

**Suppression of the Noxious Weed *Miconia calvenscens*
on the Island of Hawaii**

Annual Summary and Progress Report

July 2000 – June 2001



Data & information provided by Kim Tavares, Information Coordinator
Report prepared by Laura Hillis, Special Projects Assistant
16 E. Lanikaula St., Hilo, Hawaii 96720
Office ph: (808) 974-4140 Hotline: (808) 961-3299
Fax: (808) 974-4148 Email: miconia@aloha.net

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Executive Summary Table:

Work Performed	July 1 – Dec 31, 2000	Jan 1 – June 30, 2001	FY Total
1. Protection:			
a. Suppression	472 acres	1,506 acres	1,978 acres
b. Maintenance	343 acres	277 acres	620 acres
2. Survey, Monitor:			
a. Survey	740 acres*	15,943 acres**	16,683 acres
b. Monitor (ground)	346 acres	298 acres	644 acres

* ground only

** air and ground

Highlights of the Reporting Period: July – December 2000

Approximately 395,000 acres on the Big Island that are potentially threatened by the invasion of Miconia have been protected through suppression and maintenance operations.

A second 4-person crew was hired and started work on the Hilo operations in January 2001. This has greatly increased Operation Miconia's capacity for conducting ground surveys. A new coordinator for the Big Island Invasive Species Committee and Operation Miconia started work in April 2001. Since the Coordinator is now overseeing field operations, the former Team Leader position is being converted to a full time public relations/volunteer program coordinator.

The Miconia calvescens Management Plan for the Big Island was revised to reflect a refinement of Operation Miconia Hawaii's overall strategy for the eradication of Miconia. In the revised plan, priorities for control work at known sites are based upon the sites' proximity to the interior, or core, of the infestation. Of highest priority are sites that are either isolated or on the periphery of the infestation. Sites near the core of the infestation receive lowest priority. While fulltime field crews are engaged in clearing Miconia out of isolated and peripheral sites, volunteer community support is directed toward the maintenance of those core sites where some work has already taken place, so that ground is not lost. Adoption of this approach resulted in some differences between where work was originally proposed and where it actually took place.

The Miconia Database was also revised. Its structure is now consistent with that of the Alien Plant Control and Herbicide Use Log database in use by Haleakala National Park and the Maui Invasive Species Committee, and is expected to become the statewide standard. Over 2,000 Miconia records were normalized and are currently being used in the planning and reporting of field operations.

The results of hiring a full time crew for West Hawaii were positive. Devoting a fulltime team to focus on the Kona sites resulted in a thorough and complete effort. All mature and near mature

trees were destroyed, and seed production has stopped. The site boundaries were defined by combining data from ground and air surveys using Global Positioning Satellite (GPS) receivers and a Geographic Information System (GIS) database. The total acreage swept at the Honaunau site over the course of the Kona fieldwork (December 1999 through July 2000) was 2150 acres. A total of 23 trees and 149 immature plants were found and destroyed. The other two known Kona Miconia sites, Honalo and Kaloko, are now free from mature trees and seed production has been stopped.

Specific Activities:

1. Conduct Aerial Surveys. (Unit of measure is acres surveyed and trees found.)

Four aerial surveys were conducted during the reporting period: Honaunau (Jan. 17th), Laupahoehoe/Ninole (Feb. 28th), Jungle King (May 8th), and Hakalau/Kawainui (May 30th). A total of 8,920 acres were surveyed (Figure 1).

The gulches of Hakalau (2,857 acres) and Kawainui (680 acres) were flown, resulting in the sighting of 7 new plants in Hakalau, and 1 new plant in Kawainui. A flowering tree near Honolii, which had been seen by the pilot on a previous flight, was also reported to the spotters during this flight. The plant in Kawainui (which was immature) was located within a known infestation, and has been killed. The Hakalau plants (6 immature and 1 mature) were a newly discovered population. The plants have been killed, however the area surrounding this new population needs to be surveyed on the ground.

