

WHAT'S INSIDE?

# Kia'i Moku

guarding the island

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## WEAVING A WEB OF SCIENCE

### FOR EARLY DETECTION & MANAGEMENT OF INVASIVE PLANTS CASE STUDY: *JUNCUS EFFUSUS*

By Kelsey Brock, KISC Early Detection Botanist

The vegetation of the Hawaiian Islands has to be amongst the most complex in the whole world. Entire dynamic ecosystems comprised of alien species from across the globe lie next to communities of native plants, most of which are unique evolutionary babies arising from a recent blast of evolution on our isolated islands. Most of Hawaii's alien plants were introduced as ornamentals or through forestry plantings and there's variation in how they spread, when they arrived, whether they happened to have landed in their favorite habitats, if they were planted in large areas and have expanded little or if they've escaped from a few plantings and have spread rapidly. Still yet, some were introduced unintentionally as silent hitchhikers by people travelling about islands and from elsewhere in the world. Some new arrivals behave perfectly, others pop up occasionally in disturbed areas, and some form monotypic stands or a smothering canopy that exclude other species. Time is a huge factor: certain alien plants form the dominant structure of ecosystems on some islands while still being incipient on other islands across the Hawaiian archipelago and in the rest of the Pacific. Despite the thousands of alien plants formally documented here already, more are coming in (intentionally and accidentally) and some unknown ones have been lurking for a while – potentially poised to invade. Thus, from a plant conservation stance alone

we're left asking: how do we filter through this confusion to protect plants that live here and nowhere else in the world while preventing the great homogenization of the archipelago by a few very successful alien colonists?

KISC is filling a niche amongst our conservation partners on Kauai to get rid of incipient invasive plants before they become so widespread it's infeasible to eradicate them. This means there's an emphasis on identifying things quickly and making predictions about the potential environmental or agricultural impacts they may cause before they actually cause them. Of course, when you're dealing with thousands of plants and have a limited amount of funds to work with, trying to decide which of these aliens to eradicate first doesn't come with any easy answers. Thankfully, a little science goes a long way. Investing resources to strengthen our knowledge about

Are you Planting Pono?

Find out on Page 6



*Juncus effusus* found in Kokee

continued on pg 8

# KISC

## funders and partners

A & B Properties  
Coordinating Group of Alien Pest Species  
County of Kauai  
DLNR - Division of Aquatic Resources  
DLNR - Division of Forestry and Wildlife  
DLNR - State Parks  
Garden Island Resource Conservation and Development  
Grove Farm  
Hawaii Ant Lab  
Hawaii Department of Agriculture  
Hawaii Department of Transportation  
Hawaii Invasive Species Council  
Hui o Laka/Kokee Museum  
Invasive Species Committees  
Kauai Albatross Network  
Kauai Conservation Alliance  
Kauai Department of Water  
Kauai Farm Bureau  
Kauai Native Plant Society  
Kauai Westside Watershed Council  
Kokee Resource Conservation Program  
Kukuiula Development, Inc.  
National Tropical Botanical Garden  
Pacific Cooperative Studies Unit  
Pacific Missile Range Facility  
Private citizens  
Plant Pono  
Research Corporation of the University of Hawaii  
Sea Grant  
The Nature Conservancy Hawaii  
University of Hawaii College of Tropical Agriculture and Human Resources  
US Fish and Wildlife Service  
USDA Forest Service  
USDA Natural Resource Conservation Service  
USDA-APHIS-PPQ  
USDA-APHIS-WS

# Ho‘omanawanui

(be patient and work with what you have)

**Bill Lucey**  
Project Manager



*This past year has been a year of re-organization (see article on page 10). Our outreach, early detection and control programs are fully staffed and rolling. We will spend this upcoming year switching several targets, whose populations have almost been completely removed, into monitoring status. This will allow our early detection program time to investigate new threats and prioritize where KISC will send its control teams next. Compared to the other major islands Kauai remains mostly free of the “big four” Mongoose, Little Fire Ant, Miconia and Coqui frog. The term “mostly free” means that at any time these species can regain footholds on Kauai as described in the following:*

- *Though mongoose are not likely breeding on Kauai, it is probable that they continue to sneak in every so often. At some point enough animals will arrive to establish a population with devastating impacts on ground nesting birds. This risk is extremely high which is why KISC will begin an island-wide detection effort starting this summer to be followed by a new look at mongoose biosecurity.*
- *Little Fire Ants are all but eradicated from Kauai. However, the Hawaii Ant Lab and KISC will monitor the Kalihiwai infestation site for a full three years after the last ants are detected to ensure they are truly gone. As with all invasive species that reside on neighbor islands, reinfestation remains a real threat.*
- *Though Miconia are currently restricted to the Wailua watershed, new search techniques have revealed pockets of previously undetected adults (see article page 4). KISC is confident that we will regain the upper hand, but it illustrates how new information and diligence are key to adaptive management’s ability to remain effective over time.*
- *Coqui frogs continue to trickle in from time to time on shipments from the Big Island. Plant Quarantine and Plant Pest Control from HDOA have been taking the lead on early detection using KISC as back-up. So far no populations have been detected since the Lawai eradication in 2012. This is good news given that Maui County has had to pledge over \$2 million recently to address an expanding coqui infestation.*

*I am thankful to have a capable dedicated staff and would like to thank the entire Kauai community for all their pest reports over the past year as well as the nursery and landscaping industry backing our Pono Endorsement program (see article page 6). It is truly an effort that requires all of us to succeed.*

Mahalo,

A handwritten signature in black ink that reads "Bill Lucey". The signature is stylized and written in a cursive-like font.

