Control and Eradication of the Invasive Plant Species

*Chromolaena Odorata*

October 1, 2013—September 30, 2014

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 17 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 173 field hours a month to the detection and control of Chromolaena odorata at Kahuku Training Area (KTA). Close to 2,200 plants were treated during OISC’s surveys of subunits 3, 4, 7 and 8.

The 2014 management strategy was to prioritize surveying all hotspots to count plants and outline the area with flagging prior to aerial or power-sprayer control operations conducted by OANRP staff. The second priority was to survey once through all assigned subunits (3, 4, 7, 8), treating all plants encountered except hotspots. A hotspot is defined by five or more mature plants. The third priority was to survey and treat the adjacent private lands near the subunit 8 area. The last priority was to survey and map trails within the 800-meter buffer to delimit the extent of the infestation at KTA. These priorities were reevaluated after six months because OANRP was able to hire on a temporary field crew to address delimiting the population by surveying trails and roadsides within the 800m buffer and beyond.

OISC conducted 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 Kahuku training area. 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 01, 2013 — September 30, 2014**

*Chromolaena odorata*, also 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 *Chromolaena odorata* at the Kahuku Training Area (KTA) on the north shore of Oahu 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 devil weed in the Kahuku Training Area in partnership with the Hawai‘i Department of Agriculture and the O‘ahu Army Natural Resources Program. The OISC field crew conducted delimiting surveys to determine population distribution and density in the Kahuku region. The management trips averaged 173 fieldwork hours per month. During the reporting period, OISC staff dedicated 2,031 personnel hours, of which 1,818 were field personnel hours. OISC surveyed 1,248 acres and treated 294 mature and 1,902 immature plants for a total of 2,196 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.

From L to R: The field crew strategizing the day’s survey; basal-bark treatment of a devil weed plant; preparation for a cut-stump herbicide treatment application.
**CHALLENGES**

There were a few challenges noted during the year of treatment. The primary challenge to a successful eradication in the KTA region is the logistics of spraying the infestation area. Logistical challenges include the actual acreage needed to spray, lack of access to a water supply, steep, uneven terrain, and multiple equipment failures. KTA is extremely hot and dry in the summer months, which limits productivity and may be a potential safety hazard. OISC will reduce its control work during the hottest months of the year. While conducting ground surveys, the invasive vegetation, like small vines in the Passifloraceae family, create impenetrable ground cover and significantly impede survey progress. In addition, there are several large populations of devil weed growing within inaccessible areas, making them nearly impossible to treat plants. Two of these hotspot locations are known as Kaunala cliffs and “the View.” Aerial control methods must be incorporated on a regular basis if eradication is to be achieved.

The ideal management strategy for devil weed in KTA would be:
1. OISC staff survey subunits 3, 4, 7 and 8 two to three times a year;
2. Treat plants encountered, except large hotspots;
3. Map & flag all hotspot boundaries that need power-sprayer, UTV or aerial control management actions;
4. Share data with OANRP staff who follow up on a monthly basis to treat all hotspots;
5. Delimit population within KTA and adjacent private lands;
6. Enact a large community outreach effort to educate nearby residents and users of KTA of the potential impacts this specie may have on Oahu and the state as well as what management activities are occurring. This would help facilitate support for more through surveys on adjacent lands.

**Table 1: OISC *Chromolaena odorata* Work Effort Summary**

**October 1, 2013 - September 30, 2014**

<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</td>
<td>1248</td>
<td>294</td>
<td>1902</td>
<td>2196</td>
<td>1647</td>
</tr>
<tr>
<td>Private Property</td>
<td>1.73</td>
<td>27</td>
<td>72</td>
<td>99</td>
<td>84</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1249.73</strong></td>
<td><strong>321</strong></td>
<td><strong>1974</strong></td>
<td><strong>2295</strong></td>
<td><strong>1731</strong></td>
</tr>
</tbody>
</table>
**Figure 1: OISC *Chromolaena odorata* Work Effort in Kahuku Training Area**  
October 1, 2013 - September 30, 2014

**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 survey buffer areas, work effort and if target work goals are being met.

**PUBLIC EDUCATION & OUTREACH**  
OISC's outreach specialist hosted an informational booth at Agriculture Awareness Day and the Hawaii Invasive Species Awareness week events at the State Capital, at the Bishop Museum's Science Alive event and the Landscape Industry Council of Hawaii conference highlighting the potential impact of *C. odorata* and other invasive species. She also wrote an article regarding the status update for devil weed in Hawaii for the international newsletter, *Chromolaena odorata Newsletter*.

**OTHER**  
In January 2013, botanists confirmed a satellite population of devil weed in Kahana Valley. Since then, OISC obtained funding from the Watershed Partnership Program Grants to conduct delimiting surveys in this region. As of September 30, the majority of the 200m
initial survey buffer had been surveyed and 1,681 plants controlled. OISC will continue to delimit and control this population in the upcoming year.

**Table 2: OISC *Chromolaena odorata* Work Effort Summary in Kahana Valley**
**October 1, 2013 - September 30, 2014**

<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>Kahana Valley</td>
<td>35.7</td>
<td>37</td>
<td>1644</td>
<td>1681</td>
<td>210</td>
</tr>
</tbody>
</table>

**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.