Prior to the aerial survey over Jungle King (2,111 acres), the ground crew conducted reconnaissance to determine which areas had light tree canopy cover and could therefore be easily surveyed from the air. No plants were found during the flight, thus indicating the outer boundaries of the site, beyond which Miconia has not spread.

The flights over Honaunau (2,711 acres), Laupahoehoe (2,481 acres) and Ninole (3,560 acres) focused on the areas beyond where the field crew had surveyed on the ground, to ensure that those areas are clean. No plants were found during the aerial surveys. Another 600 acres in Honaunau still need to be aerially surveyed, while work at the Ninole site has been wrapped up for now, and work at Laupahoehoe has been permanently completed.

2. Survey for and destroy (suppress) Miconia populations using a combination of mechanical and chemical control methods in the Kona, Hilo and Puna districts. (Unit of measure is acres treated and trees killed.)

Ground surveys were conducted on a total of 2,284 acres in Hilo and Puna. Below is a summary of activities by area.

Hilo: Work in the North Hilo district was focused on northern, isolated populations within gulches and in mauka areas adjacent to forest. Seven sites were targeted for intensive survey and control efforts: Laupahoehoe, Ninole, Hakalau, Akaka, Kawainui, Puueo, and Akolea (Figure 2).

The northernmost, isolated site, Laupahoehoe, has been reclaimed from mature seed-producing trees. Operation Miconia staff conducted door-to-door visits distributing handouts with color pictures, and posters were also distributed. Residents and landowners were also contacted by mail. No plants were found or reported beyond the original 50-meter site, where a few seedlings come up each year.

Crews completed work at Ninole, and work was nearly completed at Hakalau until the area requiring ground surveys was expanded due to a new population being found during the aerial survey. Survey and control work at Akaka Falls is also complete, to 1 kilometer from the core. Additional Miconia plants may exist in the Akaka drainage, but at a lower elevation and hence are a lower priority. Most of the seed-producing trees are gone from Waiau and Akolea, however, these sites will be revisited and surveys expanded in the future.

Work continues at the Kawainui site where plants are still being found during ground surveys, while work at Puueo and Akolea will take place soon.

Waikahe and Honolii sites were demoted to lower positions on the priority list. Prior to this grant period, air surveys were conducted and all trees detected during flights were destroyed. Extended surveys are scheduled to take place according to the order of the general plan priorities.

Altogether, roughly 1,523 acres were sweep-surveyed. Plants were destroyed on 1,240 acres (Tables 1 & 2).

Puna: Surveys were conducted in 11 sites in Puna (Figure 3). Roughly 761 acres were sweep-surveyed. Plants were destroyed on 753 acres (Tables 3 & 4). Work at the Hale Puaa site was prompted by an outside report and was treated for the first time.

The crew worked extensively at the Jungle King site in Fern Forest Subdivision. Ground surveys were conducted in the adjacent Puna Forest Preserve, in sweeps working toward the subdivision. Miconia plants are still being found and treated in the subdivision, but only one sapling was found and killed in the Forest Reserve.

Ground surveys are complete for the Ihope site, pending an aerial survey. (Heavy thickets of waiwi make searching for Miconia problematic.) A seedling was found and killed along the highway near Glenwood for the second year in a row, indicating a possibility of the presence of a mature tree somewhere in the area. An aerial survey of the Glenwood area will take place during

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the upcoming flight over the Ihope site. It is more likely however that the seedlings are being brought in by vehicles or highway equipment.

Kona: Ground surveys in Honaunau, South Kona, which began in February 2000, were wrapped up just after the start of this reporting period. No mature plants and only one seedling were found and destroyed. The reduced number of plants found indicates that the crews successfully reached the outward boundary of this infestation.

Kohala: A tree was discovered at a residence in Kamuela and destroyed. It was unclear whether the tree had ever gone to seed. Soil was collected from beneath the tree and is under observation in the US Forest Service greenhouse. Miconia seeds can be dormant for several years but are expected to sprout in greenhouse conditions. No Miconia have sprouted thus far from the collected material.

