Island-based Partnerships & Statewide Coordination to Protect Hawaii
Hawaii’s Biosecurity—Safeguarding Hawaii from Invasive Pest Species

Invasive alien pests pose a constant and costly threat to Hawaii’s native ecosystems, ecosystem functions, biodiversity, watersheds, tourism- and agriculture-industries, public health, and the quality of life of residents and visitors. Over the years, state and federal programs have arisen piecemeal to address specific pest concerns, resulting today in an array of programs with limited scope and lacking in comprehensive coordination. The development of a comprehensive program to address invasive species requires acknowledgement of the numerous gaps in agency authorities and policies, the commitment of leaders to fix the system, and securing funding that will allow these programs to succeed.

A comprehensive protection program consists of the following measures:

1. **Prevention:** The most cost-effective and effective measure for protecting Hawaii. This should include adequate laws preventing importation of pests, adequate and enforceable punishments; adequate inspection protocol at all ports of entry; clear and non-conflicting agency mandates and jurisdictions.

2. **Early Detection and Rapid Response:** Even with the best prevention systems, pests will get through. There needs to be clear mandates and set protocols for monitoring, early detection and rapid response around ports of entry, including response to pests in the environment while still incipient.

3. **Ongoing control of existing pests:** Management of established, widespread pests is needed.

Some headway has been made in the past ten years to forge partnerships between agencies, organizations, and businesses in an effort to close the gaps in the system. The Coordinating Group on Alien Pest Species (CGAPS), a partnership of government agencies and non-government organizations, has been working since 1994 to address policy and funding gaps as they relate to prevention and rapid response. CGAPS works to bring about policy change to prevent new invasive pests from entering the state and helps coordinate funding for early detection and rapid response capabilities, primarily via the Invasive Species Committees of Hawaii.

This report focuses on some of the major achievements of the Invasive Species Committees as they function as rapid response crews on each island.

**Island-based Partnerships**

The Invasive Species Committees of Hawaii (ISCs) are island-based partnerships of government agencies, non-government organizations and private businesses working to protect each island from the most threatening invasive pests.

The ISCs were formed to address the need for rapid response and control work on new invasive pests that have the potential to severely impact the economy, ecosystem, watersheds, human health and quality of life. A driving objective of the ISCs is to
control the most threatening pests while populations are still relatively small and it is economically feasible to control or eliminate them.

ISCs write annual action plans to address their island’s priority target species, pest species that were evaluated and ranked to determine their level of threat and potential for control given limited monetary resources. ISC members meet regularly to coordinate actions and resources, and to track progress on species and issues. Each ISC has a field crew that carries out the action plan by mapping, controlling and monitoring their priority target species.

**Formation of the ISCs**

The Maui Invasive Species Committee was the first ISC to form, evolving in 1998 from an informal partnership called the Melastome Action Committee, which coalesced in 1991 after *Miconia* was found in Hawaii. After years of working together to address the unusually aggressive plants in the Melastome family (including *Miconia*, *Clidemia* and *Tibouchina*), it became clear to partners that there was no clear agency mandate for rapid response and control work for the wide variety of pest plants and animals flowing into the state, and no funding to carry out this important function. Furthermore, it was clear that some pests like *Miconia* were not receiving an adequate level of effort or resources. MISC wrote its’ first action plan, selected its priority target species, and secured the first of several successful grants in 1998, enabling them to hire a project coordinator, field crew and education specialist in the fall of 1999.

Other islands soon followed suit, with the evolution of the Big Island Melastome Action Committee to the Big Island Invasive Species Committee (BIISC) in 1999, the Oahu Invasive Species Committee (OISC) in 2000, the Molokai subcommittee of MISC (MoMISC), and the Kauai Invasive Species Committee (KISC) in 2001. The ISCs are in varying stages of development. Some, like KISC and OISC are in the start-up phase, purchasing or acquiring vehicles, equipment, office and baseyard space, while others are refining their structure and procedures.

Each island ISC has a different mix of agencies, organizations, businesses, interest groups and individuals that have come together in a grassroots effort to protect Hawaii from invasive pests. The ISCs have not only impacted statewide conservation efforts, but have been featured as a model for national and world efforts for addressing invasive species issues.

**Funding**

The collective funding for the ISCs is approximately $1.5 million per year. Support for ISC activities has been through grants and other soft-money sources. One steady source of funds has been through the DLNR line item, LNR 402, though which close to $400,000 has been passed each year since 2000. Other sources of funding are through the US Forest Service-Forest Stewardship Program, the US Fish and Wildlife Service, individual Counties, and the Hawaii Community Foundation Natural Resources Conservation Program. Individual ISCs have also been able to secure grants through the National Fish and Wildlife Foundation *Pulling Together Initiative*. The ISCs receive
tremendous support through its members, in the form of equipment loans and other in-kind services.

