



**A Proposal to the  
Hau'oli Mau Loa Foundation  
for  
2016 CGAPS Invasive Species Prevention Projects**

## Introduction

Our work in 2015 has been successful in many areas. Most exciting among these is the alignment of a variety of groups around the need for a State Biosecurity Plan, and Hawai'i Department of Agriculture Chair Enright's full support in funding the planning process and carrying this priority to the Governor. Biosecurity has also become a top priority for the Hawai'i Host Committee for the International Union for the Conservation of Nature (IUCN) and the Hawai'i Conservation Alliance Steering Committee. It is our hope that Gov. Ige will present the Biosecurity Plan as one of Hawaii's Commitments at the IUCN World Conservation Congress in Honolulu in September 2016. Further, the planning process is an excellent opportunity to develop multi-sector messages regarding invasive species.

Another success is the ongoing Little Fire Ant Response on O'ahu, which is being operated in the manner described in the 2013 Plant Health Emergency Plan. One year of treatments at Mililani Mauka and Waimānalo have been successful to date with no ants found during the post-treatment survey. These sites will be monitored for the next three years before eradication is declared. Gaining the public's help in finding new infestations is now the priority.

The CGAPS Legal Fellows are making steady progress on their projects, even with new issues and challenges arising weekly. In addition to this, Rep. Jarrett Keohokalole (former CGAPS Legal Fellow) continues to work with CGAPS and the current Legal Fellows to strategize and advance initiatives. Former CGAPS Legal Fellow Melissa Miyashiro has also participated in meetings, which has added continuity and perspective.

The project to develop a process and proposed list of invasive plants that could be restricted from importation into Hawai'i has been met with some concern from nursery businesses. However, the Executive Directors of the Landscape Industry Council of Hawai'i have asked for the creation of just such a list in their 2016 plan, and they have committed to assisting CGAPS in vetting and proposing the list for restriction.

At the other end of the spectrum is Rapid 'Ōhi'a Death (ROD), which is caused by a new fungal pathogen that has not yet been described or recorded anywhere in the world. The pathogen can be spread when contaminated 'ōhi'a (*Metrosideros polymorpha*) plants, 'ōhi'a wood, and soil from infested areas are moved. This disease is currently limited to Hawai'i Island, and HDOA quickly set up an Interim Rule to restrict the interisland movement of these items. However, the disease is spreading on Hawai'i Island, hop-scotching in an alarming manner, moving within watersheds via streams, and in soil during a landscaping operations. There may also be insects or other ways that the disease is spreading. So much is unknown, but the ongoing spread, combined with the 100% mortality of stands of 'ōhi'a is stunning in its implications. Can we slow or stop this disease? How do we plan for replacing the form and function of this important watershed tree which spans more than 1 million acres statewide? How do we replace 'ōhi'a as the keystone of native forests? How do we do this in light of 'ōhi'a's cultural importance? In a separate letter we are providing a list of additional strategic priority projects that CGAPS and its partners are pursuing funds to support. Please feel free to share the document with other foundations that may be in a position to help.

These issues are truly daunting, but without Hau'oli Mau Loa Foundation's help, it would be impossible to try to address them. As always, please feel free to contact us with any questions, comments, or concerns regarding any aspect of our work. Mahalo nui loa.

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## Project: CGAPS Invasive Species Law Fellowship Program (Goal 1, Action 1, 2, 4, 5, 6)

### Executive Summary

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 summer interns to work in collaboration with CGAPS in reviewing and writing invasive species prevention related statutes and rules.

### Background/Update on Fellowships

The CGAPS Law Fellowships is one of the most successful projects of our partnership with Hau'oli Mau Loa Foundation to date. Kevin Richardson started with us in January 2015, and is working primarily on the ballast and biofouling issue. In the absence of the Ballast and Hull-fouling Coordinator has also stepped up to represent Hawai'i in state and regional ballast and hull-fouling working groups and conferences. Andrew Porter started in May, 2015 and is focused on assisting the Hawai'i Department of Agriculture Plant Quarantine with proposed changes for streamlining and clarifying rules regarding plant and animal importation, inspection, compliance agreements, and penalties.