Table 1. Hilo Sites Ground Surveyed/Suppressed

Site	Acres Surveyed July-Dec 2000	Acres Surveyed Jan-June 2001	Total Acres Surveyed	Acres Suppressed July-Dec 2000	Acres Suppressed Jan-June 2001	Total Acres Suppressed
Akaka	55	233	288	55	233	288
Akolea	48	2	50	48	2	50
Hakalau	150	210	360	150	210	360
Hanawi	NA	51	51	NA	51	51
Kawainui	NA	262	262	NA	262	262
Kawili	12	NA	12	12	NA	12
Komohana	NA	3	3	NA	3	3
Laupahoehoe	155	20	175	0	0	0
Ninole	14	184	198	14	184	198
Panaewa FR	1	NA	1	1	NA	1
Panaewa HH	NA	1	1	NA	0	0
Papaikou	4	NA	4	4	NA	4
Pepeekeo	NA	6	6	NA	0	0
Puueo	101	NA	101	NA	NA	NA
Reeds Island	11	NA	11	11	NA	11
Totals:	551	972	1,523	295	945	1,240

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Table 2. Miconia Killed During Suppression and Maintenance Actions in Hilo

Site	Trees Killed July-Dec 2000	Trees Killed Jan-June 2001	Total Trees Killed	Immature Plants Killed July-Dec 2000	Immature Plants Killed Jan-June 2001	Total Immature Plants Killed
Akaka	0	1	1	1	165	166
Akolea	1	1	2	0	1	1
Hakalau	12	0	12	279	38	317
Hanawi	NA	0	0	NA	52	52
Kahaopea	2	NA	2	2	NA	2
Kawainui	NA	1	1	NA	35	35
Kawili	3	1	4	5	0	5
Komohana	1	0	1	0	25	25
Laupahoehoe	0	0	0	2	0	2
Ninole	1	4	5	13	118	131
Panaewa FR	12	NA	12	75	NA	75
Panaewa HH	137	121	258	410	733	1,143
Puueo	0	NA	0	39	NA	39
Reeds Island	1	NA	1	36	NA	36
Waiiau	11	NA	11	33	NA	33
Totals:	181	129	310	895	1,167	2,062

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Table 3. Puna Sites Ground Surveyed/Suppressed

Site	Acres Surveyed July-Dec 2000	Acres Surveyed Jan-June 2001	Total Acres Surveyed	Acres Suppressed July-Dec 2000	Acres Suppressed Jan-June 2001	Total Acres Suppressed
Anthurium	64	NA	64	64	NA	64
Aulii	2	1	2	0	0	0
Enos Lane	1	NA	1	1	NA	1
HA5DE	2	2	4	0	0	0
HA9DE	1	NA	1	0	NA	0
Hale Puaa	20	141	161	20	141	161
Ihope	50	57	107	50	57	107
Jungle King	NA	326	326	NA	326	326
Kauaea	21	NA	21	21	NA	21
Kopua	7	2	9	7	2	9
Kurtistown	NA	13	13	NA	13	13
Malieka	NA	1	1	NA	1	1
Orchidland	NA	4	4	NA	4	4
Oshiro	5	NA	5	5	NA	5
Pahoa	10	10	20	10	10	20
Palani	NA	21	21	NA	21	21
Totals:	183	578	761	178	575	753

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Table 4. Miconia Killed During Suppression and Maintenance Actions in Puna

