

Title: Detection and Control of Invasive Species in Maui County
Organization: Maui Invasive Species Committee
Award: \$172,248



The Maui Invasive Species Committee is a project of the Pacific Cooperative Studies Unit - University of Hawai'i. HISC funding supported efforts to detect and control invasive plants and animals across the islands of Maui and Lāna'i. Work on Moloka'i was conducted by the Moloka'i Invasive Species Committee as part of the same grant. Work by MoMISC is reported separately.

Strong partnerships and a supportive community were essential to MISC's successes during FY2011. HISC funding was highly leveraged: every state dollar was matched by almost 7 dollars from other sources. Consistent with HRS § 194-2(a)(12), which calls on HISC to support county-sponsored invasive species activities, the County of Maui is a vital MISC partner, providing essential funding and policy support. MISC also received strong support from Haleakalā National Park, the U.S. Forest Service, and U.S. Fish and Wildlife Service, as well as grants from private foundations and contributions from individuals and private businesses.

Work focused on achieving the goals and objectives established by the Strategic Plan of the Hawai'i Invasive Species Council. The MISC Committee, comprised of local resource managers, scientists, and agency representatives, held four meetings to set and review priorities for the control of invasive species in Maui County. Meeting topics focused on early detection/rapid response; outreach; vertebrate species; little fire ant; new technology; and work on Lāna'i and Moloka'i. Staff from partner agencies also worked side-by-side with MISC during pampas grass sweeps, on aerial control missions, and during vertebrate and ant control operations.

HISC Established Pests Working Group: Measures of Effectiveness

Number of species detected and evaluated for feasibility of eradication:

Early detection of incipient invasive species included surveys at nurseries and botanical gardens, delimitation surveys, and ant surveys.

- Surveys were completed by MISC's Early Detection Specialists, Forest and Kim Starr, at six nurseries or botanical gardens. A total of 827 taxa were identified during these surveys. An estimated 37% were considered to be weeds by the Global Compendium of Weeds.
- The Starrs submitted several reports for publication to the Hawai'i Biological Survey - Bishop Museum. For plants, they documented 1 new state record, 2 new island records, 9 range extensions, and 1 new naturalized species. For ants, they documented 9 new island records. New arthropod records were submitted for Kaho'olawe, Lāna'i, Moloka'i, and Maui.
- Delimitation surveys were conducted for four species to determine feasibility of control: *Erica lusitanica*, *Salsola tragus* (West Maui), *Nasella tenuissima*, and *Acacia podalyriifolia*. A single flowering plant of a fifth species, *Rhodomirtus tomentosa*, was discovered and removed on Lāna'i; surveys will be conducted to look for other locations in the same vicinity.



Survey at botanical garden

Number and area of priority invasive species eradicated and/or controlled:

Survey and control work focused on 20 plant species, two vertebrate species (coqui frog (*Eleutherodactylus coqui*) and veiled chameleon (*Chamaeleo calytratus*)), one plant disease (banana bunchy top virus), and the little fire ant (*Wasmannia auropunctata*). A total of 64,221 acres were surveyed and 82,246 invasive plants were removed.

- Field work successfully kept miconia (*Miconia calvescens*) out of the native rainforests of East Maui, made serious headway controlling pampas grass (*Cortaderia jubata* and *C. selloana*) in both East and West Maui Watersheds, and kept coqui frogs from spreading on the island of Maui.



Miconia aerial operations

- Over 33,552 acres were searched for miconia during ground and aerial operations, during which a total of 72,909 plants were removed, including 1,342 mature plants. Staff worked with Dr. James Leary from the University of Hawai'i - College of Tropical Agriculture and Human Resources to test experimental herbicide application techniques for miconia and pampas grass.
- Pampas grass operations covered 20,568 acres. Persistent efforts at the remote Honomanū site saw an 83% decline in the number of mature pampas plants over the last three years. Results from work on pampas grass were presented at the 2010 Hawai'i Conservation Conference.
- Highlights for other plant species included a multi-agency response to discovery of common mullein (*Verbascum thapsus*) near the summit of Haleakalā, and thorough fountain grass surveys centered on a flowering plant discovered at the entrance to the Auwahi dryland forest restoration site.
- Work on Lāna'i focused on two plant species: ivy gourd (*Coccinia grandis*) and fountain grass (*Pennisetum setaceum*). A total of 195 fountain grass plants were removed, including 47 mature plants. Ivy gourd and fountain grass appear to be on target for eventual eradication on Lāna'i.
- No veiled chameleons were detected or turned in during this fiscal year.
- Staff responded to two separate reports of feral rabbits. In one instance, the pet animals were successfully recaptured; at the other site, the landowner removed two rabbits.
- Efforts to control banana bunchy top virus were funded by Maui County. A total of 3,250 sites were surveyed for BBTv, with the disease found at 199 sites. No BBTv has ever been detected during MISC's annual survey of over 300 properties on Lāna'i.