# Mongoose Update

By Pat Gmelin, Mongoose Project Leader

In August 2015, the first ever “Mongoose Summit”, hosted by USFWS and KISC was held on Kauai, and was attended by over 60 conservation and wildlife specialists, included PIFWO, DLNR, HDOA, USDA, and mongoose experts from Amami Oshima Island in Japan.

New trapping protocols for future response were studied and discussed, including trap type and placement, spatial configuration, temporal scale, and bait choice. Future island wide surveys using tracking tunnels were examined and planned.

KISC also worked with the USFWS revising the mongoose interview and data entry form and also developed a credibility threshold that would elicit a response. Old sighting interviews along with hotspots were re-examined and re-ranked.

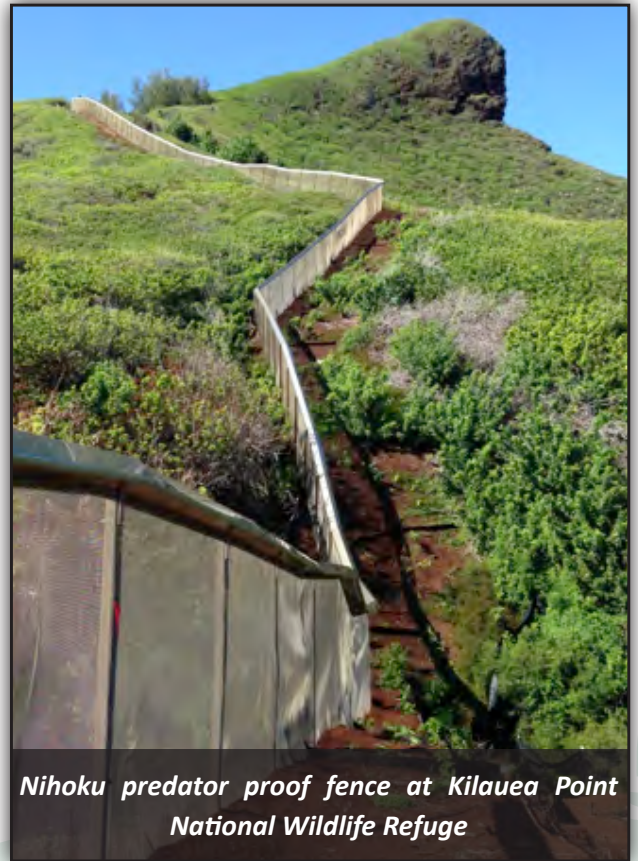
Biosecurity improvements, especially at ports of entry was researched and

Pat Gmelin toured the new Nihoku predator proof fence project at Kilauea Point National Wildlife Refuge.

Over the last year, trapping included sighting response and regular harbor monitoring. New trail cameras were used as a response in 7 areas including Moloaa, Wailua, Huleia, Puhi, Kalaheo, Waimea Canyon, and Kokee.

Mongoose outreach continued with over 200 reporting cards distributed and 50 flyer posted island-wide. The KISC mongoose display was also brought to 8 outreach events from the north shore to Kokee. Broad scale outreach efforts were achieved using publications including quarterly reports and monthly

newsletters as well as permanent displays at both shipping companies and the Lihue Airport.



Nihoku predator proof fence at Kilauea Point National Wildlife Refuge



## LONG THORN KIAWE UPDATE

Long Thorn Kiawe (LTK) (*Prosopis juliflora*), although related to our common Kiawe (*Prosopis pallida*) that is used to make charcoal, is considered invasive. The main characteristic that sets it apart from common Kiawe is the size of its thorns. LTK produces long, sharp thorns that can reach up to four inches in length. These thorns have been known to penetrate truck tires and will easily penetrate rubber soled shoes. KISC crew members use metal plated inserts in their work boots to protect their feet when working in an LTK area. KISC is working hard to rid the island of this invasive plant. Earlier this year, a large population of LTK located at PMRF, had been removed using heavy equipment and chainsaws. KISC is now monitoring the area and removing LTK seedlings as they sprout up. KISC is also working on plans to remove LTK at Kauai Raceway Park in Mana, this is made possible by the National Fish and Wildlife Foundation grant awarded to KISC in 2016. Our end goal is to eradicate all LTK on Kauai. So if you see this plant on Kauai contact KISC at (808) 821-1490.



# ENCIRCLING THE INFESTATION

*Miconia (Miconia calvescens)*

*By Bill Lucey, KISC Manager*

Miconia can completely dominate tropical pacific forests and has already done so on Tahiti, degrading forest function from wildlife habitat to water flow. On Kauai, a habitat suitability model has predicted the potential for a huge miconia forest of 158,000 acres if left unchecked.