This request is for \$117,000 would support salary, fringe, operating budget, and travel for the two legal fellows for 7 months, from July 1, 2016 through January 31, 2017, and would also support up to two University of Hawai'i William S. Richardson School of Law summer interns. Conference registration funds are also requested for the law fellows and the summer interns to allow their full participation in the IUCN World Conservation Congress. This will complement the William S. Richardson School of Law's strong track-record in environmental law leadership, and their Environmental Law Program will be able to provide valuable work experiences for its students and recent graduates through this fellowship and summer law internships.



*University of Hawai'i Willam S. Richardson School of Law Associate Dean Denise Antolini (front row, center) coordinates and leads monthly meetings as a way for the legal fellows from DAR, DOCARE, and CGAPS (Kevin Richardson and Andrew Porter second row, 3rd and 4th from the right), and other graduates of the program to comunicate and coordinate actions. Attendees have also included Bill Tam (second row right), and DLNR Chair Suzanne Case (front row, second from left).*

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

- Gaps in quarantine action authority for federal agencies when human health vectors are found in international cargo or conveyances
- Continue supporting the ballast and hull-fouling work towards rulemaking to address these gaps, and participate where possible in regional efforts to address hull-fouling
- Address DAR policy gaps regarding aquaculture, including permitting for culture, facilities inspection (for biosecurity purposes), and compliance
- Support HDOA Plant Quarantine in proposed rule changes for nursery industry compliance agreements
- Support HDOA in exploring moving some of their invasive species violations to the Environmental Court
- Support CGAPS in its goals regarding the State Biosecurity Plan, requesting special recognition for Hawai'i in Federal Pest Risk Assessments, and other biosecurity legal issues in conjunction with the IUCN World Conservation Congress
- Assist as necessary in local actions to support federal rule changes such as the Lacey Act update, the listing of Myrtaceae as restricted for import into Hawai'i and as federally actionable

### **Deliverables**

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

### **Budget**

\$94,500	Salary & fringe for two FTE for 7 months
\$3,000	Two William S. Richardson School of Law summer interns
\$3,150	Materials, supplies, including meeting refreshments/food
\$5,500	Domestic or international travel
\$5,000	Conference registration, other
\$5,850	University of Hawai'i Foundation 5%
<b>\$117,000</b>	<b>Total</b>

## **Project: Actionable list of Insects and Plant Pathogens** *(Goals 4, Action 2; Goal 1, Action 2)*

### **Executive Summary**

This project will support the work of University of Hawai'i researchers and students in the areas of entomology and plant pathology to review the arthropod and species of micro-organisms listed as federally non-actionable; identify plant pests and produce a list of arthropod plant pests and plant diseases not currently actionable for Hawai'i commercial plants and native plants; and to review other Pest Risk Assessments such as the recently completed Forest Health Pest Risk Assessment to identify additional arthropod pests and plant pathogens that are currently not actionable by Federal regulatory agencies. The final product will be a report with one or more lists of species that will be used by the Hawai'i Department of Agriculture (HDOA) and the Coordinating Group on Alien Pest Species (CGAPS) to request federal protection for Hawai'i from the identified pests.

## Background

The goal of this project is to obtain the information necessary for requesting federal recognition of Hawaii's state-managed quarantines that exclude particular plant pests that are not present in Hawaii, and where economic or environmental harm would result from their introduction, and pest known to occur in Hawaii but under state official control programs to eradicate, or contain such a plant pest. Federal recognition means that the USDA Animal and Plant Health Inspection Service-Plant Protection and Quarantine (APHIS-PPQ) will recognize Hawaii quarantines for particular pests that otherwise are not regulated at ports of entry when intercepted on foreign origin goods.

The International Plant Protection Convention (IPPC) allows that shipments containing pests under recognized state management will be subject to equivalent phytosanitary requirements in domestic and foreign commerce. The IPPC's "Glossary of Phytosanitary Terms" defines quarantine pest as "a pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled.\* As a contracting party of the IPPC, USDA-APHIS-PPQ chooses not to exercise its regulatory authority to prohibit or restrict the importation of a plant, plant product, or other article unless such action was necessary to prevent the introduction of a quarantine pest as defined by the IPPC. \*\*

When an arthropod, or a micro-organism that may be a plant pathogen, is intercepted at the port of entry, a PPQ decision must be made whether or not the material is infested/infected with a quarantine pest. For a quarantine pest, remedial measures are taken, including possible destruction of the material and/or re-export. Shipments in which interceptions are found, are placed on hold, awaiting the identification, and, if not already categorized, the determination of actionable status. Over the year, many organisms that appear or may appear in foreign imports and conveyances are already categorized either as quarantine pests that require action/reporting, or as non-quarantine pests (or are not even plant pests, such as secondary infections, saprophytes, etc.), for which no action is taken.

