

Island-based Partnerships & Statewide Coordination to Protect Hawaii from Invasive Species

Report for the 2004 Calendar Year

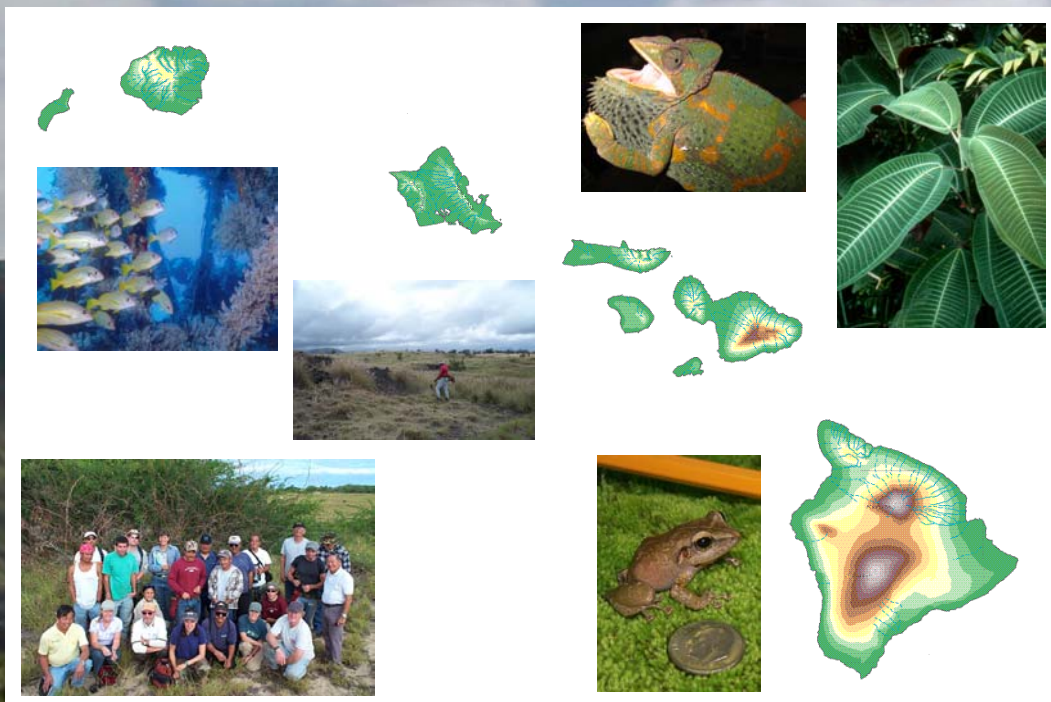


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Safeguarding Hawaii from Invasive Pest Species

The invasion of non-native organisms into the State of Hawaii over the past two and a half centuries has reached a magnitude that now threatens to devastate native ecosystems and depress sectors of the state's economy. In 2003, the legislature noted "the silent invasion of Hawaii by alien invasive species is the single greatest threat to Hawaii's economy, natural environment, and the health and lifestyle of Hawaii's people and visitors." The severity of the situation has become clearer over the past decade. Hawaii is plagued with pest invasions to a greater extent than almost any other location in the world. This invasion includes agricultural pests, plants and animals. The invasion has limited the agricultural export market, decreased bio-diversity in the forests and decimated native bird populations.

In response to these invasions, a number of innovative partnerships and a legislatively created council have been developed to combat invasive species at both the local and state levels.

Background: Hawaii's Invasive Species Partnerships

*In the past decade, partnerships and groups have arisen to address significant gaps in Hawaii's biosecurity system. They include the recently formed **Hawaii Invasive Species Council (HISC)** to provide cabinet-level leadership; the **Coordinating Group on Alien Pest Species (CGAPS)** for interagency and NGO communications and collaborative projects; and the **Invasive Species Committees (ISCs)** for island-based rapid response.*

Hawaii Invasive Species Council (HISC), 2003

A 2002 State Legislative Reference Bureau study identified the need for cabinet-level leadership and coordination of all State agencies responsible for regulating the pathways in which invasive species can gain access into Hawaii, agencies responsible for controlling invasive species on the ground, and agencies that use and promote the pathways or natural resources.

The 2003 Hawaii State Legislature and Governor Linda Lingle approved legislation that established the Hawaii Invasive Species Council (HISC) and calls State agency chairs and department heads to address gaps in Hawaii's invasive species prevention and response measures.

The HISC, under the co-leadership of the Hawaii Department of Land and Natural Resources Chairman and the Hawaii Department of Agriculture Chairperson, is comprised of leaders of the following entities:

- Hawaii Department of Agriculture
- Hawaii Department of Land and Natural Resources
- Hawaii Department of Health
- Hawaii Department of Business, Economic Development and Tourism
- Hawaii Department of Transportation
- University of Hawaii

The first official meeting of the HISC convened on October 29, 2003. HISC members adopted a working committee structure to look at laws, policies, procedures, and needs in the areas of ongoing prevention, early detection/rapid response, ongoing control of widespread pests, and increasing public awareness.

Tasked with a need to look at each agency's organizational and resource shortfalls, HISC recognized the critical need for sustainable funding sources for adequate inspections of incoming goods, the need for early detection and rapid response for priority invasive species, and the need for ongoing control of existing pests. HISC, through the Hawaii Department of Land and Natural Resources received \$4 million for a pilot state-wide invasive species program to provide support for the operations of the HISC and its cooperating partners. The HISC developed a statewide strategic plan with an administrative budget that was submitted to the legislature during the 2004 session. The legislature appropriated four million dollars for FY05, with the following budgetary allocations: Prevention –\$1,340,000, Response and Control - \$1,700,000; Research & Technology - \$700,000; and Public Outreach - \$260,000. These funds are matched 1:1 with non-state dollars.

Coordinating Group on Alien Pest Species (CGAPS), 1995

Formed in 1995, CGAPS is comprised of primarily management-level participants from every major agency and organization involved in invasive species work including federal, state, county and private entities. Members participate in quarterly meetings and ad hoc steering committee meetings in an effort to influence invasive species policy and funding decisions, improve communications, increase collaborations, and to promote public awareness.

CGAPS progress includes:

- Launching the 1997-1998 Silent Invasion Campaign which included television commercials and specials, print ads, dramatic pamphlets, and community weed pulling trips for Operation Miconia
- Facilitating the formation of the Invasive Species Committees (ISCs)-- grassroots partnerships on each island that function as early detection and rapid response teams.
- Working with legislators to suggest new legislation, and providing policymakers with information for decision making.
- Publishing an updated Summary of Findings (February 2003).
- Continuing to facilitate communication and cooperation among agencies.
- Embarking on a new Silent Invasion campaign, which will again include television and print media.

Island Invasive Species Committees (ISCs), 1997

In 1997 the first ISC was formed on the island of Maui in response to the need for an early detection and rapid on-the-ground response to an array of incipient invasive species.

In subsequent years ISCs formed on all major Hawaiian islands: Oahu/OISC; Maui/MISC; Kauai/KISC; Big Island/BISC and Molokai/MoMISC.

