

Title: Detection and Control of Invasive Species in Maui County

Organization: Moloka'i Invasive Species Committee

Award: (included in Maui County funding)



The Moloka'i Invasive Species Committee (MoMISC) focused on achieving the goals and objectives of the Hawai'i Invasive Species Council's Established Pest Working Group as outlined in the HISC Strategic Plan. Priority targets are chosen by the Moloka'i Committee and the Committee reviews work done on all species. MoMISC held four quarterly meetings throughout FY2011 to set and review priorities for the control of pests on Moloka'i. MoMISC's partners and committee members provide input and in-kind service contributions. The Maui Invasive Species Committee (MISC) provides fiscal and administrative assistance for MoMISC's work.

HISC Established Pests Working Group: Measures of Effectiveness

Number of species detected and evaluated for feasibility of eradication:

Early detection and rapid response for incipient invasive species included roadside surveys, aerial surveys, nursery surveys and investigations of reports from the public.

- Staff inspected nursery plant shipments arriving from the Big Island for coqui frog and little fire ant. During the surveys, any unusual, exotic or known weedy plants were noted to determine whether additional information was needed. With help from the HISC Weed Risk Assessment Specialists, MoMISC intercepted a cinnamon tree (*Cinnamomun verbasum*) and a vanilla vine (*Vanilla planifolia*). Both species are potentially weedy species and are not known to be naturalized on Moloka'i.
- After conducting delimitation surveys and researching the species invasiveness, the Committee added tree daisy (*Montanoa hibiscifolia*) to MoMISC's priority target list.
- MoMISC and The Nature Conservancy contracted with Resource Mapping Hawai'i to fly over 6,000 acres of forested lands to obtain pictures of targeted areas for Australian tree fern. Using a combination of ultra-high-resolution natural color data and hyperspectral imaging, they detected no positive points for Australian tree fern in areas surveyed. Several suspect points were forwarded to MoMISC for review. Ground-truthing of those points were negative and observations were forwarded to Resource Mapping Hawai'i for further assessment. However, the ground-truthing surveys detected some Australian tree ferns that had not been picked up by the remote-sensing survey. The ferns were removed. These efforts are helping to evaluate and refine new approaches to surveys in high-value and inaccessible natural areas.
- Staff responded to a landowner's report of an unusual weed, which was identified as devil's horsewhip (*Achyranthes aspera*). The Committee decided not to target the species because it was determined to be a low priority weed. Instead, the U.S. Department of Agriculture agreed to work with landowner to explore use of Farm Bill monies for control of devil's horsewhip on the property.



MoMISC staff with cinnamon plant

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

Control and eradication efforts were conducted on 20 plant species, two vertebrate species (coqui frog (*Eleutherodactylus coqui*) and green anolis (*Anolis sagrei*)), one plant disease (banana bunchy top virus), one marine invertebrate (mangrove or upside-down jelly fish (*Cassiopea andromeda*)), and one terrestrial invertebrate (little fire ant (*Wasmannia auropunctata*)). The following outlines key accomplishments:

- 10,486 acres were surveyed by air for miconia (*Miconia calvenscens*) over remote forested areas in east Moloka'i. No miconia was detected.
- 731 acres were surveyed for banana bunchy top virus in Kualapu'u and Ho'olehua and 179 plants were treated. Recent surveys indicate the virus is still contained to two districts in north central Moloka'i.
- 66 acres were surveyed for rubber vine (*Cryptostegia madagascariensis*) in Kamalō and 'Ualapu'e and 88 plants were controlled.
- 309 acres were surveyed by ground for Australian tree fern (*Cyathea cooperi*) in Kala'e and 19 plants were controlled. In addition, 6,000 acres were surveyed by Resource Mapping Hawai'i over prioritized areas in north central Moloka'i, with no detections.
- 29 acres were surveyed for albizia (*Falcataria moluccana*) in north central Moloka'i and 5 plants were controlled.
- 41 acres were surveyed for bo tree (*Ficus religiosa*) in central Moloka'i and 5 trees were controlled.
- 111 acres were surveyed for tree daisy (*Montanoa hibiscifolia*) in north central Moloka'i and 528 trees were controlled.
- 27 acres were surveyed for Barbados gooseberry (*Pereskia aculeata*) in Hālawā Valley and 79 plants were controlled.
- 199 acres were surveyed for tumbleweed (*Salsola kali*) in central Moloka'i and 1,363 plants were controlled.
- 291 acres were surveyed for fireweed (*Senecio madagascariensis*) in east and north central Moloka'i and 43 plants were controlled.



Tree daisy: a new MoMISC target

Prioritization processes identified and in place:

The Committee holds quarterly meetings to review progress on priority species. Targets are approved by the Committee after review of a staff report on the feasibility of eradication based on specific prioritization protocols.

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

- MoMISC staff implemented MISC's coqui-free certification program for a newly-opened nursery on Moloka'i. The coqui-free certification project was initially funded by a HISC Research & Technology Grant. Mahana Nursery is the first business on Moloka'i to join 29 other businesses on Maui that are certified as coqui-free. A list of coqui-free nurseries is published on a website maintained by MISC to promote the program: www.coquifreemaui.org.



Surveying a nursery shipment for coqui frogs

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

MoMISC worked to control several species in various habitats, ecosystems and managed areas including marine, wetland, native forest, forested watershed, mesic forest and agricultural lands.

