



Cooperative Forest Health Management

Project Title: **Pest Prevention/Suppression: Eradication of Incipient Forest Pest Plants by the Big Island Invasive Species Committee**

Reporting Period: **January 1 – June 30, 2002**

Goal: **To survey for, map and initiate control on known incipient weeds on the island of Hawaii.**

| Work Performed | July 1-Dec 31, 2001 | Jan 1 – June 30, 2002 |
|-----------------------|----------------------------|------------------------------|
| 1. Acres Protected: | | |
| a. Suppression | 15 acres | 116.8 acres |
| b. Maintenance | 0 acres | 0 acres |
| c. Prevention | 0 acres | 5,000 acres |
| 2. Survey, Monitor: | | |
| a. Survey | 0 acres | 1,437.5 acres |
| b. Monitor | 0 acres | 0 acres |

Accomplishments:

The Big Island Invasive Species Committee (BIISC), an informal private-state-federal partnership including members from 26 organizations, has formed to improve efforts at invasive species prevention, control and eradication for the island of Hawaii. BIISC’s control efforts focus primarily on removing proven invasive species that occur in relatively small numbers and are susceptible to island-wide or local eradication. These activities build on efforts that have been ongoing for a number of years to eradicate Miconia in Hawaii.

The funding from the Cooperative Forest Health Management Program afforded us the opportunity to expand our capacity to control forest weeds beyond our single species efforts on Miconia. A Rapid Response Team has now been developed for the eradication of incipient forest pest plants.

Once the Rapid Response Team was in place (consisting solely of a Team Leader), BIISC was in an excellent position to coordinate and utilize the efforts of the State-funded Emergency Environmental Work Force (EEWF). The EEWF created in the Third Special Session of the 2001 Hawaii State Legislature to employ workers laid off after the September 11th tragedy. Specifically, EEWF workers would help eradicate environmentally harmful, foreign species of plants and animals.

With help from the EEWf, the Rapid Response Team addressed ten incipient species and four regionally established species during this reporting period:

- Survey, mapping and control work was initiated on plume poppy (*Bocconia frutescens*), black wattle (*Acacia mearnsii*), Cape pittosporum (*Pittosporum viridiflorum*), tagasaste (*Cytisus palmensis*), and raspberry (*Rubus glaucus*).
- Survey and mapping was initiated on Brazilian jasmine (*Jasminum flumanens*), Mysore raspberry (*Rubus niveus*), rubbervine (*Cryptostegia grandiflora*), pampas grass (*Cortaderia jubata*), Padang cassia (*Cinnamomum burmanii*), and fiddlewood (*Citharexylum spinosum*).
- Control work was continued on fountain grass (*Pennisetum setaceum*), California poppy (*Eschscholzia californica*) and pickleweed (*Batis maritima*).

Progress was also made on BIISC's Early Detection System – The Highway Weeds Survey – utilizing a protocol developed by the U.S. Geological Survey, Biological Resources Division on the Big Island.

Incipient Species

Black Wattle (*Acacia mearnsii*)

Black wattle is known to be invasive on Maui where it is already broadly established. The Rapid Response Team followed up on a hotline call from a local resident. The infestation is located on the property adjacent to the Big Island Country Club. Approximately 200 individuals in a 1.5-acre area were treated with a thin line application of 100% Garlon-4. Nearly all trees were immature saplings. Follow-up work will consist of extending surveys into the surrounding land and monitoring treatment for effectiveness. (Figure 1.)