The ISCs are voluntary partnerships of private, government, non-profit organizations, and concerned individuals working together under a unified state-wide approach to protect each island from the negative impacts caused by invasive species.

The overall goal of the ISCs is to prevent, eradicate or control priority incipient invasive plant and animal species that threaten Hawaii's most intact federal, state and private conservation lands.

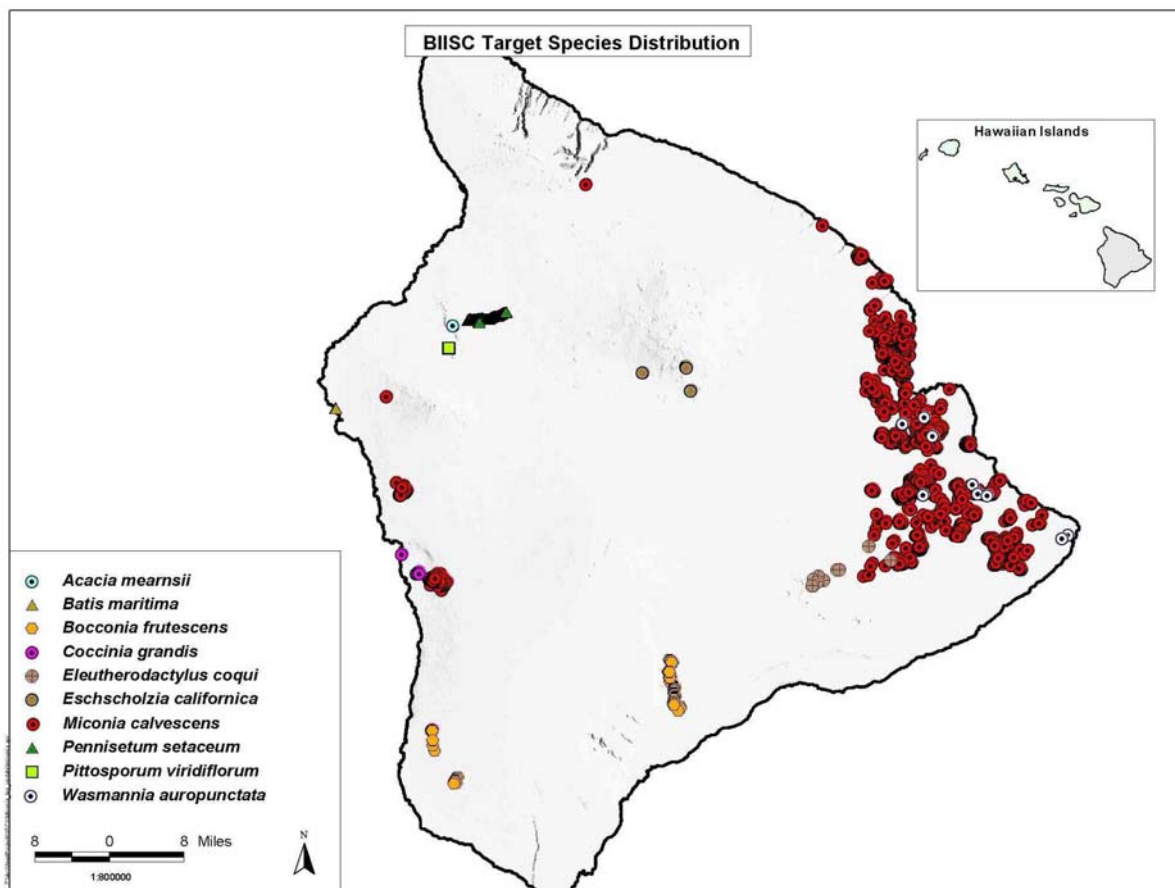
Each ISC has a voluntary chairperson and committee comprised of concerned scientists, agency resource managers, and representatives from other nonprofit and private entities, and a paid coordinator and staff to implement on-the-ground work. Funding for ISC activities comes from a combination of federal, state and private sources.

Each ISC holds regular meetings where participants select target species based on threat to the environment or economy, cost to control and feasibility of control, establishes strategies and reviews past progress of the paid staff. Hired staff conducts mechanical and chemical control on an island-wide basis, using best available practices to ensure efficiency and effectiveness, while limiting non-target impacts. Increasingly, the ISCs are adopting strategies to enhance early detection of incipient invaders and to prevent new invaders from becoming established through outreach and public education activities. These committees serve as successful models of cooperation, driven by local concerns and local expertise, to address the invasive species threat in Hawaii. Each ISC operates as a project under the auspices of the Pacific Cooperative Studies Unit of the University of Hawaii.

2004 Invasive Species Committees' Accomplishments

During 2004, the island-based Invasive Species Committees made significant progress controlling targeted plant and animal species. Additionally, the Department of Land and Natural Resources – Division of Aquatic Resources used the ISC model to develop an innovative Aquatic Response Team. This work was made possible by continued support of existing funders and enhanced support from the State of Hawaii. In addition to working on established targets, the ISCs demonstrated the ability to provide rapid response teams for unpredictable threats. The ISCs and partner organizations responded to a report of West Nile Virus (later determined to be a false positive), which set into motion a rapid response to gather additional dead birds for testing. There was also a rapid response to a credible snake sighting. Although the snake was never recovered, the response involved more than 30 personnel from multiple organizations, with the local ISC providing personnel for much of the three-week hunt. An organized search operation of this magnitude is a major accomplishment that will undoubtedly improve the chances of recovering new pests that continue to be reported.

Big Island Invasive Species Committee (BIISC)



BIISC has the largest land area in the state and the largest infestations of *Miconia calvenscens* - miconia, *Eleutherodactylus coqui* - coqui frogs and *Wasmannia auropunctata* - little fire ants. The sheer magnitude of the problem dwarfs the available resources and illustrates the necessary and important role that partnerships such as BIISC play for developing collaborations and ensuring inter-agency communication. During 2004, BIISC underwent a major re-organization and staffing restructuring, and a new manager was hired in October. BIISC will have a full field crew by early 2005 and a second crew dedicated to coqui frog control will begin working in late spring.

Field Work

Miconia infests approximately 110,000 acres of the Big Island. The potential suitable range for miconia, based on elevation and rainfall, is estimated to be nearly one million acres. Work on many invasive species, including miconia, uses a firefighting approach: population perimeters are determined and control work is conducted from the outer edge of the population, towards the center where density is highest. Field workers on the Big Island are working to eliminate outlier populations to contain the infestation within the current “footprint”, while efforts are underway to increase available resources. BIISC worked to prevent the spread of miconia into upper

elevation watersheds and high-quality native forests, such as Hawaii Volcanoes National Park. During the first six months of 2004, BIISC crews surveyed 1,476 acres for miconia. Of all plants controlled, one-third were mature trees.