**Rapid Response, Control and Monitoring**

ISCs focus their activities in 4 areas:
1. On-the-ground control, containment or eradication of targeted invasive alien species.
2. Recognition of and preparation for rapid response to control new incipient alien species not yet present.
3. Education of community members, legislators, and businesses about invasive species.
4. Support of statewide efforts by other ISCs and CGAPS to affect changes in policies related to invasive species (e.g. plant importation screening, revision of state Noxious Weed List).

Most species that the ISCs work on are considered incipient—they are present in such small numbers and in limited locations that there is the potential for “eradication”, at least until it is brought in again. However, some ISCs are dealing with large, established populations of species like *Miconia* and coqui frogs, populations that are considered not eradicable, but require control due to the potential range and damage these species could do if left unchecked. For example, *Miconia* on Maui and the Big Island are being managed by mapping all individuals and controlling mature, peripheral locations first in an effort to keep it from spreading. This concept is similar to the practice of fighting a fire from the outside towards the center, and battling small new fires outside the core to keep the problem from establishing new strongholds. At current funding levels eradication is not possible on the Big Island, and there are questions about this possibility on Maui, therefore the immediate goal is containment until adequate funding is found.

For more information on the statewide effort to control *Miconia*, see Table 6 on pg. 24.

Species are selected as targets by each committee, using the best available information on species distribution and abundance, biological and environmental information about the species, its potential range and the potential for control or eradication given limited resources. Targets are reevaluated periodically to assess the possibility of control given new information.

**Public Outreach and Education**

MISC hired a Public Relations and Education Specialist in December 1999 to assist in gaining landowner permission for the field crew and to raise awareness of invasive species issues. MISC’s media campaign is conducted through booths at community events, classroom visits, public presentations, press releases, pest alerts, and other forms of outreach.

In September 2002 the ISCs and CGAPS pulled together to hire a central Public Information Officer. The primary goal of the PIO is to educate the public, public officials and special interest groups such as the landscape and nursery industry about invasive species issues in order to effect a change in perception, actions, or funding for invasive species issues. Success in reaching this goal will be seen by a change in public awareness or perception of the issue; an increase or change in the actions of people in
regards to invasive species; or an increase in funding for invasive species programs in the state.

The secondary goal is to promote CGAPS and the ISCs as viable solutions that aid in the battle against invasive pests in an effort to build awareness and support for these initiatives. Success in reaching this goal will be seen by increased media exposure of CGAPS and the ISCs and the services they provide.

Since September, a number of press releases have been sent to news organizations about invasives, television news events and a public meeting was held to relay the status of *Miconia*, brown treessnakes (*Boiga irregularis*), red imported fire ants (*Solenopsis invicta*), West Nile Virus, invasive algae, and other pests. Additionally, articles written by the PIO and the MISC Public Relations and Education Specialist continue to appear in green industry trade journals and newspapers to raise awareness of invasive species.

**Contact Information**

**CGAPS**
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Paia, HI 96779  
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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 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 8 or more years.
- Potential range is all wet and mesic forests to 6000 ft. elevation.
- Priority Target for BIISC, KISC, MISC, OISC.

![Miconia calvescens](image)

**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.
- Potential range is all dry and mesic forests.
- Priority Target for KISC, MISC, OISC.

![Fountain Grass](image)

**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.
- Potential range is all mesic and wet forests.
- Priority Target for KISC, MISC, MoMISC, OISC.

![Pampas Grass](image)
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, OISC.

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.

Bushy Beardgrass (*Schizachyrium condensatum*)
- Tufted grass native to Central and South America, introduction history unknown.
- Produces many seeds, spread by wind and humans.
- Priority Target for OISC.

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.
Cat’s Claw (*Caesalpinia decapetala*)
- Sprawling shrub native to Tropical Asia, introduced for agriculture and ornamental.
- Produces many seeds per year, dispersed by birds, rats and humans.
- Potential range is mesic lowland forests.
- Priority Target for MoMISC.

Little Fire Ant (*Wasmannia auropunctata*)
- 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, MoMISC, OISC.

Veiled Chameleon (*Chamaeleo calyptratus*)
- Native to Yemen, illegal introduction for the pet trade.
- Spread by humans.
- Priority Target for MISC.
Results
The ISCs use hand-held GPS (global positioning system) units to record species locations and data in the field. These data are downloaded into databases to produce maps using Arc View mapping software. The collection of data allows the ISCs to track by species, the acres covered by ground and by air, locations of individual plants or populations, biological information such as the size class or reproductive status of the plant, and the amount of herbicide used to control it. The database and mapping products allow managers to effectively plan weekly-control objectives, and to schedule long-term monitoring and follow-up control work of previously treated plants.

