



**A Proposal to the
Hau'oli Mau Loa Foundation
for
2021 CGAPS Invasive Species Prevention Projects**

Introduction

This 2021 proposal marks the beginning of our tenth year of invasive species prevention projects. Looking back, we are grateful for this partnership and all that we have accomplished together. This past year has been extremely challenging, but the CGAPS staff, Steering Committee and community have continued to find ways to connect and work together on shared priorities while working from home. For example, the HISC & CGAPS 2025 Strategies were finalized in January, followed by a realignment of the HISC working groups to the Strategies, then multiple meetings to engage participants and prioritize the key actions. For each working group, one HISC and one CGAPS staff work together to organize meetings and support the group chair.

For legislative initiatives, the shutdown killed bills that were halfway through the legislative process, including bills for funding DLNR to continue the Rapid 'Ōhi'a Death Strategic Response and an aquatic biosecurity bill that would have accomplished more than a dozen of the Hawai'i Interagency Biosecurity Plan priority actions. The current outlook for state funding for ROD and aquatic biosecurity is worse than bleak, as is funding for additional HDOA inspectors and other items deemed unrelated to Covid 19 and "non-essential". Indeed, the reduction of hundreds of civil service positions after the economic downturn in 2009 is just a taste of what we can expect with the state's current \$2.3 billion shortfall. With this budget crisis right around the corner, CGAPS focused efforts on federal funding opportunities that could support parts of the 2025 Strategies.

Despite these challenges, there are bright spots. The congressional appropriations request language submitted in February by CGAPS on behalf of the Biocontrol Facilities Working Group (Strategy 5) is included in the Senate Committee on Appropriations FY21 bills at the level of \$1,000,000, and the long-awaited State Myrtaceae restriction was signed into law. Also, virtual outreach events including Stop the Ant Month was successful at reaching audiences and engaging them in detecting new infestations of little fire ants, and the week-long 'Ōhi'a Love Fest saw hundreds of participants locally and nationwide engaged in virtual workshops and events. One more example is that CGAPS and DLNR-Division of Aquatic Resources staff worked together with partners to quickly analyze and submit proposed changes to the draft EPA regulation, Vessel Incidental Discharge National Standards of Performance, which had a thirty day comment period that closed on November 25. During this time, multiple briefings were provided to the Governor's office and other state agencies, and nearly 200 people viewed a webinar discussing the language.

You will see from this proposal that the Steering Committee has prioritized core funding for existing staff and work, with just two "new" projects, both of which have been discussed for several years before inclusion in this year's proposal. Mahalo for your consideration of these requests, and for your support of our work. Mahalo nui loa!

Coordinating Group on Alien Pest Species
P.O. Box 61441
Honolulu, Hawai'i 96839
(808) 722-0995
www.cgaps.org

Project: CGAPS Legal Fellows (Strategies 1, 2, and 3)

Executive Summary

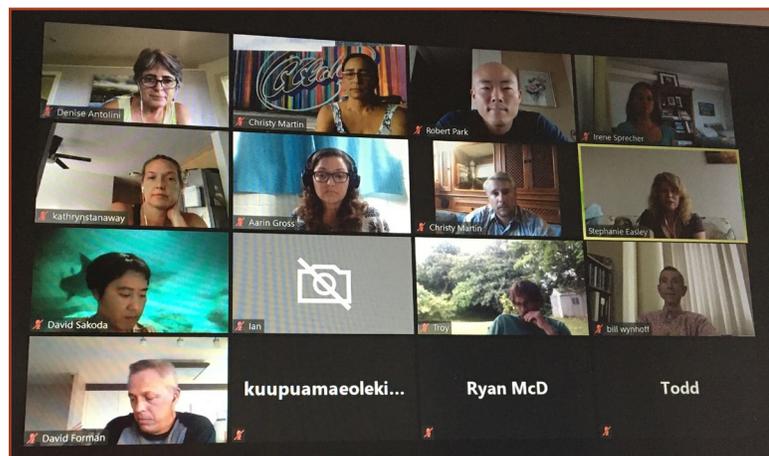
Funding for this project will provide continued salary and operational support for two full-time William S. Richardson School of Law Legal Fellows, and up to two interns to work in collaboration with CGAPS and relevant agencies in reviewing invasive species prevention-related statutes and rules, providing internal analyses, and drafting improved statutes and rules for consideration.