During the past six months, KISC crews ground-surveyed the Game Management Area, Wailua Homesteads, and Wailua River State Park (WRSP) covering 214 acres, removing 108 immature plants and 5 mature plants. In total, including helicopter effort, 1,163 acres were surveyed with 118 immature plants found and 6 adults treated.

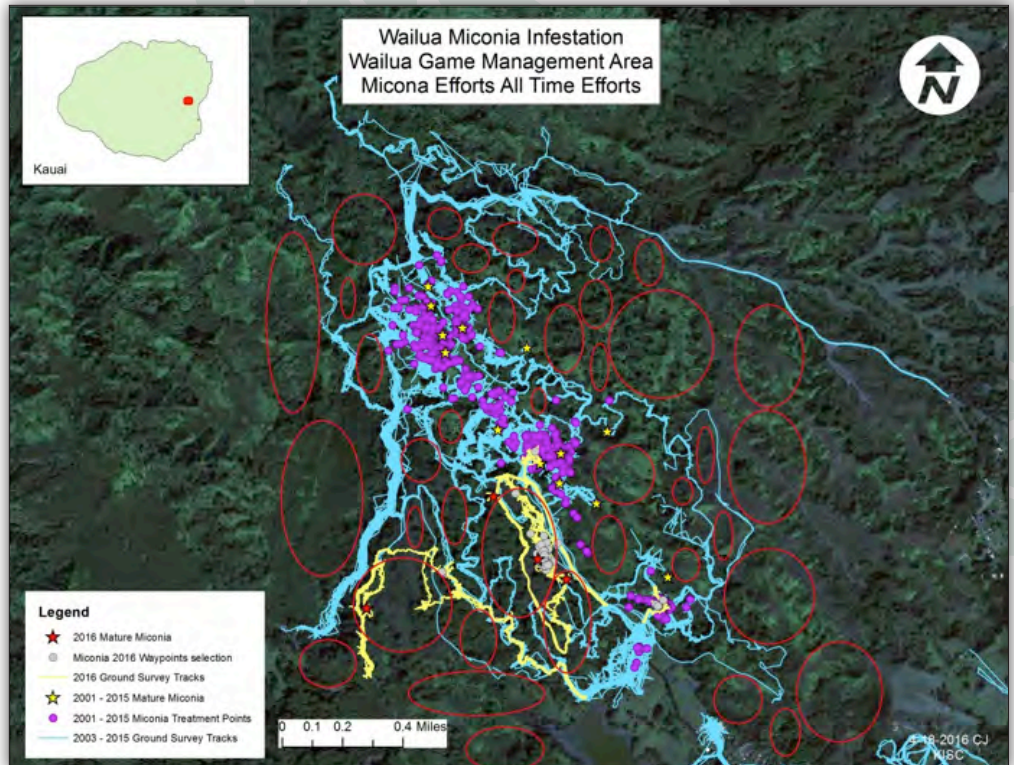
Over the course of last year, Cleve Javier, KISC Data Tech, completed a summary review of all KISC miconia data. The process is described in Cleve's article, and essentially involved reviewing and entering all historical field data sheets. This included gathering data from KISC's precursor in the response, the Kokee Resource Conservation Program which initiated miconia control in the 1990's.

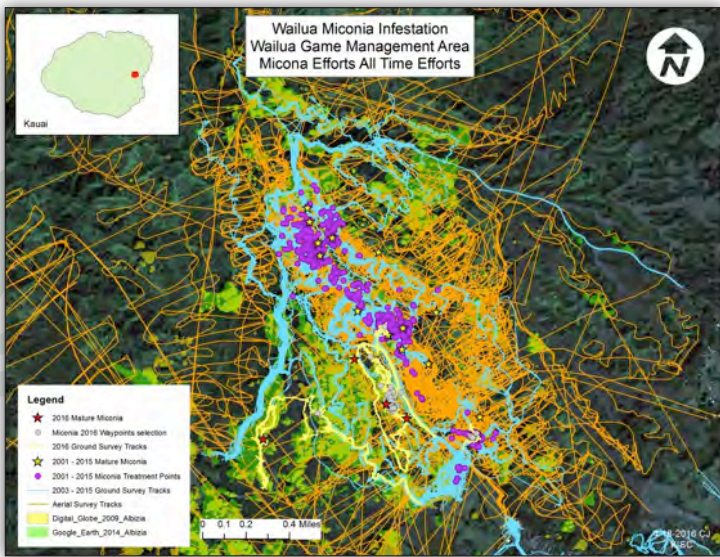
With all miconia data summarized, ground tracks were combined for all years and gaps in foot surveys were identified as shown in the first figure. In addition, helicopter survey lines are included in the second figure. These lines show solid coverage. However, albizia canopy was digitized as a third component to the analysis based on the assumption that the visibility of miconia under albizia trees is very limited. Recon gaps located under albizia trees were prioritized for reconnaissance.