Table 1: BIISC Action Summary for Miconia, 2004

Scientific Name	Common Name	Acres Surveyed	Individuals Controlled
<i>Miconia calvescens</i>	miconia	1,476	12,678 (481 mature)



During 2004, BIISC began working with the Hawaii Department of Agriculture to survey and identify populations of little fire ant. This species quickly became widespread because of limited treatment options and numerous landowners. It is believed the lessons learned addressing this species will help prepare Hawaii to address a greater threat, the Red Imported Fire Ant (*Solenopsis invicta*), which is not yet known to be present.

Photo 1. Little fire ant monitoring in Hilo.

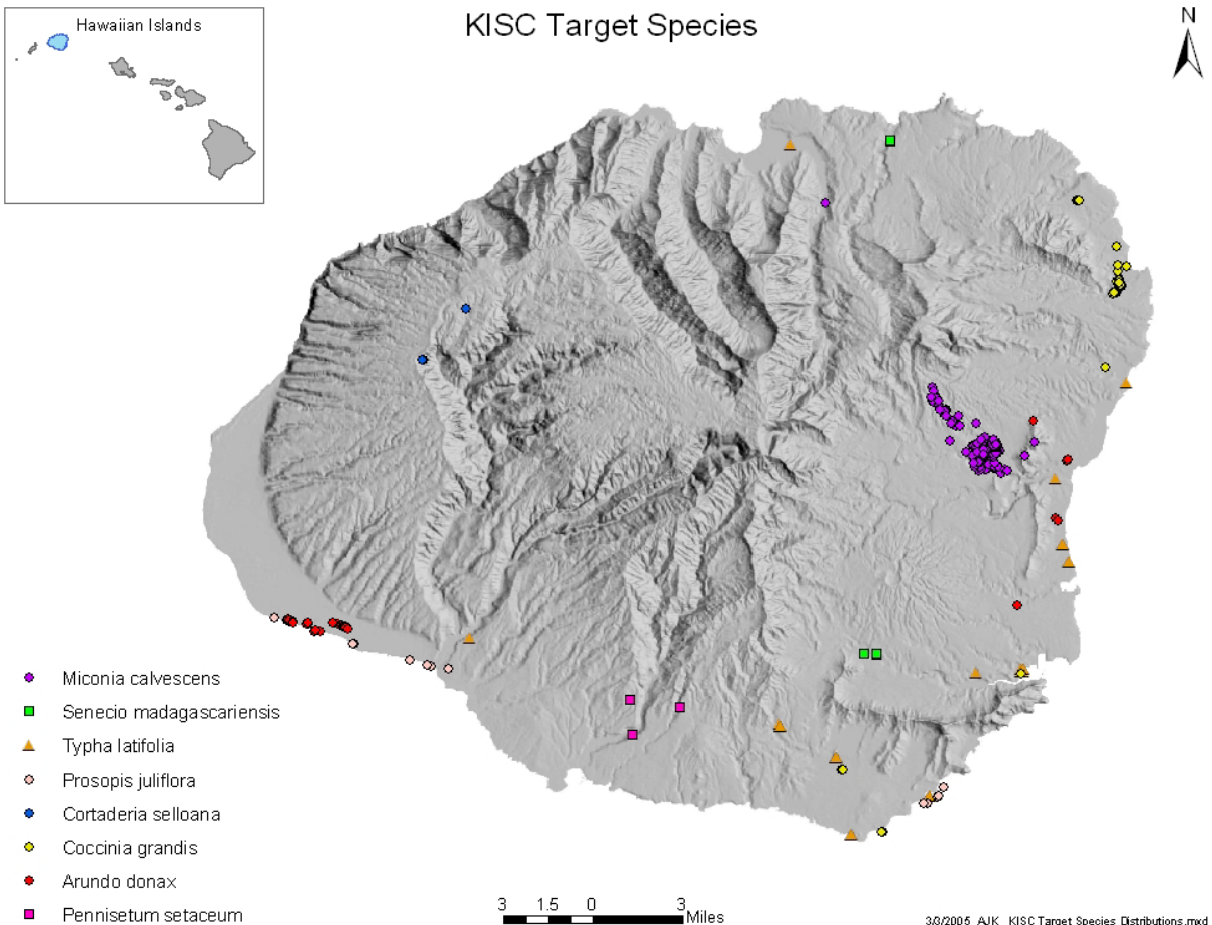
During the second half of 2004, work on coqui frogs centered on the area surrounding Hawaii Volcanoes National Park. Control was concentrated on small incipient populations of coqui frogs from Volcano Village to Glenwood Road. Ten primary survey areas in surrounding neighborhoods were identified during this reporting period. BIISC staff assisted USDA staff in testing the efficacy of hydrated lime in the Glenwood Road area. BIISC staff also assisted the Natural Area Reserve System staff in survey efforts during December in the biologically-rich Manuka NAR, where coqui frogs now infest nearly 11 acres. If coqui frogs were to invade further into the NAR, native insect fauna could be greatly impacted, thereby diminishing food sources for birds and bats.

Outreach

BIISC conducted community outreach activities during 2004, including staffing a booth at the Volcano Farmers Market and similar community events.

BIISC members: DLNR-Division of Forestry and Wildlife, USDA-Forest Service, U.S. Fish and Wildlife Service, Hawaii Department of Agriculture, USGS-Biological Resources Division, Hawaii Volcanoes National Park, UH Department of Botany/Pacific Cooperative Studies Unit, UH-College of Tropical Agriculture and Human Resources, The Nature Conservancy of Hawaii, Kamehameha Schools, Malama o Puna, the USDA-Natural Resource and Conservation Service, County of Hawaii, Pacific Basin Information Node, and Forest Solutions, Inc. Additional participants include the Hawaii County Farm Bureau and the Hawaii Invasive Species Management and Education Corporation (HISMEC), a community based non-profit.

Kauai Invasive Species Committee (KISC)



KISC formed in October 2001, and in spring of 2004, hired its third staff person. KISC also hosted its first two AmeriCorps interns. With the HISC funding, KISC has been able to permanently hire one of their AmeriCorps interns and three other field positions.

Field Work



Photo 2. *Miconia* found November, 2004 as part of aerial surveys on Kauai.

Miconia is the primary target species for KISC. Control of *miconia* on Kauai began in the mid 1990's after plants were reported in the Wailua Homesteads area that had spread from a single plant imported by a nearby nursery. The Hawaii Department of Agriculture and the Department of Land and Natural Resources - Division of Forestry and Wildlife removed several dozen plants on private properties and on state land in the canyon of Wailua River State Park. In September 2000, the Sierra Club-Kauai reported that *miconia* was spreading. The

Division of Forestry and Wildlife resumed searches of the area, assisted by Kokee Resource Conservation Program volunteers and staff. In 2002, KISC assumed responsibility for surveying, mapping and controlling miconia on Kauai. In 2004, KISC continued to focus time and energy to both ground and aerial surveys of miconia in the Wailua area. With the discovery of seeding and close-to-mature plants outside of the core area, KISC will be placing increased emphasis on these areas to ensure control and eradication of this species.