A list of some of the non-actionable insects and micro-organisms for Hawaii was developed a few years ago. Some, but not all organisms have been removed from the list, which do not meet the definition of quarantine pest on the basis of presence in Hawaii, or the basis of not being plant pests. The next step is for Hawaii to review the lists to identify organisms that meet the IPPC definition of a quarantine pest, then document the reasons for retaining quarantine status for those pests for foreign goods entering Hawaii. The list will include 1) common and scientific names, 2) evidence that the pest is not present in the state, 3) evidence of economic/environmental harm to the state 4) evidence that entry through foreign commerce, followed by establishment, is possible, 5) any information that lends to the credibility that the organism's presence would be detected and reported should it subsequently occur in Hawaii.

Invasive plant pests, including arthropods and pathogens, are major threats to the agricultural and natural ecosystems of the USA. The United States Department of Agriculture's Animal & Plant Health Inspection Service (USDA-APHIS) regulates the entry of plants and plant pests into the USA and also inspects imported materials for the presence of unauthorized arthropods and microorganisms. USDA-APHIS categorizes arthropod and microorganism species as actionable or non-actionable at US ports of entry (POE). The native flora and agricultural crops of Hawaii are often unique to the state, and may therefore be threatened by invasive species that are of no significant impact, unlikely to establish, or are native to US mainland. Some pests which are already widely distributed and causing significant damage on the US mainland, are not yet present yet in Hawaii. Hawaii takes quarantine action on the infested/infected material in interstate trade to prevent establishment of those pests, and needs

the same quarantine action to be taken when the pests are found in foreign imports into Hawai'i. As such, the Federally Recognized State Managed Phytosanitary program (FRSMP) allows for pest species to remain actionable at some POE, but be assigned as non-actionable at others.

The objectives of this work will be to review the USDA-APHIS non-actionable list and identify pests that pose a risk to significant commercial plants and to native species in Hawai'i's unique agricultural and natural ecosystems. These plant categories will include those with current economic and cultural importance, as well as crops of future importance to Hawai'i. The methodology used to generate this list will include literature surveys, pest prioritization tools, and risk analysis metrics. A review of the Forest Health Pest Risk Assessment will also be conducted to identify additional pests and pathogens of importance to Hawai'i that are currently not actionable by Federal regulatory agencies. The list generated by these efforts will be used by HDOA and CGAPS to request and obtain Federal protection against the listed pests.

The University of Hawai'i is a key resource in the effort to protect Hawai'i's natural resources, economy, and residents from the threats posed by invasive species. Under the direction of Dr. Michael Melzer's Agrosecurity laboratory and Dr. Helen Spafford's Applied Entomology laboratory, and in partnership with the CGAPS Chairs, this project will benefit the University of Hawai'i by integrating faculty, researchers, and students in Hawai'i's biosecurity programs. Close collaboration between biosecurity agencies and the University also provides research and outreach capacity where there are currently gaps, and in turn, greater integration between the University and in Hawai'i's biosecurity programs will enable faculty to identify job training and research pathways.