These first surveys yielded 4 adults and multiple seedlings in new areas that had not been visited more than once in the past decade or were completely by-passed. This illustrates the past over-reliance on aerial reconnaissance to pick up populations outside the main infestation core. Miconia reconnaissance

efforts are now scheduled twice a week in an effort to cover all gaps identified in the data summarization process.

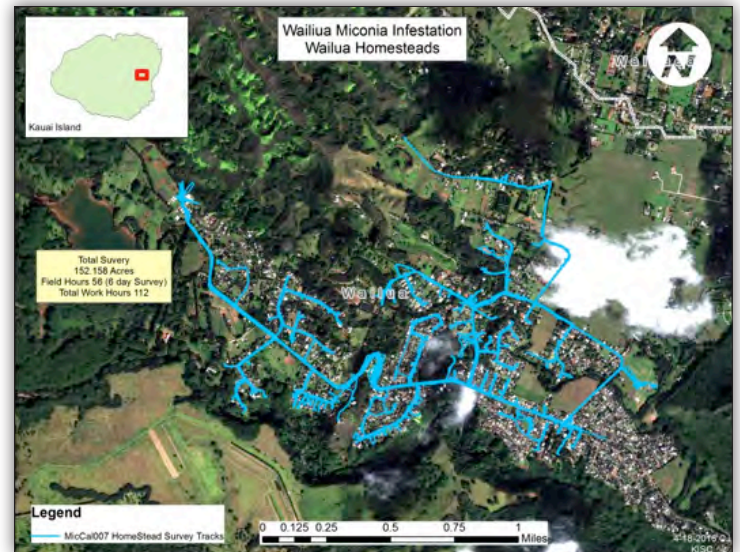
In the map below, the red circles indicate generalized gap areas not covered by foot surveys. The yellow tracks (foot) and yellow or red stars (adult trees) and purple or grey circles (seedlings) show efforts directed by the gap analysis to be highly productive at finding targets. Hundreds of acres remain to be surveyed before the true infestation can be re-delimited. UH CTAHR bulldozed a road into the southern portion of the infestation for an unrelated project which greatly enhanced access to several of the gap areas. The next step is to utilize a partnership with UH Hilo, CTAHR and KISC to set up a permanent UAV survey schedule to monitor the entire infestation combined with foot surveys under canopy. The UAV component would cover areas such as swamps that are too dense for effective detection by ground crews due to less than 5 foot visibility from the transect.





The very busy map above combines aerial and ground survey efforts to contain Kauai's miconia infestation. Though the effort appears comprehensive, the addition of both 2009 and 2014 albizia canopy cover shows how adult trees can remain undetected for years from the air. Miconia can mature under the albizia canopy's filtered light and one tree may have had multiple seeding events.

An expanded door to door survey by the KISC outreach crew in fall 2015 involved talking with private landowners and hanging miconia information packets throughout the original infestation source (see map above right).



Invasive species biology is an ever evolving discipline. Managers utilize the best science available to them for making decisions. Success depends on keeping an open mind to new techniques, new research and listening to ideas from all team members and the public. Though we have discovered new areas of miconia we feel our response has been rapid and thorough to once again get our arms around the problem and set the stage for a miconia free future Kauai.

# COQUI UPDATE



In 2012, the large coqui infestation that was first discovered within Lawai valley in 1999 had been declared eradicated. This was the only known established population on Kauai. KISC, in partnership with the Hawaii Department of Agriculture (HDOA), are the first responders to all coqui reports received on the island.

Since January of 2015, KISC has responded to 23 coqui reports. Of the 23 reports, only five were confirmed to be coqui, and were hand captured by KISC or HDOA staff. The majority of these reports turn out to be another small frog known as greenhouse frogs. Although similar in size, there are certain body features that enable you to tell them apart. One feature is the shape of the snout- a greenhouse frog has a narrower and more pointed snout than that of a coqui, which has a broader, rounder snout. If you compare the toes of both frogs, Greenhouse frogs have long skinny toes while the coqui frogs have short stumpy toes and the toe tips resemble suction cups. Visit our website [www.kauaiisc.org](http://www.kauaiisc.org) or HDOA's website [hdoa.hawaii.gov/pi/ppc/cm/coqui-information/](http://hdoa.hawaii.gov/pi/ppc/cm/coqui-information/) and learn more about coqui frogs and other invasive pests that threaten our island of Kauai.

You can also contact KISC directly by calling (808) 821-1490 if you suspect you may have a coqui frog in your area or call HDOA at 643-PEST.



Left to Right: Female Coqui, Male Coqui, Greenhouse frog.  
Photo Credit: CTAHR

## Check out these Pono Endorsed Businesses



**Kauai Seascapes Nursery Inc.**



**Windward Maintenance & Landscaping**



**Ron's Nursery & Yard Service**

# PONO ENDORSEMENT PROGRAM

***Together we can protect the forest from our backyards***

*By Rachel Smith, KISC Outreach Specialist*

You may have heard our commercials on the radio, or seen our press in The Garden Island Newspaper, or maybe you have seen the logo or signs around the island; however you have come to know about it, The Pono Endorsement Program has been officially launched. Crafted by the minds of KISC, BIISC, and Plant Pono staff, The Pono Endorsement Program is finally on the ground and running! In fact, in the first few weeks of May, KISC has already endorsed three local nursery and landscaping businesses as “Pono”.