The results are listed by island for State Fiscal Year 2002 and the first half of FY 2003 (7/1/2001-12/31/2002), and a statewide Miconia control report follows.

Big Island Invasive Species Committee
BIISC Members
Hawaii Volcanoes National Park, U.S. Geological Survey-Biological Resources Division, US Department of Agriculture-Forest Service (USFS), US Fish and Wildlife Service, Hawaii Army National Guard, Hawaii Department of Land and Natural Resources-Division of Forestry and Wildlife, Hawaii Department of Agriculture (HDOA), University of Hawaii-College of Tropical Agriculture and Human Resources, UH Department of Botany, UH Pacific Cooperative Studies Unit, The Nature Conservancy of Hawaii, and Kamehameha Schools. Additional participation is received from the Hawaii County Farm Bureau.

BIISC Priority Target Species
The Big Island Invasive Species Committee has the largest land area to care for, and the largest infestations of Miconia (Miconia calvescens), fountain grass (Pennisetum setaceum), coqui frogs (Eleutherodactylus coqui), and little fire ants (Wasmannia auropunctata). In many cases, these species have spread beyond the possibility of eradication, and in the case of fountain grass, control measures are focused on management actions that directly protect endangered or rare species or special management areas. BIISC has a crew of seven field staff, a data specialist and a coordinator.

Miconia is BIISC’s top priority species and it is estimated that 111,000 acres need to be searched by field crews every two years. This acreage is calculated by drawing 1 km rings around seeding Miconia trees and 0.5-kilometer rings around immature trees. BIISC’s objective at current funding is to slow the spread of this tree in an effort to contain it and keep it from reaching higher elevations where it would invade high-quality native forests such as Hawaii Volcanoes National Park.

The establishment of the Emergency Environmental Work Force (EEWF) had a tremendous impact on BIISC’s ability to conduct control work on Miconia. BIISC-Hilo went from a crew of 7 persons to a crew of 90 for three months. During that time, the
crew destroyed 337,382 *Miconia* over 6340 acres. The total number of *Miconia* controlled between July 1, 2001 – Dec. 31, 2002 was 383,185 plants.

BIISC has also provided assistance to HDOA in surveying for and treating populations of little fire ants (*Wasmannia auropunctata*) over 39 acres. There are currently 21 known infestations totaling over 84 acres. Original sites appear to be infested nurseries, with infestations spreading outwards, and new locations in residential areas resulting from plant movement.

On the Kona side, BIISC provided supervision for an EEWF crew working to remove pickleweed (*Batis maritima*) from Kaloko-Honokohau National Historic Site, a Hawaiian fishpond that is used by endangered Hawaiian stilts as a nest and forage site. The crew also cleared fountain grass (*Pennisetum setaceum*), and other weeds from 6.33 acres in an area identified by the National Park Service (NPS) as a priority for invasive plant control. The clearing of the area revealed previously unknown petroglyphs, graves, and an ancient trail system.

BIISC supervised a second crew in North Kona that cleared a 13-mile long, 50 feet wide swath of fountain grass to establish a network of fuel breaks. The fuel break protects 70 acres of dryland forest, 750 acres of endangered plant habitat in Pu‘uwa‘awa‘a, and 40,000 acres of DLNR Game Management Area in Pu‘uanahulu from wildfires starting along the highway. DLNR’s cost of maintaining fuel breaks due to fountain grass is over $500,000 per year.

Other work conducted by BIISC included controlling incipient plant pests like the plume poppy (*Bocconia frutescens*), a plant that is believed to be an escaped ornamental. Plume poppy is infesting dry forests, one of the most critically endangered ecosystems in Hawaii. BIISC worked to clear 140 acres of approximately 300 plants.
Map 1: BIISC Target Species Distribution

Photo 1, 2: BIISC field crewmember Jenn Randall prepares to rappel to a *Miconia* area (left). Part of the EEWF crew working with BIISC (right).
Table 1: BIISC Priority Target Species