Background

The CGAPS Law Fellowships continue to provide critical support and services in the area of invasive species prevention, the value of which is difficult to convey. With the EPA's December 4, 2020 deadline for setting new national incidental discharge standards in compliance with the 2018 Vessel Incidental Discharge Act, CGAPS legal fellows Andrew Porter and Stephanie Easley provided support for the Hawai'i Department of Land and Natural Resources-Division of Aquatic Resources by analyzing background information and the proposed regulation, formulating responses, and sharing information in the many meetings at the local, state, and regional level.

In addition to this work, Stephanie Easley continued to focus on terrestrial invasive species issues, providing support to the Hawai'i Department of Agriculture in analyzing and proposing changes for several rules and procedures. Andrew Porter continued to focus on aquatic invasive species issues as the lead on ballast water and biofouling, and also on addressing the purposeful importation of certain invasive aquatic species.

With the new 2025 HISC & CGAPS Strategies, the Legal Fellows have also taken on additional roles in the working groups for Strategies 1 (Prevention & Early Detection/ Rapid Response for new Terrestrial Invasive Species), 2 (Inter- and Intra-island Movement of Terrestrial Invasive Species), and 3 (Aquatic Biosecurity). In addition to this work, the Legal Fellows also participate in occasional UH William S. Richardson School of Law classes and workshops in their areas of expertise, to foster the understanding of invasive



UH William S. Richardson School Professor of Law Denise Antolini, top left, meets monthly with the legal fellows “and friends”. CGAPS Legal Fellow Stephanie Easley is second row on the right, Drew Porter is to the left. As the senior fellow, Drew organizes the meetings..

species issues with the learning community.

Existing funds are projected to last until the middle of March, 2021. Therefore, this request is for \$152,000, which would support two FTE from mid-March - January 2022, with salary and fringe, travel, materials, and supplies, plus up to two University of Hawai'i William S. Richardson School of Law interns.

The legal fellows will be responsible for continuing work on the following issues:

- Support DLNR DAR on creating a programmatic and regulatory framework for ballast water and biofouling inspection/in-water cleaning that does not conflict with impending federal standards and regulations
- Assist DLNR DAR and Pacific Coast state counterparts in analyzing the EPA and U.S. Coast Guard regulations related to ballast water, biofouling, and in-water cleaning
- Support HDOA Plant Quarantine in reviewing statutes and rules related to prevention, early detection & rapid response, intrastate and interstate movement, and purposeful importation of aquatic species
- Assist CGAPS in petition/s for rulemaking to restrict domestic importation of certain invasive plants, and subsequent request to USDA for federal rulemaking for foreign importation
- Address gaps in quarantine action authority for federal agencies when human health vectors are found in international cargo or conveyances
- Address DAR policy gaps regarding aquaculture, including permitting for culture, facilities inspection (for biosecurity purposes), and compliance
- Support the implementation of the new HISC and CGAPS 2025 Strategies for the Hawai'i Interagency Biosecurity Plan
- Participate in William S. Richardson School of Law lectures, classes, workshops, or other learning events where appropriate

Deliverables

The deliverables will consist of regular reports and a year-end final report on progress towards these and other priority issues.

Budget: \$152,000 (\$7,600 UHF)

Project 2: Capacity Support for CGAPS PIO and Planner *(Strategies 1-7, 9 and 10)*

Executive Summary

Funds are requested for up to three months of salary plus operating support for the CGAPS Statewide Invasive Species Public/Community Relations Coordinator (shortened to PIO), and ten months of salary plus operating costs for the CGAPS Planner. The goals of the PIO are to facilitate engagement and inter- and intra-agency communication; to coordinate and catalyze collaborative projects towards the goals outlined in the HISC & CGAPS 2025 Strategy; to promote key outreach messages;

to educate decision makers, special interest groups, and the public about invasive species in order to effect a change in perception, actions, rules, or funding for invasive species issues. The CGAPS Planner goals are to plan and carry out projects and tasks in support of the HISC & CGAPS 2025 Strategy, to assist in coordinating the CGAPS partnership, and strengthen communication networks. As a project of the University of Hawaii's Pacific Cooperative Studies Unit (UH PCSU), CGAPS staff also conducts and coordinates research, works with UH faculty to provide learning opportunities for students, and functions as a connector between the University's knowledge base, resource management agencies, and the community.