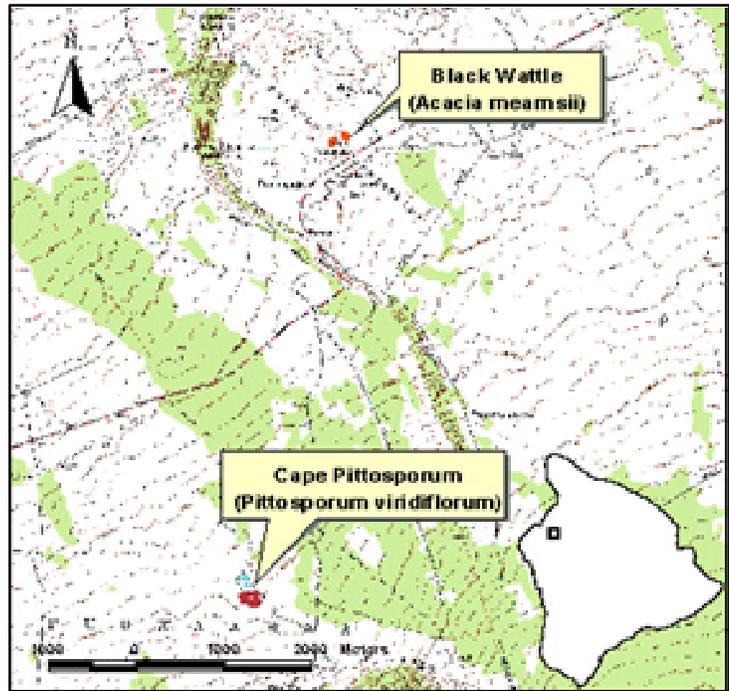


Figure 1. Black wattle in Puu Anahulu and Cape pittosporum in Puu Waawaa.

Cape Pittosporum (*Pittosprum viridiflorum*)

Cape pittosporum is well established in the vicinity of Puu Waawaa Ranch. This species has the potential of invading nearby native Hawaiian dryland forest habitat. The Rapid Response Team conducted suppression work in the heaviest portion of the infestation, as advised by DLNR resource managers and ranch personnel. Approximately 50 individuals in a 3.5-acre area were treated with a thin line application of 100% Garlon-4. Nearly all trees were mature and seed-bearing. Follow-up work will consist of extending surveys into the surrounding land and monitoring treatment for effectiveness. (Figure 1.)

California Poppy (*Eschscholzia californica*)

Two years ago BIISC initiated control work on California poppies in three different populations on Mauna Kea. The Rapid Response Team is now continuing that effort, with the goal of eradicating these incipient infestations. Plants were sprayed with a 1% solution of Arsenal. (Figure 2.)

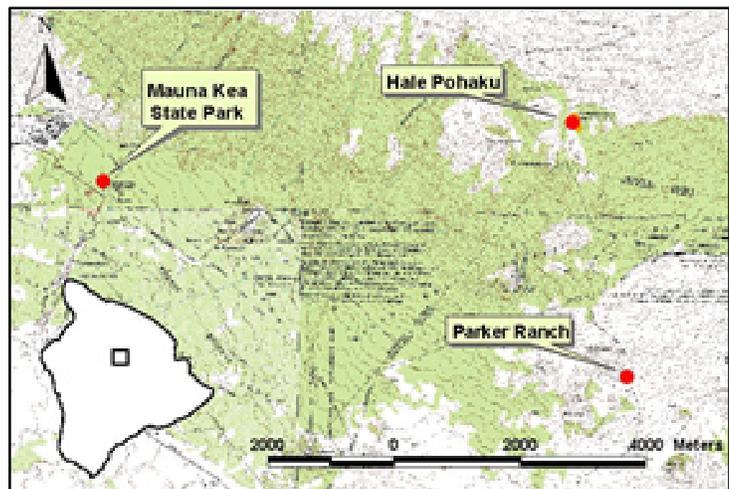


Figure 2. California poppies in Hale Pohaku, Parker Ranch and Mauna Kea State Park. Tagasaste in Hale Pohaku.

| Poppy Site | Acres | Immature | Mature |
|-----------------|-------|----------|--------|
| Hale Pohaku | 1.5 | 196 | 88 |
| Parker Ranch | 0.4 | 60 | 69 |
| Mauna Kea S. P. | 0.1 | 37 | 15 |

Tagasaste (*Cytisus palmensis*)

Three mature tagasaste broom plants were discovered at the Hale Pohaku poppy site. This is the only known occurrence of this species on the Big Island. The Rapid Response Team treated all three trees with a thin line application of 100% Garlon-4 and will follow-up to monitor effectiveness. (Figure 2.)

