4). This serves as confirmation that denial of my verbal request for a contested case hearing at the 3/24/23 meeting was invalid due to improper procedure.
5. The petition for a contested case hearing attached as exhibit 4 of the BLNR's response shows the incorrect date stamp of receipt. Please see attached corrected date stamped receipt of petition along with email from Bin C. Li confirming the error. Exhibit 4 is not "a true and correct copy of the written petition for contested case hearing filed by Tina Lia on April 3, 2023." The true and correct copy is hereby attached in my email (see attached).

Please let me know if I may provide any further details or documents regarding this matter.

Mahalo,
Tina Lia
Founder and President
Hawaii Unites
HawaiiUnites.org
(808) 298-6335
tinalia@live.com

On May 5, 2023, at 9:38 AM, OIP <oip@hawaii.gov> wrote:

Dear Ms. Lia,

Per your request, I am forwarding BLNR's response dated May 1, 2023, which responds to OIP's Notice of Appeal dated April 3, 2023.

Lori Kato
Staff Attorney

Office of Information Practices
State of Hawaii
No. 1 Capitol District Building
250 S. Hotel Street, #107
Honolulu, HI 96813
Ph: (808) 586-1400
Facsimile: (808) 586-1412

Email: oiip@hawaii.gov
Website: <http://oiip.hawaii.gov>

From: Tina Lia <tinalia@live.com>
Sent: Monday, April 24, 2023 8:22 AM
To: OIP <oiip@hawaii.gov>
Subject: [EXTERNAL] Re: Notice of Appeal of Sunshine Law Complaint (S APPEAL 23-9)

Aloha Ms. Kato,

Please let me know the status of the response from the BLNR, and when a copy of that response will be made available to me.

Mahalo,
Tina Lia
Founder and President
Hawaii Unites
HawaiiUnites.org
(808) 298-6335
tinalia@live.com

On Apr 18, 2023, at 11:03 AM, OIP <oiip@hawaii.gov> wrote:

Dear Ms. Lia,

The Board of Land and Natural Resources (BLNR) has until the end of today, April 18, 2023, to respond to the Notice of Appeal dated April 3, 2023 since April 7 was Good Friday and a State observed holiday. OIP will send you a copy of BLNR's response once we receive it.

Lori Kato
Staff Attorney

Office of Information Practices
State of Hawai'i
No. 1 Capitol District Building
250 S. Hotel Street, #107
Honolulu, HI 96813
Ph: (808) 586-1400
Facsimile: (808) 586-1412
Email: oiip@hawaii.gov
Website: <http://oiip.hawaii.gov>

From: Tina Lia <tinalia@live.com>
Sent: Tuesday, April 18, 2023 7:14 AM
To: OIP <oiip@hawaii.gov>

TO: OIP <oiip@hawaii.gov>

Subject: [EXTERNAL] Re: Notice of Appeal of Sunshine Law Complaint (S APPEAL 23-9)

Attn.: Office of Information Practices (OIP),

Per instructions from the OIP, I'm requesting a copy of the response from the Board of Land and Natural Resources to the Notice of Appeal of Sunshine Law Complaint (S APPEAL 23-9) received by their agency on April 3, 2023 (response due ten business days after receipt: April 17, 2023).

Mahalo,
Tina Lia
Founder and President
Hawaii Unites
HawaiiUnites.org
(808) 298-6335
tinalia@live.com

On Apr 3, 2023, at 2:27 PM, OIP <oiip@hawaii.gov> wrote:

Ms. Lia:

Attached is a letter dated April 3, 2023 from the Office of Information Practices regarding your request for assistance from OIP. Also attached are the Appeal Procedures and Responsibility of the Parties.

Please contact our office if you have difficulty opening the attachments.

Thank you,

Office of Information Practices
State of Hawai'i
No. 1 Capitol District Building
250 S. Hotel Street, #107
Honolulu, HI 96813
Ph: (808) 586-1400
Facsimile: (808) 586-1412
Email: oiip@hawaii.gov
Website: <http://oiip.hawaii.gov>



23-04-03
Hawaii...ing.pdf

From: Li, Bin C bin.c.li@hawaii.gov
Subject: Re: Hawaii Unites contested case petition
Date: April 3, 2023 at 4:15 PM
To: tinalia@live.com

BL

We just realized that our stamp clock malfunctioned with a wrong date stamped on the filing. Please see this version for the correction. Sorry for the mishap.

Bin C. Li
Department of Land and Natural Resources
Administrative Proceedings Coordinator
1151 Punchbowl St, Rm 131, Honolulu, Hawaii 96813
Phone (808)587-1496, bin.c.li@hawaii.gov

From: Li, Bin C
Sent: Monday, April 3, 2023 2:45 PM
To: tinalia@live.com <tinalia@live.com>
Subject: Hawaii Unites contested case petition

Hi Tina,

Per our phone discussion, please see file for record of your contested case petition filing.

Bin C. Li
Department of Land and Natural Resources
Administrative Proceedings Coordinator
1151 Punchbowl St, Rm 131, Honolulu, Hawaii 96813
Phone (808)587-1496, bin.c.li@hawaii.gov



23-04-03
Hawaii...ing.pdf



STATE OF HAWAII
BOARD OF LAND AND NATURAL RESOURCES

PETITION FOR A CONTESTED CASE HEARING

RECEIVED
 2023 APR 13 PM 4:04
 DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII
 RECEIVED
 2023 MAR 31 PM 1:02
 DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

OFFICIAL USE ONLY	
Case No.	Date Received
Board Action Date / Item No.	Division/Office

INSTRUCTIONS:

- File (deliver, mail or fax) this form within ten (10) days of the Board Action Date to:
 Department of Land and Natural Resources
 Administrative Proceedings Office
 1151 Punchbowl Street, Room 130
 Honolulu, Hawaii 96813
 Phone: (808) 587-1496, Fax: (808) 587-0390
- DLNR's contested case hearing rules are listed under Chapter 13-1, HAR, and can be obtained from the DLNR Administrative Proceedings Office or at its website (<http://dlnr.hawaii.gov/forms/contested-case-form/>). Please review these rules before filing a petition.
- If you use the electronic version of this form, note that the boxes are expandable to fit in your statements. If you use the hardcopy form and need more space, you may attach additional sheets.
- Pursuant to §13-1-30, HAR, a petition that involves a Conservation District Use Permit must be accompanied with a \$100.00 non-refundable filing fee (payable to "DLNR") or a request for waiver of this fee. A waiver may be granted by the Chairperson based on a petitioner's financial hardship.
- All materials, including this form, shall be submitted in **three (3)** photocopies.

A. PETITIONER		
(If there are multiple petitioners, use one form for each.)		
1. Name Hawaii Unites	2. Contact Person Tina Lia	
3. Address P.O. Box 1773	4. City Kihei	5. State and ZIP HI 96753
6. Email tinalia@live.com	7. Phone (808) 298-6335	8. Fax

B. ATTORNEY (if represented)		
9. Attorney Name	10. Firm Name	
11. Address	12. City	13. State and ZIP
14. Email	15. Phone	16. Fax

C. SUBJECT MATTER	
17. Board Action Being Contested	
18. Board Action Date	19. Item No.
20. Any Specific Statute or Rule That Entitles Petitioner to a Contested Case	
21. Any Specific Property Interest of Petitioner That Is Entitled to Due Process Protection	
22. Any Disagreement Petitioner May Have with an Application before the Board	
23. Any Relief Petitioner Seeks or Deems Itself Entitled to	
24. How Petitioner's Participation in the Proceeding Would Serve the Public Interest	
25. Any Other Information That May Assist the Board in Determining Whether Petitioner Meets the Criteria to Be a Party under Section 13-1-31, HAR	

Check this box if Petitioner is submitting supporting documents with this form.

Check this box if Petitioner will submit additional supporting documents after filing this form.

Tina Lia
 Petitioner or Representative (Print Name)


 Signature

03/30/2023
 Date

PETITION FOR A CONTESTED CASE HEARING
C. SUBJECT MATTER (Supporting Documents)

17. Board Action Being Contested

We are contesting the Board of Land and Natural Resources' approval of Agenda Item C-2, DIVISION OF FORESTRY AND WILDLIFE: Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the "Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui."

18. Board Action Date

March 24, 2023

19. Item No.

C-2

20. Any Specific Statute or Rule That Entitles Petitioner to a Contested Case

Relevant statutes and constitutional provisions covered in this request are: HRS 343; Hawaii Constitution Article XI, section 1, 2, 7, and 9; HRS 92-7; HAR 13-1-29

21. Any Specific Property Interest of Petitioner That Is Entitled to Due Process Protection

Hawaii Unites is a 501(c)(3) nonprofit organization dedicated to the conservation and protection of our environment and natural resources. Our mission is honoring and protecting our sacred connection to the natural world. Formed in 2023, Hawaii Unites launched a petition through Change.org to "Demand an Environmental Impact Statement for the Experimental Mosquito Release on Maui" which has received more than 2,700 signatures. Our nonprofit officers and all petition signatories residing in Hawaii, particularly those in East Maui, are directly affected by the actions of the Board on item C-2, which seeks to approve a landscape-scale biopesticide experiment with a project area covering 64,666 acres of East Maui.

The rights of our officers and signatories relevant to these natural areas are protected by the Hawaii State Constitution and state law. Hawaii Unites' officers and signatories have rights to a clean and healthful environment under article XI, section 9 of the Constitution, which mandates a contested case hearing whenever the State makes binding decisions under "laws relating to environmental quality, including control of pollution and conservation, protection and enhancement of natural resources."

22. Any Disagreement Petitioner May Have with an Application before the Board

Hawaii Unites opposes the approval of the Final Environmental Assessment and the authorization for the Chairperson to issue a Finding of No Significant Impact for the "Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui" because:

- (a) The Final Environmental Assessment lacks adequate detail as required by HEPA.
- (b) The Final Environmental Assessment fails to identify the *Wolbachia* strain planned for use in this project.
- (c) The Final Environmental Assessment fails to identify and describe the mark release recapture study as a proposed action, and this project may have been improperly segmented.
- (d) The Final Environmental Assessment fails to adequately identify the mosquito packages planned for release into the environment, and the effects on the environment from the release of biodegradable packages with an unknown decay rate are not adequately addressed.
- (e) The Final Environmental Assessment fails to identify biosecurity protocols
- (f) The Final Environmental Assessment does not address the concern of accidental pathogen introduction and does not specify required permits for interstate transport of pathogens
- (g) Viewscape impacts, noise disturbances to forest bird breeding and nesting, and significant environmental consequences, including impacts to the untrammeled, natural qualities of the wilderness character, have not been adequately addressed.
- (h) The potential negative impacts of introducing an invasive species to the islands have not been adequately addressed.
- (i) Biopesticide mosquitoes for this project originate from Palmyra Atoll. *Wolbachia* bacteria for the project originates from Kuala Lumpur in Malaysia. At least one strain of *Wolbachia* planned for import in connection with the project does not exist on these islands.
- (j) Landscape level control of *Culex quinquefasciatus* mosquitoes using the Incompatible Insect Technique (IIT) has never been done before.
- (k) The mosquito species planned for use in this project, *Culex quinquefasciatus*, has never been used for a stand-alone IIT field release.
- (l) Peer-reviewed studies confirm that *Wolbachia* bacteria can cause mosquitoes to become more capable of spreading diseases like avian malaria and West Nile virus (bird and human). The Final Environmental Assessment fails to adequately address these risks.
- (m) Tropical disease expert Dr. Lorrin Pang (private citizen) has expressed concerns about horizontal transmission of the lab bacteria to wild mosquitoes and other insect vectors of disease. The Final Environmental Assessment fails to adequately address these concerns.

- (n) Scientific studies document the risks of horizontal transmission, increased pathogen infection, evolutionary events, population replacement, and accidental release of females (who bite and breed). The Final Environmental Assessment fails to adequately address these risks.
- (o) This project has the potential to cause the extinction of endangered native birds, and it could impact human health.
- (p) Impacts to endangered native Hawaiian hoary bats, native dragonflies, and endangered native damselflies have not been adequately studied or addressed in the Final Environmental Assessment.
- (q) Biopesticide wind drift has not been studied and is not addressed in the Final Environmental Assessment.
- (r) Environmental Justice is not adequately addressed in the Final Environmental Assessment. Human health impacts of this project have not been adequately studied, and the proposed action would impact ethnographic resources and traditional cultural practices.
- (s) The Final Environmental Assessment's assertion of released mosquitoes posing no risk to human health is based on unsound science. The 2010 article by Popovici et al. cited in the Final Environmental Assessment has been discredited by the EPA.
- (t) The EPA has not conducted an Environmental Risk Assessment for this mosquito biopesticide to determine the environmental, ecological, and human health risks.
- (u) The Hawaii Department of Agriculture has applied for an EPA Emergency Exemption for use of the mosquitoes without going through regulatory safety processes. The EPA application is still under review, and the biopesticide mosquitoes have not been approved for emergency release.
- (v) A feasibility study has not been conducted to provide a detailed analysis that considers all of the critical aspects of the proposed project in order to determine the likelihood of it succeeding.
- (w) The U.S. Department of the Interior states that "although used world-wide for human health, *Wolbachia* IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown."
- (x) Under the precautionary principle, it is the responsibility of the proponents of this project to establish that the proposed activity will not result in significant harm.
- (y) The subject action will have a significant effect and, therefore, requires the preparation of an Environmental Impact Statement.
- (z) Conflicts of interest have not been disclosed or addressed.