Site	Trees Killed July-Dec 2000	Trees Killed Jan-June 2001	Total Trees Killed	Immature Plants Killed July-Dec 2000	Immature Plants Killed Jan-June 2001	Total Immature Plants Killed
Anthurium	5	NA	5	86	NA	86
Aulii	0	1	1	9	1	10
Enos Lane	52	20	72	619	242	861
Flower*	1	NA	1	1	NA	1
Glenwood*	NA	0	0	NA	1	1
HA5DE	0	0	0	5	0	5
HA9DE	2	NA	2	26	NA	26
Hale Puaa	15	0	15	5184	296	5480
Ihope	0	0	0	159	5	164
Jungle King	NA	33	33	NA	466	466
Kauaea	36	NA	36	259	NA	259
Keahialaka*	0	0	0	1	2	3
Kopua	21	1	22	926	0	926
KukuiCamp*	0	0	0	2	0	2
Kupono	13	214	227	0	5,841	5,841
Kurtistown	1	4	5	67	304	371
Laamia	3	NA	3	43	NA	43
Malieka	NA	3	3	NA	9	9
Orchidland	NA	6	6	NA	1006	1006
Oshiro	1	NA	1	57	NA	57
Pahoa	10	0	10	8,984	38	9,022
Palainui*	1	NA	1	1	NA	1
PuuHonuaula*	0	NA	0	1	NA	1
Shower*	5	NA	5	1	NA	1
Totals:	166	282	448	16,431	8,211	24,642

3. Re-treat previously treated areas to destroy emerging seedlings to deplete the soil seed bank. Re-treatment is a critical step toward reclaiming infested areas. Areas found to be free of Miconia will be considered “reclaimed from infestation.” (Unit of measure is acres treated and trees killed.)

During the grant year a total of 661 acres at Hilo and Puna satellite core areas have been re-visited. Plants were killed on 644 acres (Tables 3 - 6).

In accordance with the guidelines that were set out in the Management Plan, fulltime crews are being scheduled to perform maintenance in a logical sequence based upon the priority lists. Due to limited staffing, work at sites located in the lower priority areas (at which work has been performed) will have to wait longer for maintenance to occur, unless volunteer help is obtained. This situation unfortunately increases the likelihood that missed and/or new plants will reach maturity.

The development of community based stewardship projects and agreements for long-term (5-10 year) commitments for the control of Miconia, particularly in the Interior/core area, will enable those populations to be addressed while the fulltime crews focus on higher priority sites.

One such stewardship project is underway at the Kuponono site in the Leilani Subdivision core population. Volunteers are killing immature plants along the roadsides to keep the population from expanding outward. This year, volunteers killed 227 trees and 5,841 immature plants at the Kuponono site.

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Table 5. Hilo Sites Monitored/Maintained

Site	Acres Monitored July-Dec 2000	Acres Monitored Jan-June 2001	Total Acres Monitored	Acres Maintained July-Dec 2000	Acres Maintained Jan-June 2001	Total Acres Maintained
Akaka	5	7	12	5	7	12
Akolea	7	NA	7	7	NA	7
Hakalau	2	NA	2	2	NA	2
Kawainui	NA	113	113	NA	113	113
Komohana	NA	3	3	NA	3	3
Panaewa HH	3	5	8	3	0	3
Puueo	1	NA	1	0	NA	0
Waiau	27	NA	27	27	NA	27
Totals:	45	128	173	44	123	167

Table 6. Puna Sites Monitored/Maintained

Site	Acres Monitored July-Dec 2000	Acres Monitored Jan-June 2001	Total Acres Monitored	Acres Maintained July-Dec 2000	Acres Maintained Jan-June 2001	Total Acres Maintained
Anthurium	133	NA	133	133	NA	133
Aulii	2	3	5	0	0	0
Enos Lane	6	1	7	6	1	7
Hale Puaa	NA	3	3	NA	3	3
Ihope	37	73	110	37	73	110
Jungle King	NA	74	74	NA	74	74
Kauaea	61	1	62	61	1	62
Keahialaka	60	1	61	60	1	61
Kupono	10	10	20	10	10	20
Malieka	NA	1	1	NA	1	1
Pahoa	2	10	12	2	10	12
Totals:	311	177	488	309	174	483

4. Treat large flowering trees in older established stands using mechanical, chemical and bio-control methods.

a. Continue to kill mature trees in the core (Onomea). This effort will largely rely on volunteers and community groups. (Unit of measure is number of volunteer projects and acres treated.)

Onomea

Volunteers from the Hawaii Economic Development Board (HIEDB) have adopted the Onomea site. Their efforts during this reporting period resulted in the treatment and removal of 2,616 trees and 6,710 immature plants. The field crew also worked in a gully just above Mamalahoa Hwy in Onomea. Fifteen trees and 2,264 immature plants were treated on a 4-acre block. Last year the Alu Like summer youth worked in this area.

