HAWAI'I INVASIVE SPECIES COUNCIL

AGENDA
FOR THE MEETING OF THE
HAWAI'I INVASIVE SPECIES COUNCIL

DATE: Tuesday, December 19, 2023
TIME: 1:00 PM
PLACE: In-person - Conference Room 16; Hawai'i State Capitol 415 S Beretania St., Honolulu, HI 96813 / & Online Via Zoom Meeting ID: 854 4323 4542

ZOOM LINK:
https://us06web.zoom.us/j/85443234542?pwd=LAXKaf9yRuHR3YOcmDAvvKQQL3AVia.1
Passcode: HISC

This Council meeting will be held using interactive conference technology under section 92-3.7, Haw. Rev. Stat. Council members, staff, testifiers and the public can choose to participate on person, online via Zoom, or by telephone. The public may also view the live meeting via its live stream at: https://youtube.com/live/6JPf6QRcMuo?feature=share.

To Provide Written Testimony
We encourage interested persons to submit written testimony in advance of the meeting, which will be distributed to Council members prior to the meeting and allow a timely review. Please submit written testimony via email to: jack.f.reef.researcher@hawaii.gov. Written testimonies can also be mailed to: 1151 Punchbowl Street, Rm 325 Honolulu HI 96813. Written testimonies may be posted upon the Hawai'i Invasive Species Council Meeting website; as a precaution, please be mindful with any personal information prior to submitting unless you intend it to be shared. Late testimony will be retained as part of the record and distributed to Council members as soon as practicable, but we cannot ensure Council members will receive it in sufficient time to review prior to any decision-making.

To Provide In-Person Oral Testimony (masks are highly encouraged)
Attend in-person at: 415 S Beretania St., Honolulu, HI 96813, Conference Room 16; Hawai'i State Capitol.

To Provide Testimony by Telephone
On the day of the meeting at the start of the agenda item you wish to testify on, dial: + 1 719 359-4580 (Zoom); input the Meeting ID: 854 4323 4542 and follow the prompts.

To Provide Video/Zoom Testimony

Send your request in a timely manner to jack.f.reef.researcher@hawaii.gov with your information, email address, and the agenda item you wish to testify on. Once your request has been received, you will receive a confirmation email with pertinent information. You may testify without signing up in advance.

We kindly ask that all oral/video testimony be limited to not more than three (3) minutes. We ask that you identify yourself and any affiliation before speaking, but you can choose not to do so.

Join Zoom Meeting
https://us06web.zoom.us/j/85443234542?pwd=LAXKaf9yRuHR3YOcmDAvvKQQL3AVia.1

Meeting ID: 854 4323 4542
Passcode: HISC

Special Accommodations
If you need auxiliary aid/service or other accommodation due to disability, please contact Jack, the Hawai‘i Invasive Species Council Planner, at 808-587-0166 or jack.f.reef.researcher@hawaii.gov as soon as possible. Requests made as early as possible have a greater likelihood of being fulfilled. Upon request, this agenda and other materials are available in alternate/accessible forms.

AGENDA

Agenda items #3, 5, and 8 will be Council voting actions. The remaining agenda items provide status updates and information that do not require Council action.

1. Call to order

2. Introductions of Council Members

3. Approval of minutes from August 23, 2023 Hawai‘i Invasive Species Council meeting

4. Updates from Council members and Department representatives on 2024 legislative requests & policies related to biosecurity and invasive species. This is only an update.
    a. Governor’s FY25 Budget for Department of Land & Natural Resources; Division of Forestry & Wildlife & Division of Aquatic Resources funding to support statewide invasive ant research and control to be carried out by the Hawai‘i Ant Lab, additional funds for fire pre-suppression, readiness, response, and post-fire restoration and rehabilitation, and funding to support forest/resource management. Internal actions regarding the Vessel Incidental Discharge Act (VIDA).
    b. Governor’s FY25 Budget for Hawai‘i Department of Agriculture (DOA) includes legislation Relating to Agriculture Loans - Reduces and sets fixed interest rates for loans under the Agricultural Loan Program, Relating to Pesticides - Replaces representatives from the sugar and pineapple industries with representatives of the coffee and diversified agriculture industries, Relating to a Strategic Plan to Increase Food Production and Food Security - Requires the DOAin cooperation with the office of the governor, to establish an updated strategic plan to increase Hawaii's food production and food security. Requires DOA to submit a report to the legislature 20 days prior to the 2025 regular session. DOA is working to

schedule meetings starting mid-January 2024 for rulemaking regarding Hawai‘i Administrative Rules, Chapter 4-72, entitled “Plant and Non-Domestic Animal Quarantine Plant Intrastate Rules”. This is only an update on next steps of the rulemaking process and not a formal hearing.

c. The Hawai‘i Department of Health; Vector Control Branch is working on a legislative proposal to add language to Hawai‘i Revised Statute (HRS) 322-1, that clarifies that the department of health shall act when there are conditions which are dangerous or injurious to “public or environmental” health. HRS 322 is one of the core authorizing statutes that provides the DOH with powers to prevent, remove or abate invasive species which can cause sickness (disease vectors) or may be otherwise dangerous or injurious to health.

5. Submittal Requesting HISC Program Support Staff to develop a biosecurity & invasive species legislative package for tracking and coordination purposes during the 2024 Legislative Session; and Submit HISC-specific testimony.