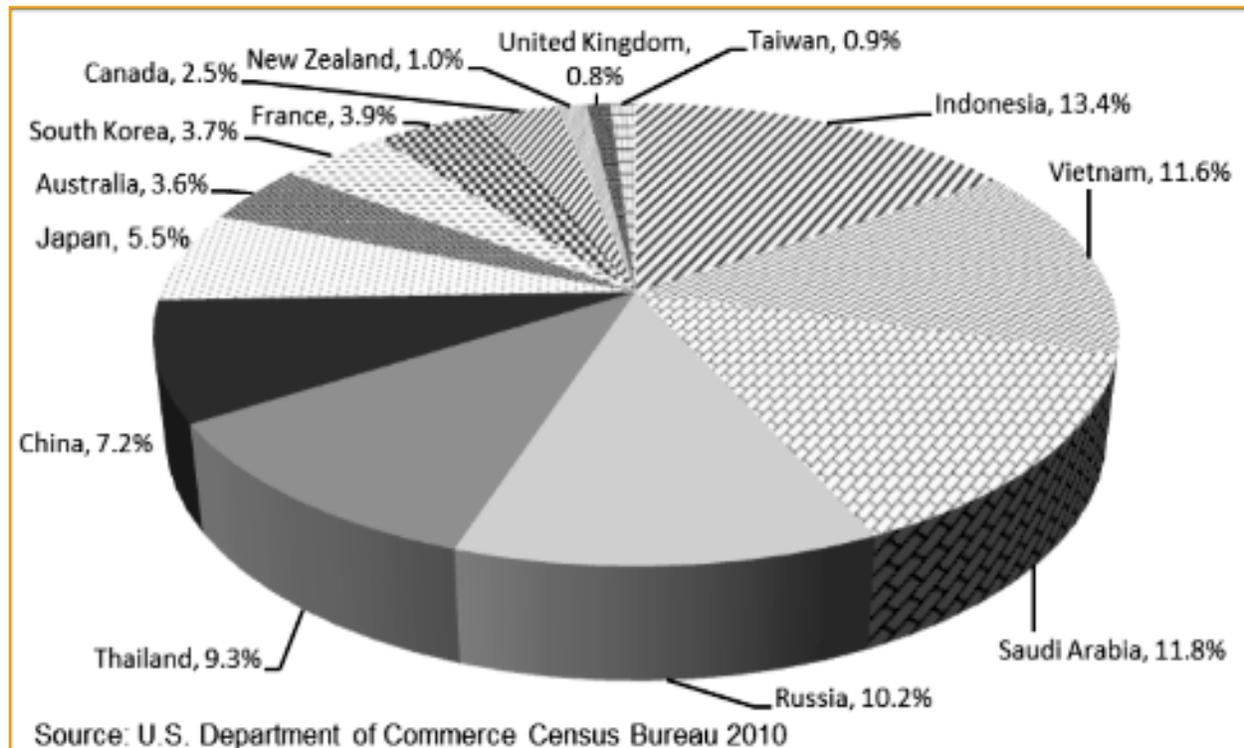


Fig. 1 The top 14 sources of foreign cargo (including fossil fuel products) by all means of transportation to Hawai'i during the period of 2008 to 2010 is tracked by the U.S. Department of Commerce Census Bureau. Source: Hawaiian Forest Health Pest Risk Assessment, in press.

## Deliverables

A semiannual report will be generated to demonstrate progress on the objectives of this project. A final report, which will include a list of identified pests and the methods used to generate the list, will be submitted to CGAPS and HDOA for their evaluation.

## Budget

\$13,467	Faculty salary
\$10,000	APT salary and fringe
\$5,033	Student assistant (\$12.50/hr) and fringe
\$1,500	University of Hawai'i Foundation 5%
<b>\$30,000</b>	<b>Total</b>

## Project: Guidance Document for Rapid 'Ōhi'a Death Strategic Response

*(Goal 4, Action 1)*

### Executive Summary

This project would contract the expertise and services of Dr. Lloyd Loope, dba Loope Environmental Consulting, to review existing scientific literature and work with researchers, resource managers, and regulatory agencies to produce a document to guide optimally effective response for Rapid 'Ōhi'a Death (ROD). This guidance document is intended to pull together all that is known about ROD and related diseases, describing and assessing in a transparent way the risks posed to Hawai'i and other Pacific jurisdictions by this plant pathogen, helping to prioritize the actions needed to prevent spread of ROD and otherwise address the immense risk to Hawai'i's native forests and watersheds. The document will also identify a range of scenarios if/when ROD spreads across the islands. It should set the stage for research and development of appropriate management strategies for preserving watershed function and biodiversity of these forests in the face of the loss of their dominant canopy species.

### Background

Scientists at the Pacific Basin Agricultural Research Service, U.S. Forest Service, and UH College of Tropical Agriculture and Human Resources Cooperative Extension Service have recognized and confronted a new fungal pathogen that is killing 'ōhi'a (*Metrosideros polymorpha*) trees on the Big Island at an alarming rate. This disease has been named Rapid 'Ōhi'a Death or ROD (see [rapidohiadeath.org](http://rapidohiadeath.org)).