Panaewa

A group of students participating in the Upward Bound program joined the volunteer force against Miconia this summer. They worked on agricultural farm lots at Panaewa, on Hawaiian Home Lands. During this reporting period, they killed 137 trees and 410 immature plants.

Table 7. Volunteer Work in Core Populations

Volunteers	Site	Acres Treated	Date
1. Upward Bound (8)	Panaewa	2	Jul 2000
2. Upward Bound (10)	Panaewa	3	Jul 2000
3. HIEDB (5)	Onomea	3	Oct 2000
4. HIEDB (4)	Onomea	3	Oct 2000
5. HIEDB (4)	Onomea	2	Oct 2000
6. HIEDB (14)	Onomea	2	Nov 2000
7. HIEDB (9)	Onomea	2.5	March 2001
8. HIEDB (12)	Onomea	2	April 2001
9. HIEDB (11)	Onomea	2.5	April 2001
Total:		22 acres	

b. Operation Miconia crews will assist the Hawaii Department of Agriculture to disperse the approved leaf-spot fungus into areas that have not yet been inoculated. The fungus will also be introduced into previously treated areas to help control newly emerging seedlings and saplings, hopefully increasing the time between re-treatments. (Unit of measure is areas treated.)

In May 2001 the fungus *Colletotrichum gloeosporioides* f. sp. *Miconiae* was applied to plants in three sites in Leilani Estates subdivision (Yamashita=s, Moku St. and Kupono St.). This area seems ideal for the fungus due to the thick tree and shrub canopy and high humidity in the understory. Two of these sites were under thick ohia canopy and the third was a relatively open cleared lot. GPS points were taken at each site. Rain fell on the application night (0.15 inches) and conditions remained humid the next day at least until mid-day. The three release sites were recently checked (July 2001) for evidence of establishment and were found to be well infected with obvious lesions on the majority of the treated plants.

The inoculum was provided by Eloise Killgore of the Plant Pathogen Quarantine Facility in Honolulu. Part of this batch of inoculum was given to the US Forest Service to inoculate experimental plants in their greenhouse. However, since there was some inoculum left over, it was taken to Honolii Gulch on old Mamalahoa Hwy to treat large trees there. This is an infestation that is isolated from the core at Onomea. When spraying began, the characteristic leaf spots caused by the fungus were noticed on the leaves. L. Sugiyama of UH Plant Pathology Dept. confirmed the ID of leaf-spot fungus by naked eye. The presence of leaf spot fungus at this site indicates that it has dispersed to this site naturally, a distance of about 4 km. from the closest treated plants. (There are known Miconia plants between these two sites but they are relatively widely spaced. The fungus was first introduced into Onomea in 1997.)

5. Public Education and Awareness.

a. Follow up on hotline calls and other reports from outside sources. (Unit of measure is number of reports for sightings of new Miconia populations.)

Hotline Reports

The Miconia Hotline received 132 calls during this reporting period. None of the calls were for newly identified areas. One call served to confirm a previously unconfirmed site:

A caller reported pulling a Miconia seedling in Keaukaha. Previously, the only known plant there had been reported (by Rick Warshauer) but was never confirmed because it disappeared before ground crews started work. The finding of this seedling confirms the presence of Miconia in Keaukaha (caller was positive, he helped design the Miconia t-shirt).

Other Outside Reports

1) A botanical garden near the Ninole site was visited and a 6-foot tall potted Miconia was found at the registration desk. Owners did not allow Miconia staff to destroy the plant, stating it is there for educational purposes.

2) A DLNR forestry crewmember found a mature Miconia tree in Kamuela Highlands subdivision, intentionally planted in a residential lot about a mile from the back end of Waipio valley. This owner was contacted and reluctantly allowed Miconia staff to destroy the plant. A road survey including interviews with residents in the subdivision did not reveal any other Miconia in the area. Soil collected from around the base of the tree and tested in a greenhouse did not reveal any germinating Miconia seeds, indicating that this tree hadn't yet reached maturity.