6. Informational presentation from Naval Facilities Engineering Systems Command Hawai‘i on invasive corals discovered in the Pearl Harbor area and ongoing management efforts.

7. Informational presentation from University of Hawai‘i Extension Specialist in Ecosystems & Fire on Wildfire in Hawai‘i with particular focus on the role of invasive grasses and shrubs

8. Submittal Requesting a Resolution Recognizing the Role of Invasive Plants as it Relates to Wildfire in Hawai‘i & Supporting Recommendations for the Prevention and Post-Recovery Efforts to Mitigate Future Impacts

9. Recommendations from Council members on topics for future HISC meetings and timeframe.

10. Adjournment

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

For information, contact:
HISC Support staff:
1151 Punchbowl St, #325, Honolulu, HI 96813; (808) 587-0166; Fax: (808) 587-0160

Chelsea Arnott, Coordinator: Chelsea.L.Arnott@hawaii.gov
Leyla Kaufman, Project Coordinator: leyla@hawaii.edu
Elizabeth Speith, 643pest.org Report Facilitator: speith@hawaii.edu
Chuck Chimera, Weed Risk Assessment Specialist: chimera@hawaii.edu
Jack Reef, Planner: jack.f.reef.researcher@hawaii.gov

JOSH GREEN
GOVERNOR OF HAWAII

SYLVIA LUKE
LIEUTENANT GOVERNOR

HAWAII INVASIVE SPECIES COUNCIL
1151 PUNCHBOWL ST, #325
HONOLULU, HAWAII 96813

VOTING MEMBERS

DAWN CHANG
DEPARTMENT OF LAND & NATURAL RESOURCES

SHARON HURD
HAWAII DEPARTMENT OF AGRICULTURE

KATHLEEN HO, D.Env
DEPARTMENT OF HEALTH

ANIA WIECZOREK, Ph.D.
UNIVERSITY OF HAWAI'I

MARY ALICE EVANS
BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

EDWIN SNIFFEN
DEPARTMENT OF TRANSPORTATION

DRAFT MEETING NOTES

Hawai'i Invasive Species Council
August 23, 2023; 1:00 PM
Hawai'i Department of Land and Natural Resources, Board Room (Rm 132) 1151 Punchbowl St, Honolulu, HI, 96813

Per Hawaii Sunshine Law guidelines, this meeting was hybrid with attendees participating virtually through a Zoom link provided by HISC Support Staff or through the HISC YouTube channel or in-person at the DLNR Board Room in the Kalanimoku Building in Honolulu, HI. Council members, legislative representatives, and HISC Resources Working Group members were provided with a Zoom link. Members of the public were able to view the meeting through the HISC YouTube Channel. A recording of the meeting can be found here: https://youtu.be/AznHvYVS6K0

1. **Call to order**
   - Opening comments for the hybrid committee were made by Chair Hurd at 1:02pm.

2. **Introductions**

   List of Attendees:
   - Council Voting Members:
     - Dawn Chang, Co-Chair (Department of Land and Natural Resources); Sharon Hurd, Co-Chair [Hawai'i Department of Agriculture (HDOA)]; Tammy Lee on behalf of Ed Sniffen (Department of Transportation); Mary Alice Evans (Department of Business, Economic Development and Tourism); Ania Wieczorek (University of Hawaii)
   - Legislative Non-Voting Members:
     - Representative Krisin Kahaloa (District 6). Malie Thoemmes Adams on behalf of Representative Luke Evslin (District 16)
   - Support staff:
     - Chelsea Arnott (HISC), Darcy Oishi (HDOA); Rob Hauff (Forestry and Wildlife); Elizabeth Speith (HISC), Jack Reef (HISC), Ellie Montgomery (HISC)
   - Other Participants:
     - Christy Martin (CGAPS); Franny Brewer (Hawai'i Invasive Species Committee), Nate Dube (O'ahu Invasive Species Committee): Laurie Buchanan (Molokai/Maui Invasive Species Committee); Tiffani Keanini (Kauai Invasive Species Committee).

- Other Attendees:
    - Tom Hallwalk and his wife.

3. Approval of minutes from June 13, 2023 meeting

HISC approved the minutes from June 13, 2023.

A motion of approval was made by Member Evans and seconded by Co-Chair Chang.

4. Presentations: FY24 HISC Recommended Budget

Item 4 involved two presentations by staff. The first presentation was from Rob Hauff (Forestry and Wildlife) and Chelsea Arnott (Forestry and Wildlife and HISC) regarding HISC funding recommendations as recommended by HISC's Working Resources Group (RWG).

The second presentation was from Franny Brewer (Big Island Invasive Species Committee) regarding the operations and funding of the Island Invasive Species Committees that oprtsyr on Kauai, O'ahu, Molokai, Maui, and Hawai'i islands.

A summary of these presentations and the discussion with HISC members is set forth below.

HISC Funding Recommendations

Rob Hauff (DLNR and the RWG Chair) provided background regarding the HISC funding applications and recommended funding actions of RWG.

- HISC funding awards followed its scoring process to recommend funding allocations;
- There were 10 members of RWG evaluating applications;
- RWG funding priorities were based on the Hawaii interagency Biosecurity Plan;
- There were 28 funding application submitted this year;
- Total funding requested was $8.494M; and
- HISC 2024 available funding was $4.1M.

