



WHAT'S
INSIDE?

Kia'i Moku

guarding the island

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KAUA'I OFFICIALLY COQUI-FREE !

By Keren Gundersen

In 2001, coqui frogs were discovered in a valley in Lāwa'i after having been accidentally introduced two years earlier. Having gone undetected for a couple of years, this pest was able to establish a breeding population covering about 10 acres with what was believed to be at that time less than 100 calling males. The challenges with this infestation included heavy vegetation, uneven terrain, access issues, and lack of an effective treatment method.

Luckily for Kaua'i, the US Department of Agriculture Animal and Plant Health Inspection Service, Wildlife Services Research Center (USDA-APHIS-WSRC) needed

an area to conduct field tests for citric acid as a control agent from 2002 to 2003 and the Lāwa'i infestation site was chosen.

Both HDOA and DLNR-DOFAW assisted with the field tests. Environmental Protection Agency (EPA) approval for this method of control was eventually achieved, although the frog population was not eradicated.

From the fall of 2003 to 2005, sporadic control efforts continued to take

place due to the lack of available manpower and funding. These efforts utilized partnerships with HDOA, KISC, DOFAW, Koke'e Resource Conservation Program, and private volunteers. Dense foliage



Bag of captured coqui - when there were many

hampered spray efforts as it provided refuge for the frogs as well as prevented citric acid penetration and distribution throughout the site. Despite these efforts, by 2005 the population density had grown to infest nearly 22 acres.

During mid-2005, a strategy meeting was held involving County, State, Federal and private representatives to devise a work-plan to more effectively eliminate this infestation. A work plan with a budget was outlined, as well as funding secured from the State Legislature, the County of Kaua'i,



continued on pg 6

KISC funders and partners

A & B Properties
County of Kaua'i
DLNR - Division of Aquatic Resources
DLNR - Division of Forestry and Wildlife
DLNR - State Parks
Garden Island Resource Conservation and Development
Grove Farm
Hawai'i Department of Agriculture
Hawai'i Invasive Species Council
Hu'i o Laka/Kokee Museum
Invasive Species Committees
Kaua'i Albatross Network
Kaua'i Conservation Alliance
Kaua'i Coqui Frog Working Group
Kaua'i Department of Water
Kaua'i Farm Bureau
Kaua'i Native Plant Society
Kaua'i Westside Watershed Council
Kokee Resource Conservation Program
Kuku'iula Development, Inc.
National Tropical Botanical Garden
Pacific Cooperative Studies Unit
Pacific Missile Range Facility
Private citizens
Research Corporation of the University of Hawai'i
UH Rural Development Project
Sea Grant
The Kaua'i Group
Sierra Club
The Nature Conservancy
Hawai'i
University of Hawai'i College of Tropical Agriculture and Human Resources
US Fish and Wildlife Service
US Geological Survey
PBIN
USDA Forest Service
USDA Natural Resource Conservation Service
USDA-APHIS-PPQ
USDA-APHIS-WS

Ho'omanawanui (be patient and work with what you have)

Keren Gundersen
Project Manager



In an environment and ecosystem that can be overwhelming with introduced invasive species, it is quite easy to keep your head down and focused on the target. But every once in a while it is necessary to turn around and see what your accomplishments are. This simple action provides motivation and inspiration to continue the sometimes grueling task ahead.

Success is not necessarily measured in how far you've come, it is a comparative thing measured against your goals, expectations, or some other value-criteria. It comes in many shades and can be counted as an individual or a collaborative achievement.

In this newsletter, we strive to put forward what we consider to be recent successes; an eradication of a population of coqui, a capture of an elusive mongoose, fruitful partnerships, and more. All of these achievements could not have been accomplished without clear goals, willing participants, and a shared blueprint for success.

Look around. Take a deep breath and practice patience. See the beauty. Relish successes.



Above: Senate members with honorees from the Hawaii Invasive Species Committees, Photo Ron Kouchi. Way to Go BIISC, MISC, MoMISC, OISC, and KISC!