3) In a report from DLNR Forestry Division, Miconia was seen near WaaWaa subdivision in Puna. This new infestation, located in Nanawale Forest Reserve, was later confirmed by Miconia field crews. Residents of WaaWaa formed a volunteer group and have adopted the site (Hale Puaa site). They have been working with the Miconia crew and on their own to destroy the plants. Fifteen mature trees and over 5,000 immature plants have been destroyed so far. Work is still in progress at this site.

4) An audience member attending Duane Nelson's presentation reported treating Miconia seedlings in McCoy Plantation (Captain Cook, Kona). This report was followed up but a positive identification could not be made. This report will remain unconfirmed until the neighborhood can be thoroughly canvassed with flyers posted and fresh samples shown to residents.

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Table 8. Hotline Calls

Hilo Sites:	2000	2001	Comments
Akaka	0	1	FALSE report
Akolea	1	2	Kaumana residential areas
Hakalau	0	1	Landowner grants permission to access
Hanawi	1	0	Adjacent to MICONIA GROUND ZERO
Hilo Landfill	0	1	1 km from source towards Keaukaha
Honolii	0	5	Highly visible large and small plants
Kahaopea	1	2	2 nd EARLY INTRODUCTION SITE
Kawili	2	1	UNCONFIRMED report in urban area
Keaukaha	0	1	TREATED – caller pulled seedling
Komohana	0	3	Various locations
Makai Kawainui	1	1	TREATED – single plant visible on hwy
Ninole	1	1	Potted specimen at botanical garden v.c.
Onomea	4	17	MICONIA GROUND ZERO
Panaewa HHL	0	10	Various locations
Papaikou	2	11	Adjacent to MICONIA GROUND ZERO
Reeds Island	1	3	Resident reporting on monitoring
Waiau	1	0	CONFIRMED needs rappelling
Waikahe	1	2	Waiakea Uka at Waikahe St. shade cloth
Zoo	0	1	1 km from confirmed satellite core
Puna Sites:			
Albizia	1	0	Resident reporting on monitoring
Aweoweo	0	3	Highly visible along roadside
BM605	0	1	Bulldozed by new development
Enos Lane	0	1	TREATED by caller
Flower	2	0	Resident reporting on monitoring
HA1DE	1	0	CONFIRMED pending access
HA5DE	1	1	CONFIRMED location in Hawaiian Acres
HA9DE	2	0	CONFIRMED pending access
Kopua	0	2	TREATED - visible along new roadside
Kukui Camp	1	1	TREATED – visible from highway
Kupono	1	4	VOLUNTEER – project site
Kurtistown	2	12	Various sites within 2 miles
Laamia	2	0	Residential area monitoring
Makuu	0	5	Various sites within residential section
Malieka	0	2	TREATED – 2 reports for same property
Orchidland	1	0	Residential area monitoring
Pahoa	1	5	Various sites within 2 miles – volunteer site
Total:	31	101	
Grand Total:	132		

b. Promote Public Awareness.

Volunteer Projects

Volunteers assisted the field team on several occasions. Several friends and family members of the regular Miconia crews also contributed to the survey and treatment of Miconia in Kona and Puna.

1. A new volunteer group made up of residents from the WaaWaa subdivision of lower Puna, joined the Miconia control project after finding Miconia growing wild in Nanawale Forest Reserve, near their homes. The Kubica family, along with their friends and neighbors, volunteered to adopt this site (Hale Puaa site).

2. Malama O Puna, formerly known as Puna Outdoor Circle, continues to volunteer time controlling Miconia in lower Puna. They are currently working at the Pahoa site, on a parcel near the Pahoa High School.

3. Residents and coffee farmers on Donkey Mill road, near the Honalo site, have taken an interest in the forest near their farms, and are now working with the West Hawaii field leader to continue surveys at this site. They are interested in learning about Hawaiian forest ecosystems while protecting them from Miconia and other invasive weeds.

