



Survey and Control of *Chromolaena odorata* in the
Kahuku Training Area, O'ahu, Hawai'i

Annual Progress Report
October 1, 2016—March 31, 2017



Clipping off the flowering heads of C. odorata to prevent further seed spread.

Summary of Project Objectives:

Chromolaena odorata, commonly known as devil weed, is a state-listed noxious weed that is toxic to livestock, people and other plants and is under some type of control program in several different countries including Australia and South Africa. It is widespread on Guam and other Pacific territories. The ability of this weed to form dense thickets and crowd out native plants means that it could be a disturbance weed. *C. odorata* is currently known from three locations on O'ahu: the Kahuku Training Area, Kahana State Park and Camp H.M. Smith in Hālawā with Kahuku Training Area being the point of introduction.

Between 2006 and 2009, botanical surveys of all publicly accessible roads on O‘ahu were conducted by OISC’s O‘ahu Early Detection program. *C. odorata* was not found during these surveys. This means that it is unlikely *C. odorata* was introduced somewhere else and dispersed onto KTA. *C. odorata* is a widely dispersed pest on the island of Guam, and units from Hawai‘i sometimes train in Guam. The seeds are wind dispersed and readily attach to clothing. One plant can produce approximately 800,000 seeds a year. Given these factors, it is highly likely the pathway of introduction was military activities. The Biological Opinion for military activities on O‘ahu requires the Army to respond immediately to incipient weeds brought in via training operations. What is currently known about *C. odorata* supports the assumptions that the center of the population is the Kahuku Training Area (KTA) and that *C. odorata* was introduced to KTA because of military activities.

The aim of this project is to contain or eradicate *Chromolaena odorata*, commonly called devil weed, from the Kahuku Training Area (KTA). Eradication at KTA will reduce the threat of this species spreading to natural areas that may contain protected species. With other funds, control operations with the aim of eradication are taking place at the other locations where *C. odorata* has been found.

At KTA, OISC conducts sweeps of designated subunits and flags devil weed infestations for later treatment by OANRP. This method allows consistent monitoring of devil weed treatments to ensure that areas that may need re-treatment are noted and any new infestations mapped. OISC’s responsibilities are:

- Surveying and monitoring treatment of subunits 3,4,7,8 and 10 within the Alpha 1 Range of Kahuku Training Area (KTA). This includes state land leased by the military and used by the public as a motorcross recreational area on the weekends.
- Flagging areas as “hotspots” for follow-up treatment by OANRP. Hotspots are defined as areas with more than five plants or areas that would be inefficient to treat without a power sprayer or an aerial spray.
- Monitoring hotspot treatment and recording amount of re-growth after treatment.
- Removing outlier *C. odorata* outside of hotspots.
- Treating re-growth inside previously treated hotspots if this can be accomplished without delaying surveying (otherwise area is flagged for follow-up treatment by OANRP).
- Communicating results of all monitoring through a Google Docs spreadsheet.



*Surveying in steep parts of
Kahuku Training Area*

Project Accomplishments: October 1, 2016—March 31, 2017.

OISC conducted four multi-day trips to control *C. odorata* for a total of 884 fieldwork hours. During the worktrips the crew:

- Conducted survey sweeps over 641 acres.
- Marked hotspots with flagging or something equivalent for later aerial or ground treatment by OANRP staff.
- Treated a total of 220 mature and 1,996 immature plants. It should be noted that these numbers are not a reflection on the total amount of plants detected or that actually exist within the subunits OISC and OANRP manage, just the total that were treated by OISC staff.
- Mapped monotypic fields of guinea grass for possible alternate survey techniques since these areas have a lower confidence level due to low visibility.



*Using the wash station at
Kahuku Training Area*

During the surveys, the crew observed that some of the mature plants they found were on the outer edges of the hotspots, validating that it is useful to do sweeps after hotspot aerial treatments. The field crew seems to be able to do the sweeps fairly quickly, but we will use the extra time to control the plants in the extremely steep sections of Kaunala gulch. As part of this effort, OANRP staff took GigaPan (extremely high-resolution panoramic photographs) images of a cliff that is too steep to survey in a traditional sweep line for OISC. The OISC crew may be able to reach some plants by hiking directly to the point. OISC staff reviewed the images and found points that could be reached directly. The crew will attempt this sometime in the next six months. The area reviewed by GigaPan equaled approximately 16 acres.

Data Management and Coordination:

During the reporting period, OISC staff entered observations for each hotspot into the Google Docs Hotspot Spreadsheet and quality controlled data from the field entered into the database. The GIS Specialist assisted staff with the review of the GigaPan photos. She also worked with OANRP staff to ensure the hotspot spreadsheet makes sense to both organizations.

Challenges:

During one survey operation, OANRP was also conducting aerial sprays, so the crew had to adjust the area they were surveying. Guinea grass over cliffs is a constant issue, during this reporting period, the crew observed some 40-foot cliffs hidden under guinea grass.