23. Any Relief Petitioner Seeks or Deems Itself Entitled to

Hawaii Unites requests that the approval of the Final Environmental Assessment and the authorization for the Chairperson to issue a Finding of No Significant Impact for the “Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui” be denied. The subject action will have a significant effect and, therefore, requires the preparation of an Environmental Impact Statement.

Hawaii Unites also requests that State of Hawaii Board of Land and Natural Resources Chairperson Dawn N.S. Chang and Board Member Vernon Char recuse themselves from participating in any discussion or voting in this matter, given that they have conflicts of interest per HRS §171-4 (d).

Any action taken by the Board of Land and Natural Resources on this Petition for a Contested Case Hearing prior to receipt of said Petition shall be null and void, as any such action is in violation of the Sunshine Law HRS §92-7 and of HAR §13-1-29. Receipt of this Petition shall serve as notice to the Board of Land and Natural Resources that the Petition remains active. Any action taken by the Board of Land and Natural Resources on the March 24, 2023 Agenda Item C-2, a subject within the adjudicatory jurisdiction of the Board, shall be subsequently null and void.

24. How Petitioner’s Participation in the Proceeding Would Serve the Public Interest

Hawaii Unites has provided peer-reviewed studies documenting the serious risks of the proposed project. We have described the concerns of tropical disease and vector expert Dr. Lorrin Pang. In a contested case hearing, we will provide the Board with additional peer-reviewed studies. We will give a detailed description of Dr. Pang’s concerns regarding horizontal transmission of the introduced bacteria strain, which will include information that has not yet been submitted in previous testimony or comments. We will provide a statement by a retired scientist from the EPA Office of Pesticide Programs strongly advising that a full Environmental Impact Statement be conducted. We will provide documentation of petition signatories and public testimony. Our evidence will demonstrate that the project risks and the concerns of the public in opposition to this proposed experiment have not been adequately studied or addressed. Our participation in a contested case hearing will help to ensure that this Board has all the information it needs to make a decision that fully protects the public’s interests and satisfies the Board’s public trust obligations per the Hawaii State Constitution.

25. Any Other Information That May Assist the Board in Determining Whether Petitioner Meets the Criteria to Be a Party under Section 13-1-31, HAR

Per HAR §13-1-31 (b) (2), Hawaii Unites represents all petition signatories who have some property interest in the land, who lawfully reside on the land, who are adjacent property owners, or who otherwise can demonstrate that they will be so directly and immediately affected by the requested action that their interest in the proceeding is clearly distinguishable from that of the general public.

Per HAR §13-1-31 (c), as a 501(c)(3) nonprofit organization dedicated to the conservation and protection of our environment and natural resources, Hawaii Unites can show a substantial interest in the matter.

From: [Megan Isaac](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Fwd: I Strongly OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case
Date: Thursday, May 11, 2023 9:13:40 AM

Aloha DLNR personnel,

I strongly oppose BLNR's denial of Hawaii Unites' Petition for a contested case hearing.

The program releasing a novel kind of mosquito into Hawaii has potential to cause immense harm. All risks of this must be considered before proceeding.

I urge you to take a principled stand in this instance and in all others that you might face going forward. I'm reminding you of your responsibility to future generations.

A contested case hearing should proceed so that known risks are addressed .

Thank you for your service to the people of Hawai'i and to our children's children by opposing BLNR's denial of Hawaii Unites' petition for a contested case hearing.

Thank you
Please kokua

Megan Magdalene
Hilo, Hawai'i

808 464-3966

@@@

From: [Sarah Martins](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Agenda Item C-4
Date: Wednesday, May 10, 2023 3:07:34 PM

Aloha,

I'm writing to OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing. There needs to be more research into if these released mosquitos will do as hoped. An EIS is needed. I want to protect Honeycreepers and other life on Maui. This is too risky.

Sarah
Haiku, Maui

From: [Tammy McClure](#)
To: [DLNR.BLNR.Testimony](#)
Cc: [Tammy McClure](#); [Stand Together Hawaii](#)
Subject: [EXTERNAL] URGENT: Agenda item C-4 - OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing!
Date: Wednesday, May 10, 2023 10:38:05 PM

On March 24, 2023, the State of Hawaii Board of Land and Natural Resources (BLNR) voted unanimously to approve the Final Environmental Assessment for the BioPesticide Mosquito Experiment on Maui and to issue a Finding of No Significant Impact (FONSI). Hawaii Unites, per [HAR §13-1-29](#), requested a contested case hearing prior to the board action. The board infringed on the public's right to open governmental processes, and our request for a contested case hearing was denied. We will appeal.

We have also [requested an investigation](#) by the Office of Information Practices (OIP) into the BLNR for their violation of the [Sunshine Law HRS §92-7](#).

We already have growing evidence of huge negligence and massive death and injury in the mandating of experimental CRISPR mRNA COVID "vaccines" on the world population which is heading for indictments and Nuremburg Trials 2.0.

Let's not repeat the same gross error with the CRISPR modified mosquitos!

You live on this island, too. You will not escape the potentially injurious or deadly impact of untested CRISPR DNA modified mosquitos on both animal and human population. And should this program be approved and later be proven to be injurious or deadly in the future, let it be known that justice will be sought as intensely as justice is being pursued for the murderous COVID "vaccine" crimes committed by not only Fauci and the pharmaceutical companies, but also the government officials, doctors and nurses who knowingly forced unproven gene therapies on the unconsenting public.

Mahalo for your attention to this serious matter.

Tammy Lee McClure
Maui Urban Permaculture, Founder
808.927.0088

From: [Michelle Melendez](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] re:(Zoom link request for 5/12 meeting) OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing!
Date: Tuesday, May 9, 2023 2:25:13 PM

I cannot believe you will not allow a contested case hearing to see the proof that Hawaii Unites has against this experiment!

Your are putting us ALL at risk and this needs to STOP!

Do what is right and have this hearing!

Michelle Melendez

Fitness and Wellness Expert Since 1996

Author Of The Best Selling and 4x Award Winning Book,

End Dieting Hell: How to find peace in your body and release the weight

<https://blossominnerwellness.com/>

Order your copy of [End Dieting Hell Click Here](#)

From: [Josh Milowe](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose
Date: Thursday, May 11, 2023 7:23:35 AM

----- Forwarded message -----

From: **Josh Milowe** <joshmilowe@gmail.com>
Date: Wed, May 10, 2023 at 9:28 PM
Subject: BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose
To: <blnr.testimony@hawaii.gov>

I'm opposed to the State of Hawaii Board of Land and Natural Resources' request to deny Hawaii Unites' Petition for a Contested Case Hearing for the planned BioPesticide Mosquito Experiment on Maui. The public has a right to meaningful participation in the decision making process for this project.

Sincerely,

Joshua Milowe

--

Joshua Milowe
phone +1-781-608-7691
portfolio www.wildandfreelance.com
GIVE THANKS

--

Joshua Milowe
phone +1-781-608-7691
portfolio www.wildandfreelance.com
GIVE THANKS

From: [John Morey](#)
To: [DLNR.BLNR.Testimony](#)
Cc: [JOHN MOREY](#)
Subject: [EXTERNAL] Agenda item C-4
Date: Wednesday, May 10, 2023 6:58:35 PM

OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing!

Please understand that we, the people of Maui, are NOT lab rats. The Hawaii Department of Land and Natural Resources and its executive Board of Land and Natural Resources are acting with extreme negligence.

From: [Halina Ngo](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose
Date: Wednesday, May 10, 2023 8:08:03 PM

RE: C-4 Request Denial of the Petition for a Contested Case of Agenda Item C-2, March 24, 2023, “Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the ‘Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui’ ”

I’m opposed to the State of Hawai‘i Board of Land and Natural Resources’ request to deny Hawaii Unites’ Petition for a Contested Case Hearing for the planned BioPesticide Mosquito Experiment on Maui. 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.

Sent from my iPhone

From: [Tim Ohern](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Agenda item C-4
Date: Wednesday, May 10, 2023 4:02:15 PM

I oppose BLNR's denial of Hawaii Unites' petition for a contested case hearing! I demand an Environmental Impact Statement on the release of 40 billion mosquitoes! It is an outright ridiculous idea to mess with the islands natural ecosystem! I do not consent!
Please do the right thing,
Timothy

From: [illusionofseparation](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose
Date: Thursday, May 11, 2023 7:40:31 AM

C-4 Request Denial of the Petition for a Contested Case of Agenda Item C-2, March 24, 2023, "Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the 'Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui' "

I'm opposed to the State of Hawai'i Board of Land and Natural Resources' request to deny Hawaii Unites' Petition for a Contested Case Hearing for the planned BioPesticide Mosquito Experiment on Maui. 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.

Sincerely,

Christopher Parks

Sent from my Verizon, Samsung Galaxy smartphone

From: [Kimberly Pecana](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR meeting 5/12/23 9:15 Testimony agenda item C4: Oppose
Date: Thursday, May 11, 2023 6:21:49 AM

I'm opposed to the State of Hawaii Board of Land and Natural resources request to deny Hawaii United petition for a contested case hearing for the planned Biopesticide mosquito experiment on Maui. The public has a right to meaningful participation in the decision-making process for this project.

Mahalo
Kimberly

Sent from my iPhone

From: [Tammy Ash Perkins](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4:
Date: Wednesday, May 10, 2023 9:54:53 PM

To Whom it May Concern;

RE: C-4 Request Denial of the Petition for a Contested Case of Agenda Item C-2, March 24, 2023, "Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the 'Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui' "

I'm opposed to the State of Hawai'i Board of Land and Natural Resources' request to deny Hawaii Unites' Petition for a Contested Case Hearing for the planned BioPesticide Mosquito Experiment on Maui. 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.

I OPPOSE!

Me Ke Aloha
Tammy

Tammy Ash Perkins
Maui Precinct 12-02
VP Events
Rules Committee
Safety Committee

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

From: [Tammy Ash Perkins](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Written Testimony for Mosquito Experiment May 12, 2023
Date: Wednesday, May 10, 2023 1:23:39 PM

Attention BLNR & DLNR,

Please break free and do what is right "Pono". We must demand that extensive research is done before unleashing something onto the people that we know very little about.

These bio-Mosquitos have never been released anywhere else in the world. These mosquitos are an insane idea brought to you by Bill Gates. This is part of a depopulation agenda. This is an attack on our people!

Where is your moral compass? This is not right! We are not guinea pigs! Please practice your "Pono", do what is right; not what you're paid to do! Be a hero and protect us from such a vile and unnecessary attack on our people.

These mosquitos will unleash avian malaria and West Nile virus on Maui. This is WRONG! I beg you to stand up and fight to protect us, the people first (not birds). Otherwise you will be sentencing us all to "death by mosquitos".

Your bad decision will catastrophically impact Maui's wildlife, environment, and public health. Is that what you want?

I DEMAND that you pray to God and look inside of yourself. Are you a puppet? Are you for humanity or against it? If you have a sliver of a conscience then please vote for more extensive research being done before sentencing the people on Maui to death by mosquitos.

If you can't guarantee that our health and ecosystems will not be affected then you must immediately stop this! We know nothing about the long term affects on our health from releasing insects that have been built in a lab.

I OPPOSE BLNR's request for denial of Hawaii Unites petition for a contested case hearing (agenda item C-4) and DEMAND that further studies be done through a comprehensive EIS.

Rethinking Hawaii
Tammy

Tammy Ash Perkins
Maui Precinct President 12-02
VP Events
Rules Committee Rep

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

From: [Nancy Redfeather](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Testimony Agenda Item C-4: Opposition
Date: Thursday, May 11, 2023 6:45:52 AM

Aloha BLNR,

Subject: BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Opposition

RE: C-4 Request Denial of the Petition for a Contested Case of Agenda Item C-2, March 24, 2023, “Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the ‘Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui’ ”

I oppose the State of Hawai‘i Board of Land and Natural Resources’ request to deny Hawaii Unites’ Petition for a Contested Case Hearing for the planned BioPesticide Mosquito Experiment on Maui. 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. There is evidence to question these actions and an EIS is necessary in order to prevent future health and environmental problems.

Mahalo for your consideration of this important matter,

Nancy Redfeather

Kona, Hawai‘i

From: [Alana Ross](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Written Testimony BLNR Testimony Agenda Item C-4
Date: Wednesday, May 10, 2023 8:10:14 PM

Alana Ross

Box 964 Hana, HI 96713

BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4:

I strongly oppose the State of Hawai'i Board of Land and Natural Resources' request to deny Hawaii Unites' Petition for a Contested Case Hearing for the planned Bio Pesticide Mosquito Experiment on Maui. The public has a right to meaningful participation in the decision-making process for this project.

I have grave concerns for the environment and the unknown effects this will have on our fragile eco system. I have concerns what effect it will have on the people and the animals which has not been studied.

I would like to see the case for the necessity of such an experiment. How big is the threat you are facing to unleash a potentially detrimental and unstudied experiment upon the island of Hawaii and its inhabitants?