Questions and Discussion from the Council Members and Staff

Biocontrol

- Rob Hauff provided a description of "biocontrol" and the process to implement biocontrol in the field in response to Member Evans' question;
- Chair Hurd added that the process to implement biocontrol is an extremely lengthy process; and
- Rob Hauff advised that the HISC website has a great detailed description of Biocontrol.

Application Procedures

- In response to a question from Chair Hurd, Chelsea Arnott provided details regarding the RFP process to solicit HISC funding applicants; and
- Member Evans asked about the challenges with State procurement requirements, and staff stated that not all of the State's restrictive procurement requirements applied to HISC because HISC funding is only open to other State agencies.

HISC Funding Applications

- Chair Chang asked why the number of HISC applicants was smaller this year, and Chelsea Arnott advised that entities who previously applied and were not awarded funds, decided against applying for funds this year. In addition, in response to Member Wieczorek's question Chelsea stated that 97% of applicants were repeat candidates;
- Member Wieczorek and Co-Chair Chang asked about "scalability" of funding proposals. Staff advised that applicants are offered an opportunity to detail how their projects could be scaled down based on funding availability, and that applicants can clarify questions for evaluators if they attend the RWG meeting;
- In response to member Evan's questions, Chelsea Arnott advised that HISC does request funding from the legislature to supplement the HISC awards, but that last year's request was not approved. Co-Chairs Chang and Hurd stressed the importance of stakeholders attending legislative meetings to advocate for funding and legislative action;
- Staff clarified for Co-Chair Hurd that reducing funding for LFA did not reduce the number of islands served.
- Member Wieczorek stated that the public could falsely perceive that applicants had inflated their funding needs because awards were provided at a reduced amount Therefore, the process needed more clarity that reduced funding directly leads to a reduction in project scope. Chelsea Arnott said that HISC is always looking for ways to improve the process;
- Staff advised that payments are reimbursements to applicants in response to a question from Co-Chair Hurd;
- Co-Chair Hurd stressed the importance of the RWG's recommendation to provide funding for two-lined spittlebug; and
- Co-Chair Chang and Member Evans discussed that UHERO relies on contracting and grant funding for student projects.

ISCs

- Chelsea stated that last year former Chair Case discussed the topic of setting aside a set-amount of funding for the ISCs; and

- Co-Chair Chang stressed the important of quantifying "In kind services" or community volunteering in order to demonstrate that "in kind services" double or triple the investments made by the legislature. Member Wiczoek seconded this point. Co-Chair Chang said that the private sector is a potential collaborative partner.

Franny Brewer's Presentation on ISCs

- Each ISC has its own steering committee;
- ISCs are not State employees and therefore can operate with more flexibility such as accessing private property;
- ISC core work is to assess invasive species and work toward eradication;
- ISCs work as the glue to help diverse stakeholders work together;
- 14k plants have been introduced in state of Hawaii and there are 56 action plans to eradicate invasive species on the Hawaiian islands;
- Early detection is not a passive duty;
- Eradiation is possible, but easier if caught early;
- ISCs leverage government funding with private funding;
- In response to Member Evans, Franny Brewer clarified that administrative costs can reach 15%;
- Co-Chair Hurd commented that ISCs and HDOA can mutually benefit from staff recruiting between entities;
- Co-Chair Chang said that DLNR has taken steps to expand work experiences when scoring job applications in order to ensure those who have experience working on invasive species are eligible for State jobs; and
- Co-Chair Chang stated that community outreach is important for LFA.

- Non-voting Member Deputy Lee (DOT) stated that in regards to addressing Albizia, the State created a temporary exemption to allow for expanding contracting capabilities.

5. **Submittal: Requesting approval of a recommended budget for Fiscal Year 2024**
Rob Hauff summarized the actions steps needed to approve RWG's recommendations.

Member Evans moved that the HISC submittal be approved and Co-Chair Chang seconded this action.

Co-Chair Hurd acknowledged that the Motion was approved without objection.

6. **Public Comments**
   - Tom Hallwalk from a local cat sanctuary discussed that feral cats are a danger to endangered species. Co-Chair Chang expressed willingness to partner with a cat sanctuary if DLNR is given priority preference. Mr. Hallwalk requested a briefing with Chair Hurd to further develop a cat sanctuary.

   - Chelsea summarized written public testimony as follows:
     - David Davis proposed a new tool to combat Coqui Frogs;
       - Chair Hurd asked for more information regarding the Coqui frog proposal and said that the pesticide branch of HDOA is best suited to address this proposal; and
     - Community members, windward side of Oahu (Waimanalu) expressed concern for Little Fire Ant, Coconut Rhinoceros Beetle and Coqu frogs and that they are seeking HISC assistance.
   - The Maui ISC wanted to inform HISC that they receive funding from the County.
   - Co-Chair Chang said that the recent Waimanolu community meeting was well attended;
   - Co-Chair Chang stated that staff should consider or the next HISC meeting should address combatting invasive species in order to reduce the risk of wildfires, including focusing on the areas impacted by the Maui fire. Any review should address how to ensure invasive species do not grow back in wildfire impacted areas, and that underground utilities may be helpful. Co-Chair Hurd said that Hemp wood is termite resistant and fireproof.`; and
   - Co-Chair Hurd stressed that its important for stakeholders to show up to the legislature when advocating for funding of legislative action. Members Chang and Evans agreed with Co-Chair's Hurds comments regarding advocacy to the legislature.