Mysore Raspberry (*Rubus niveus*)

Mysore raspberry was thought to occur on the Big Island only in the Kulani area of the Hilo District. However, during a survey of the Belt Highway at least 12 different sites containing Mysore raspberry plants were discovered between Alae and Kipahoehoe in South Kona (a distance of 10 km, covering about 8 acres). The majority of the plants were growing in rock walls along the highway and were seen spreading into adjacent Macadamia nut orchards. The survey team lopped off some of the fruiting canes, however follow-up, consisting of contacting the landowners, surveying the orchards and treating the plants, will be required.

Raspberry canes were also found being distributed at the Kona Outdoor Circle’s annual plant sale. The distributor is currently being tracked down and will be made aware that this species is a listed noxious weed in Hawaii. (Figure 3.)

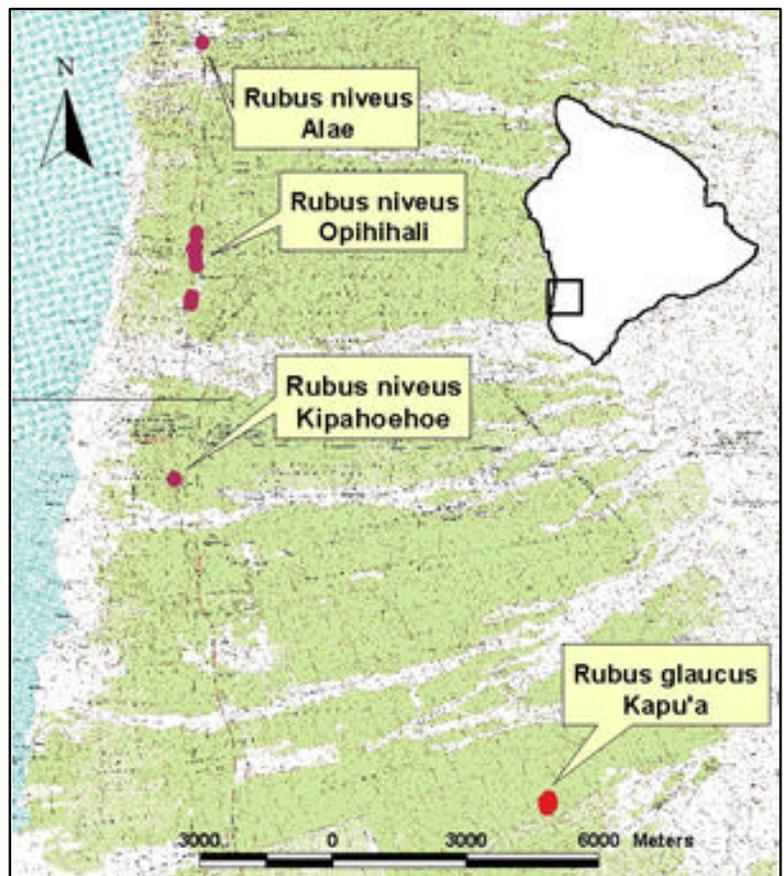


Figure 3. *Rubus niveus* in Alae, Opihihale and Kipahoehoe. *Rubus glaucus* in Kapu’a.

Raspberry (*Rubus glaucus*)

Preserve managers for The Nature Conservancy’s Honomalino Preserve reported an infestation of *Rubus glaucus* on lands belonging to Kapu’a Farms, adjacent to the

Preserve. Some initial control work was conducted by TNC staff and the Rapid Response Team assisted with a follow-up treatment of numerous small patches spread over approximately 6 acres. Patches were sprayed with a 10% solution of Garlon-3a. During this work a more extensive infestation than was previously known was discovered which will require further survey and suppression activity. It is important to suppress this population before it spreads into Preserve lands. (Figure 3.)

Rubbervine (*Cryptostegia grandiflora*)

Rubbervine is known to be invasive in Australia where a biocontrol agent has been introduced. It is also present on Maui. Plants growing in cultivation on the Big Island in Puako and Kawaihae were mapped. More survey is needed to determine whether these plants are spreading. A previously unknown population near Whittington Beach in Ka'u was discovered during the Highway Weeds Survey. These plants appeared to be spreading, and cover perhaps 0.5 acres (survey is needed). Public awareness will be necessary to inform people of the dangers of planting more of it. (Figure 4.)