I would like the right to be able to have my voice heard and my concerns addressed. I would like to see due process occur and see the environmental impact study on this idea.

This just seems like a rushed decision with no forethought. It reminds me of when they decided to bring mongoose to control the rat population and look what's happened? We are now over-run by both. This does not sit well with my soul and I would like to have answers.

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. Please support the right for the people of Hawai'i.

Mahalo for your consideration.

Alana Ross

Hana, Maui, HI

From: jadekaren@pacific.net
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose
Date: Thursday, May 11, 2023 2:20:47 AM

I'm opposed to the State of Hawai'i Board of Land and Natural Resources' request to deny Hawaii Unites' Petition for a Contested Case Hearing for the planned BioPesticide Mosquito Experiment on Maui. 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.

Karen Rowland
HI resident

From: [Trenton Schroter](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Agenda item C-4
Date: Thursday, May 11, 2023 8:02:06 AM

I OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing! I Demand an EIS (environmental impact statement) before they release 40+billion mosquitoes every year for 20 years!

Trenton Schroter
Pahoa, Hawaii

From: [sharkgss](#)
To: [DLNR.BNLR.Testimony](#)
Subject: [EXTERNAL] BNLR Testimony 12 May Agenda Item C-4 Contested Case
Date: Wednesday, May 10, 2023 7:39:23 PM
Attachments: [D Thompson BNLR C2 Testimony 24 March 2023.pdf](#)

Aloha,

I **strongly oppose** the BLNR's denial of Hawaii Unites' petition for a contested case hearing regarding the release of *Wolbachia* Injected Mosquitoes on Maui. I was witness to the 24 March 2023 BNLR meeting when Tina Lia of Hawaii Unites requested a contested case hearing. At which time the BLNR denied the request and proceeded to approve the final Environmental Assessment (EA) and issue a Finding of No Significant Impact (FONSI).

The public has the right to be part of the decision making process, especially for a project of this size and scope that involves ongoing release for decades of a lab-bred invasive vector species (up to 40 billion mosquitoes annually) without the proper Environmental Impact Statement (EIS). It is **unacceptable** that the BNLR was dismissive of very compelling evidence repeatedly provided by the public in several oral and written testimonies, including my own.

The proposed project area on Maui is over 89 times the size of the largest *Wolbachia* mosquito release area worldwide to date using the southern house mosquito, a species that has never been used before with the Incompatible Insect Technique. This is an experiment that is **irreversible** that could have serious consequences to the environment and its inhabitants.

The final EA contains no documented biosecurity protocols or risk management plan for imported unintended pathogens and ignores peer-reviewed studies showing that the bacteria can cause mosquitoes to become more capable of spreading avian malaria and West Nile virus. The final EA's assertion that released mosquitoes pose no risk to human health is based on unsound science. The 2010 article by Popovici et al. cited in the final EA has been discredited by the EPA.

As a career National Security expert, I find all of this appalling since studies show that *Wolbachia* can cause increased pathogen infection in mosquitoes and *Wolbachia* bacteria is a parasitic organism that manipulates the reproductive biology of the host to increase its own transmission. Science admittedly still has much to learn about *Wolbachia* which can also alter the behavior of the hosts they live inside and transmit horizontally to wild mosquitoes and other insect vectors of disease. We know its inevitable that lab-bred females who bite and breed will be missorted and accidentally escape. We also know lab-bred male mosquitoes can transmit bacteria and pathogens to females through mating, and the *Wolbachia* can be spread through shared feeding sites and standing water.

It is imperative the BNLR carefully review public testimony and weight the serious risks vs rushing a project thru that admittedly may not even work in the proposed landscape. Anything short of a full scope EIS is unacceptable and a serious disservice to the unique ecosystem of Hawai'i.

Attachment includes my original 24 March BNLR testimony for contested case hearing purposes.

Mahalo for your service,

Donna Thompson
Kamuela, HI

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

Subject: BLNR Meeting 3/24/23 9:15am Agenda Item C-2: **Oppose**

Aloha,

This testimony is in regards to item C-2 Request Approval of Final Environmental Assessment (EA) and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the “Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui”

I am **strongly opposed** to the request for approval of the Final Environmental Assessment for the planned biopesticide mosquito releases anywhere in Hawaii. I have been involved with submitting testimonies since spring of 2022 and it is clear this project is being fast tracked with no regard for numerous legitimate concerns. There are issues with security, conflict of interest, lack of proper study, permitting, and this project is undoubtedly an experiment which can have serious consequences that are **irreversible**.

My background spans over 30 years in National Security and Investigations as a Subject Matter Expert. According to the Final EA there has been no risk analysis conducted on the security vulnerabilities for lab bred mosquitoes that can be utilized as bio-weapons against a population (intended) nor any mention of quality control for accidental transmission of pathogens (unintended).

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.

There is no mention in the Final EA on how lab batches will be quality controlled or tested for unintended pathogens upon arrival to Hawaii or if lab employees in contact with these mosquitoes will go thru security clearance screening and training. Our

science and tech industry in the United States has been heavily infiltrated by the Chinese Communist Part (CCP). Due to the deterioration of relations between the US and China, among other adversaries, this project 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 U.S. Department of the Interior Strategy for Preventing the Extinction of Hawaiian Forest Birds confirms that The Nature Conservancy has contracted with mosquito lab Verily Life Sciences. There is no mention of this contract in the EA. No documented assurances have been made that Verily Life Sciences will be testing mosquitoes for human or avian diseases to ensure that they are pathogen-free prior to shipping to Hawaii. As this project involves the interstate transport of Culex mosquitoes, a known vector of poultry diseases, there is concern about impacts to local poultry farms and egg production in Hawaii. Has the USDA inspected the Verily insectary? There is no mention in the Final EA of a USDA permit (e.g. OV VS16-6 permit from APHIS) for the interstate transport of poultry pathogen vectors by a California shipper.

According to APHIS: The Veterinary Services, Organisms and Vectors (OV) Permitting Unit regulates the importation into the United States, and interstate transportation, of organisms and vectors of pathogenic diseases of livestock and poultry.

The Code of Federal Regulations, in 9 CFR, §122.2, mandates that “no organisms or vectors shall be imported into the United States or transported from one State or Territory or the District of Columbia to another State or Territory or the District of Columbia without a permit”.

Given that interstate transport of the vector (live Culex) is occurring from Maui to Verily's lab in South San Francisco, CA and those Culex may contain a highly contagious poultry pathogen, such as avianpox virus, movement between states needs a federal permit. Lab mosquitoes are blood fed, the EA makes no mention of what type of blood or how they would mitigate risk transporting avian pathogens back to Hawaii.

The Bill and Melinda Gates Foundation have openly discussed support of human depopulation; this is the same foundation that funded original research of Wolbachia mosquitoes in 2003. There are too many coincidences and not enough objective analysis of the big picture ecology by the BNM steering partners whom have been myopically focused on saving the birds at all costs. This lack of careful study and observation could instigate increased rates of extinction due to multiple potential secondary impacts.

Wolbachia is NOT harmless to humans. It effects filarial worms that cause human disease such as river blindness which effects tens of 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>

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“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>

Even though male mosquitoes do not bite, **male Culex mosquitoes are known to spread viruses to female mosquitoes through mating**. 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>

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/>

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/>

Horizontal gene transfer between Wolbachia and the mosquito Aedes aegypti
<https://bmcbgenomics.biomedcentral.com/articles/10.1186/1471-2164-10-33>

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](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 EA's assertion that released mosquitoes pose no risk to human health is based on unsound science. 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.”

Since Verily Life Sciences is the most likely sole source candidate to provide lab bred mosquitoes, there are several issues that should be considered by voting members of this committee in committing tax payer funds to a vendor on a project of this size and scope.

Verily Life Sciences is a relatively new corporation (incorporated in 2015). A sole source provider producing up to 40 billion mosquitoes per year on Maui alone should have much more established past performance in the Incompatible Insect Technique IIT methodologies intended for use in Hawaii.

Verily had recent leadership shake up and layoffs of 15% of staff in January 2023. Verily's owners are: Larry Page and Brin Sergey, the Soros Foundation, Silver Lake and Temasek. Verily raised 3.5 billion dollars of private equity money between 2017 and 2022 and could have direct exposure to the collapse of Silicon Valley Bank, the "go to" bank for the life science startups.

Verily had a colony collapse with mosquitoes in 2017, the titer levels of Wolbachia were a key cause for this reproductive collapse. <https://www.nature.com/articles/s41587-020-0471-x#Sec19>

It is undetermined whether Verily has perfected a sound method of sex sorting for *Culex quinquefasciatus* so that females do not escape. The company has dozens of patents for sieving apparatuses for pupae separation that are as recent as 2023 and going back NO further than 2018.

Landscape level control of *Culex* mosquitoes using this Incompatible Insect Technique (IIT) **has never been done before**. Even with *Aedes* mosquitoes, the largest project area was 724 acres. Federal documentation connected to this project confirms that “although used world-wide for human health, Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.” Additionally, the species planned for use in this project, *Culex quinquefasciatus*, **has never been used for IIT**.

The Advisory Committee on Plants and Animals’ recommendation to approve import and release of *Culex quinquefasciatus* mosquitoes should be null and void due to the

conflicts of interest of committee members pursuant to HRS 84-14. The Ethics Guide for State Board and Commission Members states that members must not take official action affecting a business in which they have "financial interest." "Financial interest" in a business includes "employment." Whether a business can be a government agency is unstated. The following members of the Advisory Committee on Plants and Animals unanimously voted (7/0) on June 9, 2022 to recommend approval of the import permit:

- Darcy Oishi, Committee Chairperson, Hawaii Department of Agriculture (HDOA)
- Dr. Maria Haws, Professor of Aquaculture, Pacific Aquaculture & Coastal Research Center, University of Hawaii at Hilo
- Cynthia King, Entomologist, Division of Forestry & Wildlife, Department of Land & Natural Resources (DLNR), Ex Officio Member Designated Representative
- Gracelda Simmons, Environmental Management Program Manager, Hawaii Department of Health, Ex Officio Member Designated Representative
- Thomas Eisen, Planner, Environmental Review Program, Department of Business, Economic Development and Tourism, Ex Officio Member Designated Representative
- Joshua Fisher, Wildlife Biologist, U. S. Fish and Wildlife Service (USFWS)
- Dr. Samuel Ohu Gon III, Senior Scientist and Cultural Advisor, The Nature Conservancy – Hawaii (TNC)

Of the seven voting members' agencies above, only Thomas Eisen and Darcy Oishi are not partner agencies in Birds, Not Mosquitoes. As employees of partner agencies, Dr. Maria Haws (University of Hawaii), Cynthia King (DLNR), Gracelda Simmons (Hawaii Department of Health), Joshua Fisher (USFWS), and Dr. Samuel Ohu Gon III (TNC) all have conflicts of interest.

Both Dr. Samuel Ohu Gon III and Cynthia King are also members of the Birds, Not Mosquitoes steering committee. The purpose of the steering committee, as stated in the National Fish and Wildlife Foundation Hawaii Conservation Business Plan, includes coordinating permits for this project.

The Hawaii Department of Agriculture has applied for an EPA Emergency Exemption for use of the mosquitoes without going through regulatory safety processes. The EPA application is still under review, and the biopesticide mosquitoes have not been approved for emergency release. The Board of Land and Natural Resources cannot approve this Final Environmental Assessment and declare before the public that there is a Finding of No Significant Impact (FONSI) when there is still a possibility that the EPA will deny the Emergency Exemption due to safety concerns. This biopesticide cannot be approved for release when its safety is still under review by the EPA.

Additional concerns not adequately addressed in the Final Environmental Assessment: lack of adequate detail as required by HEPA; failure to identify the Wolbachia strain planned for use in this project; failure to identify and describe the mark release recapture study as a proposed action; failure to adequately identify the mosquito packages planned for release into the environment; failure to adequately address the effects on the environment from the release of biodegradable packages with an unknown decay rate; failure to identify biosecurity protocols; failure to adequately address viewscape impacts, noise disturbances to forest bird breeding and nesting, and significant environmental consequences, including impacts to the untrammled, natural qualities of the wilderness character; failure to adequately address the potential negative impacts of introducing an invasive species to the islands; failure to identify the origin of biopesticide mosquitoes for this project as Palmyra Atoll; failure to identify the origin of Wolbachia bacteria for the project as Kuala Lumpur in Malaysia; failure to identify the strain of Wolbachia bacteria planned for import in connection with this project that does not exist on these islands; failure to address the concerns of tropical disease and vector expert Dr. Lorrin Pang (private citizen) regarding the serious risks of this project; failure to adequately study or address the impacts to endangered native Hawaiian hoary bats, native dragonflies, and endangered native damselflies; failure to study and address biopesticide wind drift; failure to adequately address Environmental Justice (human health impacts of this project have not been adequately studied, and the proposed action would impact ethnographic resources and traditional cultural practices); failure to conduct a feasibility study to provide a detailed analysis that considers all of the critical aspects of the proposed project in order to determine the likelihood of it succeeding; and failure to establish, under the precautionary principle, that the proposed activity will not result in significant harm.