Remote pampas grass work

- The only known population of the little fire ant on Maui has apparently been eradicated by the Hawai'i Department of Agriculture. MISC assisted with survey activities at the site and continued to conduct surveys across the island for the little fire ant. Surveys concentrated on high-risk sites, with special emphasis on businesses that receive shipments from the island of Hawai'i. Staff conducted surveys at 89 sites and taught school children how to conduct surveys as part of MISC's education program. Classroom-based surveys covered an additional 60 sites. Almost 5,500 vials were baited with peanut butter and examined for the presence of the little fire ant, with none detected. Little fire ant surveys will be an ongoing MISC activity because the growing population on Hawai'i Island creates a high risk of re-introduction to Maui.

Prioritization processes identified and in place:

MISC's prioritization process is based on protocols established in New Zealand. It is adaptive, allowing new species to be added during the year if information indicates that immediate action would help prevent costly containment in the future. Staff participated in the statewide Early Detection workshop which was designed to establish a uniform process for adopting incipient species as new targets.

Implementation of the priority response and control actions plans for the coqui frog and West Nile virus:

- MISC surveyed 11 population centers on Maui where coqui have been eradicated and moved another two sites toward eradication status. Three nurseries continue to receive coqui frogs in shipments from the island of Hawai'i, highlighting gaps in our inter-island quarantine system.
- Most coqui work focused on the Māliko Gulch infestation, which now encompasses a 3.5-mile stretch of the gulch. Māliko is the most challenging active control site in the state. Much of the infestation is on state land. MISC's three-pronged control effort consists of high-volume sprinkler stands, a PVC-pipe system with spray valves for fire hoses installed down the center of the gulch, and aerial control, all using a citric acid solution.
- A U.S. Fish and Wildlife Service-funded project is studying the efficacy of MISC's different control strategies in the gulch. MISC helped orient project staff from Utah State University and secured access to the site for the study. A total of 50 monitoring plots have been established.
- Staff also assisted Dr. Francis Benevides in testing sound pressure levels as a possible monitoring tool for coqui frog density estimates.
- Staff conducted surveys at all "Coqui-free" businesses -- those that have met the standards established by MISC's coqui-free certification program. A total of 29 Maui businesses are now participating in the program. A list of coqui-free nurseries can be viewed at: www.coquifreemaui.org.
- No reports were received for dead feral chickens or dead birds. MISC continued to promote public awareness of the issue during outreach events.



Night-time spraying in Māliko Gulch

Number and names of species, habitats, ecosystems, agricultural, and managed areas protected because of control efforts:

- Target species are chosen for the threat posed to Maui County's high-value natural areas or to agricultural production. The island of Maui has 79 federally-listed threatened and endangered

plant species and at least as many additional candidate species and species of concern. The island of Lāna'i has 37 endangered or threatened plant species.

- MISC's work occurs in residential areas where many introduced species first become established, but also involves ground and aerial surveys over remote inaccessible areas of the East and West Maui Watersheds. MISC's work helps protect the unique resources of Haleakalā National Park, the only intact summit-to-the-sea reserve in the State of Hawai'i.
- Work on banana bunchy top virus is protecting both agricultural and domestic production, and also preserves Polynesian varieties that are found on Maui.

Additional HISC Objectives: Accomplishments

Implement improvements to capacity for detection, eradication & control:

- Four temporary positions were filled to assist with work in Māliko Gulch. MISC also hosted three AmeriCorps interns for the summer, two with the Hāna miconia operation and one in Makawao.
- Staff participated in a review of statewide with the other Invasive Species Committees to review and update statewide data standards.
- Staff trainings included: helicopter manager & water-ditching protocols, Hazard Analysis and Critical Control Point management system to prevent vectoring invasive species, and wilderness first aid. Staff also attended a statewide symposium on watersheds and the 2010 Hawai'i Conservation Conference.
- MISC fostered increased capacity on a regional level by hosting Tavita Togia, who is working on invasive species with the National Park Service in American Samoa. As part of the educational campaign on the little fire ant, staff met with the Tahitian Minister and Director of the Ministry of the Environment during a trip to Tahiti.

Support development of management plans for widespread vertebrate pests:

- In concert with the Maui Farm Bureau and Hawaiian Commercial and Sugar Company, MISC helped initiate formation of the *ad hoc* Maui Axis Deer Working Group, comprised of ranchers, farmers, hunters, and agency staff. The goal of the working group is to develop a long-term management plan in response to the growing axis deer population. MISC staff serves in a facilitation capacity and will likely take a leadership role in developing the plan.

Develop capacity to conduct effective coordinated response to all snake sightings:

- The MISC Operations Manager and MISC Vertebrate Crew Leader attended a three-week long brown tree snake training in Guam. This significant commitment of staff resources helped to almost double statewide capacity to respond to snake reports.
- MISC helped organize and participated in a snake training workshop held in August 2010. The workshop was co-sponsored by Maui County, Hawai'i Department of Agriculture, and Hawai'i Department of Land and Natural Resources.



Double-fisted brown tree snakes: Guam

Establish clear agency responsibilities and criteria for rapid response activities:

- MISC developed and lead a workshop focused on identifying gaps in the statewide system for early detection and rapid response.