Table 9. Volunteer Projects

Volunteer Outing	Project Location	Acres Treated	Date
Kona			
1. Residents (4)	Honaunau	5	Jul 2000
2. Residents (2)	Honalo	5	Aug 2000
3. Residents (6)	Honalo	5	Sep 2000
Hilo			
Hilo High (8)	Panaewa HHL	2	Jan 2001
Puna			
1. Residents (2)	Hale Puaa	5	Aug 2000
2. Residents (4)	Hale Puaa	5	Aug 2000
3. Residents (2)	Pahoa	1	Aug 2000
4. Residents (2)	Pahoa	1	Aug 2000
5. Residents (2)	Pahoa	1	Aug 2000
6. Residents (3)	Pahoa	1	Sep 2000

Continued...

Table 9. Continued

Volunteer Outing	Project Location	Acres Treated	Date
7. Residents (6)	Hale Puaa	75	Nov 2000
8. Resident (1)	Kopua	<1	Jan 2001
9. Stewards (2)	Kupono	<1	Mar 2001
10. Stewards (1)	Kupono	29	Mar 2001
11. Stewards (7)	Kupono	3	Apr 2001
12. Residents (2)	Palani	<1	May 2001
13. Residents (3)	Palani	<1	May 2001
14. Residents (2)	Palani	<1	Jun 2001
15. Stewards (5)	Kupono	<1	Jun 2001
16. Resident (1)	HA5DE	<1	Jun 2001
17. Residents (2)	Hale Pua'a	15	Jun 2001
18. Residents (2)	Hale Pua'a	20	Jun 2001
	Total:	173 +	

Presentations

Operation Miconia volunteers, staff and committee members participated in a variety of presentations. Miconia awareness efforts appeared in newspapers, magazines, on film, on the Internet, and as fresh cut samples at malls, schools, conferences, and fairs.

1. Paula Helfrich, Miconia volunteer and member of the Hawaii Island Economic Development Board, arranged a series of radio talk show interviews with Nelson Ho and herself, to talk about the progress and events related to the program. Calls to the Miconia hotline were generated from this effort.
2. The Annual Hawaii Conservation Conference also took place in August. A poster was prepared and presented that describes Geographic Information System (GIS) technology and its use in Miconia control.
3. In September the Kona Farm Fair (West Hawaii) and the Hawaii County Fair (East Hawaii) donated booth space to the project. East and West Hawaii residents visited the booths and talked with staff about their Miconia concerns. Visitors who had never seen Miconia before were able to see and feel a fresh cut sample, were given instructions about what to do if they found some, and several signed up to do volunteer work.
4. Operation Miconia staff spoke with students and teachers of biology, geography, and botany, and made presentations to their classes. Some students are developing skills to spot and treat plants. The groups are also encouraged to consider adopting sites.

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Table 10. Presentations

Presentation	Date
1. KPUA Radio Talk Show (45 minutes); N. Ho/HIEDB	09 Aug 2000
2. KHLO Radio Talk Show (60 minutes); N.Ho/Keoni Lopez	15 Aug 2000
3. KHLO Radio Talk Show (update); N.Ho/Keoni Lopez	29 Aug 2000
4. UH Botany Club (K.Tavares)	06 Sep 2000
5. Kona Farm Fair (L.Hillis/Field Crews)	07-10 Sep 2000
6. Hawaii County Fair (N.Ho/Field Crews)	14-17 Sep 2000
7. Hawaii Geographic Alliance (K.Tavares) http://www.hawaii.edu/hga/gaw00/gaw00_wkshop/geowksp.html	16 Sep 2000
8. Geography Awareness Week Prince Kuhio Mall (K.Tavares) http://www.hawaii.edu/hga/GeoMatters/Hilo/hilo1.html	November 2000
9. Keaau High School Biology Class (N.Ho)	10 Oct 2000
10. Keaau High School Natural Science Class (N.Ho)	17 Oct 2000
11. UH Hilo Ag Economics Class (N.Ho)	14 Nov 2000
12. Waiakea Elementary School Geography (N. Ho)	15 Nov 2000
13. Keaau High School Biology Class (N.Ho)	27 Nov 2000
14. UH CTAHR's Sustainable Agriculture Conf. Field Trip	26 Jan 2001
15. UHH Graduate Seminar on Humans and the Environment	07 Feb 2001
16. Aloha Estates Community Assoc. members' meeting	15 Feb 2001
17. Construction crew safety meeting	12 March 2001
18. Maku'u Farmers Assoc.	14 March 2001
19. Leilani Community Assoc.	17 March 2001
20. Kawananakoa Intermediate School	24 March 2001
21. Hawaiian Acres Community Assoc.	22 April 2001