The Pono Endorsement Program is a voluntary partnership between any nursery or landscaping business, Plant Pono, and KISC. Pono Endorsed businesses are those who practice and promote making “pono” plant decisions that will benefit the health and well being of Kauai. This program seeks to address invasive species directly linked to the nursery and landscaping trade. Over the years invasive species have found their way to Kauai through a number of pathways, but one of the most common pathways is through the horticultural industry. Pests like Little Fire Ant (LFA) and Coqui frog were both accidentally introduced through the plant trade, by way of them hitching a ride inside of the soil media of plants shipped from off island. The Pono Endorsement Program offers Kauai nurseries and landscapers scientifically based strategies and procedures to follow that will help prevent any new introductions of pests like LFA and Coqui, while also minimizing the spread of existing invasive species.

One of the great parts of the Pono Endorsement Program is that it is voluntary and non-regulatory. A nursery or landscaping business voluntarily chooses to become endorsed. Each business works with an Endorsement Program representative to develop a plan to work with their specific business. The nursery or landscaping business owner will agree to follow “pono commitments”, and choose best management practices to prevent the spread and introduction of invasive species.

Some examples of these include:

- Pre-screening any new plants using the Hawaii Pacific Weed Risk Assessment, to determine a plant's invasiveness
- Attempt to source all plants locally or from other Pono Endorsed Businesses
- Survey and inspect all incoming material for Coqui and LFA
- Disinfect gear and equipment between work sites
- Discontinue and phase out specifically listed invasive plants

Once a business becomes endorsed, they receive free advertising, featured recognition, and promotional signage to show their endorsement. KISC reaches over 10,000 Kauai residents through outreach and events, and we plan to promote all the Pono Endorsed businesses at our booths, presentations, on our website, as well as through social media. We are excited to promote these businesses. A Pono Endorsed business essentially makes our job easier, but also gives businesses and Kauai residents ownership and recognition in helping to protect Kauai from invasive species.

Nursery and landscaping businesses are in the best position to prevent the spread of invasive pests. Invasive ornamental plants commonly spread from their intended gardens. Even if they are not seen spreading in your yard, their spores, seeds, and viney arms can quickly escape into the forest. Often times, many of these beautiful ornamental plants cause unintended harm to the agriculture industry, livestock, and Hawaii's native and delicate ecosystem. With the Pono Endorsement Program officially in action, the Kauai community can now take the first step towards implementing our very own non-regulated form of biosecurity.

Next time you are out shopping for plants, landscaping material, or even a yard maintenance person, check for the Pono Endorsement. And if you find that a business isn't endorsed, you can do your part by inquiring why they aren't, and suggesting their partnership in the program. KISC's mega goal is to get every business on this island endorsed. If every resident is making an effort, we can look forward to comprehensive protection from pests like Little Fire Ant, Coqui Frog, Miconia, or even the next Albizia.



## ***Congratulations Trae Menard!***

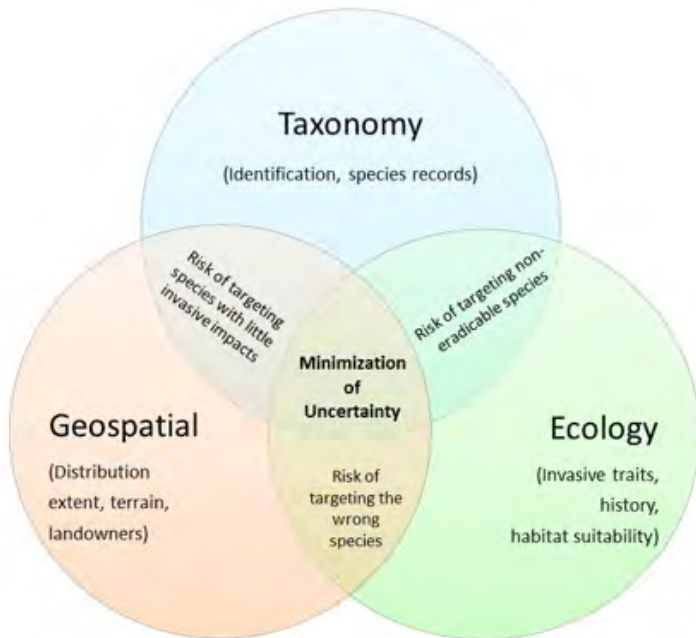


### ***2016 HISAW Kauai County's MVP***

Trae Menard, The Nature Conservancy, was recognized at the 2016 **Hawaii Invasive Species Awareness Week Award Ceremony** as the **Kauai County's MVP** for his efforts to protect watershed areas and control the spread of invasive species on the island of Kauai.