Fountain grass is another example of a species that is widespread on other islands but still has a limited distribution on Kauai. During 2004, KISC stepped-up efforts to control fountain grass by increasing helicopter surveys and groundwork. KISC is trying to keep fountain grass from spreading from its original population north of Kalaheo, further west, where the habitat is more favorable.

Table 2: Action Summary for KISC Priority Species for 2004

Scientific Name	Common Name	Acres Surveyed	Individuals Controlled
<i>Miconia calvenscens</i>	miconia	2,117	944 (4 mature)
<i>Senecio madagascariensis</i>	fireweed	33	34
<i>Typha latifolia</i>	cattail	51	6,711
<i>Prosopis juliflora</i>	long thorn kiawe	12	706
<i>Cortaderia</i> sp.	pampas grass	2	44
<i>Coccinia grandis</i>	ivy gourd	70	1,230
<i>Arundo donax</i>	giant reed	19	30,000
<i>Pennisetum setaceum</i>	fountain grass	400	2,300

Kauai currently has one coqui frog population in a largely rural area, infesting approximately 15 acres (including a buffer zone). From May through October, when coqui tend to vocalize more, KISC devoted 600 staff hours in a cooperative effort with the Hawaii Department of Agriculture to survey and control the population. The coqui population on Kauai is still at a stage where eradication is possible. With additional HISC funds, KISC will be able to significantly increase staff hours, materials, equipment and supplies toward removal of this pest.

In August, KISC received funding for dedicated work on control of the little fire ant population. While there is only one known population, it spans 3.5 acres on private property. The KISC staff member hired for this work coordinates closely with the Hawaii Department of Agriculture to monitor and control the little fire ant population, and to conduct outreach activities in the community.

KISC has led a cooperative effort to follow up on recent credible sightings of mongoose on Kauai. The U.S. Fish and Wildlife Service provided funding for a temporary staff person to monitor areas where there have been multiple sightings, using live traps and tracking boards. The Department of Land and Natural Resources and U.S. Department of Agriculture - Wildlife Services helped with monitoring and evaluation of sighting information. Tracks were found and inclusive prompting further testing by the USDA APHIS National Wildlife Research Center in

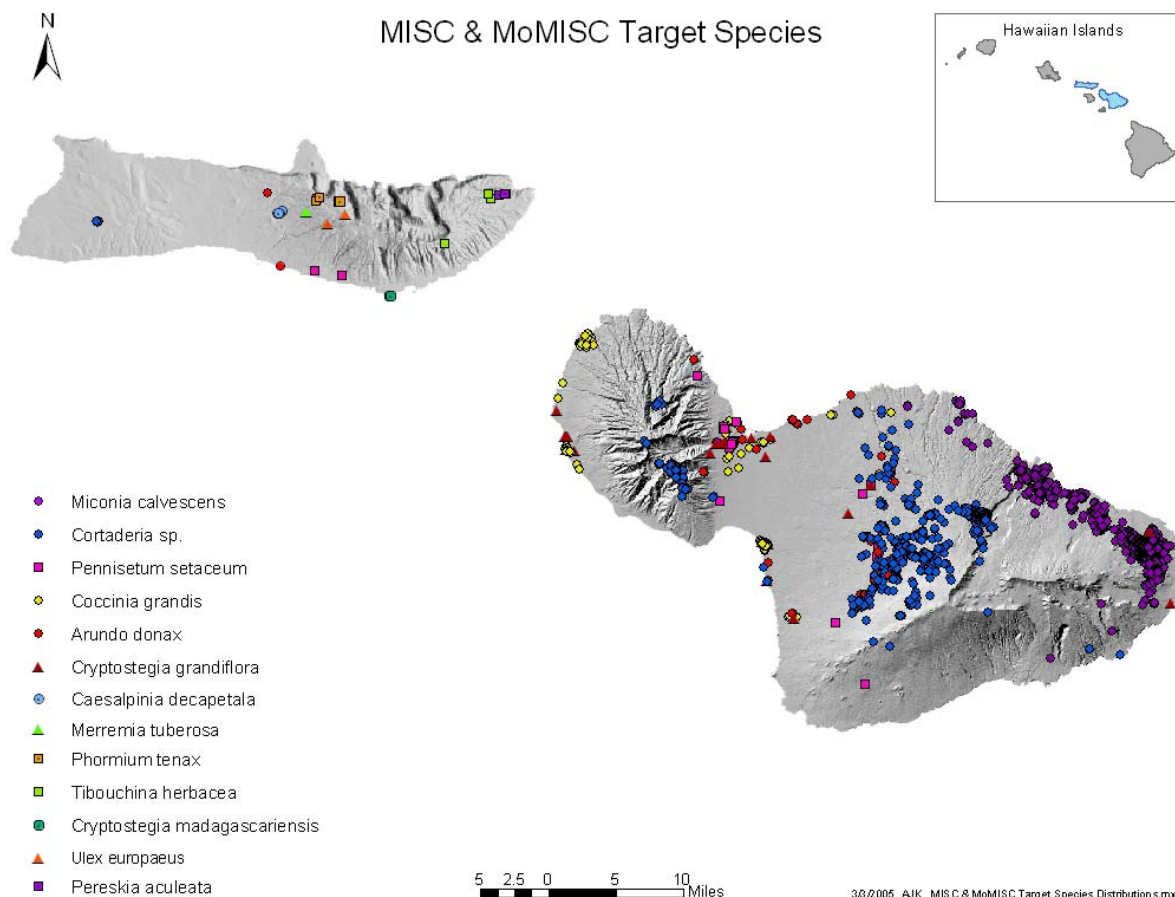
Hilo on better keys to mongoose and rat tracks. Because of continuing credible sightings the rapid response trapping and tracking program will be continued for the next year.



Photo 3. KISC mongoose trapping display at a local fair.

KISC members: USDA Forest Service, USDA-Natural Resource Conservation Service, USDA-APHIS, USDA Wildlife Services, U.S. Fish and Wildlife Service, Department of Defense-Pacific Missile Range Facility, Hawaii Army National Guard, DLNR-Division of Forestry and Wildlife, DLNR-State Parks, HDOA, UH-College of Tropical Agriculture and Human Resources, UH Pacific Cooperative Studies Unit, Kauai Community College, Kauai County Office of Economic Development, Kauai County Department of Water, Kokee Resource Conservation Program, Hui o Laka/Kokee Museum, Kamehameha Schools, National Tropical Botanical Garden, The Nature Conservancy of Hawaii, Sierra Club-Kauai Chapter, Pacific Basin Information Node, Kauai Farm Bureau, Kauai Westside Watershed Council, Kauai Watershed Alliance, Garden Island Resource Conservation & Development, Sea Grant, Hanalei Heritage River, Kauai Landscape Industry Council, A&B Foundation, Kauai Nursery and Landscape, and Grove Farm, LLC.

Maui Invasive Species Committee (MISC)



The Maui Invasive Species Committee (MISC), the first of the island-based ISCs, has its roots in the Melastome Action Committee, which formed in 1991. Participating members decided to broaden the Committee’s focus beyond melastomes and in 1999 MISC was formed and hired its initial staff. Unlike the other ISCs, MISC has received strong support from Maui County; roughly 25% of MISC’s operating budget is received from the county.