<table>
<thead>
<tr>
<th>Type</th>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Acres FY 02</th>
<th>FY 03 (7/02-12/02)</th>
<th>Individuals Controlled FY 02</th>
<th>FY 03 (7/02-12/02)</th>
<th>Total Individuals Controlled 7/1/01-12/31/02</th>
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<tbody>
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<td>Plants</td>
<td>Acacia mearnsii</td>
<td>black wattle</td>
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<td>0</td>
<td>200</td>
<td>0</td>
<td>200</td>
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<tr>
<td></td>
<td>Bocconia frutescens</td>
<td>plume poppy</td>
<td>140</td>
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<td>300</td>
<td>0</td>
<td>300</td>
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<td>Batis maritima</td>
<td>pickleweed</td>
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<td>N/A</td>
<td>N/A</td>
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<td>Cytisus palmensis</td>
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<td>3</td>
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<td>3</td>
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<td>449</td>
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<td></td>
<td>Miconia calvescens</td>
<td>Miconia</td>
<td>17,877.1</td>
<td>9393.9</td>
<td>361,717</td>
<td>21,468</td>
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<td>N/A</td>
<td>N/A</td>
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<td>100</td>
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<td></td>
<td>Wasmannia auropunctata</td>
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<td>26</td>
<td>13</td>
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<td>N/A</td>
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<td>27,555.9</td>
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N/A: Not applicable. The data category is not usable for the situation or species. Acres: species cannot be measure by acres; Individuals controlled: unable to count number of individuals controlled.
C/O: Individuals controlled by agency/individual other than the ISC.
N/P: Species not known to be present on the island, monitoring will continue.
N/T: Species not on the Priority Target list at this time.
Kauai Invasive Species Committee

KISC Members

KISC Priority Target Species
The Kauai Invasive Species Committee is the newest ISC. KISC hired a coordinator in April 2002 and a second staff person soon after. Both KISC staff were from the Emergency Environmental Workforce working with the Kokee Resource Conservation Program, and received extensive training prior to being hired at KISC. Work acreages and numbers reflect the hours of survey time needed to assess the status of species for consideration as priority targets. As with all the ISCs, there is extensive survey work conducted to determine the extent of the species before, during and after control work.

*Miconia* is the top priority target for KISC. Control of *Miconia* on Kauai began in the mid 1990’s after plants were reported in the Wailua Homesteads area, which had spread from a single plant imported by a nearby nursery. HDOA and DLNR-Division of Forestry and Wildlife (DOFAW) 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 division reported that *Miconia* was spreading. DOFAW, assisted by the volunteers and staff of the Kokee Resource Conservation Program, resumed systematic searches of the area. In 2002 KISC assumed responsibility for surveying, mapping and controlling *Miconia*. With assistance from these partners and volunteers, KISC has since found 12 *Miconia* plants, one of which was mature and seeding. It is thought that approximately 2000 acres around known seed banks need to be searched by field crews every 2-3 years. KISC will begin aerial survey work for *Miconia* and other species once safety training is complete.

KISC has also helped stem the spread of long-thorn kiawe (*Prosopis juliflora*) along the coast, where it is blocking beach access and hybridizing with the short-thorn kiawe. In addition, KISC worked to control waterway-clogging giant reeds (*Arundo donax*) and cattails (*Typha latifolia*) in wetlands and drainages.
KISC staff maintains a watch over imported plants at retailers like Kmart and Wal-Mart to reduce the possibility of coqui infesting Kauai through these pathways. KISC also assists HDOA in monitoring the previously treated little fire ant site in Kalihiwai, and the infestation of greenhouse frogs (*Eleutherodactylus planirostris*).

Map 2: KISC Target Species Distribution

Photo 3, 4: KISC field crewmember Sarah Newton uses a tube to capture a coqui frog (left). KISC with partner agencies and members of the EEWF work on long-thorn kiawe.
Table 2: KISC Priority Target Species

<table>
<thead>
<tr>
<th>Type</th>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Acres FY 02</th>
<th>Acres FY 03</th>
<th>Individuals Controlled FY 02</th>
<th>Individuals Controlled FY 03</th>
<th>Total Individuals Controlled 4/1/02-12/31/02</th>
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<tbody>
<tr>
<td>Plants</td>
<td>Arundo donax</td>
<td>giant reed</td>
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<td>.7</td>
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<td>1938</td>
<td>1938</td>
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<tr>
<td></td>
<td>Coccinia grandis</td>
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<td>60</td>
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<tr>
<td></td>
<td>Cortaderia sp.</td>
<td>pampas grass</td>
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<td>11</td>
<td>N/T</td>
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<td>400</td>
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<td>12</td>
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<tr>
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<td>C/O</td>
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<td>N/A</td>
<td>C/O</td>
<td>C/O</td>
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</tr>
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</table>

Sub-Total | 448.8 | 617.6 | 18 | 3226 | 3244 |

KISC Total | 1066.4 | 3244 |

N/A: Not applicable. The data category is not usable for the situation or species. Acres: species cannot be measure by acres; Individuals controlled: unable to count number of individuals controlled.

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N/P: Species not known to be present on the island, monitoring will continue.