Progress and next steps on the 2025 Strategies are discussed at monthly HISC & CGAPS staff meetings. Clockwise from the left is Ambyr Mokiao-Lee (CGAPS ROD Outreach), Christy Martin (CGAPS Program Manager), Kailee Lefebvre (CGAPS Planner), Chelsea Arnott (HISC Planner), Leyla Kaufman (HISC Mamalu Poepoe Program Coordinator), Andrew Porter (CGAPS Legal Fellow), Randy Bartlett (HISC Interagency Coordinator), and Josh Atwood (Acting HISC Coordinator).

Background

The University of Hawai'i is a key resource in the effort to protect Hawaii's natural resources, economy, and residents from the threats posed by invasive species. Under the direction of PCSU Director Dr. Shaya Honarvar, with continuing guidance from Director Emeritus Dr. David Duffy, and in partnership with the CGAPS Chairs, this project will benefit the University of Hawai'i by integrating faculty, researchers, and students in Hawaii's biosecurity programs. Close collaboration between biosecurity agencies and the University also provide research and outreach capacity where there are currently gaps, and in turn, greater integration between the University and Hawaii's biosecurity programs will enable faculty to identify job training and research pathways.

The role of CGAPS as a federal, state, and non-government organization partnership is to identify gaps in Hawaii's biosecurity framework and programs, and work to bridge or fill these gaps. A core function of the CGAPS staff is to either catalyze, coordinate, and in some cases, implement projects or initiatives that improve our ability to prevent or address invasive species. In addition to coordinating agencies and filling gaps, the CGAPS PIO and Planner (along with the ROD Statewide Outreach Coordinator) are based at the University of Hawai'i at Mānoa and serve as informational resources and collaborators for the UH community.

Support is requested for up to three months of salary and fringe, and for operating funds to support the CGAPS PIO through January 2022. Contributions from the Hawai'i Invasive Species Council, Hawai'i Department of Agriculture, National Park

Service, U.S. Fish and Wildlife Service, and U.S. Forest Service also support the salary, fringe, and operating costs of this position, and additional funds are being sought. Support is also requested for ten months of salary and fringe, and operating costs for the CGAPS Planner. With existing and requested funds, the position would be funded through January 2021.

CGAPS is able to conduct its work through the help of the Pacific Cooperative Studies Unit, which provides assistance in the areas of human resources, budget/ accounts tracking, purchasing, reimbursements, and the tracking of grants and other paperwork through the various UH offices. A nominal amount of grant funds also supports these functions.

Deliverables

Progress reports are provided to the CGAPS Steering Committee and funders at quarterly meetings, and a final report will be produced and shared at the end of the year. Measures of effectiveness are included for projects where appropriate.

Budget: \$100,000 (\$5,000 UHF)

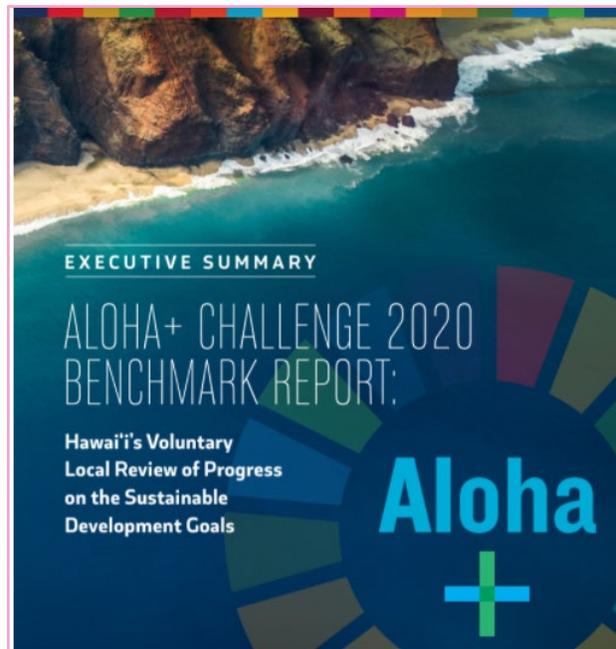
Project 3: Support for the Hawai'i Green Growth (Strategy 9)