Table 1: OISC *Chromolaena odorata* Work Effort Summary at Kahuku Training Area October 1, 2016-March 31, 2017

Location	Acres Surveyed	Mature Plants Treated	Immature Plants Treated	Total Plants Treated	Effort (Hours)
KTA Subunits 3, 4, 7, 8, 10	641	220	1996	2,216	884*

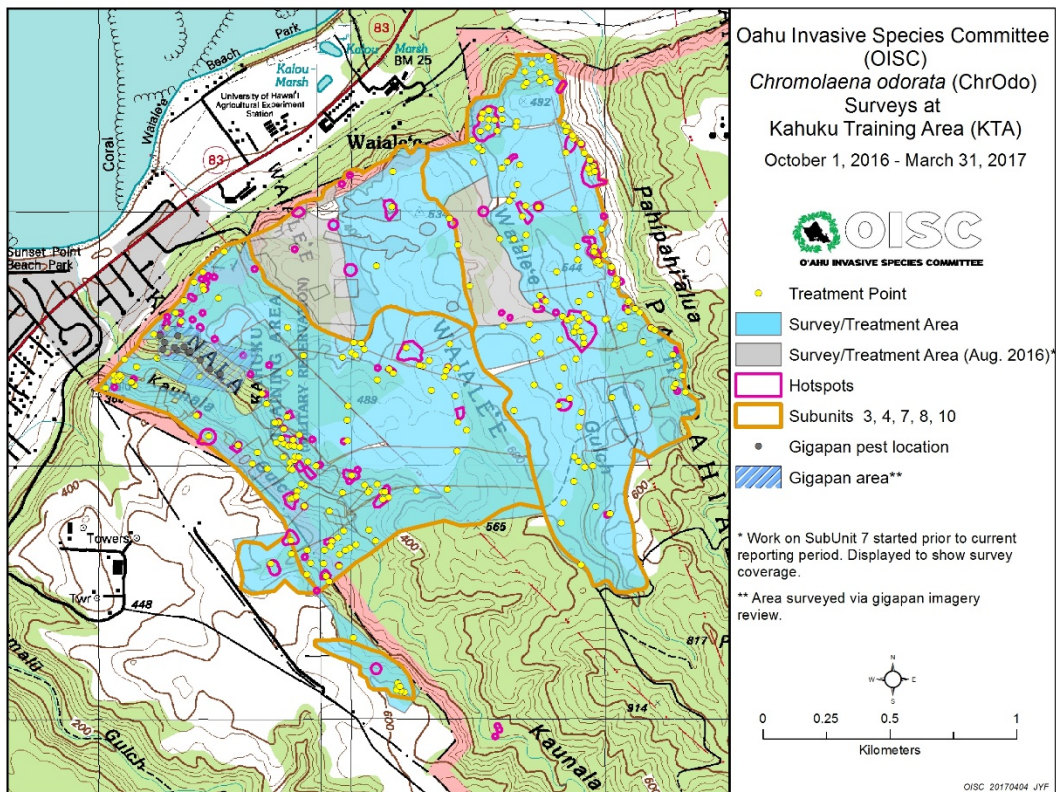
**This number is higher than the time summary spreadsheets; work on subunits 8 and 10 was not included in the time summary spreadsheets and a mistake in the amount of 2 hours was made in the amount of work done in October.*



*Top: Bagging flowers and seed heads to prevent seed spread.
Bottom: C. odorata seeds attached to flagging.*



**Figure 1: OISC *Chromolaena odorata* Work Effort in Kahuku Training Area
October 1, 2016 – March 31, 2017**



***C. odorata* Activities Supported with Other Funds:**

Surveys and Control for *C. odorata* outside of the Kahuku Training Area (KTA)

OISC conducted 567 acres of ground surveys in 'Aiea, removing 657 immature and 70 mature plants. Unfortunately, much of the surveys need to be done on private property and acquiring access permission is time-consuming.

OANRP allowed OISC to use the sprayer they built to treat the *C. odorata* in Kahana Valley. OISC paid for the helicopter time. Although the operation was delayed several times due to weather, the spray finally happened in December and monitoring took place in February. The spray was efficient and effective. It only took a day to treat every hotspot and during a subsequent monitoring trip only a few plants were found on the edges of the spray area and in between patches.

OISC crew conducted road surveys in North Shore neighborhoods and the residential area around Camp Smith in Hālawā. OISC joined an interagency team on an annual fountain grass survey of the Bellows Air Force Station in Waimānalo and surveyed for *C. odorata* since one was found in the adjacent neighborhood of Lanikai by an off-duty OANRP employee.

Table 2: OISC *Chromolaena odorata* Work Effort Summary on non-KTA lands. October 1, 2016 – March 31, 2017:

Location	Ground Acres Surveyed	Mature Plants Treated	Immature Plants Treated	Total Plants Treated	Effort (Hours)
‘Aiea	567	70	657	727	602
Hālawa	42.87	0	0	0	12
Kahana Valley*	54.66	26	397	423	261.5
Kālanunāʻiwa (N. Shore Road Survey)	116.79	0	0	0	24
Keamaneā	30.63	0	0	0	32
‘Ōi‘o (Hale‘iwa)	77.71	0	0	0	90
Non-KTA Paumalu	168	5	180	185	1101
Waiawa	32.48	0	0	0	24
Waimanālo (Bellows Survey)	1201	0	0	0	8
Total	2291.14	101	1,284	1,335	2,154.5

**These are the combined numbers from surveys before and after the aerial spray, counts were not taken during the aerial spray as the pilot was the only person in the helicopter.*

Compliance:

OISC is a project of the Pacific Cooperative Studies Unit through the Research Corporation of the University of Hawai‘i, an equal opportunity employer. OISC utilizes RCUH and PCSU standard operating procedures and employee guidelines. OISC employees are trained in wilderness first aid, off-trail hiking safety and pesticide safety.