N/T: Species not on the Priority Target list at this time.
Maui Invasive Species Committee
MISC Members

MISC Priority Target Species
MISC is the oldest ISC, with staff first hired in September 1999. MISC receives over half of its funding from Maui County and has ten full time staff, including a public relations and education specialist, a GIS database specialist, a field operations manager and an administrative specialist.

MISC’s top priority target species is Miconia, which was introduced as an ornamental to nurseries in Hana, Nahiku and Keanae in the late 1960’s. It was discovered spreading in Hana in 1988 and immediate efforts to contain it with volunteers looked promising until large stands of Miconia were was spotted above Hana in 1993. A 5-person crew supervised by DOFAW was assigned to clean the 2,000 acres of the known infestation, but it had already spread beyond these boundaries by the time MISC was able to hire a field crew in November 1999.

MISC has mapped all known Miconia plants and infestations, and surveyed likely habitats for more. The estimated number of acres that require searching every 2-3 years is 25,000 acres, including a 1-kilometer buffer zone around all seeding trees, and a half-kilometer buffer around immature trees. This information was relayed to officials at Haleakala National Park and National Park Service, which prompted unprecedented assistance from Haleakala National Park and NPS-Pacific Islands Exotic Plant Management Team (PIEPM). MISC field crews now work alongside the NPS Pacific Islands Exotic Plant Management Team to control Miconia.

MISC also received a boost in labor from the Emergency Environmental Work Force, which supported 12 additional field crew members. Between January and May 2002, they surveyed over 2000 acres and eliminated 244,920 Miconia including 1985 that were fruiting/flowering.

MISC’s rapid response to incipient invaders like downy rose myrtle (Rhodomyrtus tomentosa) has been successful. Three populations of this plant were seen by USGS-
Biological Resources Division staff and reported to MISC. Public outreach to homeowners and property owners garnered support for the removal of this species, and all 150 known plants were controlled. Similar rapid response efforts were conducted on ruby saltbush (*Enchylaena tomentosa*) at Kanaha Pond Wildlife Sanctuary, Jerusalem thorn (*Parkinsonia aculeata*) on DLNR land, and Indian rhododendron (*Melastoma septemnervium*) on private property. Monitoring for regrowth and new locations of these species is ongoing.

In May 2002 MISC received a report of a dead veiled chameleon (*Chamaeleo calyptratus*) found on agricultural land. Media attention by MISC resulted in the report and recovery of and two live veiled chameleons in a residential area. Since December 2002, subsequent surveys by MISC in cooperation with HDOA and DOFAW have revealed that this species has been newly established, and periodic surveys continue in an effort to control them before they spread.

MISC has also received reports of snake sightings, and has provided the necessary manpower to conduct searches.

Map 3: MISC Target Species Distribution
Table 3: MISC Priority Target Species

<table>
<thead>
<tr>
<th>Type</th>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Acres FY 02</th>
<th>FY 03 (7/02-12/02)</th>
<th>Individuals Controlled FY 02</th>
<th>FY 03 (7/02-12/02)</th>
<th>Total Individuals Controlled 7/1/01-12/31/02</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plants</td>
<td><em>Enchylaena tomentosa</em></td>
<td>ruby saltbush/Australian chenopodium</td>
<td>.002</td>
<td>N/P</td>
<td>30</td>
<td>N/P</td>
<td>30</td>
</tr>
<tr>
<td>Plants</td>
<td><em>Arundo donax</em></td>
<td>giant reed</td>
<td>.4</td>
<td>1.5</td>
<td>690</td>
<td>220</td>
<td>910</td>
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<tr>
<td>Plants</td>
<td><em>Coccinia grandis</em></td>
<td>ivy gourd</td>
<td>163.5</td>
<td>84.5</td>
<td>4021</td>
<td>4212</td>
<td>8233</td>
</tr>
<tr>
<td>Plants</td>
<td><em>Cortaderia sp.</em></td>
<td>pampas grass</td>
<td>24,444.8</td>
<td>19,924.7</td>
<td>1690</td>
<td>1127</td>
<td>2817</td>
</tr>
<tr>
<td>Plants</td>
<td><em>Cryptostegia sp.</em></td>
<td>rubber vine</td>
<td>.9</td>
<td>.7</td>
<td>20</td>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>Plants</td>
<td><em>Melastoma septemnervium</em></td>
<td>Indian rhododendron</td>
<td>N/P</td>
<td>0</td>
<td>N/P</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Plants</td>
<td><em>Miconia calvescens</em></td>
<td>Miconia</td>
<td>15,991.8</td>
<td>8059.4</td>
<td>247,739</td>
<td>4711</td>
<td>252,450</td>
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<tr>
<td>Plants</td>
<td><em>Parkinsonia aculeata</em></td>
<td>Jerusalem thorn</td>
<td>.1</td>
<td>N/P</td>
<td>17</td>
<td>N/P</td>
<td>17</td>
</tr>
<tr>
<td>Plants</td>
<td><em>Pennisetum setaceum</em></td>
<td>fountain grass</td>
<td>8017.3</td>
<td>229.4</td>
<td>271</td>
<td>387</td>
<td>658</td>
</tr>
<tr>
<td>Plants</td>
<td><em>Rhodomyrtus tomentosa</em></td>
<td>downy rose myrtle</td>
<td>0</td>
<td>2.2</td>
<td>0</td>
<td>152</td>
<td>152</td>
</tr>
<tr>
<td>Animals</td>
<td><em>Chameleo calyptratus</em></td>
<td>veiled chameleon</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Animals</td>
<td><em>Eleutherodactylus coqui</em></td>
<td>coqui frog</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Animals</td>
<td><em>Class: Reptilia Order: squamata Suborder Serpentes</em></td>
<td>snakes</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sub-Total</td>
<td>48,621.8</td>
<td>28,309.4</td>
<td>254,480</td>
<td>10,813</td>
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<td></td>
<td><strong>MISC Total</strong></td>
<td></td>
<td><strong>76,931.2</strong></td>
<td></td>
<td></td>
<td><strong>265,293</strong></td>
<td></td>
</tr>
</tbody>
</table>