Further, per HRS §171-4 (d), BLNR Chair Dawn N.S. Chang and Board Member Vernon Char **must recuse themselves** from participating in any discussion or voting in this matter, given that they have clear conflicts of interest. Chang is employed by the DLNR, a lead agency in the mosquito project. Char is employed by a law firm whose clients include The Nature Conservancy, another lead partner in the project.

I am opposed to the authorization for the Chairperson to issue a Finding of No Significant Impact (FONSI). The scope, security risks, and experimental nature of the plan require detailed, comprehensive studies, and documentation of the impacts to our native birds, wildlife, environment, and public health. **I demand an Environmental Impact Statement (EIS).**

Mahalo for your service,

Donna Thompson
Kamuela, HI
sharkgss@protonmail.com

From: [Kyle Visoky](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Agenda Item C-4
Date: Wednesday, May 10, 2023 1:27:21 PM

OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing! Demand in EIS (environmental impact statement) before they release 40+billion mosquitoes every year for 20 years!

There had not been enough research to do this in such a sensitive environment as the Hawaiian Islands. I support the effort to help native species. There has to be a better way

Thanks

From: [Joanna Weber](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Testimony on Agenda Item C-4: OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing!
Date: Wednesday, May 10, 2023 5:49:59 PM

ALOHA

**Testimony on Agenda Item C-4:
OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing!**

This testimony is made by a real citizen whose morality as well as tax-contributions are not in agreement with this dangerous open-air experiment.

- **A FAIR Environmental Risk Assessment for this bio-pesticide must be conducted by the EPA AND**
- **A FAIR Environmental Impact Statement has not been completed by state agencies or partners.**

ALOHA, JOANNA WEBER

Sherilyn Wells' Testimony re Contested Case application by Hawai'i Unites/Tina Lia (Proposal to release billions of Wolbachia Biopesticide Mosquitoes/week for 20 years).

WOLBACHIA GENES NOW DETECTED IN HUMANS.

The Hawai'i Environmental Protection Act (HRS 344) and the Environmental Impact Statements (HRS 343) both fall under Title 19 – PUBLIC HEALTH.

<https://law.justia.com/codes/hawaii/2022/title-19/>

Therefore, with Public Health as the umbrella under which these issues are debated, let's begin with the most radical change in the scientific landscape around Wolbachia – the detection of Wolbachia genes IN A HUMAN (a vertebrate¹).

[https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X\(14\)00040-8/fulltext](https://www.clinicalmicrobiologyandinfection.com/article/S1198-743X(14)00040-8/fulltext)

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RESEARCH NOTE INFECTIOUS DISEASES | VOLUME 21, ISSUE 2, P182.E1-182.E4, FEBRUARY 2015 [Download Full Issue](#) PDF [713 KB] Figures

< **Detection of *Wolbachia* genes in a patient with non-Hodgkin's lymphoma**

X.-P. Chen [†] • Y.-J. Dong [†] • W.-P. Guo • ... J. Xu • J.S. Dumler • Y.-Z. Zhang [✉] • [Show all authors](#) • [Show footnotes](#)

[Open Archive](#) • Published: October 28, 2014 • DOI: <https://doi.org/10.1016/j.cmi.2014.09.008>

This is how Wolbachia was previously described: *Wolbachia* “is not know(n) to directly infect vertebrates, but infects a wide variety of

¹ A vertebrate is an animal with a backbone. [Fishes](#), [amphibians](#), [reptiles](#), [birds](#), and [mammals](#), including humans, are all vertebrates.

terrestrial arthropods² and filarial nematodes³.” & “..cannot survive outside mosquito cells..”

Wolbachia are closely related to the disease causing Ehrlichia, Anaplasma and Rickettsia. Unlike these close relatives, Wolbachia is not known to directly infect vertebrates, but infects a wide variety of terrestrial arthropods and filarial nematodes. The

<https://www.sas.rochester.edu/bio/labs/WerrenLab/WerrenLab-WolbachiaBiology.html>

“(ii) Releases of male mosquitoes carrying the bacterium *Wolbachia*.... Because these bacteria are highly specialized and cannot survive outside mosquito cells, they are completely harmless to humans and birds..”

<https://drive.google.com/file/d/0ByJvTQW8e0viVndpYjILcDFKUTQ/view?resourcekey=0-iRGH7hVNJFO5xRMPpSKiSg>

Since Rickettsia and Wolbachia are considered sufficiently similar that they have been co-studied in a variety of research AND since some of the organisms that are on the List of Select Human Pathogens are Rickettsia (Section 4-71A-23), is it possible that these similarities have somehow played an evolutionary role in the Wolbachina-genes-now-in-humans phenomenon?

“We also focus on the emergence of Rickettsia as a diverse reproductive manipulator of arthropods, similar to the closely related Wolbachia, including strains associated with male-killing, parthenogenesis, and effects on fertility.”

.....

Phylogenetic analysis suggests multiple transitions between symbionts that are transmitted strictly vertically and those that exhibit mixed (horizontal and vertical) transmission.

² **<https://www.merriam-webster.com/dictionary/arthropod> “any of a phylum (Arthropoda) of invertebrate animals (such as insects, arachnids, and crustaceans) that have a segmented body and jointed appendages, a usually chitinous exoskeleton molted at intervals, and a dorsal anterior brain connected to a ventral chain of ganglia”**

³ **<https://www.merriam-webster.com/dictionary/nematode> & <https://www.merriam-webster.com/dictionary/filarial> “any of a phylum (Nematoda or Nemata) of elongated cylindrical worms parasitic in animals or plants or free-living in soil or water, also called also roundworm” “any of numerous slender filamentous nematodes (*Wuchereria*, *Onchocerca*, and related genera) that as adults are parasites in the blood or tissues of mammals and as larvae usually develop in biting insects**

***Rickettsia* may thus be an excellent model system in which to study the evolution of transmission pathways. We also focus on the emergence of *Rickettsia* as a diverse reproductive manipulator of arthropods, similar to the closely related *Wolbachia*, including strains associated with male-killing, parthenogenesis, and effects on fertility.**

<https://royalsocietypublishing.org/doi/10.1098/rspb.2006.3541>

Wellcome Trust (of Covid-19 injection fame) partnered with Gates multiple times, including for “exploring synergies between human and animal infections.”

<http://www.eliminatedengue.com/progress/index/view/news/1088>

<https://www.gatesfoundation.org/about/committed-grants/2014/05/opp1109338>

For the Environmental Assessment to virtually ignore this major shift in species re “detection” of Wolbachia genes is a travesty in terms of updated, accurate, comprehensive analysis, leading to what can only be very deficient prognostication of outcomes.

THE IMMUNE-COMPROMISED FACTOR.

Also worth noting is that the Wolbachia genes were detected in an (immuno-compromised) human. Whether the immune deficiency was the determining factor in Wolbachia genes’ ability to achieve human “penetration” is unknown at this point, absent a broader survey of the population.

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).

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).



April 13, 2023

Joseph Gehrett, MD; Barbara Gehrett, MD; Chris Flowers, MD; and Loree Britt

• DailyClout

• Pfizer Reports

Report 66: 1,077 Immune-Mediated/Autoimmune Adverse Events in First 90 Days of Pfizer mRNA "Vaccine" Rollout, Including 12 Fatalities. Pfizer Undercounted This Category of Adverse Events by 270 Occurrences.

The War Room/DailyClout Pfizer Documents Analysis ...

The above report is part of an amazing compendium of ever-increasing scientific/medical analyses of 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/>

An interesting fact is that, in 2021 and 2022, Pfizer was #5 and #4 in the top ten Department of Defense contractors.

<https://about.bgov.com/top-defense-contractors/>

<https://dsm.forecastinternational.com/wordpress/2023/02/22/top-100-defense-contractors-2022/>

And there's are the volumes of evidence re the government planning to use mosquitoes in biowarfare. Here's one presentation.

<https://archive.org/details/FutureStrategicIssuesFutureWarfareCirca2025> -

A few additional analyses of the "side effects" of Covid-19 gene therapy on the immune system ...

- 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/>

- **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/>

HOME > NEWS > SCIENCEINSIDER > FURTHER EVIDENCE SUPPORTS CONTROVERSIAL CLAIM THAT SARS-COV-2 GENES CAN INTEGRATE WITH HUMAN DNA

SCIENCEINSIDER | HEALTH

Further evidence supports controversial claim that SARS-CoV-2 genes can integrate with human DNA

After being challenged, research team provides more data to back its controversial hypothesis but the relevance to human health is unclear

6 MAY 2021 • BY JON COHEN

<https://www.science.org/content/article/further-evidence-offered-claim-genes-pandemic-coronavirus-can-integrate-human-dna>

<https://en.protothema.gr/pfizer-mrna-vaccine-goes-into-liver-and-changes-into-dna-swedish-study-finds/>

<https://www.mdpi.com/1467-3045/44/3/73/htm>

<https://www.lunduniversity.lu.se/article/qa-covid-19-vaccine-study-gains-attention>

<https://pubmed.ncbi.nlm.nih.gov/34696485/>⁴

⁴ SARS-CoV-2 spike protein significantly inhibits DNA damage repair, which is required for effective V(D)J recombination in adaptive immunity. [Our findings reveal a](#)

<https://twitter.com/KanekoaTheGreat/status/1610380950768345088>

WHEN WOLBACHIA GENES “MEET” COVID-19’S SPIKE PROTEIN, LIPID NANOPARTICLES, ETC., what might that cellular encounter look like?

Wolbachia is consistently described as “manipulating the host’s reproductive system” -

“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 (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 – see footnote 5: “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 mobilome⁵). 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.

potential molecular mechanism by which the spike protein might impede adaptive immunity and underscore the potential side effects of full-length spike-based vaccines.

⁵ Mobilome in eukaryotes. Transposable elements are elements that can move about or propagate within the genome, and are the major constituents of the eukaryotic mobilome.^[4] Transposable elements can be regarded as genetic parasites because they exploit the host cell's transcription and translation mechanisms to extract and insert themselves in different parts of the genome, regardless of the phenotypic effect on the host.^[6]

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).

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>

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 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>

SO, NOT ONLY HAVE WOLBACHIA GENES ENTERED “NEW – human - TERRITORY,” AN UNEXPECTED ADAPTATION, BUT ITS 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/>

NOT THE MOST STABLE SITUATION ON WHICH TO BET THAT 20 YEARS CAN PASS WITHOUT INCIDENT...

Might that “fast evolution” of mosquitoes have anything to do with this phenomenon below and/or could this reaction be connected to “SARS-CoV-2 Spike” (most humans on the planet have been exposed, one way or another) and/or is some secret project already underway without public notice (act first and confess/apologize later)? It would be far from the first time that the public has been an unsuspecting guinea pig..

The two pictures below document strange phenomena associated with Big Island mosquito bites in September and October 2022. I have never before seen a mosquito bite with a “tail” and/or with “legs” and am curious to know why a mosquito bite skin reaction is taking these forms.





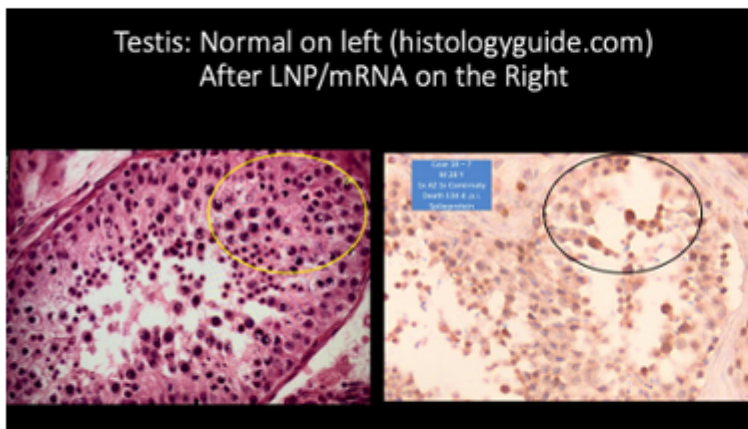
How might a bacterium that manipulates host reproduction, has “mobile genetic elements,” and is hostile to males, interact with components of a gene therapy injection that can also have very negative effects on the person’s immune and reproductive systems?⁶

For instance, for one male reproductive effect, 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/>

⁶ **Report 69: BOMBSHELL – Pfizer and FDA Knew in Early 2021 That Pfizer mRNA COVID “Vaccine” Caused Dire Fetal and Infant Risks, Including Death. They Began an Aggressive Campaign to Vaccinate Pregnant Women Anyway.**

<https://dailyclout.io/bombshell-pfizer-and-the-fda-knew-in-early-2021-that-the-pfizer-mrna-covid-vaccine-caused-dire-fetal-and-infant-risks-they-began-an-aggressive-campaign-to-vaccinate-pregnant-women-anyway/>



March 3, 2023

Robert W. Chandler, MD, MBA

• DailyClout

• Pfizer Reports

Report 58: Part 2 – “Autopsies Reveal Atrocities of Genetic Therapies Being Respiratory Virus”

This report is a follow-up to “Report

“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.