Right: KISC Crew



Kaua'i Conservation Community Unites

There are many types of conservation projects happening on the island of Kaua'i; from the north shore to the west side, from high in the Alaka'i to the ocean beaches, reefs, and ocean. For years, many of these conservation projects worked independently of each other, sometimes in complete isolation or without collaboration.

In November, 2011, an interested group of conservation individuals (non-governmental organizations, state and Federal agencies, and non-profits) saw the need to unite the work being conducted across the island by forming the Kaua'i Conservation Alliance (KCA). The vision of this group is to envision a Kaua'i with healthy and diverse native ecosystems, accomplished with community-supported conservation. The mission of the KCA is to provide leadership, education, and outreach to advance conservation of Kaua'i's native ecosystems.

The Alliance meets the first Thursday of the month to discuss projects, collaborate, and to form partnerships. One of the first events sponsored by the KCA was a presentation by DLNR DOFAW regarding the Nene Relocation Project to ensure

that timely and accurate information was being shared with the public. Another important priority of the group was to provide a Conservation Workshop to the Kaua'i County Council demonstrating the many ways that conservation activities are impacting Kaua'i. The KCA was also successful in sponsoring the first-ever Conservation Awareness Day during Earth Day activities in April.

This new conservation partnership has already proven to be effective at educating, uniting, and increasing capacity of projects by collaboration.



KISC crew assists KFBRP with designing, building and installing rat-proof artificial nest-boxes for the endangered Puaiohi

Rubbervine

Rubbervine is a decorative woody vine or shrub with dark green, shiny leaves. The funnel shaped white, pink or purple flowers make this a desirable landscaping focal point in yards. One of the unique features of this plant is the triangular seedpods growing in wing-like pairs. These seed pods are filled with tiny feathery seeds that travel long distances in the wind. Unfortunately, this plant was spotted on the 2010 KISC ED Roadside Survey. Most known locations of this plant are as ornamental features in residents' yards. Educating the public about the harm of this aggressive vine is the only way to successfully remove this plant from Kaua'i. Not only will rubbervine dominate forests and yards, but parts of this plant are toxic to humans causing swelling of the nose and throat as well as dermatitis.



Species of Concern

FEATURED INVASIVE PEST:

CISSUS

By Natalia Tangalin, NTBG

The genus *Cissus*, climbing woody vines, is in the Vitaceae (grape) family and includes 350 species. Most species are inedible to humans, having acrid fruits containing needle-like crystals which can cause a stinging sensation in the mouth for up to 24 hours. A number of species have been used medicinally.

Birds readily spread this group's fleshy berries, and one Malay name for this group translates as "the birds' discomfort." It can also be easily propagated from stem cuttings. Three species of *Cissus* are known to be on Kaua'i, probably from introductions as ornamental plants: *Cissus rotundifolia* (Arabian Wax Cissus), *Cissus verticillata* (Princess Vine), and *Cissus nodosa* (Grape Ivy). They all have simple leaves, flowers and fruits in loose, grape like clusters, and can be observed roadside, climbing on trees.

C. rotundifolia originates from East Africa to southern Arabia and is well adapted to hot dry climates. On Kaua'i, it is naturalized in Waimea District and was first collected in 1995 by Tim Flynn in secondary vegetation dominated by *Leucaena leucocephala* (haole koa). It is also naturalized on O'ahu and Maui. *C. rotundifolia* has fleshy, but brittle, glaucous (blue-green) waxy-looking leaves. Leaves are simple, circular and have (scalloped) margins. Older stems have characteristic 4-5 corky wings. Flower petals are green and berries are small and purple.

C. verticillata is native to Florida, the Caribbean, Tropical America, and Africa. It thrives in wet humid areas and it has been observed to develop red aerial roots that seek out water. *C. verticillata* was first collected in Kalaheo in 2005 by Warren Wagner. It has simple, ovate-oblong to rounded-ovate, often very asymmetrical, fleshy leaves. This species is known to be highly variable, but on Kaua'i has been observed to have yellow flowers and whitish pubescence (hairs) on the underside of the leaves. Fruits are single-seeded, shiny, round and black.