Field Work

MISC’s top priority plant target is miconia, which was introduced as an ornamental to East Maui in the early 1970’s. It was discovered spreading in Hana in 1991 and volunteer efforts to contain it looked promising until large stands of miconia were spotted above Hana in 1993. A five-person crew supervised by DOFAW worked to control the core infestation, but it had already spread beyond these boundaries by the time MISC hired a field crew. Today, the miconia “footprint” is approximately 37,000 acres, with an estimated 13,000 acres needing to be searched by ground crews every 2-3 years to ensure the removal of plants before they set seed. In 2001, the status of miconia and the discovery of two plants in the national park at Kipahulu Valley prompted action from National Park Service officials at Haleakala National Park. NPS funding

supports a crew that works exclusively on miconia in Hana. An additional crew based at MISC headquarters in Makawao spends approximately half their time on miconia, with a total of 13,353 staff hours spent controlling miconia in 2004.

Crews treated both newly discovered miconia infestations and newly emerging plants from established seed banks. Treatment included on-the-ground manual or chemical control and aerial spot-spraying in both core and outlying infestations. Aerial spray operations were generally scheduled for four days a month, with two helicopters operating simultaneously. Aerial surveys are especially useful in detecting mature trees that are emerging through the canopy in dense vegetation where plants are difficult to detect on the ground. Aerial and ground management techniques are a complementary strategy, assuring thorough coverage and providing meaningful information during revisits.

Table 3: Action Summary for MISC Priority Species for 2004

Scientific Name	Common Name	Acres Surveyed	Individuals Controlled
<i>Miconia calvescens</i>	miconia	21,901	143,703 (2,505 mature)
<i>Cortaderia</i> sp.	pampas grass	3,630	2,650 (673 mature)
<i>Pennisetum setaceum</i>	fountain grass	128	80 (12 mature)
<i>Coccinia grandis</i>	ivy gourd	1,419	3,883 (614 mature)
<i>Arundo donax</i>	giant reed	380	2,474
<i>Cryptostegia</i> sp.	rubber vine	57	46 (3 mature)

In addition to work on miconia, MISC actively targeted five other priority plant species. *Cortaderia jubata* and *C. selloana* - pampas grass control is concentrated during the fall months when flowering plants produce large plumes, making aerial reconnaissance of remote areas feasible. Maui has only four known sites of *Pennisetum setaceum* - fountain grass which require



repeat visits to address remaining seed banks. Control of *Coccinia grandis* - ivy gourd remains challenging, as new sites in South Maui continue to be discovered. MISC switched to a site-led strategy for control of *Arundo donax* - giant reed to focus on infestations that threaten natural areas, particularly low elevation wetlands. Complete eradication of *Cryptostegia grandiflora* - rubber vine, a toxic plant, continues to be thwarted by property access issues.

Photo 4. Maui fountain grass surveys.

Table 4: MISC Eradicable Species Project for 2004.

Target Species for Island-Wide Eradication	Common Name	Status
<i>Acacia auriculiformis</i>	Earpod wattle	Permission
<i>Acacia mangium</i>	Mangium wattle	Permission
<i>Acacia podalyrifolia</i>	Silver wattle	In progress
<i>Acacia retinoides</i>	Water wattle	Controlled
<i>Macaranga mappia</i>	Bingabing	Controlled
<i>Maclura pomifera</i>	Osage orange	In Progress
<i>Melastoma sanguineum</i>	Melastoma	Controlled
<i>Morella cerifera</i>	Wax myrtle	Controlled
<i>Pittosporum viridiflorum</i>	Cape pittosporum	In Progress
<i>Verbascum thapsus</i>	Common mullein	Controlled

MISC is also working on an additional fourteen species as part of an experimental eradication project, funded by the U.S. Fish & Wildlife Service. Of the ten species targeted for island-wide eradication, five have been eradicated and five are in progress or permission for private property access has been granted. Of the four species targeted for local control, two have been eradicated (*Caesalpinia decapetala*, *Morella faya*) and two (*Macaranga tanarius*, *Sideroxylon persimile*) are in progress.

In 2004, MISC began working on banana bunchy top virus (BBTV)

with county funding, in close cooperation with HDOA, UH CTAHR and other community representatives. A survey of 727 households in and near the infested areas of Makawao and Pukalani resulted in finding and controlling two new infestation sites. MISC also developed and conducted outreach activities to inform the public about how to recognize and report BBTV symptoms in their banana plants. As a result of MISC's work, Maui County decided to continue the project at an increased level of support.

MISC works on two incipient vertebrate species, *Eleutherodactylus coqui* - coqui frog and *Chamaeleo calypttratus* - veiled chameleon. MISC has taken a lead role on Maui in documenting and investigating new reports of coqui frogs and verifying the presence or absence of frogs at previously reported sites. In past years, inadequate funding limited MISC's ability to actively control this species. With increased funding from the HISC and some dedicated funding from the County, MISC has increased staff time on coqui control. In 2004, MISC fielded 58 reports and made 227 site visits, including survey and control operations. There were 25 active sites during 2004. MISC conducted control activities at 18 of those sites, including hand capture and spray operations.

Veiled chameleons are a species not previously known to Hawaii and which are illegal to import. MISC received the first report of this species in 2002, which led to the discovery of a population in a residential area. MISC works closely with HDOA and other partners (who contributed 49 hours in 2004) to capture these pests. In 2004, a total of 39 individuals were captured.

During 2004, MISC participated in a rapid response effort led by the Hawaii Department of Agriculture and the Department of Land and Natural Resources to respond to a snake sighting in the Hana area by providing skilled field staff, equipment and logistical support for the

participating agencies. For three weeks, staff schedules were changed to assist in nightly snake searches. MISC also contributed to the control effort by managing local media involvement. MISC co-hosted a media tour on August 16 related to the hunt, and at least ten newspaper articles resulted from coverage of the snake hunt.

Outreach

During 2004, MISC conducted outreach activities using local press releases, printed pest alerts, presentations to schools, professional groups and booths at the county fair and other public events. With assistance from CGAPS, MISC produced a public service announcement on reporting coqui frog locations, which was broadcast on local radio stations. In coordination with the Maui Association of Landscape Professionals and Maui County, MISC sponsored the second annual award program designed to recognize landscape professionals who work to protect Maui County from invasive plants. MISC developed wide-ranging publicity and the award was presented to a local arborist.

MISC's members: Haleakala National Park, Hawaii Department of Agriculture, Hawaii Department of Land and Natural Resources, Maui County Department of Water Supply, Maui County Office of Economic Development, UH Pacific Cooperative Studies Unit, Pacific Basin Information Node, Maui Land & Pineapple Company, Inc., The Nature Conservancy of Hawaii, U.S. Department of Agriculture- Forest Service, U.S. Department of Agriculture, Tri-Isle Resource Conservation and Development Council, Inc., U.S. Fish and Wildlife Service, U.S. Geological Survey-Biological Resources Division, and University of Hawaii.