Padang Cassia (*Cinnamomum burmanii*)

Padang cassia was observed spreading rampantly in a stream drainage in North Kohala (Kapa'au) where it was mapped (roughly 5 acres). Other drainages will need to be surveyed and mapped. It is also present in Honaunau where it is being grown commercially and is spreading into the surrounding forest. (Figure 4.)

Pampas Grass (*Cortaderia jubata*)

Initial location data are being collected for pampas grass. This species is still incipient on the Big Island and may be an appropriate target for eradication. (Figure 4.)

Fiddlewood (*Citharexylum spinosum*)

There are two species of fiddlewood on the Big Island. *Citharexylum caudatum* is well-established regionally in East Hawaii. *Citharexylum spinosum* is invasive in Maui and is also present in East Hawaii. Several plants were found growing in cultivation in West Hawaii and North Kohala and were mapped. However these do not appear to be spreading. (Figure 4.)

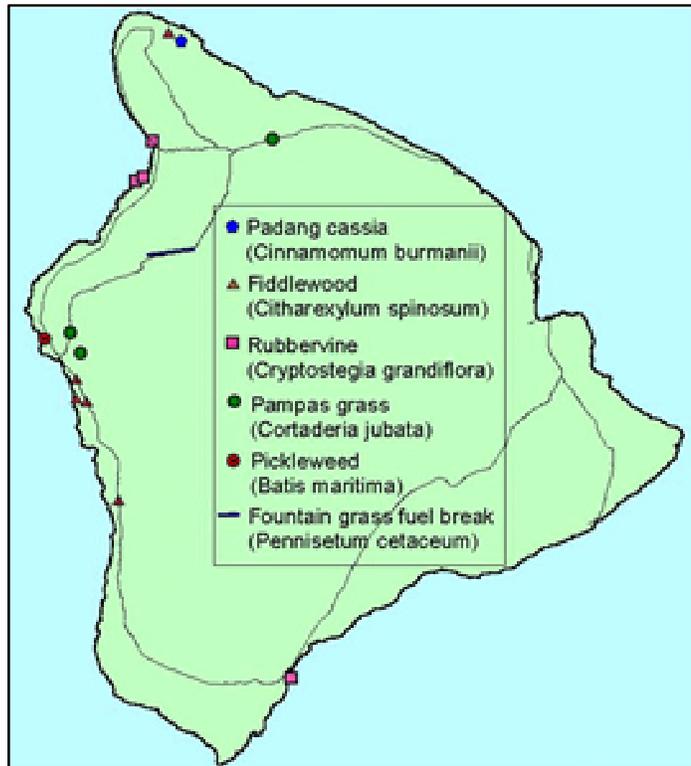


Figure 4. Locations of padang cassia, fiddlewood, rubbervine, pampas grass, pickleweed, and fuel break.

Regionally Established – Locally Incipient

Fountain Grass (*Pennisetum setaceum*)

The Rapid Response Team helped to coordinate and oversee the efforts of the State-funded Emergency Environmental Work Force (EEWF). Over the course of 4 months, the work force crew removed a 13 mile long, 50 ft wide swath of fountain grass (85.5 acres). These 13 miles of fuelbreak will serve as the most critical component in an integrated wildfire management strategy that will *directly* protect 70 acres of community dry forest restoration projects at Kaupulehu, over 750 acres of prime endangered plant habitat at Puu Waawaa, and 40,000 acres of Game Management Area in Puu Anahulu. These projects will also have *indirect* benefits to over 40,000 acres of U.S Army lands at Pohakuloa Training Area, over 30,000 acres of rangeland and game habitat at Puu Waawaa through maintaining woody vegetation cover, and habitat for 25 federally endangered plant and animal species by ultimately reducing both the number and size of wildfires that occur within those large landscapes. (Figure 4.)

