Survey and Control of Devil Weed (*Chromolaena odorata*) in the Kahuku Training Area, O‘ahu, Hawaiʻi
Progress Report
October 1, 2014—March 31, 2015

Mature devil weed (*Chromolaena odorata*) in the Kahuku Training Area
Summary of Project Objectives

The O‘ahu Invasive Species Committee (OISC) was founded by a concerned group of citizens and land managers volunteering their weekends to control fountain grass and miconia on O‘ahu. Since then, OISC has grown into a partnership of federal, state and municipal agencies with a full-time field crew that works across all land ownerships.

OISC now systematically controls the island’s most damaging forest invaders, employs 16 people and educates the public about forest health and invasive species. OISC’s partners include the Hawai‘i Department of Land and Natural Resources/Division of Forestry and Wildlife, Honolulu Board of Water Supply, Hawai‘i Department of Transportation, Hawai‘i Department of Agriculture, Honolulu Botanical Gardens, and other state and federal agencies. The O‘ahu Army Natural Resources Program (OANRP) is a founding partner of OISC and one of OISC’s most supportive partners throughout its ten-year history. OISC is a project of the Pacific Cooperative Studies Unit of the University of Hawai‘i at Mānoa.

During the reporting period, OISC dedicated an average of 235 field hours a month to the detection and control of Chromolaena odorata at Kahuku Training Area (KTA). 1,849 plants were treated over 767 acres during OISC’s surveys of subunits 3, 4, 7, 8 and 10.

The FY2015 survey and control plan is to:

- Sweep once through all hotspots to count plants prior to OANRP conducting aerial or power sprayer drench with Oust, and delimit hotspots with flagging, or something equivalent.
- Follow up with on the ground “spot” chemical or mechanical control of OANRP treated hotspot areas.
- Survey once through subunits 3, 4, 7, 8, and 10 twice a year and treat plant population of five plants or less when encountered.

Communicate with OANRP via a google docs spreadsheet the locations where spray operations of large patches are needed. OISC also uses the spreadsheet to note if treatment was effective.

OISC continues to obtain permission from private landowners on the northern side of KTA to survey their properties. These efforts will complement the surveys on KTA. Non-OANRP funds are supporting this work.

OISC conducts monthly management camping trips to reduce the time spent commuting to the work site in order to increase logistics efficiency. OISC works with OANRP to acquire access using KTA’s range control protocols. OANRP staff observed that C. odorata tends to set seed between March and April so management actions are scheduled to minimize the chance that control work will inadvertently spread this species.

OISC also conducts survey and control efforts outside the property boundaries of the KTA. The OISC outreach specialist obtains permission from private landowners on the northwestern side of KTA to survey and control populations on their properties. These efforts complement work efforts on KTA to prevent the spread of C. odorata to other locations on the island. Non-OANRP funds are supporting this work.
**PROJECT ACCOMPLISHMENTS: OCTOBER 1, 2014-MARCH 31, 2015**

*Chromolaena odorata* commonly known as devil weed is a state-listed noxious weed, toxic to other plants, livestock and humans, possesses the ability to root vegetatively, produces up to 800,000 wind-dispersed seeds a year and is a fire promoting species that forms dense, monotypic stands of vegetation. The OANRP discovered *C. odorata* at the Kahuku Training Area (KTA) on the north shore of O‘ahu in January 2011. 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 and that *C. odorata* was introduced to KTA because of military activities:

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 major 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.

OISC conducts survey and treatment for *C. odorata* at KTA in partnership with OANRP and the Hawai‘i Department of Agriculture. The OISC field crew conducted delimiting surveys to determine population distribution and density in the Kahuku region and some limited control work. The management trips averaged 241.5 fieldwork hours per month. During the reporting period, OISC staff dedicated 1,449 personnel hours, of which 1,360 were field personnel hours. OISC surveyed 767 acres and treated 316 mature and 1,533 immature plants for a total of 1,849 plants. It should be noted that these control numbers are not a reflection on the total amount of plants detected or that actually exist within the subunits OISC manages, just the total that were treated by OISC staff. Large “hotspots” suitable for ground or aerial spraying were flagged for later treatment by OANRP.

**CHALLENGES**

The area to be treated poses logistical challenges and some safety concerns that OISC is working to resolve. Crewmembers find they must carry more than three liters of water to ensure adequate hydration and heat exhaustion is a concern. The amount of ground covered when it is extremely hot will be reduced due to the need to take frequent breaks to prevent heat-related illnesses.