C. nodosa has attractive deep red inflorescences and fleshy red berries. It was first collected in 1996 by Tim Flynn in Kalaheo, and again a few years later in Lihu'e. Leaves are glabrous

Cissus verticillata

Photos:
Natalia Tangalin



(smooth) with cordate (heart-shaped) bases that become wedge-shaped on flowering portions of the plant. It is native from Malaysia and Indonesia through New Guinea and the Philippines. The Malays make poultices of the leaves for swellings and fevers. It is sparingly naturalized on Kaua'i, Maui and Hawai'i.

A Dictionary of the Economic Products of the Malay Peninsula (Burkill, 1966; p. 2282-2288)

A Tropical Garden Flora (Staples & Herbst, 2005; p. 572-573)

Bishop Museum Occasional Papers, Lorence, David H./Flynn, Tim (1997) (p. 12)

Vouchers cited: Flynn & Hanna 5810 (PTBG), Flynn & Hume 1944 (PTBG), Wagner & Flynn 7045 (PTBG)

www.hear.org/pier/species/cissus_rotundifolia.htm

www.hear.org/pier/species/cissus_nodosa.htm

www.hear.org/pier/species/cissus_verticillata.htm

Cissus nodosa and *Cissus verticillata* are two of KISC Early Detection species. The KISC crew is currently running delimiting surveys and treatment trials to determine if control by KISC is feasible.

MOST VALUABLE PARTNER:

U.S. Fish and Wildlife Service Refuge Complex



What do avian botulism and mongoose have in common? Both are shared targets of KISC and USFWS. KISC's coveted title of Most Valuable Partner goes to the USFWS Refuge Complex. Early in 2012, KISC was able to assist the Refuge by collecting dead animals infesting the Hanalei Refuge in an effort to curb an outbreak of avian botulism. USFWS has also assisted KISC by responding to mongoose sightings in both Hanalei and Huleia. Both efforts required rapid response and clear communication which effectively activated emergency action. This collaboration is a great example of outstanding partnership work.



KUDOS TO THE COUNTY

Little Fire Ant (LFA) (*Wasmannia auropunctata*) is said to be the next "big" pest of serious concern, affecting agriculture, human health, and negatively impacting the entire ecosystem.

Following a presentation in the Mayor's Office about LFA, Mayor Carvalho paused, sat back in his chair, and said, "I get it. Now, what can the county do?"

Because of this response, and with the help of the Office of Economic Development, KISC was successful in getting informational signage designed and installed on two pathways in the only known infestation area on the north shore of Kaua'i, in Kalihiwai. These signs not only tell the public when the area is being treated with chemicals, but also provides take-away literature to help them be better informed and educated about the impacts that LFA can have. Also included in the literature are cards and mailing envelopes with instructions on how to survey for *W. auropunctata* on their own.

The next thing that Mayor Carvalho did was to help KISC organize Early Detection Workshops with county employees who primarily work outdoors. These presentations were given to employees of Public Works, Parks and Recreation,

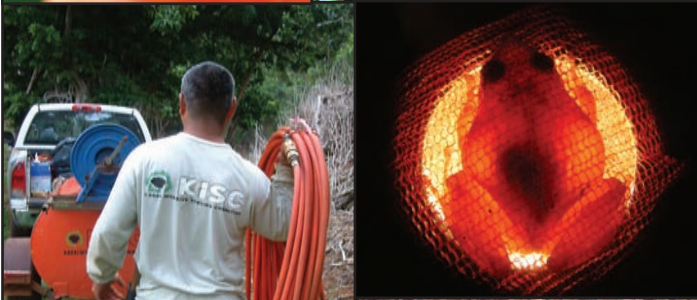
Department of Water, Solid Waste, Building Division, the Finance Department, and Transportation. Over 90 county employees attended the workshop and all left with KISC's Early Detection Field Guide as a reference.