Molokai subcommittee (MoMISC)



Photo 5. Lori Buchanan with rubber vine pod.

The Molokai Invasive Species Committee (MoMISC) formed as a sub-committee of MISC in 2001. The committee has had one employee since April 2002. With funding from HISC, MoMISC will double its staff to two. MoMISC relies heavily on volunteer labor and support from its partners, especially The Nature Conservancy and the Maui County branch of the Division of Forestry and Wildlife as well as labor and administrative oversight from MISC.

Field Work

Molokai does not have established populations of miconia or coqui frogs. Due to Molokai's emphasis on partner involvement, outreach and rapid response, MoMISC has had previous successes in completely controlling incipient populations of coqui frogs and fountain grass and continues to monitor surrounding areas. In

2004, MoMISC responded to reports of sightings of the red-vented bulbul, an invasive bird, in east Molokai. MoMISC increased public outreach in efforts to verify the sightings and involve the community in efforts to establish the bulbul's location and distribution. MoMISC is

evaluating the addition of the Australian tree fern to its priority species list because it is not yet established in natural areas of Molokai and because of its known invasiveness in Hawaii. MoMISC has been successful at gaining the cooperation of the single nursery on Molokai; the owner has agreed to stop selling this invasive plant on Molokai. Entry of this invasive species to residential gardens has increased MoMISC's awareness of the effect of the nursery trade influencing what is available for landscaping.

Outreach

MoMISC has been very successful in designing and implementing an outreach and education program that reaches a large segment of the island's population. MoMISC meets with local agencies and other community groups to educate the general population, especially employees working in the environment about invasive species. MoMISC's expanded outreach during 2004 included maintaining a kiosk at the airport which informs visitors about invasive species, and presenting information to the crew of the Maui Princess Ferry and providing flyers to be distributed on board the ferry.

In 2004 MoMISC had the assistance of an AmeriCorps intern who developed and completed a unique outreach project where seeds of native plants were collected, packaged with photos of the mature plant and planting information and distributed to cooperating landowners in exchange for the removal of target species. The intent of the project is to create native seed sources in residential gardens and to help shift the focus of landowners to species known to be a beneficial part of the environment and culture.

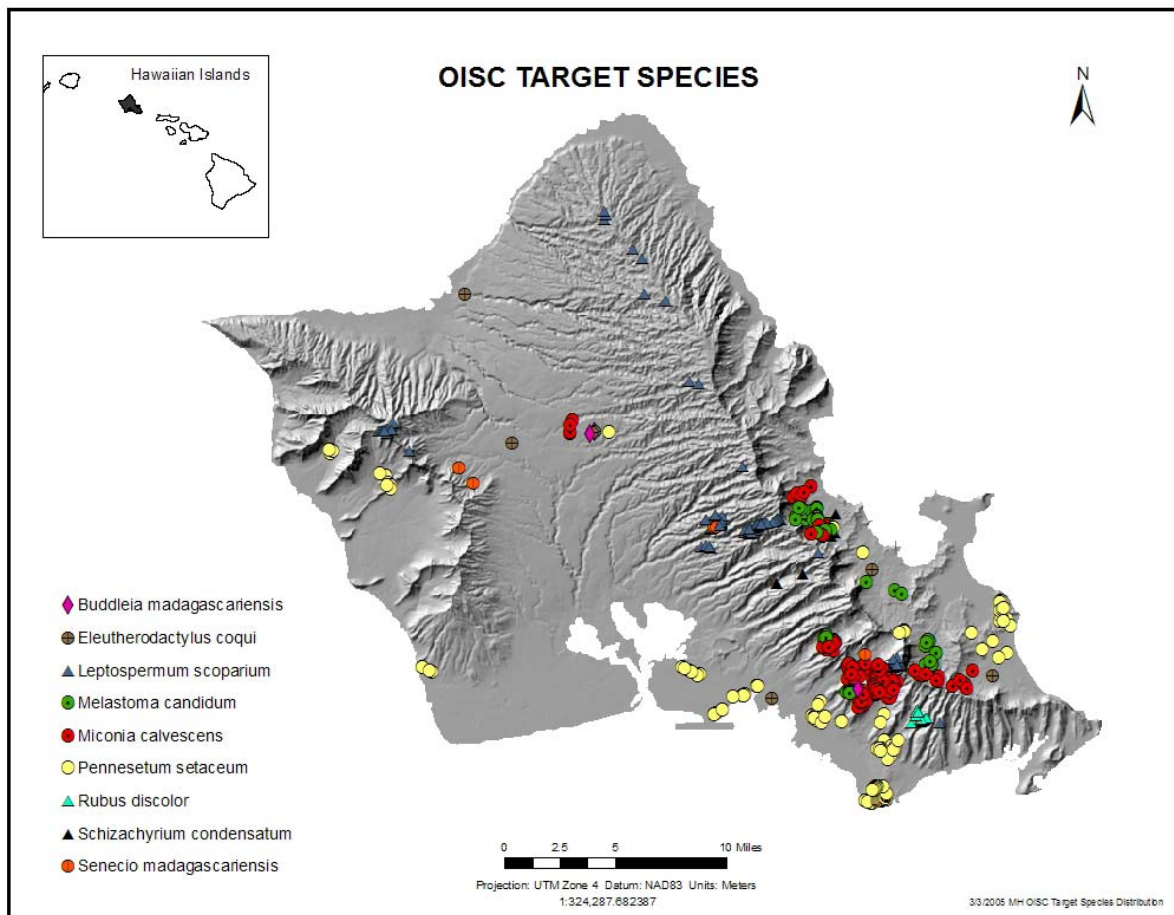
Table 5: Action Summary for MoMISC Priority Species for 2004

Scientific Name	Common Name	Acres Surveyed	Individuals Controlled
<i>Arundo donax</i>	giant reed	<1	N/A
<i>Caesalpinia decapetala</i>	cat's claw	<1	N/A
<i>Merremia tuberosa</i>	wood rose	1	7
<i>Phormium tenax</i>	New Zealand flax	2.5	185
<i>Tibouchina herbacea</i>	tibouchina	283	131
<i>Cryptostegia</i> sp.	rubbervine	15	320
<i>Ulex europaeus</i>	gorse	493	17
<i>Cortaderia</i> sp.	pampas grass	12	0
<i>Pennisetum setaceum</i>	fountain grass	14	0
<i>Pereskia aculeata</i>	Barbados gooseberry	<1	N/A

N/A- Data not available due to plant habit (vines, growth from underground rhizomes).

MoMISC members: Kalaupapa National Historic Park, USDA Forest Service, USDA Natural Resource Conservation Service, U.S. Fish and Wildlife Service, DLNR-Division of Forestry and Wildlife, DLNR-Division of Aquatic Resources, Hawaii Department of Agriculture, UH-College of Tropical Agriculture and Human Resources, UH Pacific Cooperative Studies Unit, The Nature Conservancy of Hawaii, Pacific Basin Information Node, USDA Tri-Isle Resource Conservation and Development Council, Inc., USDA Moloka'i-Lana'i Soil and Water Conservation District, and Maui Land & Pineapple Company, Inc.