As part of his role as the Director for Forest Conservation with the Hawaii Nature Conservancy, Trae plays an extremely active role in controlling invasive species in the upper watersheds of Kauai. He also coordinates the Kauai Watershed Alliance and has a successful record of partnering with public and private landowners to achieve large-scale conservation actions. In 2015, Trae utilized new technology from high-resolution imaging and helicopter based plant control to combat the spread of Australian Tree Fern in the Wainiha Preserve and further protect and restore the Alakai region on Kauai.

*Photo Credit: TNC*



# CASE STUDY

## *Juncus effusus*

continued from page 1

Hawaii's flora is important because too much uncertainty can have expensive consequences for environmental and agricultural sustainability, not to mention KISC's budget.

Above you'll see a colorful figure explaining the factors examined by KISC's Plant Early Detection Program. The circles represent the critical information necessary to make good management decisions while the overlapping areas describe the risk of wasting resources by acting on insufficient data.

While the data I collect from early detection surveys gathers some critical information, I lean heavily on the worldwide scientific community and Hawaii's network of conservationists to fill in some of the gaps. Last November, we accepted *Juncus effusus* (Common mat rush, Japanese mat rush) as a KISC target in partnership with the Kokee Resource Conservation Program (KRCP). Let's walk through the detailed story of how everything came together such that we, with minimal uncertainty, decided to accept *Juncus effusus* as a target for eradication. The story is color-coded according to the figure above so you can understand how information is passed through an intricate, science-based web to make sound conservation decisions. If you want more information on what this plant looks like or think you've seen it and want to report it, check out our website [www.kauaiisc.org/common-rush/](http://www.kauaiisc.org/common-rush/).

It started when Mapuana O'Sullivan from Kauai DLNR, **detected a rush species she didn't recognize** along the Pihea trail in Kokee. When she relayed this information to Adam Williams, DOFAW's Kauai Botanist, he **recognized**

it based on previous field surveys he had done mapping its spread in bogs within the Kaala Natural Area on Oahu. He double checked his suspicions using **dichotomous keys to accurately identify it as *Juncus effusus*** and looked it up on the **list of native and naturalized plants in Hawaii** maintained by the Bishop Museum. The list revealed that in 2012, Alex Lau and Danielle Frohlich from Oahu Invasive Species Committee (OISC) had declared this plant **newly naturalized in Kauai** based on a specimen collected by Tim Flynn of the National Tropical Botanical Garden (NTBG) that was **deposited in the NTBG herbarium** in 2008. Additionally,

and should be targeted for eradication.

Adam relayed this news to me and together we set out to **determine the extent of *Juncus effusus* via a field survey**. We found a **prolifically seeding** mature patch that was **densest along the trail just before Pihea peak with juveniles occurring less frequently further along the Pihea trail, into the Alakai Swamp trail and into the Hono O Na Pali Natural Area Reserve (NAR)**. We



also noted that juveniles were popping up where hikers were forced to step off the damaged boardwalk. We concluded that the **distribution pattern indicated that the sticky seeds were mainly being spread by**

Bishop Museum's list also revealed that this plant has also **naturalized on Oahu, Molokai, Maui and Big Island, which indicates that it's capable of colonizing and spreading outside of its native range**. Given its relatively recent discovery and what we knew about its invasion success elsewhere, we decided to further investigate to see if it could

**hikers** and Adam and I compiled and circulated a pest alert document to the conservation community so that they could aid in **locating additional populations** and discuss control and prevention measures. We received a few reports of additional populations, but I confirmed that they were all lookalikes during field surveys. Since



then, I've spent 5 more days surveying the surrounding infested area, some days alone and some with the help of KRCP, and found that *Juncus effusus* has spread along the NAR fence line and the entirety of the Alakai Swamp trail. One happy mature clump was found growing amongst bog vegetation and one immature plant was found at the very end of the trail at the Kilohana lookout, growing out of a teaspoon of soil nestled in the cracks of the wooden viewing platform.

Although it was pretty obvious from what I'd seen in the field that *Juncus effusus* was invasive and dangerously situated next to the Alakai's valuable native forest and unique bog habitat, I did further research to gather the whole story. I referred to my in-progress invasive plant database of Kauai I'd compiled the previous summer based on NTBG and some Bishop Museum digitized herbarium collections, evidence of invasiveness elsewhere in the world, scores provided by the Hawaii-Pacific Weed Risk Assessment (HPWRA) and any known distribution data. This confirmed that *Juncus effusus* was indeed on the survey list I had created for species that needed their Kauai distributions mapped and had been assigned a score of "High Risk" by the HPWRA in 2013. I looked at NTBG's herbarium to see if there have been any other collections of *Juncus effusus* elsewhere on Kauai. There was one other collection from the same location on Pihea trail in 2006 (phew, only 2 years

earlier than previously thought), but it flew under the radar because it had been misidentified as *Juncus polyanthemos*. According to dichotomous keys in Hawaii's Manual of Flowering plants, this mistake is easily done because you need to scrutinize the tiny flowers and cut the stem open with a razor blade to examine the pith. The great benefit of herbaria is that you can review or revise pressed plant vouchers stored from years ago once new information is learned and I worked with NTBG's Dr. David Lorence to update one voucher and review other lookalikes in the NTBG herbarium. It turns out I can remove *Juncus polyanthemos* from my invasive plant database for Kauai because that species has never been recorded here. Kim and Forest Starr, who do early invasive plant detection work for Maui Invasive Species Committee (MISC), have helpfully photo-documented thickets of *Juncus effusus* dominating areas of bog habitat in Maui and excluding native species. Similar impacts of this plant have been noted in Oahu's bogs. This confirms that leaving *Juncus effusus* uncontrolled along the Pihea trail is a danger to Kauai's bogs.