Preventing the unintentional spread of Little Fire Ant from the only known population on Kaua'i as well as quickly detecting it elsewhere is of utmost importance, and the County of Kaua'i understands this.



Kaua'i Coqui-Free!

Continued from page 1



and Kukui'ula Development, Inc. Efforts utilizing this work-plan commenced early in November 2005.

**15,114
person-hours
expended**

Habitat modification to battle the dense foliage was the top priority of this new work-plan. Heavy machinery was brought in to clear all vegetation 14"d. and under to make the area less hospitable to coqui and put stress on their reproductive cycle.

With the additional funding provided by the County of Kaua'i during FY07, additional temporary staff was hired, supplies of citric acid were received, and work continued at the Lāwa'i infestation site. Joseph Aguon-Kona stepped in as Field Supervisor, working with a 10-person crew working 4 ten-hour days utilizing both daylight and nighttime work hours. Although the temporary coqui crew ended their term at the beginning of November 2007, work at the site continued by the KISC crew. Priority was given to this eradication project with at least two days/week dedicated to control work at the infestation site in Lāwa'i.

During the course of the project, both citric acid and hydrated lime solutions were used as control agents. Specialty spray guns were built by Joe Kona, KISC Field Operations Supervisor, out of copper pipes and fittings. These custom spray guns helped to facilitate distance spraying as well as give good foliar coverage.

In 2007, a request was made by Kaua'i County Council Chairperson, Kaipo Asing, that KISC somehow show measures of effectiveness on the ongoing eradication project.

**14,214
gallons of citric
acid solution used**

At that point it was difficult to determine what the population of coqui was at the infestation site; counting individual calling frogs was out of the question. Jeff Schlueter, KISC Data Tech at the time, investigated and implemented the use of ornithological software and simple recording devices to help determine population densities of the calling frogs. Recorders in PVC housings were placed strategically throughout the site to ensure complete coverage. Recordings were made and then analyzed for loudness, densities of calls, and frequencies. Other ambient noises such as roosters and barking

dogs could easily be filtered out and therefore not affect the study. In the end, graphs showing the effectiveness of KISC's work on calling frogs could be made, showing a downward trend, and therefore successfulness, of the ongoing project.

9,988 acres surveyed

During both 2009 and 2010 spraying efforts could be paired down from a landscape level, to a more focused approach where reoccurring coqui calls were. Hand-capturing the frogs was also possible, with specimens often collected for outreach purposes.

Over this past year, the crew monitored the site for calling frogs to ensure successful eradication. Neighboring residents also served as area surveyors, listening for calling frogs in the night time.

Now, after 12 consecutive months with no calling frogs, the Lāwa'i infestation is considered eradicated. Thanks go out to all of KISC's crew, associates, partners, volunteers, and neighbors who helped make this project a successful one.



Above: Coqui infestation area before habitat modification
Left: Coqui infestation area after habitat modification

FIGHTING MICONIA WITH HERBICIDE BALLISTIC TECHNOLOGY

Another Tool for the Conservation Toolbox



By John Chapman

Since KISC's inception, *Miconia calvescens* has been Priority-Target #1 in terms of invasive species control. As a result, KISC has spent countless hours scouring the infestation areas by ground and air in the Wailua River State Park and the Wailua Game Management Area. This work can be extremely grueling due to steep terrain and thick vegetation. Due to the magnitude of the job, KISC is always looking at ways to improve work processes to ensure better coverage, conduct more effective survey methods, and to increase removal efficacy.



Dr. James Leary in HBT gear

At the beginning of 2011, KISC partnered with Dr. James Leary, Assistant Weed Specialist with the College of Tropical Agriculture and Human Resources (CTAHR), who had been developing a new technology called Herbicidal Ballistic Technology (HBT) to control miconia from the air. HBT was invented by Dr. Leary and is a method of encapsulating herbicide into paintballs that are then applied to plants using standard paintball equipment.