7. **Adjournment**
   2:48pm

HAWAIʻI INVASIVE SPECIES COUNCIL

December 19, 2023

SUBMITTAL

TO: Co-chairs and Members
Hawaiʻi Invasive Species Council
State of Hawaiʻi

SUBJECT: Requesting HISC Program Support Staff to Develop a Biosecurity & Invasive Species Legislative Package for Tracking and Coordination During the 2024 Legislative Session; and Submit HISC-specific Testimony

Background
The Hawaii Invasive Species Council is an inter-departmental collaboration comprised of the Departments of Land & Natural Resources (DLNR), Agriculture (DOA), Health (DOH), Transportation (DOT), Business, Economic Development & Tourism (DBEDT), and the University of Hawaii (UH). The HISC was established in 2003 by Chapter 194, Hawaii Revised Statutes, in response to a 2002 State Legislative Reference Bureau study identifying the need to address a number of gaps in invasive species management statewide.

The purpose of the Council is providing policy level direction, coordination, and planning among state departments, federal agencies, and international and local initiatives for the control and eradication of harmful invasive species infestations throughout the State and for preventing the introduction of other invasive species that may be potentially harmful.

As part of the HISC mandate to provide policy direction, program support staff for the Council put together legislative packages based on departmental requests reflective or in support of the Hawaiʻi Interagency Biosecurity Plan each legislative session prior to the pandemic. This helped coordinate department efforts and support for biosecurity and invasive species policies, keep the Council informed of upcoming hearings, and continue implementation of the Biosecurity Plan. HISC Program Support Staff also submitted HISC-specific testimony for bills related to invasive species and biosecurity.

Legal Authority
- HRS 194-2 (a): Establishes the HISC for the purpose of cabinet-level coordination and planning among state departments, federal agencies, and international and local initiatives;
- HRS 194-2 (a)(2): Advise, consult, and coordinate invasive species-related efforts with and between the departments of agriculture, land and natural resources, health, and transportation, as well as state, federal, international, and privately organized programs and policies.

Recommendation:
The Hawaiʻi Invasive Species Council requests HISC Program Support Staff to include relevant requests, presented in Agenda Item # 4 and other related policies, in a 2024 Biosecurity & Invasive Species Legislative Package for tracking purposes, inform HISC Departments of upcoming hearings for testimony submittal, and submit HISC specific testimony as long as it does not conflict with Council Department's testimony.

HAWAII INVASIVE SPECIES COUNCIL

December 19, 2023

SUBMITTAL

TO: Co-chairs and Members
Hawai'i Invasive Species Council
State of Hawai'i

SUBJECT: Requesting a resolution recognizing the role of invasive plants as it relates to wildfire in Hawai'i & supporting recommendations for the prevention and post-recovery efforts to mitigate future impacts

Background

The devastating fires in Lahaina and Kula, Maui in August 2023, as well as reoccuring wildfires on Hawai'i Island and throughout the State, are clear examples of the negative impacts of invasive species and a changing climate. Over the last century, the average annual rainfall decreased across 90% of the Hawaiian Islands with the greatest declines in already dry leeward areas, the frequency and severity of drought has increased, and the average area burned in Hawai'i increased by 400%. Invasive species can exacerbate climatic conditions leading more increased frequency and intensity of natural disaster like wildfire.

Hawaii's native ecosystems did not evolve with fire as a regular part of the ecosystem resulting in most native species not being fire-adapted. Hawaiian landscapes began a massive change 245 years ago with the introduction of livestock (including cattle, goats, and sheep) and western principles of land management, as well as drought-resistant grasses and shrubs for their fodder, and invasive plants that contribute to the degradation of watersheds and loss of native species. The transformation of upland native forests to dominated stands of invasive plants like strawberry guava, *psidium cattlianum*, can cause more water to transpire into the atmosphere resulting in less water feeding into streams, aquifers, and cooling forests. Introduced grasses, when left unmanaged, can dry rapidly resulting in a large build-up of continuous fuels across large areas that allow for easier ignitions and for fire to spread long distances before they are stopped.

Discussion

The natural environment is the first line of defense against climate change and managing invasive species must be included as a critical component of protecting island resiliency. Current and projected future climate change impacts, include increased land temperatures, a decline in rainfall, increased frequency and severity of drought, and increased storm severity that will all serve to increase the risk of wildfire in Hawai'i in the future. Invasive grasses can dry rapidly resulting in a large build-up of continuous fuels across large areas that allow for easier ignitions and for fire to spread long distances before they are stopped. When Hawaiian forests burn, fast-growing grasses and woody invaders will be the first to establish by outcompeting native regeneration, thus altering hydrological and nutrient cycling, and making landscapes more prone to future fire.

This Resolution recognizes the complexity of wildfire in Hawai'i and takes into account that 1) unmanaged lands pose a greater wildfire risk than managed land and that any vegetation, invasive or not, can burn under

extreme drought and high wind conditions, 2) some invasive grasses still play a critical role in managed systems like ranching and agriculture that are economically important industries, as well as in ecological restoration where some species suppress other harmful plants or are adapted to grow in more extreme climatic conditions without the need for irrigation, and 3) high intensity wildfires can leave bare ground that is at increased risk of large-scale erosion that can threaten the near-shore environment and also deplete soil of vital nutrients that are needed for soil stablization and revegetation.