All of the above information was reviewed via KISC's Prioritization and Feasibility of Control Process which



*Juncus effusus* invading

involves a written report that scores invasive impacts against the likelihood that we can get rid of every last plant. This led the entire KISC committee to confidently decide to allocate funds towards *Juncus effusus* island-wide eradication in partnership with KRCP. So far, most control work has been done by KRCP and together we've removed over 400 plants from the Alakai.

We can't see the future, but using and strengthening our scientific resources is as close as we're going to get to being able to predict the consequences of controlling some plants vs. letting them go. I'd like to warmly thank all the scientists and conservationists out there that may or may not know their influence in making decisions like these; you're making Kauai a better place.

## LITTLE FIRE ANT UPDATE

Under the guidance of Michelle Montgomery of Hawaii Ant Lab (HAL) and her awesome crew, and alongside Craig Kaneshige of the Hawaii Department of Agriculture (HDOA), KISC crew members have been hard at work tackling the only known Little Fire Ant (LFA) infestation on Kauai. Located on the north side of the island, the original infestation covered over nine acres on three separate properties. Through new, innovative application techniques and a strong IPM (integrated pest management) system, the population has been cut down to undetectable levels. HAL, HDOA, and KISC will continue to monitor the site to make sure there is not a resurgence of the population. A special thanks goes out to the property owners and landscapers of the properties for giving us access and working around our schedule. Without their support, we would not have been able to take on this challenging project.

**MAHALO NUI !**



# A Walk Back in Time

By Cleve Javier, KISC Data Tech

**"No one knows what the future might hold, but at least now we can look at the past and see where we came from, what we have done, and the achievements KISC has made."**

For the past nine months, I have been given the task of archiving, fixing up, and correcting the KISC Database. I have also been assigned the task of connecting old data (dating back before 2001) with our ArcGis mapping program linked with the database. Surprisingly, it is not as much fun as one might think it would be.

The first part of this giant task was to dust off the old material which included datasheets, logs, and paper maps. Next, I had to translate the way KISC used to collect data into the way that we collect data now to try and normalize our data. The problem with this was that there were at least three other data technicians before me, that each logged and collected information a little differently than the previous person.

One of the most common problems I encountered was old technology versus the new technology that we use now. I saw paper and pencil logs, with hand drawn maps, and a dot on a piece of paper that I now needed to get into the digital world. I had to work with no GPS points, just a coordinate written down about where the data was collected.

2003 saw the first GPS data and it was pretty rough. The lines looked as though someone was trying to draw a straight line in an earthquake and the waypoints that should be somewhere on the island were placed somewhere out in the Pacific Ocean. I tried my best to correct and symbolize where KISC surveyed and treated specific species. This was a good thing, because now we can revisit site locations that we have treated in the past to see if any invasive

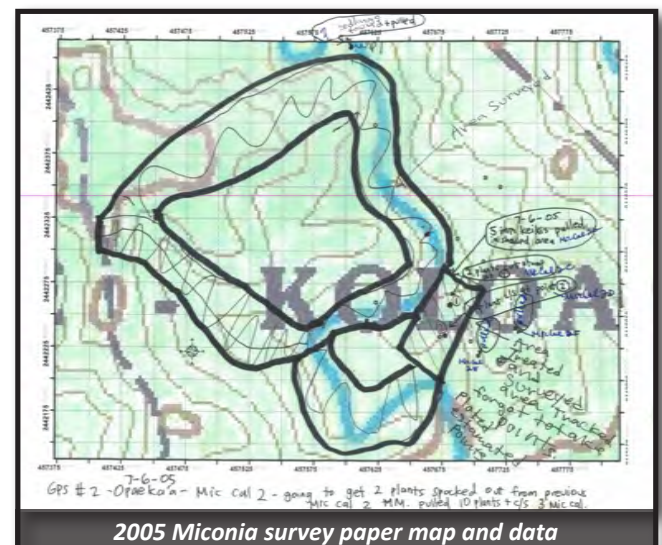
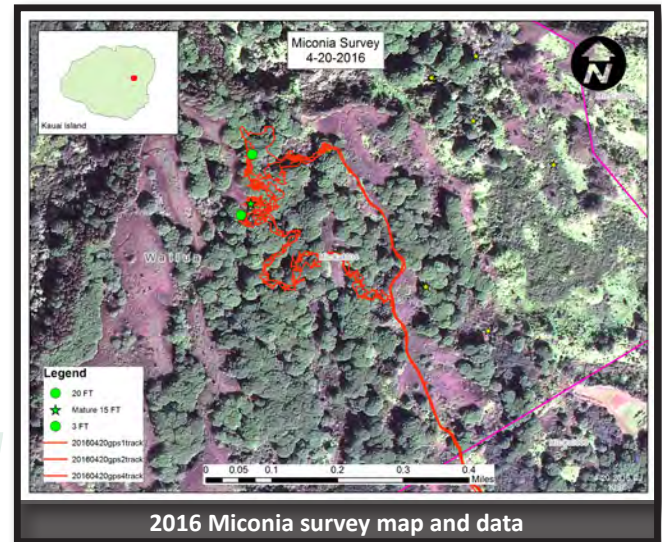
species might have made a comeback.