N/A: Not applicable. The data category is not usable for the situation or species. Acres: species cannot be measure by acres; Individuals controlled: unable to count number of individuals controlled.

C/O: Individuals controlled by agency/individual other than the ISC.

N/P: Species not known to be present on the island, monitoring will continue.

N/T: Species not on the Priority Target list at this time.
MoMISC Members

MoMISC Priority Target Species
MoMISC hired one part time field staff in March 2002 and continues to rely heavily on volunteer support and in-kind services from partners like The Nature Conservancy-Hawaii and DOFAW Maui County.

MoMISC’s top priority target is cat’s claw (*Caesalpinia decapetala*), due to the absence of established *Miconia*, fountain grass and coqui frogs. MoMISC works closely with staff of The Nature Conservancy-Hawaii and volunteers to monitor for these and other pests. Reports of *Miconia* in Wailau Valley have been investigated by MoMISC. Residents and MoMISC members have not found *Miconia*, although large expanses of the alien invasive Koster’s curse (*Clidemia hirta*) are present. All reports have been misidentifications of Koster’s curse.

Cat’s claw is a thorny shrub that was introduced to the islands before 1910 as a biological pasture fence, similar to gorse. MoMISC surveyed and mapped three relatively small areas of cat’s claw on Molokai, and has controlled 6556 plants to date.

MoMISC, with partners DOFAW and TNC, surveyed and controlled the only known populations of New Zealand flax (*Phormium tenax*) on Molokai, in the Molokai Forest Reserve and Puu Kolekole, areas dense with native species. MoMISC was also responsible for alerting property owners to the presence of pampas grass (*Cortaderia sp.*), which was subsequently controlled by the landowner.

As a rapid response crew, MoMISC was alerted to the presence of a single calling coqui frog in a nursery. MoMISC staff responded and captured the frog. MoMISC also documented the arrival of a gold dust day gecko (*Phelsuma laticauda*) aboard an interisland barge, and subsequently confirmed that the species was already established in some areas of Molokai.
Map 4: MoMISC Target Species Distribution

Photo 5, 6: MISC field crew leader Jamie Bruch uses a pole to capture a veiled chameleon while Teya Penniman and Erik Barnard look on (left). MoMISC staff Lori Buchanan and Chair Tina Lau prep herbicides for spot-spraying of cat’s claw (right).
Table 4: MoMISC Priority Target Species