Pickleweed (*Batis maritima*)

The Rapid Response Team coordinated and oversaw the EEWF in the removal of pickleweed along the shoreline of Kaloko Pond. The endangered Hawaiian stilt uses the mudflats of Kaloko Pond for foraging and roosting but is unable to use areas that are infested with invasive pickleweed. Approximately 300 m of shoreline were cleared (about an acre) and the debris was removed from the site. (Figure 4.)

Brazillian Jasmine (*Jasminum flumanense*)

Jasminum flumanense is mentioned in the Manual of Flowering Plants of Hawaii (Wagner, et al. 1999). In 1976 it was noticed growing in the Hookena Beach area and in 1988 it had vigorously reproduced. It now covers a large portion of the vegetation in this area. The Rapid Response Team attempted to determine the extent of the infestation. The northern perimeter was found (Pu'uhonua o Honaunau National Historical Park lies just to the north), but the eastern and southern perimeters are still unknown. Approximately 100 acres were surveyed. The infestation could cover 500 acres or more.

This species is capable of smothering other vegetation (it currently covers mainly non-indigenous scrubby vegetation in an abandoned pastureland). It produces juicy berries containing seeds which are eaten and spread by birds. It may be possible to contain jasmine in this region if the public is made aware of its threat and if the Park is warned about its imminent invasion. It is significant that no jasmine was observed during the Highway Survey. (Figure 5.)

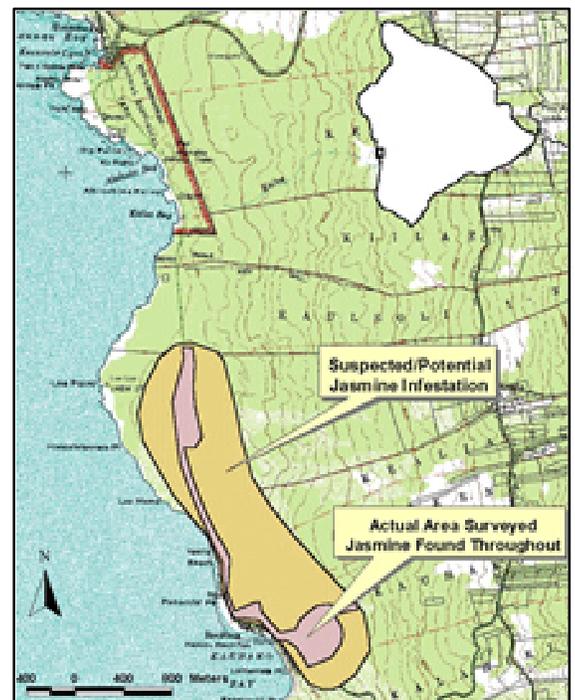


Figure 5. Brazillian jasmine in Hookena.

Plume Poppy (*Bocconia frutescens*)

The Rapid Response Team conducted initial survey and suppression work on three different populations of *Bocconia*: Wood Valley, Manuka and Honomalino.

Wood Valley

Well over 1,000 acres in the Wood Valley area are infested with *Bocconia*. Abandoned sugar cane lands that once contained numerous mature trees have recently been bulldozed and planted with an extensive Eucalyptus plantation. *Bocconia* is a disturbance-adapted species and therefore the population has been greatly enhanced by the ground clearing and planting activities. Seedlings were observed throughout the entire plantation and mature trees are still present in the surrounding cane lands.

The “mother trees” were found high up in the drainage above Wood Valley. Hundreds of trees in this area were treated with a thin line application of 100% Garlon-4. The drainage was surveyed from 1900 ft elevation (Wood Valley Temple) down to 1200 ft, where it passes beneath the highway (a distance of 5 km). *Bocconia* was found along the drainage down to 1500 ft (a distance of 3.5 km). (Figure 6.)