- Reports from the public of stinging jellyfish prompted MoMISC to remove mangrove jellyfish (*Cassiopea andromeda*) from the designated swimming area at the Moloka'i harbor to protect human health.
- MoMISC spearheaded an effort to control several mangroves growing on a breakwall at the Kaunakakai harbor. In addition, 495 mangrove seedlings were pulled from the reef adjacent to the breakwall to deter establishment of mangrove species and protect the fringing reef.
- MoMISC continued to control banana bunchy top virus (BBTV) to keep it from spreading throughout the island. Staff helped to stop the spread of BBTV at a banana farm in central Moloka'i and also protected neighboring farms. Targeting BBTV helps to protect an important agricultural food staple and also preserves the Polynesian varieties that still remain in remote areas on the north shore valleys and cliff sides of Moloka'i.
- Control or eradication of the following species helped protect mesic and rainforests and other forested watersheds: mule's foot fern (*Agiopteris evecta*), cat's claw (*Caesalpinia decapetala*), Australian tree fern (*Cyathea cooperi*), albizia (*Falcataria moluccana*), bo tree (*Ficus religiosa*), woodrose (*Merremia tuberosa*), tree daisy (*Montanoa hibiscifolia*), Barbados gooseberry (*Pereskia aculeata*), New Zealand flax (*Phormium tenax*), rose (*Rosa multiflora*), tumbleweed (*Salsola kali*) and palm grass (*Setaria palmifolia*).
- Control efforts focused on rubber vine (*Cryptostegia madagascariensis*) protected several wetland parcels along the south shore of Moloka'i.
- Removal of all known fireweed plants (*Senecio madagascariensis*) protected pastoral agricultural lands that are important for livestock.

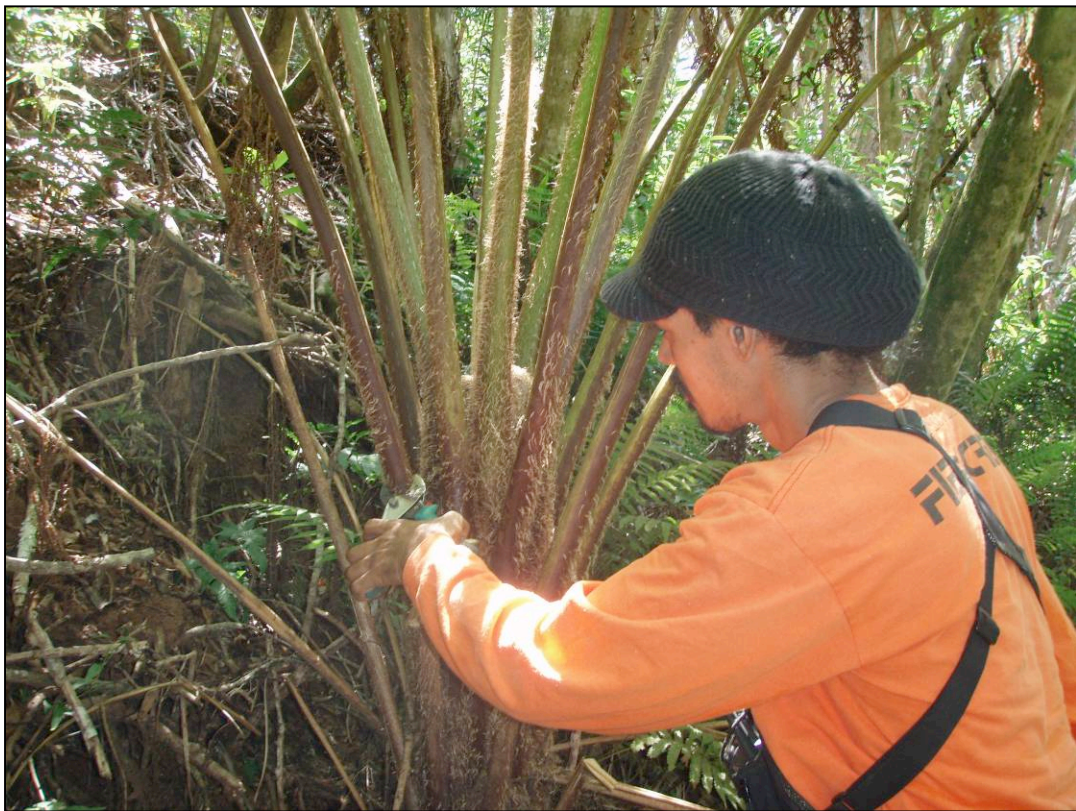
Additional HISC Objectives: Accomplishments:

Implement improvements to capacity for detection, eradication & control:

One additional field staff was hired. Staff capacity was enhanced by attending pesticide certification classes and ArcGIS 10 training. Staff assisted the Hawai'i Department of Agriculture with bee surveys for small hive beetle and varroa mite. MoMISC staff participated in the statewide data workshop for the Invasive Species Committees.

Other:

Partner collaboration: The Nature Conservancy's Technical Information Specialist continued to provide invaluable support to the MoMISC staff concerning data collection and database use. MoMISC is a project of the Pacific Cooperative Studies Unit – University of Hawai'i.



Controlling Australian tree fern