The advantage of HBT is that it has the potential to treat miconia during what would normally only be aerial survey operations. Traditional miconia strategies require that each plant located from the air be treated from the ground. This strategy also requires

up to 3 days of additional ground work after one hour of flight time. Due to the effectiveness of HBT, KISC has shifted its survey strategies from yearly helicopter surveillance to quarterly; and has decreased its ground operations from weekly to bi-monthly. This shift has freed up 24 days that the crew can work on other priorities.

Another real advantage of HBT is access to steep terrain. In the past, in order to treat plants located on cliff walls, rappelling had to be employed. This was particularly hazardous because the ground in these areas is normally made up of loose dirt and rocks; during rappelling operations the rope can dislodge large rocks from above which are extremely dangerous to the person rappelling. Now, using HBT, plants can be treated from a safe distance, either from the ground or air, removing the risk of rappelling operations in these treacherous areas.

By utilizing HBT in KISC miconia operations, not only can significant time savings be captured, but risk-aversion can be employed on a target species that requires extensive safety training and specialty equipment. KISC is grateful for Dr. Leary's contribution as well as all those that have worked on developing and testing this new technology on other islands. This is a great example of how innovation and technology can revolutionize conservation practices.



Dr. James Leary treating miconia (highlighted in the circle) from the air in the Wailua Game Management Area

MISSION POSSIBLE

SUCCESSFUL EARLY DETECTION

By Cleve Javier

Photo: Forest and Kim Starr

Following up on an island-wide early detection roadside survey conducted in 2010 by O'ahu's Early Detection team consisting of Alex Lau and Danielle Frohlich, KISC has prioritized select species for further delimiting surveys and possible targeted eradication. What at first seems like a likely candidate for removal can later prove too wide-spread and difficult making it an unlikely eradication success. Many of the early detection species were planted purposely by homeowners hoping to beautify their yards; not realizing they had planted ticking time-bombs of ecological destruction.

In late April, the KISC crew was successful in safeguarding Kaua'i from an evergreen tree called Wax Myrtle (*Morella cerifera*). This plant can have greyish-white flowers and grayish-blue fruits that are heavily coated with smooth wax and easily dispersed by birds. The leaves are serrated and the trees can mature in only 3 years. Wax Myrtle has become a problem on both Maui and the Big Island where some property owners have been reluctant to be rid of them.

The roadside survey discovered only a handful of trees growing on Kaua'i. With landowner cooperation, all have been cut and treated. Monitoring will be ongoing to ensure there are no re-sprouts or seedlings. For this selected target, the mission was indeed possible and has been marked "case closed".



Above: Joseph Aguon-Kona examining the *Morella cerifera* planting in Kapa'a before removal



Left: Wax Myrtle leaves

KISC GOES PAPERLESS

TAKING GIS TO THE FIELD

KISC recently upgraded field technology and equipment to enable the crew to "go paperless" with all field work. This new mobile GIS data system is not only eco-friendly, but also gives the field crew crucial information with a checkout-copy of the KISC geodatabase, imagery, TMK maps, and much more. The crew now has dynamic map access in the field with the ability to query and view map data as-needed on rugged laptops. KISC can also fill in the data gaps by adding crucial biological data and photo links directly to the datasheet. Workflow is now easier due to automated datasheet transfer and GIS data updates between the KISC server and the field laptops.

Out with the old (recreational gps, hard copy maps and datasheets; volumes of archived data), and in with the new (mapping GPS, rugged tablet PC and a server)!

A DAY IN THE LIFE OF A

MONGOOSE HUNTER

By Pat Gmelin



As I roll into the CTAHR Ag Station and KISC base-yard at 6:20 am, the sun is just rising, and the birds are chirping; mocking me as if to say, “You are not catching me today!” Such is my life for the past year as I doggedly pursue my quarry, the elusive mongoose that has been spotted by both residents and visitors from Polihale to Ha’ena.

Since about 2003, KISC has been educating the community as to the threats that mongoose pose to Kaua’i’s ecosystem and abundant ground-nesting birds. Because mongoose were never intentionally introduced to Kaua’i (and Lana’i) in the 1880’s, like the rest of Hawai’i, this island can boast to have the only growing population of nēnē and the most abundant seabird populations. My job, essentially, is to keep it that way.