Legal Authority

- HRS 194-2 (a): Establishes the HISC for the purpose of cabinet-level coordination and planning among state departments, federal agencies, and international and local initiatives
- HRS 194-2 (a)(2): Advise, consult, and coordinate invasive species-related efforts with and between the departments of agriculture, land and natural resources, health, and transportation, as well as state, federal, international, and privately organized programs and policies.

Recommendation:

That the Hawai‘i Invasive Species Council adopt a resolution, substantially similar to the attached draft resolution, in order to:

1. Recognize the prevention, management, and control of invasive plants must be prioritized to mitigate future wildfire threats and improve Hawaii's climate resiliency for the protection and health of communities, native species, businesses and industries, and way of life in the islands;
2. Support a holistic approach for land-use planning, including fire codes and taxation policies to incentivize risk reduction and enhance ecosystem services and public well-being that includes identifying support mechanisms that empower ranchers and local agricultural producers to reduce existing fuel loads while also meeting food security goals, and setting aside land for fire buffers around communities using low-fire risk crops, and considering the use of biocontrol strategies for landscape level control, a process that does take into consideration economic and ecological implications as well as potential impacts to critical industries;
3. Recommend:
    a. Using native plants or non-native plants that are low risk of becoming invasive for revegetation efforts whenever feasible and that local seed sources are used whenever possible to reduce the risk of new invasive plant introductions;
    b. Amplifying the production of locally appropriate native seed and other plant materials to provide adequate resources for post-fire recovery and fuels conversion projects to reduce fire risk;
    c. Sourcing organic materials for erosion control and re-vegetation from on-island sources, and ensuring if a local source is not available, that material is inspected or treated before transporting to the site for invasive species like coconut rhinoceros beetles (*Oryctes rhinoceros*) and little fire ants (*Wasmannia auropunctata*); and
4. Not recommend revegetating or creating fire breaks with plants that are considered invasive or high-risk by the Hawaii-Pacific Weed Risk Assessment and the Weed Fire Risk Assessment Tools, both of which are scientifically established and validated methods for assessing a plant's risk of invasion or being fire-promoting respectively.

Attachments:

1. Draft HISC Resolution 23-1: Recognizing the Role of Invasive Plants as it Relates to Wildfire in Hawai‘i & Supporting Recommendations for the Prevention and Post-recovery Efforts to Mitigate Future Impacts
2. The Tragedy in Lahaina: How invasive grasses and shrubs are fueling the wildfire crisis in Hawai'i https://naisma.org/wp-content/uploads/2023/10/Tragedy-in-Lahaina-Parsons-and-Martin-2023-with-Endnotes-FINAL.pdf

HAWAI'I INVASIVE SPECIES COUNCIL

RESOLUTION 23-1

RECOGNIZING THE ROLE OF INVASIVE PLANTS AS IT RELATES TO WILDFIRE IN HAWAI'I & SUPPORTING RECOMMENDATIONS FOR THE PREVENTION & POST-RECOVERY EFFORTS TO MITIGATE FUTURE IMPACTS

WHEREAS the devastating fires in Lahaina and Kula, Maui in August 2023, as well as reoccuring wildfires on Hawai'i Island and throughout the State, are clear examples of the negative impacts of invasive species and a changing climate; and

WHEREAS Hawaii's native ecosystems did not evolve with fire as a regular part of the ecosystem and most native species are not fire-adapted; and

WHEREAS Hawaiian landscapes began a massive change 245 years ago with the introduction of livestock (including cattle, goats, and sheep) and western principles of land management, and also drought-resistant grasses and shrubs for their fodder, and invasive plants that contribute to the degradation of watersheds and loss of native species; and

WHEREAS the transformation of upland native forests to dominated stands of invasive plants like strawberry guava, *psidium cattlianum*, can cause more water to transpire into the atmosphere resulting in less water feeding into streams, aquifers, and cooling forests; and

WHEREAS over the last one hundred years, the average annual rainfall decreased across 90% of the Hawaiian islands with the greatest declines in already dry leeward areas; and

WHEREAS the frequency and severity of drought has increased in the Hawaiian Islands, contributing to increased wildfire risk and the average area burned in Hawai'i increasing by 400% over the last century; and

RECOGNIZING that the natural environment is the first line of defense against climate change and that managing invasive species must be included as a critical component of protecting island resiliency; and

RECOGNIZING that unmanaged lands pose a greater wildfire risk than managed land and that any vegetation, invasive or not, can burn under extreme drought and high wind conditions; and

RECOGNIZING that invasive grasses can dry rapidly resulting in a large build-up of continuous fuels across large areas that allow for easier ignitions and for fire to spread long distances before they are stopped; and

RECOGNIZING that when Hawaiian forests burn, fast-growing grasses and woody invaders are the first to establish by outcompeting native regeneration, thus altering hydrological and nutrient cycling, and making landscapes more prone to future fire; and

RECOGNIZING that some invasive grasses still play a critical role in managed systems like ranching and

agriculture that are economically important industries, as well as in ecological restoration where some species suppress other harmful plants or are adapted to grow in more extreme climatic conditions without the need for irrigation; and