*In late 2012, Puna and Hilo area homeowners began reporting the rapid death of healthy, mature 'ōhi'a lehua trees such as this orange flowered-variety. Researchers have not found a way to control or kill the fungal pathogen in infected trees or at a landscape scale. There is a lot of variety in 'ōhi'a, and the hope is that some will be resistant to this fungal pathogen.*

The fungus that causes ROD is apparently part of a notorious and confusing species complex (*Ceratocystis fimbriata*) that is rapidly evolving so that in the past 20 years it has surpassed the rust pathogen *Puccinia psidii* as the greatest threat to Eucalyptus forestry in Brazil. It is not currently clear where the ROD pathogen came from (possibilities include Brazil, South Africa, China, mainland U.S., or a local host shift). Despite an interim rule by Hawai'i Department of Agriculture restricting the movement of known disease vectors from Hawai'i Island, there are only voluntary measures set in place for restricting the movement of known infested materials on Hawai'i Island. Further, current research indicates that this pathogen can spread in a multitude of ways – e.g., via waterways, from root-to-root, by feral cattle, and possibly by wood-boring insects. All indications are that ROD will continue to spread across the Big Island and will eventually reach the other forested islands unless effective containment strategies are fully developed and implemented.

'Ōhi'a is unique to Hawai'i and is an overwhelmingly important element of native culture. It is by far the most widespread tree in our forests, playing a vital role in the function of our watersheds and, therefore, our water supply. 'Ōhi'a nectar is also the primary food source for most of Hawaii's surviving native forest birds; without this tree, the prospects of survival are poor for these imperiled species. What will we do if we lose virtually all of our 'ōhi'a to this disease? Other members of the genus *Metrosideros* make up a large part of the native forests in several other Pacific islands—most notably New Zealand (12 spp.) and New Caledonia (21 spp.). ROD poses the highest conceivable threat level to Hawaii's 'ōhi'a, and an informed, strategic, and coordinated approach for the next 2-3 years is of the utmost importance.

**Deliverables**

After six weeks from the start of the contract, a preliminary report will be submitted, summarizing the available science to-date regarding ROD and related diseases, the risks posed to Hawai'i and other Pacific jurisdictions by this pathogen, providing guidance for prioritized actions that are needed for immediately addressing the greatest of these risks. The full report, produced after 6-12 months, will provide more detail for future management scenarios and needs for research and implementation of proposed actions to maintain or restore watershed function and preserve native species. It will include a relatively comprehensive section on the cultural values of 'ōhi'a.

**Budget**

\$48,420	Dr. Lloyd Loope, Loope Environmental Consulting
\$5,380	Hawai'i Conservation Alliance Foundation indirect 10%
<b>\$53,800</b>	<b>Total</b>

**Project: Capacity Support for CGAPS PIO and Plant Pono Liaison**  
*(Multiple Goals and Action items; Goal 1, Action 5 & 6)*

**Executive Summary**

Funds are requested for 3 months of salary and fringe, plus operating support for the CGAPS Statewide Invasive Species Public/Community Relations Coordinator (shortened to PIO). The goals of this position are to facilitate engagement and inter- and intra-agency communication; to coordinate and catalyze collaborative projects towards the goals outlined in the CGAPS Strategic Plan; to promote key outreach messages; to educate decision makers,