Oahu Invasive Species Committee (OISC)



In 2000, a volunteer organization called the Fountain Grass Working Group evolved into OISC. In the spring of 2004 OISC employed five paid staff members and one summer intern. At the end of the year, with HISC funding, three additional staff and an AmeriCorps intern were hired.

Field Work

Miconia is OISC's top priority target. Since July 2001, OISC has surveyed over 6,000 acres and eliminated close to 4,500 *miconia* plants, 45 of which were seeding. In the past year, only six mature/seeding trees were discovered. However, *miconia* has been found outside the one-kilometer buffer zone around known seeding trees, necessitating a larger search area. In 2004, five mature trees were discovered in Kahaluu on the windward side.

OISC, in conjunction with the Hawaii Department of Agriculture, Army Environmental and the Division of Forestry and Wildlife is coordinating a multi-agency effort to eradicate coqui frogs from Oahu. Currently there is one population in a natural area encompassing approximately five acres, and four nursery infestations (ranging from a few frogs to a few hundred). OISC is responsible for maintaining the database and tracking all coqui frog work. In 2004, OISC and

partner agencies dedicated 900 hours to controlling/retreating over 160 acres of land. OISC is planning to dramatically ramp up efforts on coqui eradication with the hiring of 4 temporary staff and 1 full time vertebrate specialist dedicated to coqui eradication efforts.



Photo 6. Coqui control in Wahiawa.

During the summer, OISC assisted with rapid response efforts to a report of West Nile Virus by assisting with transport of dead birds for testing.

Table 6: Action Summary for OISC Priority Species for 2004

Scientific Name	Common Name	Acres Surveyed	Individuals Controlled
<i>Miconia calvenscens</i>	miconia	1,620	1,465 (6 mature)
<i>Eleutherodactylus coqui</i>	coqui frog	161	N/A
<i>Rubus discolor</i>	Himalayan blackberry	29	3,348
<i>Schizachyrium condensatum</i>	bushy beardgrass	427	12,130
<i>Buddleia madagascariensis</i>	butterfly bush	429	289
<i>Senecio madagascariensis</i>	fireweed	29	1
<i>Pennisetum setaceum</i>	fountain grass	2,086	4,826
<i>Morella faya</i>	fire tree	57	0
<i>Leptospermum</i> sp.	manuka	655	6,448
<i>Melastoma candidum</i>	Indian rhododendron	507	400

In August, OISC hosted a planning workshop to assess the extent of the fountain grass infestation on Oahu. As a result of this meeting, fountain grass control has become a collaborative effort coordinated by OISC. OISC is focused on prevention and eradication of fountain grass from the Waianae range which is most at risk from this fire-promoting grass and works collaboratively with the Hawaii Department of Agriculture on controlling several satellite populations in the southern Koolau range. Army Environmental assists OISC in the Waianae range and controls satellite populations on their training grounds. OISC assists the Hawaii Army



National Guard and Marine Corp Base Hawaii to control fountain grass on Bellows Air Force/Marine Corp Training Area and the high traffic areas of Diamond Head.

During 2004, OISC controlled all known plants of *Morella faya* - fire tree (in the Koolau range) and *Buddleia madagascariensis* - butterfly bush, and these species have subsequently been moved from OISC's "priority species" list to a "target species to monitor" list.

Photo 7. Fountain grass surveys in the Waianae.

Outreach

An education/public relations campaign took place in Temple Valley, drawing attention to *Schizachyrium condensatum* - bushy beardgrass populations on private residential property. This resulted in obtaining access permission from all 150 householders.

Through the University of Hawaii's Hawaiian Internship Program OISC was able to hire an intern to focus on designing and creating an invasive species awareness display at Honolulu Airport's Inter-Island terminal.

OISC, in collaboration with KISC, received funding from the HISC Outreach Working Group to produce and distribute a radio public service announcement that will air on Kauai and Oahu stations to promote public awareness of coqui frogs and is working to update web information to assist the public in correctly identifying and reporting coqui frogs. OISC also developed miconia identification cards that they are actively distributing to hunters, hikers, and other relevant user groups to assist with the detection of miconia.

OISC members: USDA Forest Service, USDA-APHIS, APHIS Wildlife Services, U.S. Fish and Wildlife Service, Marine Corps Base Hawaii, USGS-Biological Resources Division, USGS Water Resources Division, U.S. Army-Environmental, Hawaii Army National Guard, DLNR-Division of Forestry and Wildlife, Hawaii Department of Agriculture, Hawaii Department of Transportation, UH-College of Tropical Agriculture and Human Resources, UH Pacific Cooperative Studies Unit, Pacific Basin Information Node, Harold L. Lyon Arboretum, Honolulu Board of Water Supply, Hoomaluhia Botanical Garden, The Nature Conservancy of Hawaii, Sierra Club-Oahu Chapter, Hawaii Audubon Society, Hawaii Natural Heritage Program, Bishop Museum, Pono Pacific, Hawaii Trail and Mountain Club and Pisces Pacifica. Additional participation is received from the Koolau Watershed Partnership and the UH Departments of Botany, Zoology and Geography.

Aquatic Response Team

As part of the HISC funding for response and control, the Division of Aquatic Resources received \$300,000 to develop an experimental aquatic invasive species response team. The team will be composed of a supervisor, three technicians, a data manager, and a monitoring specialist. The team supervisor and technicians will be housed at the Hawaii Institute of Marine Biology under a special collaboration agreement. The data manager and monitoring specialist positions are still under development, but the individuals will be located in Hilo while working on statewide data and monitoring issues.

The team will address a number of aquatic invasive species issues in collaboration with other agencies. Most notably there will be a close working relationship between the University of Hawaii and the team as an experimental method of removing *Kappaphycus sp.* from Kaneohe



Bay is explored. The team will undertake the difficult task of removing the *Carijoa riisei* - snowflake coral from Port Allen, Kauai, and the project will begin by controlling the current population with the ultimate goal of eradication from the port. The team will assist with the effort to map the distribution of alien algae across the state and control populations deemed to be a threat to uninfested reefs. Lastly, the team will target known incipient populations of aquatic alien species.

Photo 8. Alien algae clean up in Waikiki.

Data Management

During 2004, staff from the USGS Pacific Basin Information Node, reviewed each ISC's data management system. The result of this process will be the establishment of a reliable and efficient Hawaii Invasive Species Committee statewide reporting system on invasive species. The new, integrated reporting system is expected to be operational by June of 2005.

Outreach and Education

CGAPS' public outreach staff continued to work on a major media campaign, which will utilize television and print media to educate the public about how they can help protect Hawaii from invasive species. The campaign, scheduled for 2005-2006, will include the following messages: "Protect Hawaii—Don't Pack a Pest," which emphasizes the importance of filling out declaration forms upon arrival; "Protect Hawaii—Don't Plant a Pest," which identifies commonly sold invasive plant species and suggests non-invasive alternatives and "Protect

Hawaii—Report a Pest,” which promotes the State Pest Hotline. A fourth message about invasive aquatic species has yet to be titled. The “Don’t Plant a Pest” message has generated a significant response from the landscape and nursery industries. Meetings and discussions, which are ongoing, have centered on certain invasive ornamental plants, which nurseries and landscapers continue to promote even though the species are invading and damaging natural areas and ecosystems.