RECOGNIZING that high intensity wildfires can leave bare ground that is at increased risk of large-scale erosion that can threaten the near-shore environment and also deplete soil of vital nutrients that are needed for soil stablization and revegetation; and

RECOGNIZING that current and projected climate change impacts, including increased land temperatures, a decline in rainfall, increased frequency and severity of drought, and increased storm severity will all serve to increase the risk of wildfire in Hawai‘i in the future; and

WHEREAS, Chapter 194, Hawai‘i Revised Statutes, authorizes the Hawai‘i Invasive Species Council to advise and coordinate invasive species-related efforts with and between local, state, federal, international, and private programs, and to coordinate the State’s position with regard to invasive species; now, therefore,

BE IT RESOLVED that the Hawai‘i Invasive Species Council recognizes that the prevention, management, and control of invasive plants must be prioritized to mitigate future wildfire threats and improve Hawaii’s climate resiliency for the protection and health of communities, native species, businesses and industries, and way of life in the islands; and

BE IT FURTHER RESOLVED that the Hawai‘i Invasive Species Council supports a holistic approach for land-use planning, including fire codes and taxation policies to incentivize risk reduction and enhance ecosystem services and public well-being that includes identifying support mechanisms that empower ranchers and local agricultural producers to reduce existing fuel loads while also meeting food security goals, and setting aside land for fire buffers around communities using low-fire risk crops, and considering the use of biocontrol strategies for landscape level control, a process that does take into consideration economic and ecological implications as well as potential impacts to critical industries; and

BE IT FURTHER RESOLVED that the Hawai‘i Invasive Species Council recommends using native plants or non-native plants that are low risk of becoming invasive for revegetation efforts whenever feasible and that local seed sources are used whenever possible to reduce the risk of new invasive plant introductions; and

BE IT FURTHER REOLVED that the Hawai‘i Invasive Species Council recommends amplifying production of locally appropriate native seed and other plant materials to provide adequate resources for post-fire recovery and fuels conversion projects to reduce fire risk; and

BE IT FURTHER RESOLVED that the Hawai‘i Invasive Species Council recommends sourcing organic materials for erosion control and re-vegetation from on-island sources, and ensuring if a local source is not available, that material is inspected or treated before transporting to the site for invasive species like coconut rhinoceros beetles (*Oryctes rhinoceros*) and little fire ants (*Wasmannia auropunctata*); and

BE IT FURTHER RESOLVED that the Hawai‘i Invasive Species Council does not recommend revegetating or creating fire breaks with plants that are considered invasive or high-risk by the Hawaii-Pacific Weed Risk Assessment and the Weed Fire Risk Assessment Tools, both of which are scientifically established and validated methods for assessing a plant’s risk of invasion or being fire-promoting respectively; and

BE IT FURTHER RESOLVED that certified copies of this Resolution be transmitted to the Governor of Hawaii, the President of the State Senate, the Speaker of the State House of Representatives, and to the

directors or chairpersons of each HISC agency.

Adopted by the Hawai‘i Invasive Species Council on the following date: December 19, 2023

Laura Kaakua, Department of Land & Natural Resources	Dexter Kishida, Department of Agriculture
Kathleen Ho, D. Env., Department of Health	Tammy Lee, Department of Transportation
Mary Alice Evans, Office of Planning, Department of Business, Economic Development, and Tourism	Ania Wieczorek, Ph.D., University of Hawai‘i

The Tragedy in Lahaina: How invasive grasses and shrubs are fueling the wildfire crisis in Hawai‘i

By: Dr. Elliott Parsons - Pacific RISCC & Christy Martin - CGAPS

Weeks have passed since the deadly fire in Lahaina, one of several wildfires that started on Maui and on Hawai‘i, the “Big Island,” on August 8-9, 2023.[1] Many of us learned about the fire triangle,[2] that without one of the three components – oxygen, heat, and fuel – a fire cannot start or be sustained. High winds with gusts up to 80 miles per hour were recorded[3] on the dry, leeward slopes of the islands from Hurricane Dora passing 550 miles to the south and exacerbated by a strong high-pressure system north of the islands, which led to low humidity.[4] As officials and communities look for answers about the ignition sources, it is worth understanding how the islands came to have an overabundance of fuel and the challenges ahead with the synergistic effects of invasive species and climate change.

A history of land use changes and grass invasions

Like many tropical Pacific islands, Hawai‘i has far fewer lightning strikes than continental systems[5], and thus ecosystems and species did not evolve with fire as a regular part of the system. Polynesian voyagers first arrived in Hawai‘i more than 1,000 years ago,[6] bringing a handful of culturally important non-native plants and animals,[7] and are believed to have used fire to clear some lowland areas for agriculture and to promote useful plants.[8] The changes that came after Western contact 245 years ago included the introduction of livestock (including cattle, goats, and sheep), drought-resistant grasses and shrubs for their fodder, and foreign ideas such as private land ownership.[8,9]

In the upland watershed forests, introduced trees became invasive and began spreading and displacing native trees. Strawberry guava, which was introduced in 1825 as an ornamental with edible fruit,[10] is now the most abundant tree in Hawai‘i, present across more than 443,000 acres in 2019.[11,12] This invasive tree was shown to transpire 53% more water into the atmosphere in dry years than the native ‘ōhi‘a trees they replaced, water which used to seep into aquifers, cool the forest, raise humidity, and feed streams.[13] The last one hundred years also saw the average annual rainfall decrease across 90% of the islands with the greatest declines in already dry leeward areas.[14]