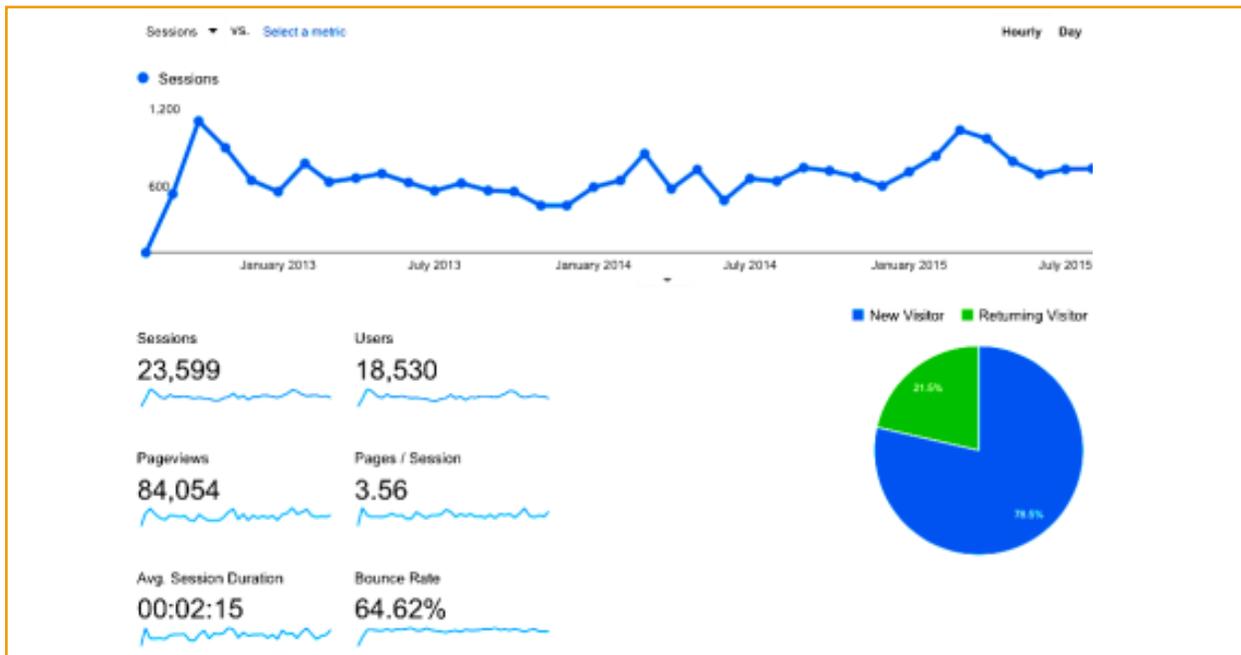
special interest groups, and the public about invasive species in order to effect a change in perception, actions, rules, or funding for invasive species issues.

Funds are also requested to continue support for the Hawai'i-Pacific Weed Risk Assessment (HPWRA)/Plant Pono Outreach Liaison, for 7.5 months salary and fringe, plus operating costs through January 30, 2017. The goals of this position are to work with the CGAPS PIO to promote awareness and use of the HPWRA in the nursery and landscape industry and other key groups; to continue to develop the Plant Pono website and program, and to engage relevant stakeholders in the process of working towards restricting the importation of certain invasive plants into Hawai'i.

## 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 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 provides research and outreach capacity where there are currently gaps, and in turn, greater integration between the University and in Hawaii's biosecurity programs will enable faculty to identify job training and research pathways.

Funding for the CGAPS PIO will cover 3 months of salary and fringe to continue work on CGAPS goals, manage Hau'oli Mau Loa Foundation prevention projects, contractors, and staff. Contributions from the Hawai'i Invasive Species Council, Hawai'i Department of Land and Natural Resources, National Park Service, U.S. Forest Service, and U.S. Fish and Wildlife Service also support the salary, fringe, and operating costs of position.



*Fig. 2 Google Analytics for the Plant Pono website. Purposeful importation of non-native plants continues to provide virtually unrestricted entry of new invasive plants. Invasive plants also continue to be sold and used. The HPWRA is promoted as a free service providing, an accurate, non-binding assessment of a plant's invasive potential. The Plant Pono website (plantpono.org) is the online portal to the HPWRA, which has gained 18,530 users since August 2012.*

Existing funds will support Amanda Skelton, the HPWRA/Plant Pono Liaison, through May, 2016. Additional funding for 7.5 months will enable progress through January 2017. The Liaison will continue with outreach to target audiences, manage content and updates for the Plant Pono website, and will continue to engage stakeholders on the Restricted Plant List project.

**Deliverables**

Progress reports are provided to the CGAPS Steering Committee at quarterly meetings, and a final report will be generated for these and a variety of other accomplishments at the end of the year.

**Budget**

\$25,468	1 FTE salary & fringe (partial funding) for CGAPS PIO
\$3,000	CGAPS PIO materials & supplies, mileage
\$3,500	CGAPS PIO domestic or international travel
\$7,000	Small service contracts, meeting facilitation & website security services
\$34,730	1 FTE salary & fringe (13 months) for HPWRA/Plant Pono Liaison
\$3,000	Plant Pono materials & supplies, mileage
\$3,500	Plant Pono domestic travel
\$1,040	Plant Pono facilities (partial office rent at UH CTAHR)
\$9,000	CGAPS PIO and Plant Pono conference registration, other costs associated with promoting and coordinating Biosecurity Planning process, the Biosecurity Journey elements and site visit costs for the 2016 IUCN World Conservation Congress, (including, but not limited to food and refreshments), etc.
\$4,762	PCSU direct costs
\$5,000	UHF indirect (5%)
<b>\$100,000</b>	<b>Total</b>

**Project: Support for the Hawai'i Green Growth**  
*(Goals 3 & 5)*

**Executive Summary**

Provide support for the leadership and coordination of Hawai'i Green Growth (HGG) and its 2016 goals including ongoing development and implementation of dashboards for invasive species and natural resource protection and collaborative advocacy around shared priorities.