BLNR FOLLOWING 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 Committee⁷ compounds the error of partiality and bias that is explicitly supposed to be absent from administrative processes. The mandate, the longstanding judicial precedent, to preserve the appearance of integrity and impartiality with the process, as well as ACTUAL integrity and impartiality, is well codified within caselaw and will be described further below, in LONGSTANDING TENETS TO GUARD AGAINST BOTH BIAS AND THE APPEARANCE OF BIAS.

The basis for bias 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

⁷ Consider ACIP and its heavily conflicted advisory approvals as yet another example of “captured” agencies no longer functioning in the public interest -

<https://www.lawfirms.com/resources/environment/environment-health/cdc-members-own-more-50-patents-connected-vaccinations>

Members being affiliated with agencies who are a part of Birds Not Mosquitoes, which has the firmly stated intention of using Wolbachia mosquitoes/biopesticides.

BIRDS^{'''}

NOT MOSQUITOES

Birds, Not Mosquitoes is a multi-agency partnership urgently working to save the native Hawaiian honeycreepers from extinction. The southern house mosquito is invading the honeycreepers' habitat and spreading a deadly disease called avian malaria.

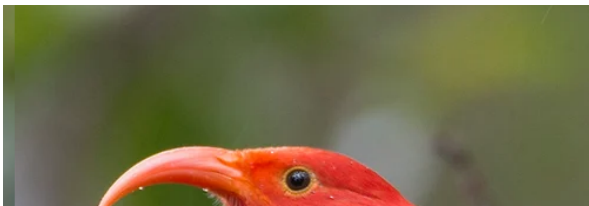
Together, the partnership will use naturally-occurring bacteria as a mosquito "birth control" to suppress the southern house mosquito's populations in Hawai'i. Suppressing the southern house mosquito

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?

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 immunocompromised human, a fact which, if revealed, might alter the general public's perception of this project.

The BNM website also erroneously refers to the mosquitoes being sourced locally (see below – LOCAL mosquitoes in a lab), when the project proposal says that the lab mosquitoes will come from Palmyra, a protectorate but NOT part of Hawai'i State or Maui County.



Researchers have developed a method to transfer a naturally-occurring “birth control” bacteria to local mosquitoes in a lab as a tool to solve this problem. Only male mosquitoes would be released, which

“..but the mosquitoes would be bred from mosquitoes captured here in Hawai‘i. The mosquitoes would then be packaged, shipped to Hawai‘i, and released shortly after their arrival.”

<https://www.nps.gov/articles/the-time-is-now-saving-maui-s-honeycreepers-before-it-is-too-late.htm>

Here are the conflicted/biased Committee members whose agency affiliations (members of BNM) makes their approvals and recommendations suspect/deficient in terms of maintaining 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.

The two BLNR board members with open conflicts of interest are Dawn N.S. Chang and Vernon Char. See Tina Lia’s and Donna Thompson’s testimony for details on these conflicts.

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.

from the same political party. A Member having any interest, direct or indirect, in a matter before the BLNR must disqualify her/himself from voting on or participating in discussion on the matter. The BLNR convenes twice monthly ([with limited exceptions](#)) to review and

<https://dlnr.hawaii.gov/boards-commissions/blnr-board/>

For actions indicating bias, I would say the ENTIRE BLNR is guilty. BLNR board members are Dawn N. S. Chang, Riley Smith, Doreen Nāpua Canto, Karen Ono, Aimee Keli‘i Barnes, Vernon Char, and Wesley “Kaiwi” Yoon.

Here is the BLNR sequence for a two-step Contested Case application process, a sequence the BLNR completely ignored in its rush to premature judgment (instant rejection).

([Home](#) » [Boards & Commissions](#) » [Board of Land and Natural Resources](#) » [FAQs](#))

Q: HOW DO I MAKE A REQUEST FOR A CONTESTED CASE HEARING?

A:

Pursuant to Hawai'i Administrative Rule (HAR) Section 13-1-29*, an oral or written request for a contested case hearing must be made *prior to the close of* either the public hearing (if required) or public meeting at which the matter is scheduled for disposition.

In addition to the oral or written request, a written petition must be filed with the BLNR not later than ten days after the close of the public hearing or the BLNR meeting. The written petition may be either hand-delivered or mailed to the Board of Land and Natural Resources, 1151 Punchbowl Street, Room 130, Honolulu, HI 96813.**

***For a copy of the Rules of Practice and Procedure of the Board of Land and Natural Resources, see [HAR Title 13 Chapter 1](https://dlnr.hawaii.gov/boards-commissions/blnr-board/faqs/). <https://dlnr.hawaii.gov/boards-commissions/blnr-board/faqs/>**

As per the standards set in the Federal and State Constitutions (Due Process) and in administrative law (recusal to preserve the appearance of fairness, as well as to eliminate actual conflict of interest), the entire BLNR present on 3/24/23 demonstrated actual/procedural bias with -

- **their spontaneous placement of Tina Lia's verbal Contested Case request on their Agenda during THAT meeting,**
- **absent public notice/opportunity to participate,**
- **proceeding without receipt of a written Petition to review,**
- **swiftly concluding that the Contested Case request must be rejected,**
- **thereby illegally truncating the process and denying the petitioner her/their right to present further evidence.**

Subsequent attempts to restore the proper process do not remove the obvious taint of bias and partiality that led to the original action/denial.

In fact, guidance from ACUS (Administrative Conference of the United States) suggests that an alternate panel should hear the Contested Case, as the level of demonstrated bias indicates that BLNR members are unlikely to have the ability to objectively review their own errors

and correct the deficiencies they overlooked. Ergo they should recuse themselves.

“Recusal rules can further provide for appeal of those decisions within the agency. Such appeals are typically conducted by OTHER agency adjudicators acting in an appellate capacity..”

<https://www.govinfo.gov/content/pkg/FR-2019-02-06/pdf/2019-01284.pdf>

Every citizen has a long-established right to have their testimony heard by an impartial panel, as well as a right to request recusal of panel members who are either not free of bias/conflict of interest and/or who appear to not be impartial.

These “rights” are foundational tenets of all administrative procedures and specifically fall under the “rights, duties, privileges” of a party to this (or any) administrative proceeding.

Here is the most recent ACUS (Administrative Conference of the United States) guidance/recommendations affirming these tenets, which adds the right to have a WRITTEN EXPLANATION of the reasons for an administrative adjudicator remaining a sitting member (refusing to recuse) or for recusing themselves.

Consistent with the APA, adjudicators, including appellate reviewers, must provide parties with a written explanation of their recusal decisions.

Emphasis Added. <https://www.govinfo.gov/content/pkg/FR-2019-02-06/pdf/2019-01284.pdf>

I herein request that written explanation from each of the seven BLNR members as to why they broke with their own procedures and unceremoniously, prematurely rejected a VERBAL request for a Contested Case before receiving the written application, with that explanation concluding with their current recusal decision.

This act of premature dismissal, of denial/rejection, re Tina Lia/Hawai'i Unites' verbal application for a Contested Case is an example of the selfsame “foregone conclusion” that the Birds Not Mosquitoes (BNM) website demonstrates with its language of assumption re outcome - “together, the partnership WILL USE naturally-occurring bacteria” (a.k.a. Wolbachia biopesticide) - versus employing less-outcome-

certain language such as, “are exploring the use of naturally-occurring bacteria.”

How is it that the BNM group are certain this outcome WILL take place, prior to the parties/agencies receiving all federal and state permits, prior to the chance that the obvious need for a more comprehensive and more accurate environmental review (a full and accurate EIS) will be affirmed by a court, unless they have reason to believe, have been given secret assurances(?), that BLNR bias/support guarantees a favorable outcome?

Bias, interest, or motive is always relevant. 69 H. 204, 738 P.2d 812.

<https://law.justia.com/codes/hawaii/2013/title-33/chapter-626/rule-609.1>

LONGSTANDING TENETS TO GUARD AGAINST BOTH BIAS AND THE APPEARANCE OF BIAS.

Recusal standards exist to protect that most fundamental of requirements - a genuinely fair (administrative) hearing, to remove not just actual conflict of interest, but also any hint of or potential for bias or lack of fairness or partiality.

Nemo iudex in causa sua (or *nemo iudex in sua causa*) (which, in Latin, literally means "no-one is judge in his own cause") is a principle of natural justice that no person can judge a case in which they have an interest.^{[1][2]} In many jurisdictions the rule is very strictly applied to any appearance of a possible bias, even if there is actually none: "Justice must not only be done, but must be seen to be done".^[3]

The legal effect of a breach of natural justice is normally to stop the proceedings and render any judgment invalid; it should be quashed or appealed, but may be remitted for a valid re-hearing.

It appears in *Arnett v. Kennedy*, 416 U.S. 134, 197 (1974) ("we might start with a first principle: '[N]o man shall be a judge in his own cause.' *Bonham's Case*, 8 Co. 114a, 118a, 77 Eng. Rep. 646, 652 (1610)").

https://en.wikipedia.org/wiki/Nemo_iudex_in_causa_sua

Just as petitioners can pursue remedies in equity, which are derived from English law (<https://www.law.cornell.edu/wex/equity>), the landmark case that established a standard re “appearance

necessitating recusal” in administrative proceedings demonstrates that even in situations where it is extremely unlikely that any conflict of interest/bias has occurred, nothing trumps the requirement to preserve the appearance of impartiality.

In that landmark case, the judges (justices) retired to discuss a case, accompanied by a deputy clerk who also worked for one of the parties to the lawsuit.

- Notwithstanding that the deputy clerk was not in the room when the judges deliberated,
- notwithstanding that every judge gave a sworn affidavit indicating that the clerk was not present, made no comments, and had no influence on their deliberations...
- the appearance of the potential for, the possibility of, bias/partiality/improper influence became the governing maxim, regardless of post-event affidavits.

<https://www.barandbench.com/columns/the-origins-of-justice-must-be-seen-to-be-done#:~:text=Few%20sentences%20have%20been%20quoted,%5B1924%5D%201%20KB%20256>

Few sentences have been quoted more often than the aphorism: ***“Justice must not only be done, but must also be seen to be done”***. This dictum was laid down by Lord Hewart, the then Lord Chief Justice of England in the case of *Rex v. Sussex Justices*, [1924] 1 KB 256.

“Lord Hewart went on to observe that what was important *was not what was actually done, but what might appear to have been done* and held :

“Nothing is to be done which creates even a suspicion that there has been an improper interference with the course of justice.”

..this landmark ruling .. remains as one of the pillars of administrative law and indeed as the basis of the principles of natural justice.”

Given that the State’s environmental policy act and administrative procedures act are modeled after their federal counterparts, so may

we look, for guidance, to the recommendations of the 70th Plenary Session of the Administrative Conference of the United States (ACUS), adopted 12/13/18, regarding standards for administrative hearing recusal. <https://www.govinfo.gov/content/pkg/FR-2019-02-06/pdf/2019-01284.pdf>

“Recusal serves two important purposes.

First, it helps ensure that parties to an adjudicative proceeding have their claims resolved by an impartial decisionmaker. This aspect of recusal is reflected in the Due Process Clause, as well as statutory, regulatory, and other sources of recusal standards. Second, the recusal of adjudicators who may appear partial helps inspire public confidence in adjudication in ways that a narrow focus on actual bias against the parties themselves cannot.”

Consistent with the APA, adjudicators, including appellate reviewers, must provide parties with a written explanation of their recusal decisions.”

There is no requirement to prove actual conflict of interest, merely the requirement to preserve both the integrity AND the perceived integrity of the process by eliminating even the potential for or the appearance of partiality.

Ethics rules prohibit employees from participating in certain matters when they have a conflict of interest or an appearance of a conflict. Adjudicative recusal rules focus on how an agency, acting through its adjudicators and appeal authorities, decides who will hear certain cases in a manner that ensures the integrity and perceived integrity of adjudicative proceedings...In this light, ethics rules tend to be very precise, as agency employees need to have clear guidance as to what they may or may not do.

Adjudicative recusal rules, by contrast, tend to be much more open-ended and standard-like. They are focused on maintaining both actual impartiality and the appearance of impartiality of adjudicative proceedings, which may be compromised by conduct that would not constitute a breach of any ethics rule..”

THE COMPLETE PROJECT IS AN ALL-ISLAND (STATEWIDE) RELEASE OF THESE MOSQUITOES. HEPA’S STATED PREFERENCE IS FOR COMPREHENSIVE CONSIDERATION OF PROJECTS, NOT PIECEMEAL.

Therefore, it is of utmost importance that the “First Domino” – Maui - set the correct analytical standard in reviewing ALL the evidence (Environmental Impact Statement a necessity) lest the remaining steps/locations/islands receive perfunctory review based on the prior initial approval... a “slippery slope” in which one imagines that the prior hearings covered all necessary inquiry/analysis, which they have NOT.

MOSQUITOES AS BIOWEAPONS. The elephant in the corner of the proposal-room.

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).

<https://archive.org/details/FutureStrategicIssuesFutureWarfareCirca2025>

DARPA is looking into manipulating skin’s microbiome, ostensibly to increase resistance to mosquito bites (and it could just as easily reveal the contrary/reverse – how to increase susceptibility).

<https://news.fiu.edu/2020/team-awarded-15m-by-darpa-to-develop-skin-microbiome-based-mosquito-repellent>

And there’s the alarming Gene Drive research, which many feel could lead to catastrophic consequences.