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Table 11. Press Releases

Press Release	Date
1. "Miconia Volunteers" Hawaii Tribune Herald - outing announcement in Datebook	30 Jul 2000
2. "Battling Miconia – a Beauty that Became a Beast" Lane Wick; Hawaii Island Journal	August 2000
3. "At War with Invasive Species" Dispatch Science Writer; William Allen; St. Louis Post	September 2000
4. "Earthly Treasures" Cynthia Oi; Honolulu Star Bulletin	06 Nov 2000
5. "May Earth Live" – video documentary Tom Coffman; PBS broadcasting	November 2000
6. "Preserving Hawaii's Rain Forests" Dan Boylan; Midweek Magazine	08 Nov 2000
7. "Miconia Mission reports in with count of 51,278 plants" Hawaii Tribune Herald	03 Dec 2000
8. "Alien Tree Invader Trimmed in Fern Acres" Nelson Ho – Fern Acres Community Assoc. Newsletter	January 2001
9. "Be Alert for Miconia Invader" Nelson Ho – Aloha Estates News	Winter 2000/2001
10. "Miconia Management in the New Millennium" Nelson Ho & Pat Conant – Hawaii Landscape	January/February 2001
11. "War Against Invasive Tree Not Over Yet" Hunter Bishop – Hawaii Tribune-Herald	1 March 2001
12. KBIG Radio: Russ Roberts' coverage of Operation Miconia's February 2001 Heli-ops	1 March 2001
13. "Miconia Eradication Effort Needs Help" Hawaii Tribune-Herald	18 March 2001
14. "Islands Wage War on Pesky Miconia" Jan TenBruggencate – Honolulu Advertiser	21 March 2001
15. "Miconia Research Money Sought" Hawaii Tribune-Herald	22 March 2001
16. "Miconia: The Green Cancer Spreads" Emma Yuen – Environment Hawaii	March 2001
17. "Miconia Eradicators Needed" Malama Puna	20 April 2001
18. "Miconia Eradicators are Needed Saturday in Leilani" Hawaii Tribune-Herald	26 April 2001
19. "Miconia Down but Far From Out" Nelson Ho – Malama I Ka Honua (Sierra Club)	April-June 2001
20. "Miconia is Invading Kauai"	22 May 2001

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Lester Chang – The Garden Isle	
21. “Miconia Survey Wednesday” Hawaii Tribune-Herald	29 May 2001
22. “Miconia Search by Air” Kim Tavares – Public Service Announcement	29 May 2001
23. “Miconia SWAT Team Shifts Into High Gear Sat in Leilani” Rene Siracusa – Hawaii Tribune-Herald	1 June 2001
24. “Inefficient ‘Harvest’” Rene Siracusa – Letter to the Editor, Hawaii Tribune-Herald	21 June 2001
25. “Islands Wage War Against Miconia” Hugh Clark – Honolulu Advertiser	25 June 2001

Other

Table 12. Donations

Donation	Value
1. Mr. & Mrs. Yanagisawa; residents Cash for refreshments for volunteer crews Oct. 2000	\$ 75.00
2. Hawaii Information Service Real Estate parcel information data service	\$1,684.20
3. Operation Miconia website: http://www.hear.org/operationmiconia/ K. Tavares donated time/skills, HEAR.ORG donated server space	\$ 3,000.00