**Background**

Funds are again requested to help support HGG. In 2015, HGG moved into high gear to make the most of the opportunities surrounding the 2016 IUCN WCC, coordinating meetings to work collaboratively on measures for the Aloha + Challenge, and hiring its first Executive Director.

HGG has taken the lead in coordinating multi-agency and multi-sector meetings to identify and coordinate HGG support for shared priorities for the upcoming legislative session. CGAPS has had limited success in this area in the past, and the value that HGG brings to this process is immeasurable. Through HGG's work to produce an indicators dashboard for

the Aloha + targets, invasive species was identified as a priority under the natural resources protection target, and it has its own primary indicator. These help CGAPS in meeting two goals identified in the 2015-2019 CGAPS Strategic Plan, and also support the over arching communications and coordination goals of CGAPS.

The HGG Working Group committed to three years of continued cross-sector collaboration and identified four priorities for 2015-2017 to kick-start the Aloha + Challenge and build a strong foundation for long-term success:

- Aloha + Challenge Dashboard for decision-makers and the public completed and used to track progress and inform action on the six sustainability targets. Structure and funding in place to maintain the Dashboard's utility through 2030.
- Annual Aloha + Challenge priorities for joint action agreed and advanced by state and county governments, Office of Hawaiian Affairs, University of Hawai'i, and higher education institutions, federal agencies, and private sector and non-profit leaders. At least one major statewide sustainability initiative announced at the 2016 World Conservation Congress that leverages public and private funding.
- Sustainability coordination staffed and funded at state & county level with committed positions (or leads) in the six governments that signed the Aloha + Challenge and the University of Hawai'i.
- Effective stewardship of the Aloha + Challenge to achieve the targets, including convening public and private partners across targets, catalyzing and sustaining commitments, and creating a statewide structure to mobilize action on the Aloha + Challenge by government, private sector, and civil society organizations--with a special focus on engaging business and tourism leaders by 2017.

HGG's active Working Group includes leaders from more than 45 organizations. Funding secured to support HGG core operations and projects through financial support by 20 organizations, and the in-kind support of an additional 20. This request is for \$25K in support of HGG.

### **Deliverables**

With continued support, HGG will continue to make progress on all bullet points listed above. Progress reports and a final report will be provided.

### **Budget**

**\$25,000**            **Total to O'ahu Economic Development Board (OEDB) for HGG**

## 2016 Budget

	2016 Projects	Term	Subtotal	Admin	Overhead	Total
1	Law Fellowship Program year 4 funding for two legal fellows (RCUH), + up to 2 summer interns, materials & supplies, travel, conferences	1/30/2017	\$ 111,150	UHF 5%	\$ 5,850	\$ 117,000
2	Support for UH entomology & plant pathology experts to review arthropods and microorganisms listed as federally non-actionable, and other relevant risk assessments to provide CGAPS and HDOA with the documentation for requesting federal protection	12/31/2016	\$ 28,500	UHF 5%	\$ 1,500	\$ 30,000
3	Contract for technical analysis and strategic response planning for Rapid 'Ōhi'a Death	12/31/2016	\$ 48,420	HCAF 10%	\$ 5,380	\$ 53,800
4	Support for CGAPS PIO 3 months sal & fringe, operational; 7.5 month funding for Plant Pono Liaison salary, fringe, operational; PCSU 5% direct (sal & fringe for PCSU admin staff support of CGAPS)	1/30/2017	\$ 95,000	UHF 5%	\$ 5,000	\$ 100,000
5	Support for Hawai'i Green Growth	12/31/2016		OEDB		\$ 25,000
6	Reduce interisland pest movement at source (funding received in 2014, borrowing from 2015 and 2016)	12/31/2016	\$24,000 2014; \$23,000 2015; \$23,000 2016	UHF 5%	\$1,264 2014; \$1,211 2015; \$1,211 2016	\$ 24,211
<b>Total</b>						<b>\$ 350,011</b>

11/24/2015