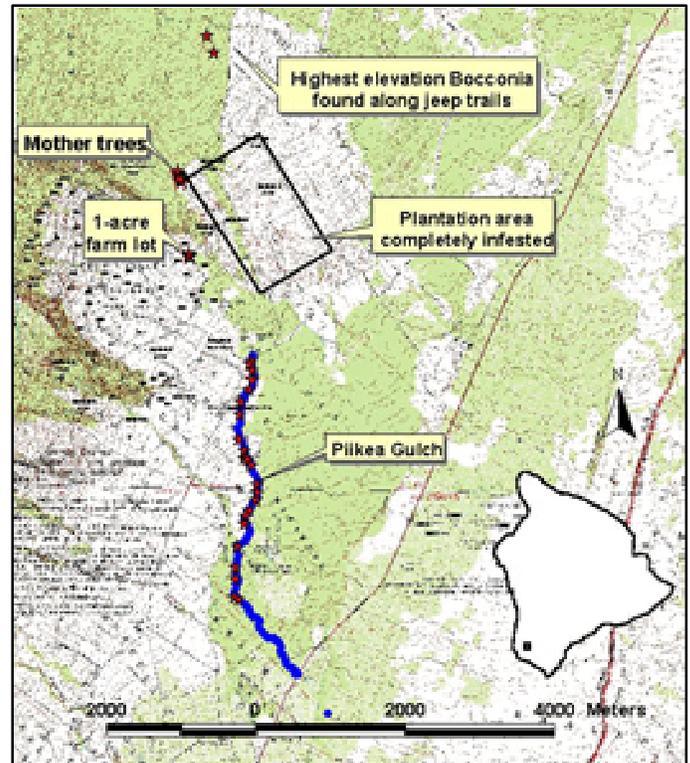


Figure 6. *Bocconia* in Wood Valley.

Manuka

Bocconia plants were found directly adjacent to Manuka State Park, particularly in an area that had recently been cleared of woody vegetation, and clustered close to the road on the other side of the highway. No plants were found above 2000 ft elevation. (Figure 7.)

Honomalino

Bocconia plants were found near Honomalino during the Highway Weeds Survey. The Rapid Response Team conducted some initial survey work on State lands. No *Bocconia* plants were found in the forested areas. However, plants were seen scattered in adjacent pastureland and a report was received of plants growing on the west (makai) side of the highway. A few plants along the paved access road were treated with a thin line application of 100% Garlon-4. Follow up will consist of finding and treating these plants, contacting landowners in the area, and posting flyers. (Figure 8.)

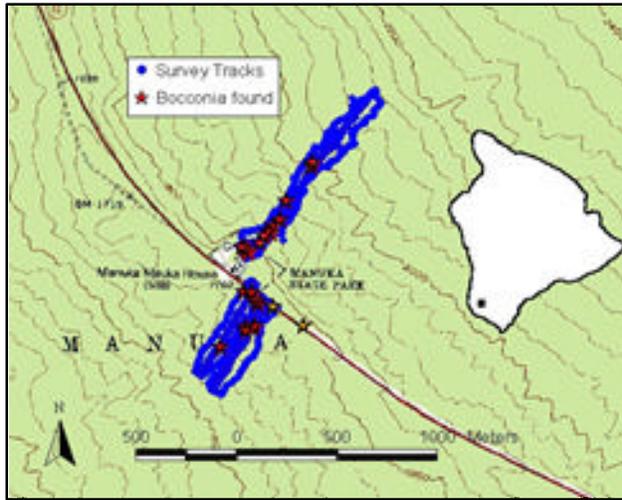


Figure 7. Bocconia in Manuka.

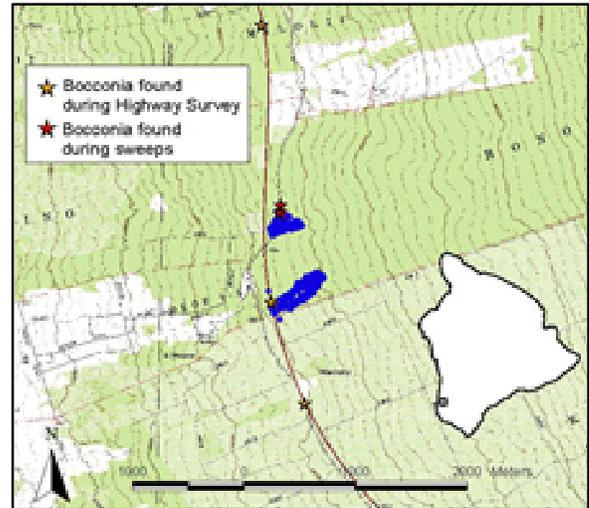


Figure 8. Bocconia in Honomalino.