<https://www.theguardian.com/science/2017/dec/04/us-military-agency-invests-100m-in-genetic-extinction-technologies>

THE COMPANY YOU KEEP. QUESTION THE SOURCE OF THE DATA..

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 and is well-known for his comments on the desirability of population reduction. Apparently, he’s 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).

Wellcome Trust and the Bill & Melinda Gates Foundation stand to profit handsomely from their investments in drug companies researching solutions for the pandemic.

Some say that raises critical questions around conflicts of interest, transparency and accountability.

<https://childrenshealthdefense.org/defender/foundations-investments-influence-covid-research/>

His windfall profits 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>

He 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/>

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>

Gates is also studying how to aggressively push genes into a different biome. <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/>

<https://www.theguardian.com/science/2017/dec/04/us-military-agency-invests-100m-in-genetic-extinction-technologies>

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>

AND 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>

Bill Gates-Funded Biotech Firm Claims GMO Mosquito Project a ‘Success,’ But Critics Cite Lack of Proof

Oxitec this week said its first study of genetically engineered mosquitoes in the U.S. produced “positive” results, but critics said the experiment so far hasn’t stemmed the spread of mosquito-borne illness.

<https://childrenshealthdefense.org/defender/bill-gates-biotech-gmo-mosquito/>

What could go wrong when an avowed population-reduction “philanthropist” is/has been associated with Wolbachia and Covid-19 injections and the alarming “gene drive” technology?

SHERILYN WELLS AS A CONTESTED CASE PARTY.

My part in a Contested Case hearing is one of a narrow subset of involved and impacted citizens whose participation will be of benefit to the proceedings in ensuring that a broader swath of relevant issues are considered.

BIG ISLAND RESIDENT

I reside on the Big Island, ergo have an interest in a COMPREHENSIVE discussion at the first stage of a biopesticide Project that will eventually include my island IF the Project proceeds unabated, without that more comprehensive look (an Environmental Impact Statement).

As only one distinguishing feature, the Big Island has a majority of the known climate zones on the planet –

The revelation that Hawaii Island possessed 10 of Koppen’s original 14 world climate zones first appeared in a 1978 report celebrating the 20th anniversary of the island’s Mauna Loa Observatory. For their study, “Climate and Water Balance on the Big Island,” a trio of University of Hawaii at Hilo geology professors mapped what they found to be an unusually large range of climate diversity on Hawai’i Island comparable with far larger world landmasses.

<https://www.hawaiimagazine.com/hawaii-has-10-of-the-worlds-14-climate-zones-an-explorers-guide-to-each-of-them/>

The Big Island also has active volcanoes, which have a distinctive effect on air quality, geomagnetics, etc. How might geomagnetic effects (see below) lend themselves to further “evolution/adaptation” of the vector and its endosymbiont?

<https://www.sciencedirect.com/science/article/abs/pii/S0022191014001310>

Volcano-electromagnetic effects—electromagnetic (EM) signals generated by volcanic activity—derive from a variety of physical processes. These include piezomagnetic effects, electrokinetic effects, fluid vaporization, thermal demagnetization/remagnetization, resistivity changes, thermochemical effects, magnetohydrodynamic effects, and blast-excited traveling ionospheric disturbances (TIDs). Identification of different physical processes and their interdependence is often possible with multiparameter monitoring, now common on volcanoes, since many of these processes occur with different timescales and some are simultaneously identified in other geophysical data (deformation, seismic, gas, ionospheric disturbances, etc.). EM monitoring plays an important part in understanding these processes.

https://link.springer.com/referenceworkentry/10.1007/978-1-4020-4423-6_315

PERSONAL HEALTH - I am particularly susceptible to mosquito bites, so I have a pronounced health interest in discovering implications of the presence of *Wolbachia* in various somatic tissues and now in humans, in an analysis that does much more justice to the shifting “truths” about this bacterium. Please note that there is a DOD experiment in the skin/mosquito interface, looking into decreasing (ergo, also increasing, one must presume) the skin’s vulnerability to penetration.

In addition, the earlier photos of my mosquito bites reveal a change in recent months – the emergence of distinctly different shapes from the traditional “round” presentation (“tails” and “legs” now included), ergo AM I a “canary in the coal mine?” This is a phenomenon worthy of further investigation.

ENVIRONMENTAL, LEGAL, AND JOURNALISM ACTIVISM “ABOVE AND BEYOND”

- I have served as a residential volunteer with U.S. Fish and Wildlife on Midway Atoll and at the Kilauea Lighthouse Reserve on Kaua’i, both refuges for birds, and provided photographs for interpreter slideshows educating the public on preservation of indigenous avian species.
- I have litigated pro se to protect the environment in another state in which I resided (Washington State), focusing on environmental issues arising within the Growth Management Act, within property development/land use statutes, and within the Clean Water Act.
- I have co-established a source of comprehensive news for local citizens regarding projects in their community (co-founder of Whatcom Watch for Whatcom County, Washington) to compensate for the suppression of important public interest details due to the influence of their advertisers on that local mainstream media. I also wrote extensively for that publication, as well as other local newsmagazines.
- I have served as a Board Member, then a Co-President, of the Washington Environmental Council, a statewide coalition of local environmental groups with a significant presence in the deliberations of the State Legislature in Olympia.

- **I have served as a Board Member of the Washington Toxics Coalition (since renamed).**
- **I have co-founded a local environmental organization – the Watershed Defense Fund, later renamed the Clean Water Alliance – whose role was to appear before hearings boards and courts, to litigate to protect the environment when government and corporations failed to follow the law. This activity included frequent reviews of comprehensive plans and of environmental analyses, including EIS's, and was often done in concert with the local chapter of the Audubon Club, specifically the Conservation Chair and the President(s).**

<https://www.taxexemptworld.com/organization.asp?tn=1448058>

Subject: BLNR Meeting 3/24/23 9:15am Agenda Item C-2: **Oppose**

Aloha,

This testimony is in regards to item C-2 Request Approval of Final Environmental Assessment (EA) and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the “Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui”

I am **strongly opposed** to the request for approval of the Final Environmental Assessment for the planned biopesticide mosquito releases anywhere in Hawaii. I have been involved with submitting testimonies since spring of 2022 and it is clear this project is being fast tracked with no regard for numerous legitimate concerns. There are issues with security, conflict of interest, lack of proper study, permitting, and this project is undoubtedly an experiment which can have serious consequences that are **irreversible**.

My background spans over 30 years in National Security and Investigations as a Subject Matter Expert. According to the Final EA there has been no risk analysis conducted on the security vulnerabilities for lab bred mosquitoes that can be utilized as bio-weapons against a population (intended) nor any mention of quality control for accidental transmission of pathogens (unintended).

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.

There is no mention in the Final EA on how lab batches will be quality controlled or tested for unintended pathogens upon arrival to Hawaii or if lab employees in contact with these mosquitoes will go thru security clearance screening and training. Our

science and tech industry in the United States has been heavily infiltrated by the Chinese Communist Part (CCP). Due to the deterioration of relations between the US and China, among other adversaries, this project 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 U.S. Department of the Interior Strategy for Preventing the Extinction of Hawaiian Forest Birds confirms that The Nature Conservancy has contracted with mosquito lab Verily Life Sciences. There is no mention of this contract in the EA. No documented assurances have been made that Verily Life Sciences will be testing mosquitoes for human or avian diseases to ensure that they are pathogen-free prior to shipping to Hawaii. As this project involves the interstate transport of Culex mosquitoes, a known vector of poultry diseases, there is concern about impacts to local poultry farms and egg production in Hawaii. Has the USDA inspected the Verily insectary? There is no mention in the Final EA of a USDA permit (e.g. OV VS16-6 permit from APHIS) for the interstate transport of poultry pathogen vectors by a California shipper.

According to APHIS: The Veterinary Services, Organisms and Vectors (OV) Permitting Unit regulates the importation into the United States, and interstate transportation, of organisms and vectors of pathogenic diseases of livestock and poultry.

The Code of Federal Regulations, in 9 CFR, §122.2, mandates that “no organisms or vectors shall be imported into the United States or transported from one State or Territory or the District of Columbia to another State or Territory or the District of Columbia without a permit”.

Given that interstate transport of the vector (live Culex) is occurring from Maui to Verily's lab in South San Francisco, CA and those Culex may contain a highly contagious poultry pathogen, such as avianpox virus, movement between states needs a federal permit. Lab mosquitoes are blood fed, the EA makes no mention of what type of blood or how they would mitigate risk transporting avian pathogens back to Hawaii.

The Bill and Melinda Gates Foundation have openly discussed support of human depopulation; this is the same foundation that funded original research of Wolbachia mosquitoes in 2003. There are too many coincidences and not enough objective analysis of the big picture ecology by the BNM steering partners whom have been myopically focused on saving the birds at all costs. This lack of careful study and observation could instigate increased rates of extinction due to multiple potential secondary impacts.

Wolbachia is NOT harmless to humans. It effects filarial worms that cause human disease such as river blindness which effects tens of 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>

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“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>

Even though male mosquitoes do not bite, **male Culex mosquitoes are known to spread viruses to female mosquitoes through mating**. 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>

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/>

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/>

Horizontal gene transfer between Wolbachia and the mosquito Aedes aegypti
<https://bmcbgenomics.biomedcentral.com/articles/10.1186/1471-2164-10-33>

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](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 EA's assertion that released mosquitoes pose no risk to human health is based on unsound science. 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.”

Since Verily Life Sciences is the most likely sole source candidate to provide lab bred mosquitoes, there are several issues that should be considered by voting members of this committee in committing tax payer funds to a vendor on a project of this size and scope.

Verily Life Sciences is a relatively new corporation (incorporated in 2015). A sole source provider producing up to 40 billion mosquitoes per year on Maui alone should have much more established past performance in the Incompatible Insect Technique IIT methodologies intended for use in Hawaii.

Verily had recent leadership shake up and layoffs of 15% of staff in January 2023. Verily's owners are: Larry Page and Brin Sergey, the Soros Foundation, Silver Lake and Temasek. Verily raised 3.5 billion dollars of private equity money between 2017 and 2022 and could have direct exposure to the collapse of Silicon Valley Bank, the "go to" bank for the life science startups.

Verily had a colony collapse with mosquitoes in 2017, the titer levels of Wolbachia were a key cause for this reproductive collapse. <https://www.nature.com/articles/s41587-020-0471-x#Sec19>

It is undetermined whether Verily has perfected a sound method of sex sorting for *Culex quinquefasciatus* so that females do not escape. The company has dozens of patents for sieving apparatuses for pupae separation that are as recent as 2023 and going back NO further than 2018.

Landscape level control of *Culex* mosquitoes using this Incompatible Insect Technique (IIT) **has never been done before**. Even with *Aedes* mosquitoes, the largest project area was 724 acres. Federal documentation connected to this project confirms that “although used world-wide for human health, Wolbachia IIT is a novel tool for conservation purposes and its degree of efficacy in remote forest landscapes is unknown.” Additionally, the species planned for use in this project, *Culex quinquefasciatus*, **has never been used for IIT**.

The Advisory Committee on Plants and Animals’ recommendation to approve import and release of *Culex quinquefasciatus* mosquitoes should be null and void due to the

conflicts of interest of committee members pursuant to HRS 84-14. The Ethics Guide for State Board and Commission Members states that members must not take official action affecting a business in which they have "financial interest." "Financial interest" in a business includes "employment." Whether a business can be a government agency is unstated. The following members of the Advisory Committee on Plants and Animals unanimously voted (7/0) on June 9, 2022 to recommend approval of the import permit:

- Darcy Oishi, Committee Chairperson, Hawaii Department of Agriculture (HDOA)
- Dr. Maria Haws, Professor of Aquaculture, Pacific Aquaculture & Coastal Research Center, University of Hawaii at Hilo
- Cynthia King, Entomologist, Division of Forestry & Wildlife, Department of Land & Natural Resources (DLNR), Ex Officio Member Designated Representative
- Gracelda Simmons, Environmental Management Program Manager, Hawaii Department of Health, Ex Officio Member Designated Representative
- Thomas Eisen, Planner, Environmental Review Program, Department of Business, Economic Development and Tourism, Ex Officio Member Designated Representative
- Joshua Fisher, Wildlife Biologist, U. S. Fish and Wildlife Service (USFWS)
- Dr. Samuel Ohu Gon III, Senior Scientist and Cultural Advisor, The Nature Conservancy – Hawaii (TNC)

Of the seven voting members' agencies above, only Thomas Eisen and Darcy Oishi are not partner agencies in Birds, Not Mosquitoes. As employees of partner agencies, Dr. Maria Haws (University of Hawaii), Cynthia King (DLNR), Gracelda Simmons (Hawaii Department of Health), Joshua Fisher (USFWS), and Dr. Samuel Ohu Gon III (TNC) all have conflicts of interest.

Both Dr. Samuel Ohu Gon III and Cynthia King are also members of the Birds, Not Mosquitoes steering committee. The purpose of the steering committee, as stated in the National Fish and Wildlife Foundation Hawaii Conservation Business Plan, includes coordinating permits for this project.