As technology got better so did our data collecting ability and the story of KISC. Now we can use a trend line to see the decline of invasive species in a watershed. Also, KISC went paperless with tuffbooks that the Field Crew takes into the field. So no more dusting off old binders or asking someone "Can you read this?" and no more sneezing. Everything is accessible by computer to look back at anything that we have done on a particular day. This ultimately makes it easier for me to enter into our KISC database.

I have seen KISC control large areas of invasive species to site eradications like the Coqui Frog, Fireweed, and Wax Myrtle. I have seen the decline of all of our target invasive species in the watersheds across the island. I have also seen great employees come and go and the great achievements of those who have stayed.

The only drawback from achieving old data was when it was put to a map. We can now see holes in areas that we have not surveyed. With this new insight on things, in 2016 we found 4 new mature *Miconia calvenscens* in the KISC Wailua infestation area. Archiving the database is already paying off and I can see my efforts being put to use.

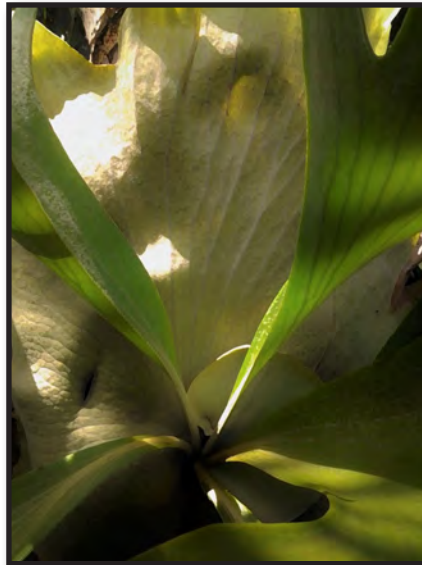
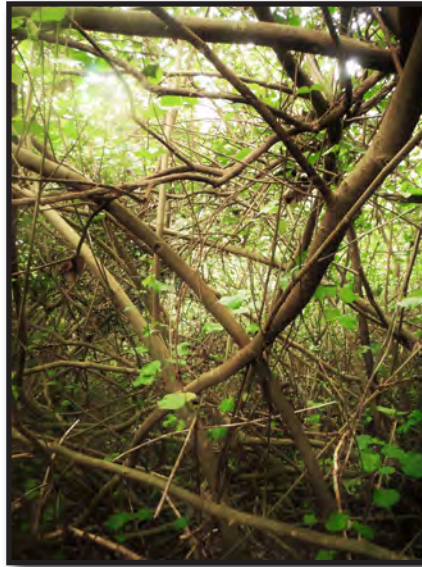
These last 9 months were boring, redundant, frustrating, and a headache at times with the old data. But it is finally complete and the story of KISC can now move forward. The archiving and fixing have been done and now it will be used in the strategic plan. As technology gets better so will KISC. No one knows what the future might hold, but at least now we can look at the past and see where we came from, what we have done, and the achievements KISC has made.



# NAME THAT PLANT

Can you name each of the plants featured in the pictures below?

*Pictures by Mugs.*



Answers: Top Left - Hau (*Hibiscus tiliaceus*), Top Right - Scarlet Jade Vine (*Mucuna benettii*), Middle Left - Staghorn Fern (*Platycentrum superbum*), Middle Right - Eucalyptus, Bottom - African Tulip (*Spathodea campanulata*)

## Are you a Guardian of the Garden Isle?

Guardian of   
the Garden Isle

**KAUAI INVASIVE SPECIES COMMITTEE**  
www.kauaiisc.org

Guardians make commitments like:

- Planting native gardens
- Brushing off gear after hiking
- Reporting KISC target species
- Volunteering to remove invasives
- Staying informed

Guardian of   
the Garden Isle

**KAUAI INVASIVE SPECIES COMMITTEE**  
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Become a Guardian and get your membership card and free gift today!

Sign up today at [www.kauaiisc.org/guardian](http://www.kauaiisc.org/guardian)

# Kia'i Moku - Guarding the Island

is the official newsletter of the Kauai Invasive Species Committee.

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The Kauai Invasive Species Committee (KISC) is a voluntary partnership of government, private and non-profit organizations, and concerned individuals working to prevent, control, or eliminate the most threatening invasive plant and animal species in order to preserve Kauai's native biodiversity and minimize adverse ecological, economic and social impacts. KISC is a project of the Pacific Cooperative Studies Unit and Garden Island Resource & Conservation Development, Inc.

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*Kia'i Moku: Guarding the Island*

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