Surveys through guinea grass have a low confidence level because it is difficult to see even a short distance to the next crewmember. Guinea grass also presents a safety hazard.
because it obscures the steep drop-offs and cliffs common in the area. As a result, OISC crews are treading more carefully and covering less acres per hour.

Additional acreage has been added to the area OISC needs to survey. Subunit 4 was extended to add 37 acres and subunit 10 was added. OISC had previously been able to sweep the entire area in 6 months and estimated that we could be finished in five months. However, the heat and terrain that have forced the crew to go more slowly and the additional acreage mean that we may not be able to complete all the surveys.

Table 1: OISC Chromolaena odorata Work Effort Summary
October 1, 2014-March 31, 2015

<table>
<thead>
<tr>
<th>Location</th>
<th>Acres Surveyed</th>
<th>Mature Plants Treated</th>
<th>Immature Plants Treated</th>
<th>Total Plants Treated</th>
<th>Effort (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>KTA Subunits 3, 4, 7, 8, 10</td>
<td>767</td>
<td>316</td>
<td>1,533</td>
<td>1,849</td>
<td>1,449</td>
</tr>
</tbody>
</table>

Figure 1: OISC Chromolaena odorata Work Effort in Kahuku Training Area
October 1, 2014 – March 31, 2015
DATA MANAGEMENT
OISC tracks its survey and control efforts in Microsoft Access and ArcGIS databases. It uses this data to plan field operations and report on progress. The OISC field crew completes field forms daily and is trained in the use of ArcPad and ArcGIS programs and the OISC Access database. The OISC Operations Planner and Data Analyst compiles and analyzes data collected in the field to assess work effort and if target work goals are being met.

OANRP and OISC jointly update a google doc spreadsheet to communicate hotspot treatment efficacy. OISC communicates to OANRP via the spreadsheet if a location is still a hotspot or if plants are present and OANRP lets OISC know when treatments have been completed.

PUBLIC EDUCATION & OUTREACH
OISC’s outreach specialist provided an informational update to the Koʻolauloa Neighborhood Board and an identification and reporting workshop to Board of Water Supply maintenance crew at their Kalihi baseyard.

OTHER
In January 2013, botanists confirmed a satellite population of *C. odorata* in Kahana Valley. Since then, OISC obtained funding from the Watershed Partnership Program Grants to conduct surveys and control in this region. OISC’s Outreach Specialist obtained Annual Special Use Permits for the survey and control of *C. odorata* populations at Kahana Heiau and Kea’iwa Heiau State Parks. Summaries of these efforts at the State Parks are provided by the outreach specialist to the respective Park Coordinators on a quarterly basis. As of March 31, the initial 200 meters around hotspots were surveyed and 2,008 plants controlled. Unfortunately, more plants were found within this initial buffer and the crew will continue to survey outward until they have delimited the population.

In addition to the Kahana population, a significant infestation of *C. odorata* was discovered by off-duty OANRP employees in ‘Aiea. OISC is still working to delimit and treat the population. Plants are spread across Navy, State Park, State Forest Reserve, and Honolulu Board of Water Supply land. Staff from Marine Corps Base Hawai‘i and OANRP have joined OISC staff during surveys and treatment. Staff from MCBH also assisted with gaining access to the Navy managed portion of the land.

Table 2: OISC *Chromolaena odorata* Work Effort Summary in Kahana Valley
**October 1, 2014 – March 31, 2015**

<table>
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<tr>
<th>Location</th>
<th>Acres Surveyed</th>
<th>Mature Plants Treated</th>
<th>Immature Plants Treated</th>
<th>Total Plants Treated</th>
<th>Effort (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kahana Valley</td>
<td>25.36</td>
<td>11</td>
<td>290</td>
<td>301</td>
<td>209</td>
</tr>
<tr>
<td>‘Aiea</td>
<td>109.33</td>
<td>125</td>
<td>95</td>
<td>220</td>
<td>300</td>
</tr>
</tbody>
</table>
In January, the OISC field crew found one *C. odorata* plant while doing surveys for *Senecio madagascariensis* in the Keamanea watershed at a spot that OISC visits frequently. OISC has dedicated gear for *C. odorata* surveys and washes the trucks in between species but there is a possibility that OISC dispersed it to this area. However there are other possible vectors. This area is near KTA, but close enough that wind dispersal is a possibility. Drum Road also runs through this area. OISC will continue to watch for *C. odorata* in this area and to closely follow decontamination protocols.

**COMPLIANCE**
OISC is a project of the Pacific Cooperative Studies Unit through the Research Corporation of the University of Hawaii, 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.