In the lowlands, large tracts of land were owned and operated as sugar or pineapple plantations supported by water that was diverted from streams, and grazing lands

covered more than 2 million acres across the Hawaiian Islands.[15] By the 1990s most plantations had closed, and the drought-resistant grasses and shrubs quickly filled the fallow fields.[16] As well, pasturage declined due to the shifting economics of cattle grazing, leaving large areas of uneaten invasive and fire-promoting grasses to proliferate.[17] Dry forest ecosystems were also invaded by introduced forage grasses like guinea grass and buffelgrass, and by ornamental species such as the fire-adapted fountain grass.[18] Recent estimates suggest that about a quarter of the land area in Hawai‘i (about a million acres), is now covered in flammable invasive grasses and shrubs,[19] and a sobering assessment by the Western Council of State Foresters found that a greater percentage of Hawai‘i’s land area is under higher risk of wildfire than the 16 western-most states in the U.S.[5]

The threat of wildfire in Hawai‘i

By compiling and analyzing statewide records, scientists found in 2015 that the average area burned in Hawai‘i had increased by 400% over the last century.[5] This increase in the size of fires, while driven largely by a decline in vegetation management and livestock grazing on former agricultural lands and the proliferation of non-native grasses and shrubs, has also paralleled a significant increase in the duration and severity of drought in Hawai‘i.[20] The two worst droughts over the last 100 years both occurred since the late 1990s. Drought can elevate fire risk by lowering moisture levels in the soil and plants, which increases flammability, and both wildfire and drought can magnify future fire risk when invasive grasses cover areas formerly burned or denuded by drought.[20,21]

The consequences of these long-term changes in Hawai‘i have been severe. A USGS report in 2018 found that the density of invasive species is almost 200% higher in Hawai‘i as compared to the U.S. continent.[22] And, due to the warm, tropical climates in Hawai‘i, these invasive plants have favorable growing conditions year-round. Invasive grasses in particular can respond rapidly to rainfall, greatly increasing in size and height during wet years.[23] This has led to a “fire season” that lasts 12 months,[24] compared to only a 7-month average fire season in the continental U.S.[25] While fire risk can vary depending on time and location, many low-elevation and dry leeward areas face very high to extreme fire risk all year long.[26]

Wildfires now burn a higher percentage of land annually in Hawai‘i (0.48%) than in the continental U.S (0.3%).[5] And despite the small land area, the islands are home to 1.4 million people and receive more than 9 million visitors annually, many to communities in or adjacent to large areas of invasive and flammable grasses.[27] These areas, where developments intermix with wildland fuels, are called the wildland urban interface, and

are indicative of a high risk of wildfire. And based on an analysis in 2020, 94.4% of the homes in Hawai‘i were found to be vulnerable because they are built within the wildland urban interface compared with 42.3% of structures in the conterminous U.S.[28]

Invasive grasses and wildfire

While land use and climate affect wildfire risk in Hawai‘i, it is important to understand how invasive grasses themselves also contribute. Invasive grasses exacerbate wildfire because grasses have thin tissues which can dry quickly and burn easily. Invasive grasses also support a significant proportion of dead standing plant material that is very slow to decompose, and they can provide continuous fuels across large areas that allow fire to spread long distances before they are stopped.[29] These fine fuels can also burn under a broader range of conditions than can other fuel types (e.g., wood or leaf litter). As a result, grasses support a microenvironment that is hotter and drier than in forests or shrublands.[21] This means that the conditions that favor fire are much more common in grass-invaded areas.

Hawai‘i is not alone in this increasing trend of invasive grassland-fueled fires. A 2019 study found that six species of fire-prone invasive grasses in the continental U.S. were linked to a 150% increase in fire frequency.[30] Buffelgrass, one of these six species, was one of the forage grasses introduced to Hawai‘i. It has one of the highest fire-risk ratings of all invasive plants in Hawai‘i, and it can even burn when green.[31] It was found to be prolific around Lahaina before the wildfire, and is found extensively throughout Hawai‘i.

Invasive grasses in Hawai‘i have also fueled some of the largest wildfires. For example, the Mana Road fire on Hawai‘i Island in 2021 was the largest wildfire in state history and burned ~42,000 acres.[32] This fire led to the evacuation of the nearby town of Waikoloa, and created dust storms that lasted for months, making driving conditions hazardous and reducing air quality for thousands of nearby residents. While fires do burn in shrublands and forests, greater than 80% of the area burned annually in Hawai‘i is in non-native grasslands.[23]