<table>
<thead>
<tr>
<th>Type</th>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Acres</th>
<th>Individuals Controlled</th>
<th>Total Individuals Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>FY 02</td>
<td>FY 03 (7/02-12/02)</td>
<td>FY 02 (7/02-12/02)</td>
</tr>
<tr>
<td>Plants</td>
<td>Arundo donax</td>
<td>giant reed</td>
<td>0</td>
<td>1.7</td>
<td>0 N/A</td>
</tr>
<tr>
<td></td>
<td>Caesalpinia decapetala</td>
<td>cat’s claw</td>
<td>120</td>
<td>53.6</td>
<td>3627 2929</td>
</tr>
<tr>
<td></td>
<td>Cortaderia sp.</td>
<td>pampas grass</td>
<td>2</td>
<td>2</td>
<td>C/O N/P</td>
</tr>
<tr>
<td></td>
<td>Miconia calvescens</td>
<td>Miconia</td>
<td>4.7</td>
<td>N/P</td>
<td>N/P N/P</td>
</tr>
<tr>
<td></td>
<td>Pennisetum setaceum</td>
<td>fountain grass</td>
<td>N/P</td>
<td>N/P</td>
<td>N/P N/P</td>
</tr>
<tr>
<td></td>
<td>Pereskia aculeata</td>
<td>Barbados gooseberry</td>
<td>1.2</td>
<td>1</td>
<td>0 0</td>
</tr>
<tr>
<td></td>
<td>Phormium tenax</td>
<td>New Zealand flax</td>
<td>0</td>
<td>.6</td>
<td>0 1826 1826</td>
</tr>
<tr>
<td></td>
<td>Ulex europaeus</td>
<td>gorse</td>
<td>0</td>
<td>5.6</td>
<td>0 24 24</td>
</tr>
<tr>
<td>Animals</td>
<td>Eleutherodactylus coqui</td>
<td>coqui frog</td>
<td>N/A</td>
<td>N/A</td>
<td>1 N/P 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sub-Total</td>
<td>127.9</td>
<td>3628 4779</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>MoMISC Total</td>
<td>190.7</td>
<td>8407</td>
</tr>
</tbody>
</table>

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Oahu Invasive Species Committee

OISC Members

OISC Priority Target Species
OISC evolved from the Fountain Grass Working Group in August 2000, hired a coordinator in January 2001 and is currently operating with five staff.

OISC’s top priority target is Miconia. Since July 2001 OISC has covered over 2429 acres and eliminated 3358 Miconia plants, 37 of which were seeding. Approximately 6000 acres need to be searched every 2-3 years, an area that includes half kilometer buffer zones around non-seeding Miconia and one kilometer around mature trees.

OISC has also conducted extensive survey and control work on Himalayan blackberry (Rubus discolor), treating more than 2,400 plants over 70 acres.

Bushy beardgrass (Schizachrium condensatum) was spotted growing next to H-3 and reported by OISC partners. This fire-promoting grass has invaded Hawaii Volcanoes National Park and other sensitive areas, and requires intensive control work. OISC has covered over 50 acres controlling this plant and the work is ongoing.

Fountain grass (Pennisetum setaceum) is OISC’s fourth priority target. There are 14 known populations of fountain grass on Oahu, including major infestations at Diamond Head and Punchbowl craters and in Lanikai. OISC has controlled close to 19,000 fountain grass plants over 504 acres.

Survey, monitor and control work for other species such as hiptage (Hiptage bengalensis), fire tree (Morella faya), manuka (Leptospermum sp.), and long thorn kiawe (Prosopis juliflora) are conducted with assistance from volunteers and partner agencies.

Coqui frog work is focused on reducing the spread of this species by targeting garden shops and new, small populations. With the help of OISC, a large garden retailer was able to treat an infested area with citric acid and eliminate the population.
Map 5: OISC Target Species Distribution

Photo 7, 8: OISC field staff work with the Sierra Club to run *Miconia* service trips with volunteers, most of which are from the Hawaii Trail and Mountain Club (left). OISC crew members Ryan Smith and Meghan Halabisky participate in plant sales and community events to educate people about invasive species (right).
Table 5: OISC Priority Target Species