Interview, deploy, collect data, and educate. These are my primary job duties. It all starts with a credible report from someone who sees this animal. To decide credibility, I interview them using a 6-page form that was designed to let the observer tell his/her story and allow me to get as much of the particulars as possible. Sometimes the person I interview is not completely certain of what they saw, so this interview helps us determine if what they saw was actually a mongoose, a cat, a rat, or something entirely different. This interview can lead to even more interviews as I canvass the neighborhood to see if anyone else has seen anything suspicious; which sometimes they have.

Next comes deployment. The tools that I have at my disposal are live-traps and tracking tunnels. Until quite recently, the tracking tunnels were a make-shift waxed cardboard sort of contraption that bends into a tunnel. Bait is placed inside the tunnel on an inked board with paper clipped at each end. Whatever goes into the tunnel to retrieve the yummy

sardines (or whatever the main course of the day is), gets their tiny feet inky, and then their dirty little foot prints are left on the paper. So far I’ve gotten great examples of geckos, chickens, small birds, cats, mice, rats, toads, as well as a few unknown-but-definitely-not-mongoose tracks. I’ve been told that mongooses are more likely to go into a tracking tunnel rather than a trap, but so far, this doesn’t appear to be the case on Kaua’i. This is probably because he’d have to stand in line behind all of those other critters

looking for a free meal.

“my efforts paid off and I claimed my 15 minutes of fame”

The traps I use are humane live-traps made by Tomahawk.

These traps have been generously loaned to us from DLNR-DOFAW, US Fish and Wildlife, and the Kaua’i Forest Bird Recovery Project. We are all pulling together with a common interest to stop the possible infestation of mongoose. I place the traps along fence-lines and pathways where mongooses like to run. Because the areas I work are often accessed by the public, this is quite a challenge. I need to place them in logical mongoose pathways, but I don’t really want the traps visible to the public. Apparently these traps attract more attention from humans than mongoose and often they seem to sprout legs and walk away all by themselves! I put signage on each trap indicating their purpose, but thieves seemingly don’t know how to read or (most likely) don’t care.

Baits have run the gamut: chicken, meat, coconut, hot dogs, cat food, left-overs from the KISC refrigerator, tuna, sardines; essentially everything and anything. The best baits are ones that don’t attract ants, last more than a day, and don’t leave me stinking all day long. I’ve also attached pheasant feathers to the front of the traps, leaving them

to gently blow in the wind. These are used as a visual attractant and have apparently been successful in other parts of the world.

Data collection takes a major portion of each day. I not only track where each trap and tracking tunnel are deployed, but also which traps are tripped, what is caught, and what baits are used. This is a tedious job, but in the end we will be able to analyze this data to help guide ongoing and future efforts. I use a GPS unit (Trimble), and a laptop for the field (Toughbook). Over the course of the year, KISC has moved to going paperless which has actually made my job easier.

Outreach is almost my favorite part of my job. Every part of my work involves outreach as I am constantly interacting with people telling them what I am doing. The most fun, however, is talking to kids and addressing groups. There are still many people on Kaua'i (especially the kids) that have never seen a live mongoose. KISC has a stuffed and professionally mounted mongoose hovering menacingly over a nest with eggs in it, teeth bared. The kids will approach the display and ask if the mongoose is guarding his babies (the eggs). Obviously we have a lot more outreach to conduct...