Photo 9. Christy Martin, CGAPS Public Information Officer documenting rubber vine control on Molokai.

Through the HISC Working Group on Education and Outreach, staffing for invasive species outreach has increased with the addition of three full-time positions. The positions have statewide mandates, although there is an emphasis on island-specific issues. Positions are based on Kauai, the Big Island and Oahu and are housed by the ISCs.

In addition, outreach efforts will be complemented by a marine outreach coordinator, which will be affiliated with the aquatic response team. The marine outreach specialist is a collaborative effort between the Department of Land and Natural Resources – Division of Aquatic Resources, CGAPS, and The Nature Conservancy of Hawaii (TNC). The marine outreach specialist will continue coordination of the alien algae clean-ups initiated by TNC and will work with the ISCs and other organizations to expand public awareness of AIS issues.

Funding

Funding for the ISCs comes from a variety of state, federal and private sources. One steady source of funds has been through the Department of Land and Natural Resources line item, LNR 402, through which is passed to the ISCs each year since 2000. Other sources include the U.S. Forest Service-Forest Stewardship – Prevention and Suppression Program, the U.S. Fish and

Wildlife Service and the Hawaii Community Foundation Natural Resources Conservation Program. The individual counties have supported local ISCs at varying levels.

Table 7: 2004 ISC Funding Sources

Source of Funds 2004	\$	%
Federal	\$768,000	24%
State (thru DLNR)	\$310,000	10%
HISC	\$1,400,000	44%
County (Gov't/Water Board)	\$585,000	18%
Other (Foundations/private)	\$110,000	4%
Total	\$3,173,000	100%

In past years, the combined budgets for the island ISCs were approximately \$1,600,000. The HISC funding of \$1,400,000 in 2004 is an increase of 79% over past years. This increase will allow for further leveraging of dollars by providing a source of matching funds. The ISCs

also receive a tremendous amount of support from their partners through loans of equipment and other in-kind services.

The table below outlines the increase in full-time staff positions for the ISCs and CGAPS resulting from the HISC funding. Several of the ISCs will be using HISC funds to hire temporary field staff to focus on coqui frogs in the spring and summer because the frogs tend to be more active in the summer months, making detection and control easier. An additional administrative position, housed with support services at Pacific Cooperative Studies Unit/University of Hawaii (PCSU/UH) will be added to assist all the ISCs. As the table illustrates, for the majority of the ISCs, the increase in staff is dramatic. If one includes outreach positions, the new aquatics team, and the shared administrative position, the increase in capacity is 35.5 additional staff positions.

Table 8: ISC Staffing for 2004

Entity	Pre-HISC Funding	Post-HISC Funding (temporary/coqui season)
BIISC	9	14 (5)
KISC	2	6 (3)
MISC	18	22 (4)
MoMISC	1	2 (N/A)
OISC	5	8.5 (4)
CGAPS	2	3

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Priority Target Species

All of the plant species targeted by the ISCs are able to outcompete existing plants, resulting in a change in ecosystem components, structure and function. Some plants, like fountain grass and bushy beardgrass, also change the fire regime of an area. Animal species like coqui consume large amounts of insects, and veiled chameleons are able to take birds, disrupting pollination services and further jeopardizing threatened and endangered species. Some species also impact ecosystems *and* human health and quality of life, such as long-thorn kiawe, little fire ants and coqui frogs.



Miconia (*Miconia calvescens*)

- Tree native to Central and South America, introduced as an ornamental.
- Produces millions of seeds per year dispersed by birds, rats, pigs, humans. Seeds remain viable for 10 or more years.
- Potential range is all wet and mesic forests to 6000 ft. elevation.
- Priority Target for BIISC, KISC, MISC, OISC.



Fountain Grass (*Pennisetum setaceum*)

- Bunch grass native to Africa, introduced as an ornamental.
- Produces many seeds per year, wind dispersed. Seeds remain viable for 7 or more years. Promotes and fuels wildfires.
- Potential range is all dry and mesic forests.
- Priority Target for KISC, MISC, OISC.



Pampas Grass (*Cortaderia selloana* and *C. jubata*)

- Large bunch grass native to South America, introduced as an ornamental.
- Produces many seeds per year, wind dispersed. Promotes and fuels wildfires.
- Potential range is all mesic and wet forests.
- Priority Target for KISC, MISC, MoMISC, OISC.



Long-Thorn Kiawe (*Prosopis juliflora*)

- Tree or sprawling shrub native to Africa, introduced for agriculture, possibly accidentally.
- Produces many seeds that are water and animal dispersed.
- Potential range is unknown; appears able to hybridize with short-thorn kiawe.
- Priority Target for KISC.



Bushy Beardgrass (*Schizachyrium condensatum*)

- Tufted grass native to Central and South America, introduction history unknown.
- Produces many seeds, spread by wind and humans. Promotes and fuels wildfires.
- Priority Target for OISC.



Rubber Vine (*Cryptostegia grandiflora*)

- Climbing woody shrub native to Madagascar, introduced and still sold as an ornamental.
- Produces many seeds that are spread by wind.
- Moist forests at risk.
- Priority Target for MISC. Large infestation of *C. madagascariensis* on Molokai cannot be controlled by MoMISC with current resources.



Ivy Gourd (*Coccinia grandis*)

- Vine native to tropical Asia, introduced as a food crop.
- Produces many seeds that are bird dispersed; spreads vegetatively.
- Potential range is unknown.
- Priority Target for KISC, MISC.



Cattail (*Typha latifolia*)

- Wetland rush native to North America, North Africa and Eurasia, introduction history unknown.
- Reproduces and spreads vegetatively and by wind-dispersed seeds.
- Potential range is all low elevation wetlands.
- Priority Target for KISC.



Australian Tree Fern (*Cyathea cooperi*)

- Large tree fern up to 40 feet, native to Australia. Introduced and still sold as an ornamental
- Produces many lightweight spores that are spread long distance by wind.
- Priority Target for MoMISC.



Veiled Chameleon (*Chamaeleo calyptratus*)

- Large chameleon, up to 24 inches. Native to Yemen, illegal introduction for the pet trade.
- Spread intentionally by humans.
- Priority Target for MISC.



Little Fire Ant (*Wasmannia auropunctata*)

- Small, slow moving red ant native to Central and South America, accidental introduction via infested plants.
- Spreads in infected nursery materials, particularly palms.
- Priority Target BIISC, KISC.



Coqui Frog (*Eleutherodactylus coqui*)

- Native to Puerto Rico, accidental introduction via infested plants.
- Spreads in infected nursery materials.
- Priority Target for BIISC, KISC, MISC, OISC, although resources to control this pest have not kept pace with its spread.

Acknowledgements

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