Executive Summary

This project would provide support for Hawai'i Green Growth (HGG) leadership and work on 2021 partnership goals, including the implementation of the Hawai'i Interagency Biosecurity Plan and natural resource protection, and Hawaii's implementation of the United Nation's Sustainable Development Goals through the Aloha + Challenge.

Background

Funds are requested to help support HGG and its multi-sectoral approach to catalyze action across government, private sector, and civil society to promote a culture of sustainability through the Aloha+ Challenge 2030 sustainability goals, the Hawai'i Sustainable Business Forum, and high-level engagement with the United Nations on the Sustainable Development Goals. Through participation in HGG,



HGG convenes business and agency leaders and decision makers to advance the sustainability goals through the Aloha + Challenge.

CGAPS taps into a broader network for shared messaging and support for addressing invasive species issues. Although invasive species can impact multiple sectors and many agencies, organizations and businesses can take steps to prevent or address invasive species issues, it is rarely seen in this way. HGG's events and meetings provide a forum and framework for this cross-sectoral awareness-raising.

This year, HGG staff worked with partners to conduct its first statewide Voluntary Local Review to assess progress to date on the Aloha+ Challenge, Hawaii's framework to achieve the UN Sustainable Development Goals. The Review and the annual partners meeting was a good opportunity to dig into the 2020 benchmark data and identify next steps, priorities, and how the Aloha + Challenge can continue to catalyze the decisions, changes, and investments needed to keep on track.

Financial support for HGG is shared among multiple agencies and entities. Funding is requested to provide partial support to HGG for core operations and projects.

Deliverables

With continued support, HGG will be able to engage leaders in meeting the Aloha + Challenge. HGG will provide updates and a year-end report.

Budget: \$25,000 (\$1636 OEDB)

Project 4: Airport Biosecurity Display *(Strategies 1, 2, and 7)*

Executive Summary

This project would utilize the expertise of Bernice Pauahi Bishop Museum Exhibits staff in creating at least one display/exhibit for high-traffic passenger areas at the Daniel K. Inouye International Airport.

Background

In 2019, visitors and residents moving through Hawai'i's airports exceeded 19 million, with more than 10 million using the Daniel K. Inouye International Airport (DKI). Visitors and returning residents are an important pathway for the arrival of new invasive species, and airports provide unique opportunities to message to the traveling public. In recent years, Hawai'i Department of Transportation (HDOT) entered into a contract with private companies to rent "ad space" on airport terminal walls and video monitors, and the Hawai'i Department of Agriculture (HDOA) has signed a multi-year agreement for some of those spaces and will be developing biosecurity messaging for airports statewide. Many of these ad spaces are in high-traffic areas.

However, departing passengers typically spend more time in the airports as they wait for their flights, and despite it's pre-Covid ranking as one of the 30 busiest airports in the U.S., there are relatively few options for things to do while awaiting boarding. This project would utilize funds to contract with Bishop Museum or other qualified educational exhibit contractor to design and install an educational, engaging, and interactive

biosecurity display or exhibit in a terminal at DKI. Where possible, the project team will coordinate designs and messages to complement an HDOA-funded contract for messaging at State airports.

Initial conversations have identified the existing invasive species display area utilized by HDOA and USDA in the interisland terminal as a possible space. However, this project would start with CGAPS staff working with HDOA, USDA, and HDOT to identify an available space that is appropriate for the type of interactive display or exhibit that would engage travelers of all ages. HMLF funds would then be used to contract the design and installation of the exhibit. If there is a need for additional funds to successfully complete this project, CGAPS will identify potential sources and apply for those funds. CGAPS staff will coordinate meetings between interested agencies and the exhibit contractor in the design phase and as necessary during the process, while serving as the point of contact and overall coordinator of the project.