The Hawaii Department of Agriculture has applied for an EPA Emergency Exemption for use of the mosquitoes without going through regulatory safety processes. The EPA application is still under review, and the biopesticide mosquitoes have not been approved for emergency release. The Board of Land and Natural Resources cannot approve this Final Environmental Assessment and declare before the public that there is a Finding of No Significant Impact (FONSI) when there is still a possibility that the EPA will deny the Emergency Exemption due to safety concerns. This biopesticide cannot be approved for release when its safety is still under review by the EPA.

Additional concerns not adequately addressed in the Final Environmental Assessment: lack of adequate detail as required by HEPA; failure to identify the Wolbachia strain planned for use in this project; failure to identify and describe the mark release recapture study as a proposed action; failure to adequately identify the mosquito packages planned for release into the environment; failure to adequately address the effects on the environment from the release of biodegradable packages with an unknown decay rate; failure to identify biosecurity protocols; failure to adequately address viewscape impacts, noise disturbances to forest bird breeding and nesting, and significant environmental consequences, including impacts to the untrammled, natural qualities of the wilderness character; failure to adequately address the potential negative impacts of introducing an invasive species to the islands; failure to identify the origin of biopesticide mosquitoes for this project as Palmyra Atoll; failure to identify the origin of Wolbachia bacteria for the project as Kuala Lumpur in Malaysia; failure to identify the strain of Wolbachia bacteria planned for import in connection with this project that does not exist on these islands; failure to address the concerns of tropical disease and vector expert Dr. Lorrin Pang (private citizen) regarding the serious risks of this project; failure to adequately study or address the impacts to endangered native Hawaiian hoary bats, native dragonflies, and endangered native damselflies; failure to study and address biopesticide wind drift; failure to adequately address Environmental Justice (human health impacts of this project have not been adequately studied, and the proposed action would impact ethnographic resources and traditional cultural practices); failure to conduct a feasibility study to provide a detailed analysis that considers all of the critical aspects of the proposed project in order to determine the likelihood of it succeeding; and failure to establish, under the precautionary principle, that the proposed activity will not result in significant harm.

Further, per HRS §171-4 (d), BLNR Chair Dawn N.S. Chang and Board Member Vernon Char **must recuse themselves** from participating in any discussion or voting in this matter, given that they have clear conflicts of interest. Chang is employed by the DLNR, a lead agency in the mosquito project. Char is employed by a law firm whose clients include The Nature Conservancy, another lead partner in the project.

I am opposed to the authorization for the Chairperson to issue a Finding of No Significant Impact (FONSI). The scope, security risks, and experimental nature of the plan require detailed, comprehensive studies, and documentation of the impacts to our native birds, wildlife, environment, and public health. **I demand an Environmental Impact Statement (EIS).**

Mahalo for your service,

Donna Thompson
Kamuela, HI
sharkgss@protonmail.com

From: [Sherilyn Wells](#)
To: [DLNR, BLNR Testimony](#)
Subject: [EXTERNAL] CORRECTION Re: 5/12/23 BLNR meeting (item C-4) - Contested Case. You have an opportunity, with the Contested Case, to correct your procedural and substantive deficiencies.
Date: Monday, May 8, 2023 7:10:57 AM
Attachments: [D.Thompson BLNR C2 Testimony 24 March 2023.pdf](#)

Correction to Conflict of Interest - identity of Board as BLNR - should be Dept. of Agriculture Advisory Committee on Plants and Animals.

Statements re maintaining appearance of fairness and violating your own procedures (e.g, BLNR's response to verbal request for Contested Case) are accurate.

Board members listed from the Dept. of Agriculture Advisory Committee on Plants and Animals DO raise a separate conflict of interest issue regarding its own processes/legitimacy, but also because that tainted approval **set the stage for the BLNR's approval and which, by BLNR not questioning the Committee members' biases, was a deficiency in the BLNR investigation.**

This failure continues a pattern of superficial review, as evidenced by approving an EA that overlooks huge swaths of documented concerns and references/relies on a study from which federal approval was withdrawn).

The BLNR board members are Dawn N. S. Chang, Riley Smith, Doreen Nāpua Canto, Karen Ono, Aimee Keli'i Barnes, Vernon Char, and Wesley "Kaiwi" Yoon.

The two BLNR board members with conflicts of interest noted are Dawn N.S. Chang and Vernon Char.

See attached testimony of Donna Thompson, Federal Investigator, and of Hawai'i Unites President Tina Lia, outlining specific conflicts.

https://hawaiiunites.org/wp-content/uploads/2023/03/2023_0324_BLNR_Testimony_References_Attachments.pdf

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

----- Original Message -----

On Friday, May 5th, 2023 at 6:53 PM, Sherilyn Wells <votetrees@protonmail.com> wrote:

Aloha BLNR,
Please see attached.
Mahalo,
Sherilyn Wells

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

**Re Participation In Contested Case Petition of Tina Lia/Hawai'i Unites and
Requests for Recusal, Vacatur**

Sherilyn Wells
68-1921 Lina Poepoe St.
Waikoloa 96738
votetrees@protonmail.com

Recusal and Reconstitution for Impartiality

First I ask, as per HEPA's remedies that the courts may enforce in EQUITY - HRS 604A-2(b) - that my "request to participate" and "the Contested Case Petition itself" be reviewed by a reconstituted and impartial panel, not by the original BLNR panel ("original" meaning those Board members present at the hearing on 3/24/23).

In order to identify the five BLNR members who should recuse themselves to preserve the appearance of integrity and impartiality, as well as ACTUAL integrity and impartiality, within the process, see the testimony of Donna Thompson and of Tina Lia/Hawai'i Unites.

Their testimony outlines those seven BLNR members' history of employment, of historical and current association and allegiances (including, but not limited to, being affiliated with agencies who are a part of Birds Not Mosquitoes, which has the stated intention of using Wolbachia mosquitoes/biopesticides – see below re BLNR - "any interest, direct or indirect"), clear/obvious conflicts of interest (votes on permit applications, etc.), etc.:

(1) Dr. Marcia Haws, (2) Cynthia King, (3) Gracelda Simmons, (4) Joshua Fisher, (5) Dr. Samuel Ohu Gon III.

from the same political party. A Member having any interest, direct or indirect, in a matter before the BLNR must disqualify her/himself from voting on or participating in discussion on the matter. The BLNR convenes twice monthly (with limited exceptions) to review and

<https://dlnr.hawaii.gov/boards-commissions/blnr-board/>

For actions indicating bias (e.g., the unanimous response to Tina Lia's verbal request for a Contested Case hearing, in direct violation of BLNR's published

Sherilyn Wells re Recusals/Reconstitution, Request to Participate, Vacatur, re Contested Case Petition of Tina Lia/Hawai'i Unites (BLNR hearing 3/24/23 – Wolbachia/Mosquito Biopesticide release)

procedures), I add the remaining two BLNR members as “tainted by bias, ergo insufficiently impartial” to hear testimony with an open mind, a standard which is the foundation of all fair administrative hearings (those not subsequently subject to vacatur) – (6) Thomas Eisen and (7) Darcy Oishi.

See below for the BLNR guidance for a contested case hearing ([Home](#) » [Boards & Commissions](#) » [Board of Land and Natural Resources](#) » FAQs)

As per the standards set in the **Federal and State Constitutions (Due Process)** and in administrative law (recusal to preserve the appearance of fairness, as well as to eliminate actual conflict of interest), the entire **BLNR** present on 3/24/23 **already demonstrated actual/procedural bias** with their **spontaneous placement of Tina Lia’s verbal Contested Case request on their Agenda** during their meeting, **absent public notice/opportunity to participate**, then **proceeded without receipt of a written Petition to review**, and **swiftly acted by concluding that the Contested Case request must be rejected, illegally truncating the process.**

Subsequent attempts to restore the proper process do not remove the obvious taint of bias and partiality that led to the original action/denial.

Q: HOW DO I MAKE A REQUEST FOR A CONTESTED CASE HEARING?

A:

Pursuant to Hawai‘i Administrative Rule (HAR) Section 13-1-29*, **an oral or written request for a contested case hearing must be made prior to the close of either the public hearing (if required) or public meeting at which the matter is scheduled for disposition.**

In addition to the oral or written request, **a written petition must be filed with the BLNR not later than ten days after the close** of the public hearing or the BLNR meeting.** The written petition may be either hand-delivered or mailed to the Board of Land and Natural Resources, 1151 Punchbowl Street, Room 130, Honolulu, HI 96813.

*For a copy of the Rules of Practice and Procedure of the Board of Land and Natural Resources, see [HAR Title 13 Chapter 1](#).

<https://dlnr.hawaii.gov/boards-commissions/blnr-board/faqs/>

The **right to have this testimony heard by an impartial panel** (“OTHER agency adjudicators” – see ACUS guidance below) and my right to request recusal of those who are either not free of bias/conflict of interest and/or who **appear** to not be impartial is one of my “rights” under the foundational tenets of administrative procedures and specifically falls under my “rights, duties, privileges” as a party to any/this administrative proceeding.

Here is the most recent ACUS (Administrative Conference of the United States) guidance/recommendations affirming these tenets, which **adds** the right to have a WRITTEN EXPLANATION of the reasons for an administrative adjudicator remaining a sitting member (refusing to recuse) or for recusing themselves.

I herein request that written explanation from each of the seven BLNR members.

“Recusal rules can further **provide for appeal of those decisions** within the agency. **Such appeals are typically conducted by OTHER agency adjudicators acting in an appellate capacity..**”

Consistent with the APA, **adjudicators, including appellate reviewers, must provide parties with a written explanation of their recusal decisions.**

Emphasis Added. <https://www.govinfo.gov/content/pkg/FR-2019-02-06/pdf/2019-01284.pdf>

This act of premature dismissal, of denial, re Tina Lia/Hawai’i Unites’ verbal application for a Contested Case represents the selfsame “foregone conclusion” that the Birds Not Mosquitoes (hereinafter BNM) website demonstrates (see image below) with its **language of assumption** re outcome - “together, the partnership **WILL USE** naturally-occurring bacteria” (a.k.a. Wolbachia biopesticide) - versus employing less-outcome-certain language such as, “are exploring the use of naturally-occurring bacteria.” **How is it that they are certain this outcome WILL take place**, prior to the parties/agencies receiving all federal and state permits, prior to the chance that the obvious need for a more comprehensive and more accurate environmental review (a full and accurate EIS) will be affirmed by a court, **unless they have reason to believe, have**

Sherilyn Wells re Recusals/Reconstitution, Request to Participate, Vacatur, re Contested Case Petition of Tina Lia/Hawai’i Unites (BLNR hearing 3/24/23 – Wolbachia/Mosquito Biopesticide release)

been given secret assurances(?), that BLNR bias/support guarantees a favorable outcome?



Birds, Not Mosquitoes is a multi-agency partnership urgently working to save the native Hawaiian honeycreepers from extinction. The southern house mosquito is invading the honeycreepers' habitat and spreading a deadly disease called avian malaria.

Together, the partnership will use naturally-occurring bacteria as a mosquito "birth control" to suppress the southern house mosquito's populations in Hawai'i. Suppressing the southern house mosquito population will decrease the transmission of avian malaria among the

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.

<https://pubmed.ncbi.nlm.nih.gov/25658559/>

Case Reports > Clin Microbiol Infect. 2015 Feb;21(2):182.e1-4. doi: 10.1016/j.cmi.2014.09.008.

Epub 2014 Oct 29.

Detection of Wolbachia genes in a patient with non-Hodgkin's lymphoma

X-P Chen¹, Y-J Dong², W-P Guo¹, W Wang¹, M-H Li¹, J Xu¹, J S Dumler³, Y-Z Zhang⁴

Affiliations + expand

PMID: 25658559 DOI: 10.1016/j.cmi.2014.09.008

[Free article](#)

PREVIOUS ASSUMPTION

Sherilyn Wells re Recusals/Reconstitution, Request to Participate, Vacatur, re Contested Case Petition of Tina Lia/Hawai'i Unites (BLNR hearing 3/24/23 – Wolbachia/Mosquito Biopesticide release)

“(ii) Releases of male mosquitoes carrying the bacterium *Wolbachia*:

Suppression and elimination of mosquito populations can also be achieved by releasing male mosquitoes that carry insect specific bacteria called *Wolbachia*.

Because **these bacteria** are highly specialized and **cannot survive outside mosquito cells**, they are completely harmless to humans and birds”

<https://drive.google.com/file/d/0ByJvTQW8e0viVndpYjLcDFKUTOQ/view?resourcekey=0-iRGH7hVNJFO5xRMPpSKiSg>

Therefore, agencies whose prior position was favorable to this biopesticide now need to take a much longer look at newly emerging data, **at possible human interaction and side-effects** (e.g., an EIS), especially given emerging evidence that there might be manipulation of the human genome via the mRNA injection for Covid-19 and/or exposure to the gain-of-function Sars-CoV-2 organism.