<table>
<thead>
<tr>
<th>Type</th>
<th>Scientific Name</th>
<th>Common Name</th>
<th>Acres</th>
<th>Individuals Controlled</th>
<th>Total Individuals Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>FY 02</td>
<td>FY 03</td>
<td>FY 02 FY 03 (7/02-12/02)</td>
</tr>
<tr>
<td>Plants</td>
<td>Cinchona pubescens</td>
<td>quinine tree</td>
<td>0</td>
<td>53.4</td>
<td>0 0 0</td>
</tr>
<tr>
<td></td>
<td>Hiptage benghalensis</td>
<td>hiptage</td>
<td>N/T</td>
<td>5.5</td>
<td>N/T 100 100</td>
</tr>
<tr>
<td></td>
<td>Leptospermum sp.</td>
<td>manuka</td>
<td>45</td>
<td>165.1</td>
<td>500 3859 4359</td>
</tr>
<tr>
<td></td>
<td>Melastoma septemervium</td>
<td>Indian rhododendron</td>
<td>0</td>
<td>7</td>
<td>0 0 0</td>
</tr>
<tr>
<td></td>
<td>Miconia calvescens</td>
<td>Miconia</td>
<td>1639</td>
<td>790.3</td>
<td>3070 288 3358</td>
</tr>
<tr>
<td></td>
<td>Morella faya</td>
<td>fire tree</td>
<td>0</td>
<td>40.8</td>
<td>0 223 233</td>
</tr>
<tr>
<td></td>
<td>Pennisetum setaceum</td>
<td>fountain grass</td>
<td>155</td>
<td>349.7</td>
<td>9142 9779 18,921</td>
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<tr>
<td></td>
<td>Prosopis juliflora</td>
<td>long-thorn kiawe</td>
<td>1.6</td>
<td>0</td>
<td>649 0 649</td>
</tr>
<tr>
<td></td>
<td>Rhodomyrtus tomentosa</td>
<td>downy rose myrtle</td>
<td>0</td>
<td>2.7</td>
<td>0 100 100</td>
</tr>
<tr>
<td></td>
<td>Rubus discolor</td>
<td>Himalayan blackberry</td>
<td>20</td>
<td>45.9</td>
<td>500 1904 2404</td>
</tr>
<tr>
<td></td>
<td>Schizachyrium condensatum</td>
<td>bushy beardgrass</td>
<td>N/T</td>
<td>50.8</td>
<td>N/T 1606 1606</td>
</tr>
<tr>
<td></td>
<td>Tibouchina urvilleana</td>
<td>glorybush</td>
<td>N/T</td>
<td>9.1</td>
<td>N/T 20 20</td>
</tr>
<tr>
<td>Animals</td>
<td>Eleutherodactylus coqui</td>
<td>coqui frog</td>
<td>N/A</td>
<td>N/A</td>
<td>283 195 478</td>
</tr>
<tr>
<td></td>
<td>Sub-Total</td>
<td></td>
<td>1860.6</td>
<td>1520.3</td>
<td>14,144 18,084 32,228</td>
</tr>
</tbody>
</table>

OISC Total | 3380.9 | 32,228 |

N/A: Not applicable. The data category is not usable for the situation or species. Acres: species cannot be measure by acres; Individuals controlled: unable to count number of individuals controlled.
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Table 6: Statewide Control Report for *Miconia calvescens*


<table>
<thead>
<tr>
<th>Invasive Species Committee</th>
<th>Method</th>
<th>Acres FY 02 (7/02-12/02)</th>
<th>FY 03 (7/02-12/02)</th>
<th>Immature FY 02 FY 03 (7/02-12/02)</th>
<th>Mature FY 02 FY 03 (7/02-12/02)</th>
<th>Total 7/1/01 – 12/31/02</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Big Island</strong></td>
<td>Ground</td>
<td>10,510.1</td>
<td>3275.9</td>
<td>50,370</td>
<td>1186</td>
<td>311,347</td>
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<tr>
<td></td>
<td>Air</td>
<td>7369</td>
<td>6118</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Kauai</strong></td>
<td>Ground</td>
<td>30.5</td>
<td>238.3</td>
<td>0</td>
<td>10</td>
<td>0</td>
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<tr>
<td></td>
<td>Air</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Maui</strong></td>
<td>Ground</td>
<td>1299.2</td>
<td>97.7</td>
<td>245,220</td>
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<td></td>
<td>Air</td>
<td>14,692.6</td>
<td>7961.7</td>
<td>435</td>
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<tr>
<td><strong>Molokai</strong></td>
<td>Ground</td>
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<td>0</td>
<td>N/P</td>
<td>N/P</td>
<td>N/P</td>
</tr>
<tr>
<td></td>
<td>Air</td>
<td>0</td>
<td>0</td>
<td>N/P</td>
<td>N/P</td>
<td>N/P</td>
</tr>
<tr>
<td><strong>Oahu</strong></td>
<td>Ground</td>
<td>447</td>
<td>361.2</td>
<td>3037</td>
<td>284</td>
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<tr>
<td></td>
<td>Air</td>
<td>1192</td>
<td>429.1</td>
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<tr>
<td><strong>Sub-Total</strong></td>
<td></td>
<td>35,545.1</td>
<td>18,481.9</td>
<td>299,062</td>
<td>6052</td>
<td>313,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
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<td>54,027</td>
<td>305,114</td>
<td>333,916</td>
<td>639,040</td>
<td></td>
</tr>
</tbody>
</table>

N/P: Species not known to be present on the island, monitoring will continue.

Acknowledgements

This report was prepared in May 2003 by Christy Martin, Public Information Officer for CGAPS and the ISCs, with contributions from staff and members of each of the ISCs. Maps were produced by Mike Walker, the MISC GIS database specialist. Questions or comments may be directed to CGAPS at (808) 722-0995. Mahalo to all of our partners for your continuing support.