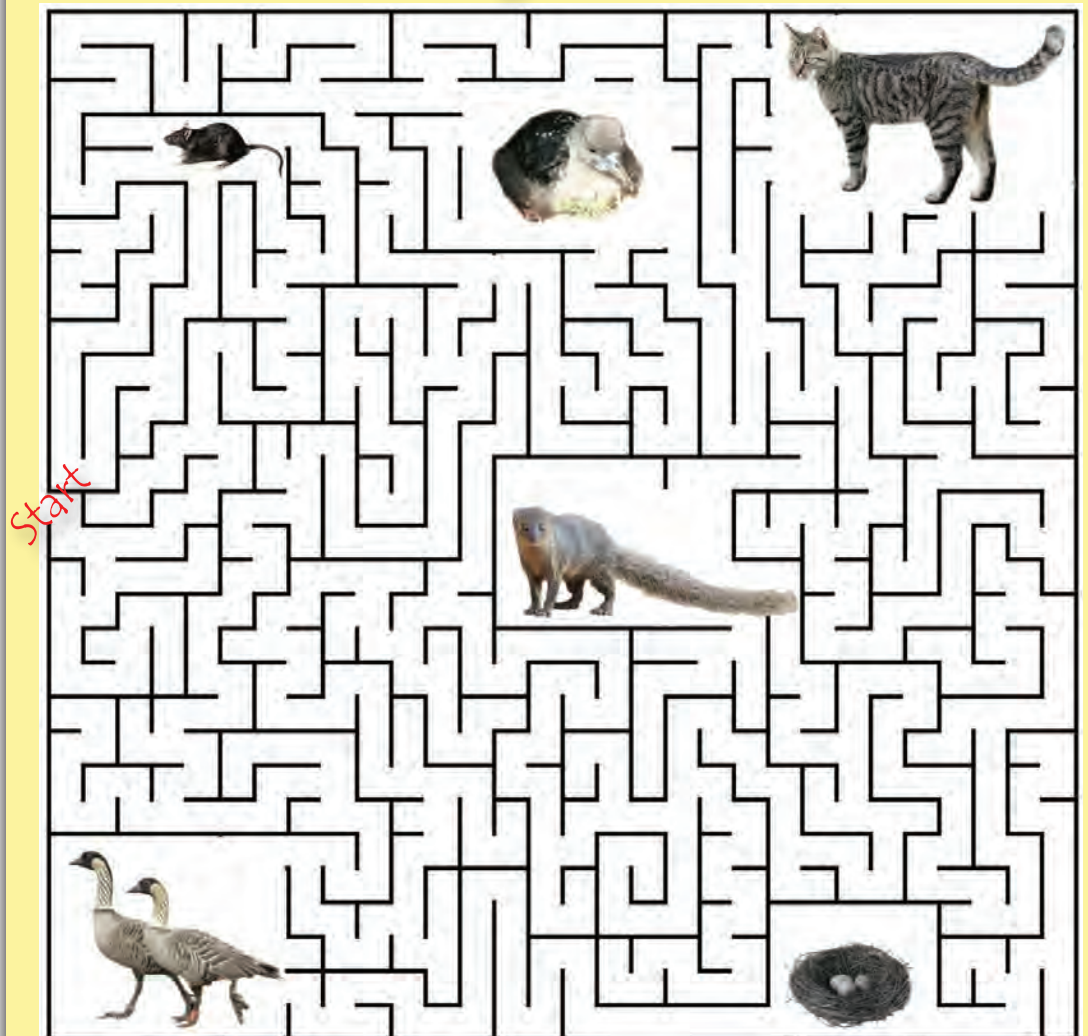
After 11 months of dedicated mongoose response and trapping, my efforts paid off and I claimed my 15 minutes of fame. On May 23, 2012, at 9:15 am, a mature male mongoose was apprehended in one of my traps baited with coconut. It was, and always will be, a high point in my life. I accomplished something that had not been done before on Kaua'i.

I continue to interview, deploy, collect data, and educate the public about mongoose. Now, I do so with my head held a little higher and my shoulders a bit more square. I've been recognized in public as "Trapper Pat", which is okay with me. I

was able to verify what had been suspected for 44 years, and now ongoing efforts will involve more partners and possibly more trappers. The more the merrier.



Be a Mongoose Hunter



Help catch the mongoose before it raids the nest and feeds on native birds. Beware of other predators... we want the mongoose not the cat or the rat!

Kia'i Moku - Guarding the Island

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The Kaua'i 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 Kaua'i'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.

** All Photos by KISC unless noted*



Kia'i Moku: Guarding the Island

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