<https://www.science.org/content/article/further-evidence-offered-claim-genes-pandemic-coronavirus-can-integrate-human-dna>

<https://pubmed.ncbi.nlm.nih.gov/35723296/>

<https://dailyclout.io/category/pfizer-reports/>

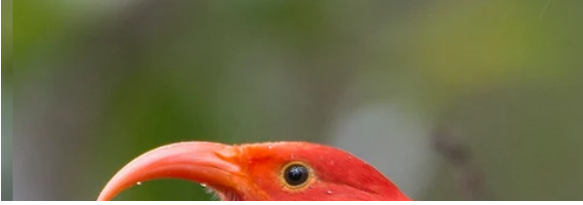
Let’s remember that **HEPA** (Chapter 344 and Chapter 343 – EIS) is found within the Title 19 for the **Department of Health**. Ergo, the mandate to include analysis of novel human exposure (and genetic) circumstances is self-evident.

Here are 2 photos taken immediately after mosquito bites on the Big Island (September and October 2022). The strange “legs” and “tail” surrounding the raised center are new developments with – to date – no explanation for what could be causing this alteration of the traditional round shape.



In another example of not being completely transparent with the public, the BNM's website also inaccurately states that LOCAL mosquitoes will be used, when the proposal states that they will come from Palmyra.

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Researchers have developed a method to transfer a naturally-occurring "birth control" bacteria to local mosquitoes in a lab as a tool to solve this problem. Only male mosquitoes would be released, which

Recusal standards exist to protect that most fundamental of requirements - a genuinely fair (administrative) hearing, **to remove not just actual conflict of interest, but also any hint of or potential for bias or lack of fairness or partiality.**

Nemo iudex in causa sua (or *nemo iudex in sua causa*) (which, in [Latin](#), literally means "no-one is judge in his own cause") is a principle of [natural justice](#) that **no person can judge a case in which they have an interest.**^{[1][2]} In many jurisdictions the rule is very strictly applied to any appearance of a possible bias, even if there is actually none: "Justice must not only be done, but must be seen to be done".^[3]

The legal effect of a breach of natural justice is normally to stop the proceedings and render any judgment invalid; it should be quashed or appealed, but may be remitted for a valid re-hearing.

It appears in [Arnett v. Kennedy](#), 416 U.S. 134, 197 (1974) ("we might start with a first principle: '[N]o man shall be a judge in his own cause.' *Bonham's Case*, 8 Co. 114a, 118a, 77 Eng. Rep. 646, 652 (1610)").

https://en.wikipedia.org/wiki/Nemo_iudex_in_causa_sua

Just as petitioners can pursue **remedies in equity**, which are derived from English law (<https://www.law.cornell.edu/wex/equity>), the landmark case that established a standard re "**appearance necessitating recusal**" in administrative proceedings demonstrates that even in situations where it is extremely unlikely that any conflict of interest/bias has

occurred, **nothing trumps the requirement to preserve the appearance of impartiality.**

In that landmark case, the judges (justices) retired to discuss a case, accompanied by a deputy clerk who also worked for one of the parties to the lawsuit. Notwithstanding that the deputy clerk was not in the room when the judges deliberated, notwithstanding that every judge gave a sworn affidavit indicating that the clerk was not present, made no comments, and had no influence on their deliberations... the **appearance** of the potential for, the possibility of, bias/partiality/improper influence became the governing maxim, regardless of post-event affidavits.

<https://www.barandbench.com/columns/the-origins-of-justice-must-be-seen-to-be-done#:~:text=Few%20sentences%20have%20been%20quoted,%5B1924%5D%201%20KB%20256>

Few sentences have been quoted more often than the aphorism: “*Justice must not only be done, but must also be seen to be done*”. This dictum was laid down by **Lord Hewart**, the then Lord Chief Justice of England in the case of *Rex v. Sussex Justices*, [1924] 1 KB 256.

“Lord Hewart went on to observe that what was important **was not what was actually done, but what might appear to have been done** and held :

“Nothing is to be done which creates even a suspicion that there has been an improper interference with the course of justice.”

..this landmark ruling .. remains as one of the pillars of administrative law and indeed as the basis of the principles of natural justice.”

Given that the State’s environmental policy act and administrative procedures act are modeled after their federal counterparts, so may we look, for guidance, to the recommendations of the 70th Plenary Session of the Administrative Conference of the United States (ACUS), adopted 12/13/18, regarding **standards for administrative hearing recusal**. <https://www.govinfo.gov/content/pkg/FR-2019-02-06/pdf/2019-01284.pdf>

“Recusal serves two important purposes.

First, it helps ensure that parties to an adjudicative proceeding have their claims **resolved by an impartial decisionmaker**. This aspect of recusal is reflected in

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the Due Process Clause, as well as statutory, regulatory, and other sources of recusal standards.

Second, the recusal of adjudicators who may appear partial helps inspire public confidence in adjudication in ways that a narrow focus on actual bias against the parties themselves cannot.

Consistent with the APA, **adjudicators, including appellate reviewers, must provide parties with a written explanation of their recusal decisions.**

There is no requirement to prove actual conflict of interest, merely the requirement to preserve both the integrity AND the perceived integrity of the process by eliminating even the potential for or the appearance of partiality.

Ethics rules prohibit employees from participating in certain matters when they have a conflict of interest or an appearance of a conflict. **Adjudicative recusal rules focus on how an agency, acting through its adjudicators and appeal authorities, decides who will hear certain cases in a manner that ensures the integrity and perceived integrity of adjudicative proceedings...** In this light, ethics rules tend to be very precise, as agency employees need to have clear guidance as to what they may or may not do.

Adjudicative recusal rules, by contrast, tend to be much more open-ended and standard-like. They are focused on maintaining both actual impartiality and the appearance of impartiality of adjudicative proceedings, which may be compromised by conduct that would not constitute a breach of any ethics rule..”

VACATUR

However, as seen above, the original BLNR hearings are tainted by bias to the degree that the decisions and actions of this BLNR should be VACATED as violating the fundamental tenet of administrative hearings – the right to be heard by a neutral adjudicator.

An under-considered possibility: PARTHENOGENESIS Promoting Mosquito Population Levels, particularly of the biting female (the Opposite Effect from intended IIT outcomes)

Numerous scientific articles discuss parthenogenesis in female mosquitoes (asexual reproduction), a response to pressures when sex/gender distribution in a mosquito population undergoes major alteration (as it would/could using the IIT system).

I have seen little to no consideration of this as **a factor that could produce the exact opposite effect (promoting the production of the biting females)** from this project's stated intentions.

One strain may hide another: Cryptic male killing *Wolbachia*

Emily A. Hornett

1,2*, Gregory D. D. Hurst¹

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“In the first type, **maternally inherited microbes distort the host sex ratio** through male-killing (MK), feminisation of genetic males, or **parthenogenesis induction—acts that promote the production or survival of female hosts.**”

Table 7.1. Types of Reproductive Parasitism Induced by *Wolbachia*

Manipulation	Effect on Progeny	Sex Ratio Distortion?	Example Strain and Host Species
Cytoplasmic incompatibility	<i>Wolbachia</i> -infected embryos develop normally. Uninfected embryos only develop if both parents were uninfected.	No	wRi infection in <i>Drosophila simulans</i>
Feminization	Genetic male embryos become female. Genetic female embryos develop normally.	Yes	wVulM in <i>Armadillidium vulgare</i>
Male killing	Male embryos do not develop. Females develop normally.	Yes	wBol1 in <i>Hypolimnas bolina</i>
Parthenogenesis	Unfertilized and/or fertilized eggs develop into female progeny.	Yes	wUni in <i>Muscidifurax uniraptor</i>

The most widespread of the reproductive manipulations is CI. This occurs when a *Wolbachia*-infected male mates with an uninfected female. The female lays eggs as normal; however, the hatch rate of these eggs is either greatly decreased (known as incomplete CI), or they all fail to hatch (known as complete CI). In contrast, *Wolbachia*-infected females are capable of producing viable progeny by mating with both *Wolbachia*-infected and

“FIRST DOMINO” OF A FUTURE STATEWIDE EXPERIMENT – but no comprehensive analysis.

HEPA mandates a COMPREHENSIVE look at environmental issues. There has been a failure of analysis, in the current project, to factor in its status as the first domino in a statewide project – and once a FONSI is affirmed for the first stage, it becomes increasingly difficult to overcome an initial precedent and prove the contrary at any other stage, on any other island. This failure to take a look at the full spectrum of what is being planned is contrary to the spirit and letter of HEPA.

My part in a Contested Case hearing is one of a narrow subset of involved and impacted citizens whose participation will be of benefit to the proceedings.

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BIG ISLAND RESIDENT

I reside on the Big Island, ergo have an interest in a COMPREHENSIVE discussion at the first stage of a biopesticide Project that will eventually include my island if the Project proceeds unabated, without that more comprehensive look. As only one distinguishing feature, the Big Island has a majority of the known climate zones on the planet –

The revelation that Hawaii Island possessed 10 of Koppen’s original 14 world climate zones first appeared in a 1978 report celebrating the 20th anniversary of the island’s Mauna Loa Observatory. For their study, “Climate and Water Balance on the Big Island,” a trio of University of Hawaii at Hilo geology professors mapped what they found to be an unusually large range of climate diversity on Hawai‘i Island comparable with far larger world landmasses.

<https://www.hawaiimagazine.com/hawaii-has-10-of-the-worlds-14-climate-zones-an-explorers-guide-to-each-of-them/>

The Big Island also has active volcanoes, which have a distinctive effect on air quality, geomagnetics, etc.

Volcano-electromagnetic effects—electromagnetic (EM) signals generated by volcanic activity—derive from a variety of physical processes. These include piezomagnetic effects, electrokinetic effects, fluid vaporization, thermal demagnetization/remagnetization, resistivity changes, thermochemical effects, magnetohydrodynamic effects, and blast-excited traveling ionospheric disturbances (TIDs). Identification of different physical processes and their interdependence is often possible with multiparameter monitoring, now common on volcanoes, since many of these processes occur with different timescales and some are simultaneously identified in other geophysical data (deformation, seismic, gas, ionospheric disturbances, etc.). EM monitoring plays an important part in understanding these processes.

https://link.springer.com/referenceworkentry/10.1007/978-1-4020-4423-6_315

HEALTH - I am particularly susceptible to mosquito bites, so I have a pronounced health interest in discovering implications of the presence of Wolbachia in somatic tissues and now in humans, in an analysis that does much more justice to the shifting “truths” about this bacterium. In addition, the earlier photos of my mosquito bites reveal a change in recent months – the emergence of distinctly different shapes from the traditional “round” presentation (“tails” and “legs” now included), ergo is a phenomenon worthy of further investigation.

ENVIRONMENTAL ACTIVISM ABOVE AND BEYOND

- **I have served as a residential volunteer with U.S. Fish and Wildlife on Midway Atoll and at the Kilauea Lighthouse Reserve on Kaua’i, both refuges for birds, and provided photographs for interpreter slideshows educating the public on preservation of indigenous avian species.**
- **I have litigated pro se to protect the environment in another state in which I resided (Washington State), focusing on environmental issues arising within the Growth Management Act, within property development statutes, and within the Clean Water Act.**
- **I have co-established a source of comprehensive news for local citizens regarding projects in their community (co-founder of Whatcom Watch for Whatcom County, Washington) to compensate for the suppression of important public interest details due to the influence of their advertisers on that local mainstream media.**
- **I have served as a Board Member, then a Co-President, of the Washington Environmental Council, a statewide coalition of local environmental groups with a significant presence in the deliberations of the State Legislature in Olympia.**
- **I have served as a Board Member of the Washington Toxics Coalition (since renamed).**
- **I have co-founded a local environmental organization – the Watershed Defense Fund – whose role was to appear before hearings boards and courts,**

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to litigate to protect the environment when government and corporations failed to follow the law. This activity included frequent reviews of comprehensive plans and of environmental analyses, including EIS's.

<https://www.taxexemptworld.com/organization.asp?tn=1448058>

From: [JnKC Wilt](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] Agenda item C-4
Date: Wednesday, May 10, 2023 3:01:51 PM

Agenda item C-4

OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing!
No bio engineered mosquitoes in Hawaii!

KC Wilt
73-1210 Kaalele st
Kailua-Kona, HI 96740

Sent from my iPhone

From: [Kachina Woolger](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] BLNR Meeting 5/12/23 9:15am Testimony Agenda Item C-4: Oppose
Date: Wednesday, May 10, 2023 7:37:54 PM

C-4 Request Denial of the Petition for a Contested Case of Agenda Item C-2, March 24, 2023, “Request Approval of Final Environmental Assessment and Authorization for the Chairperson to Issue a Finding of No Significant Impact for the ‘Suppression of Invasive Mosquito populations to Reduce Transmission of Avian Malaria to Threatened and Endangered Forest Birds on East Maui’ ”

I’m opposed to the State of Hawai‘i Board of Land and Natural Resources’ request to deny Hawaii Unites’ Petition for a Contested Case Hearing for the planned BioPesticide Mosquito Experiment on Maui. 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

Sincerely

Kachina Woolger

Hauiki rd

Kapaa

Kauai

From: [He is Royal](#)
To: [DLNR.BLNR.Testimony](#)
Subject: [EXTERNAL] : OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing!
Date: Wednesday, May 10, 2023 8:44:26 PM

OPPOSE BLNR'S Denial Of Hawaii Unites' Petition For A Contested Case Hearing!
Kerriyeakey

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Kerri Yeakey