This invasive species display was installed in 2004 in the HDOA space at the interisland terminal. This space and other locations at DKI will be considered during the planning phase of this project.

Deliverables

CGAPS will provide project updates upon request and an annual report within thirty days of the end of each calendar year. The selected contractor will provide to CGAPS a detailed budget and timeline for the design, production, and installation of the exhibit, with short reports at billing points and upon completion. The Scope of Work for the contract will be filed with the Hawai'i Conservation Alliance Foundation and will detail deliverables and billing points.

Budget: \$43,000 (\$4,300 HCAF)

Project 5: Preventing New Invasive Plants *(Strategies 1 and 2)*

Executive Summary

This project would be conducted by Dr. Michael Melzer, director of the University of Hawai'i Agrosecurity Laboratory, and a graduate student in the Agrosecurity Lab to procure, test, and integrate the use of new diagnostic tools that could be used by regulatory officials to quickly identify harmful plant pathogens during the inspection

process for plants for planting and cut flowers.

Background

State agricultural inspectors are currently limited in their ability to detect microbial pathogens on incoming plant materials. Of particular concern are propagative materials which are often associated with the plant nursery industry. Mandatory quarantine employed to monitor for disease development is limited to certain crops or host groups. This can have limited utility in detecting cryptic infections by pathogens that may induce severe disease in other hosts, or may take longer than quarantine time to develop disease symptoms.



HDOA Plant Quarantine (PQ) does not have a plant pathologist on staff, and disease samples are either sent to staff without specialized pathology expertise, or they may be sent to other agencies or research labs for identification. Tools like the Oxford Nanopore MinION sequencer and training could help PQ inspectors quickly identify harmful pathogens.

The emerging gold standard for pathogen detection is high-throughput sequencing (HTS) which is represented by a suite of distinct technology platforms that typically require expensive (>\$100k) instrumentation, significant computing power, and a high degree of technical knowledge in molecular biology and bioinformatics by the user. In a significant departure from this paradigm, Oxford Nanopore has developed a low-cost compact sequencing platform with units the size of a cellular phone, and at a cost of about \$1000-5000. These units minimize the technical skills required for sample preparation and have the added benefit of real-time data analyses with user-friendly web-based software. Importantly, data generation is in real time, and meaningful runs can be completed in as little as 6-12 hours, thereby speeding up diagnostics-based quarantine decisions. The units are fully field deployable, and have been used on research vessels, in jungle field camps, and even in the International Space Station. Its diagnostic use for plant pathogens has been validated by research and regulatory agencies in several countries and USDA APHIS is evaluating its use as well.

The University of Hawaii's Agrosecurity Laboratory works closely with state and federal regulators, fellow scientists, and other relevant stakeholders to prevent the introduction of invasive species, detect incipient populations, and help manage established pests and diseases affecting Hawaii's agriculture. As such, the Agrosecurity Laboratory is in a unique position to test this technology, develop training materials, and conduct training for regulators and collaborators.

In this proposal, funding is requested to initiate the integration of nanopore sequencing into the Hawai'i Department of Agriculture's (HDOA) inspection activities. To achieve this goal of integration, we propose to evaluate and optimize the nanopore sequencer and its ancillary components at the University of Hawai'i Agrosecurity Lab in order to develop a simplistic pipeline for sample analysis. Once this pipeline is established, we will provide training sessions for HDOA personnel on the equipment.

With training complete, all protocols and equipment will be available to HDOA for their use in plant inspection activities, thereby providing them a powerful tool for preventing the introduction of targeted pests and pathogens into Hawai'i.