Invasive species and climate change

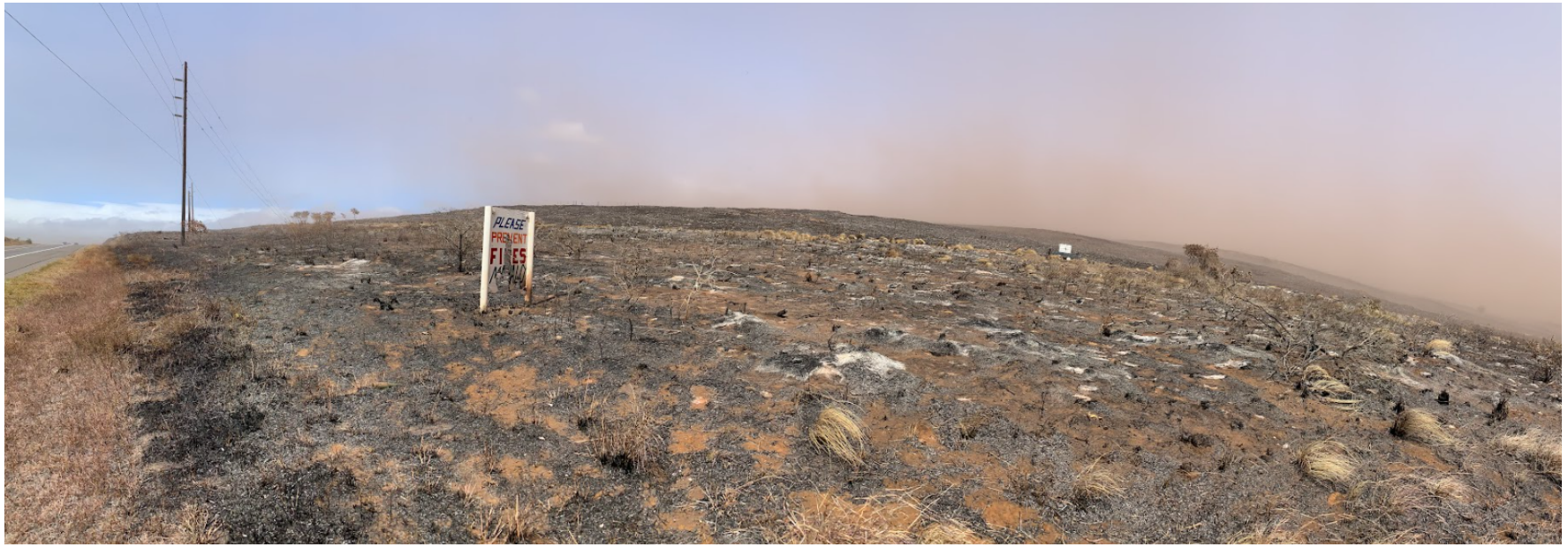
The devastating fires in Lahaina and Kula, Maui in August are clear examples of the synergistic effects of invasive species and a changing climate.[33] Recent declines in rainfall coupled with increasing drought severity have already created parched conditions in leeward areas, yet climate change is likely to exacerbate dry conditions.[34] Higher temperatures, as well as larger, more severe storms and drought are all projected to increase with climate change,[35] and these impacts will most certainly interact with invasive grasses and shrubs to affect wildfire risk.

So, what can be done? There is no single fix or silver bullet to protect communities and native species from invasive plant-fueled wildfires in Hawai‘i. Instead, there are multiple tools that will need to be used and each will help.[36] These include a focus on more holistic land-use planning to incentivize risk reduction and enhance ecosystem services and public well-being.[37] Identifying support mechanisms that empower ranchers and local agricultural producers could reduce existing fuel loads while also meeting food security goals.[38] Also, land that is set aside to provide fire buffers around communities could be planted with low-fire risk crops including indigenous Hawaiian agroecosystems,[39] non-invasive plants with low flammability,[40] or endemic dryland forest trees and shrubs that lower fire risk.[41,42]

Finally, identifying and restricting the introduction of new species of flammable non-native species should be a priority. For those particularly harmful species already present, biocontrol is the only viable way to reduce the abundance and vigor of widely established invasive plants,[43] followed by active restoration of plants that can better serve communities and ecosystems.[44] And while climate change impacts are projected to favor prime wildfire conditions, and ignitions will continue to be difficult to control at best, we need to roll up our sleeves and work together to effectively manage fuels to break the fire triangle and protect communities.

Invasive fountain grass, a fire-promoting perennial bunchgrass introduced as an ornamental plant in 1914, now covers an estimated 200,000 acres on Hawai‘i Island.[45] This view is along Highway 190, in the North Kona district. Photo credit: Elliott Parsons.

A wildfire burning buffelgrass in Lahaina, Maui in 2009. Photo credit: Forest and Kim Starr.



In 2021, the Mana Road fire on Hawai‘i Island burned 42,000 acres and is currently considered the largest wildfire in state history. The fire was fueled by non-native grasslands. This photo was taken after the fire alongside Highway 190. Photo credit: Elliott Parsons

A view of buffelgrass and invasive shrubs above Lahaina, Maui before the fire in August, 2023. Photo credit: Google Street View, accessed on 8/23/23 with imagery taken October, 2019.

Dr. Elliott Parsons is a specialist with the Pacific Regional Invasive Species and Climate Change Management Network (Pacific RISCC). He has a Ph.D. in fish and wildlife biology from the University of Montana and was a land manager for the Hawai‘i Department of Land and Natural Resources for 10 years prior to his current role. His current work focuses on helping to build Pacific Island resilience to climate change and invasive species.

Christy Martin is the program manager and information officer for the Coordinating Group on Alien Pest Species, a project of the University of Hawai‘i at Mānoa - Pacific Cooperative Studies Unit. She is also a current member of the Invasive Species Advisory Committee to the National Invasive Species Council. Her current work focuses on addressing gaps in invasive species policies, programs, and communications.

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