Highway Weeds Survey

A total of 67 miles of the Big Island's Belt Highway (Highway 11), and the 11 mile Highway 160 (City of Refuge Road to Napoopoo Road) were surveyed during this reporting period (925 acres total). The presence of invasive plants on a target list of 200+ species was recorded for each mile of highway surveyed. The target species range from very common, broadly established plants, to incipient and/or newly naturalized plants. (Figure 9.)

This survey serves as BIISC's early detection system. Several important discoveries were made during this survey:

- Ivy gourd (*Coccinia grandis*) was found 25 miles outside of its known range
- New populations of Mysore raspberry (*Rubus niveus*) were discovered
- An unidentified plant in the *Euphorbiaceae* family was found reproducing
- Mickey Mouse plant (*Ochna thomasiiana*) was found to be well established in the wild and was also discovered in cultivation
- Previously unknown rubbervine (*Cryptostegia grandiflora*) plantings were found

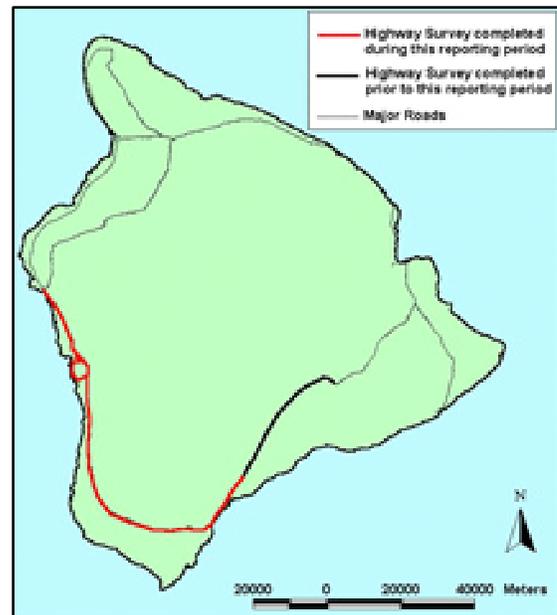


Figure 9. Highway Weeds Survey

| Species | Acres Suppressed |
|--|-------------------------|
| Black Wattle (<i>Acacia mearnsii</i>) | 1.5 |
| Cape Pittosporum (<i>Pittosporum viridiflorum</i>) | 3.5 |
| California poppy (<i>Eschscholzia californica</i>) | 2.0 |
| Raspberry (<i>Rubus glaucus</i>) | 6.0 |
| Fountain grass (<i>Pennisetum cetaceum</i>) | 85.5 |
| Plume poppy (<i>Bocconia frutescens</i>) | 17.5 |
| Pickleweed (<i>Batis maritima</i>) | 0.8 |
| Tagasaste (<i>Cytisus palmensis</i>) | (3 plants) |
| Total: | 116.8 |

| Species | Acres Surveyed |
|--|-----------------------|
| Mysore raspberry (<i>Rubus niveus</i>) | 8.0 |
| Rubbervine (<i>Cryptostegia grandiflora</i>) | 0.5 |
| Padang cassia (<i>Cinnamomum burmanii</i>) | 4.6 |
| Pampas grass (<i>Cortaderia jubata</i>) | 0.5 |
| Fiddlewood (<i>Citharexylum spinosum</i>) | 0.5 |
| Brazillian jasmine (<i>Jasminum flumanens</i>) | 100.0 |
| Plume Poppy (<i>Bocconia frutescens</i>) | 398.4 |
| | |
| Survey | |
| Highway Weeds Survey | 925 |
| Total: | 1,437.5 |

This report was prepared by Laura Hillis, BIISC Rapid Response Team Leader