Deliverables

- Standard laboratory procedures will be generated for plant pest and disease diagnostics using a nanopore sequencer
- Training on the use of the use of the technology will be conducted, recorded, and made available to HDOA staff and other workshop participants
- A report on the testing and use of the technology in plant inspections will be produced and made publicly available
- HDOA will receive access to a nanopore sequencer, and all ancillary equipment, to enable its use at the front line of invasive species prevention in Hawai'i

Budget: \$30,000 (\$1,500 UHF)

Rapid 'Ōhi'a Death (ROD) Supplemental Request: ROD Prevention Outreach & Diagnostics (Strategies 2 and 7)

Executive Summary

The two pathogens that cause Rapid 'Ōhi'a Death (ROD) can be spread through environmental carriers that aren't fully understood, and through the movement of the disease spores by people. Supplemental funding would support approximately eight months of salary and operating costs for the ROD Statewide Outreach Coordinator to continue coordinating and implementing ROD prevention outreach, and up to five months salary and operating costs for a UH CTAHR laboratory technician in the USDA Agricultural Research Service (USDA ARS) lab to conduct diagnostics on the many samples submitted for the detection of the ROD pathogens. These two key positions are currently funded through a variety federal sources and state funding through DLNR, although the ROD funding bill died with the shutdown and DLNR did not receive ROD funding for FY21.



In 2020, public outreach shifted from in-person events to all remote outreach via videoconference, social media, and other safe communication tools. Ambyr Mokiao-Lee and Senator Gabbard talked ROD at Ag Day at the Capitol in February.

Background

The multi-agency & NGO response to ROD is continuing, and the University of Hawai'i plays a major role in the research, response, community outreach, and strategic planning related to ROD. This project would provide partial support for outreach and diagnostic work that are two critical control points for the spread of ROD, and support the entire response framework of the ROD Strategic Response.

This project would provide eight months of salary and operating costs for the ROD Statewide Outreach Coordinator, who focuses on engaging partners and potential partners to increase outreach capacity and reach across the state, and on conducting direct outreach to key audiences. This project would also provide partial support for a diagnostic lab technician in the USDA ARS lab. This lab is responsible for testing all 'ōhi'a wood samples to determine which of the two pathogens are present (or if they are absent), including the testing of 'ōhi'a logs for shipment in support of the HDOA quarantine rule, and for the testing of samples from suspected ROD trees sighted during statewide aerial surveys. The diagnostic lab technician also tests for the presence of the pathogens in environmental samples such as soil, ambrosia beetles, and boring sawdust from the beetles, in support of research on the environmental pathways that spread ROD.

These positions have been funded through multiple federal, state, and private foundation grants to UH, including initial funding from HMLF, with Drs. Michael Melzer and J.B. Friday of the UH Manoa College of Tropical Agriculture and Human Resources (UH CTAHR) as the Principal Investigators.

Deliverables

Updates and a final report on the work and results for these two key positions will be provided.

Budget: \$100,000 (\$5,000 UHF)

2021 Budget

Item	Projects	Term	Admin	Direct	Overhead	Total
1	Legal Fellowship Support. Salary, fringe (through 1/31/22) & operating support for two legal fellows + 2 interns	12/31/2022	UHF	\$ 144,400	\$ 7,600	\$ 152,000
2	CGAPS Core Support. Partial salary, fringe & operating support for PIO and Planner, projects, PCSU project support	12/31/2022	UHF	\$ 95,000	\$ 5,000	\$ 100,000
3	Support for Hawai'i Green Growth. Annual support for multi-sector approach to sustainability, incl. invasive species priorities	12/31/2021	OEDB	\$ 23,364	\$ 1,636	\$ 25,000
4	Airport biosecurity display. Contract for the production and installation of a biosecurity display at DKI airport	12/31/2022	HCAF	\$ 38,700	\$ 4,300	\$ 43,000
5	Plant Pathogen Rapid Diagnostic Tools	12/31/2021	UHF	\$ 28,500	\$ 1,500	\$ 30,000
Total						\$ 350,000
Item	ROD Supplemental Projects	Term	Admin	Subtotal	Overhead	Total
1	ROD Prevention Outreach & Diagnostics	12/31/2022	UHF	\$ 95,000	\$ 5,000	\$ 100,000
Total						\$ 100,000