Abutilon menziesii 2009-2010 Status Report

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I. Introduction

A population of *Abutilon menziesii* was discovered in late 1996 at Kapolei in the Ewa area, island of Oahu, on former sugarcane land. *Abutilon menziesii* has been a federally listed species since 1986. This population is located within the proposed footprint of a Department of Transportation road and as a result, a Habitat Conservation Plan (HCP) for *Abutilon menziesii* at Kapolei was completed to mitigate for the effects of development on this population (November 2003). The HCP outlines the measures planned over the next 20 years. The goal of the HCP is to initiate and sustain a program which would result in an overall net gain in the number of *Abutilon menziesii* on Oahu. The end goal is the establishment of three protected off-site populations on Oahu from the single degraded Kapolei population. This 2009-2010 status report serves as a way of monitoring the progress towards this end goal.

To date, *Abutilon menziesii* has been outplanted at six different sites: Diamond Head, Honouliuli Wildlife Refuge, Ewa Villages Golf Course, Contingency Reserve Area, Pouhala Marsh, and Koko Crater Botanical Garden. Diamond Head and Honouliuli Wildlife Refuge will be used towards the goal of establishing three self reproducing populations. The third site is yet to be identified or established. Pouhala Marsh has potential to be the third site. The Koko Crate Botanical Garden and Ewa Villages Golf Course populations will function as protected repositories for the full genetic stock of the Kapolei population. The Pouhala Marsh site is an experimental site meant to test the biological requirements of the plant. The main focus for 2009-2010, was to continue to represent the full genetic stock available for this species at each of the reintroduction sites, monitor for seedling establishment, and to look for potential sites for future outplantings.

Propagation of select rare coastal species continued during this reporting period. A total of 493 rare coastal species were outplanted in joint projects with the Boy Scouts, Camp Erdman, and Oahu Forestry staff. In addition, coastal plants were grown for the Army's Natural Resource Program.

II. Population Summaries

A. Diamond Head

In 2004, an MOU was established with the Hawaii State Parks and the Hawaii Army National Guard to establish an *Abutilon menziesii* population. One-hundred and four plants were outplanted in September 2004 representing 65 percent of the genetics from the Kapolei population. A low flow, low maintenance irrigation system is in place that utilizes the municipal water supply. The planting strategy used at this site was to plant the plants close together with high rates of fertilization and water to help the plants out compete the weeds and fill the area with a continuous stand of *Abutilon menziesii*. This has resulted in a very healthy population of *Abutilon menziesii*. The thought behind this strategy is that by getting the plants off to a healthy start, a seed bank will be established early on in the process. A firebreak was established around the perimeter of the population using plants that were present in the nursery in excess numbers. Groundcover was established for fire and weed control purposes using the following native species: *Vitex rotundifolia*, *Rauvolfia sandwicensis*, *Lipochaeta lobata*, *Sida fallax*, and *Sesbania tomentosa*.

Due to drought conditions, no new plants were outplanted during 2009-2010. There are now 117 total plants at Diamond Head representing 71 percent of the Kapolei population. This site is currently monitored and weeded once a month. Of the 28 seedlings seen during 2008-2009, 16 seedlings

survived for over one year. The goal for 2010-2011 is to increase the genetic representation at this site and expand the planting area.

B. Koko Crater Botanical Garden

The plants at Koko Head Botanical Garden are thriving. Originally, there were 62 plants representing 46 lineages at this site. Currently, there are 88 plants representing 50% of the genetic stock. The plants located at Koko Head are an invaluable source of working material for the program (i.e. cuttings, seeds, etc). This is a good example of how botanical gardens and various forestry programs can and should work together towards recovery of rare species. During 2009-2010, a total of four additional plants were outplanted. Work was also performed on the irrigation system. Several kiawe trees were removed from the site, expanding the Abutilon planting area and eliminating maintenance issues. The goal for 2010-2011 is to continue to add more plants to the site and to expand the planting area.

C. Honouliuli

The Honouliuli outplanting site is located along the western edge of the West Loc of Pearl Harbor. This site is within three to four miles of the original population and is very well protected. The site itself is part of the Oahu National Wildlife Refuge Complex. The refuge consists of about 20 acres of fenced land, much of which is occupied by two ponds. The land itself is still under Navy ownership but USFWS has a cooperative agreement with the Navy to manage the site as a refuge in perpetuity. There are two separate areas being used for outplanting within the refuge. The first consists of a narrow strip, approximately 20 by 600 feet, while the second site is approximately 60 by 300 feet.

The first planting commenced on March 15, 2002 in the 20 by 600 foot site. There has been no recruitment of juveniles at this location, although the threat from weeds is minimal. Work at the second location began January of 2003. The new location is about 500 yards south of the first outplanting site. The plants at Honouliuli are healthy and the site is showing promise. During 2005-2006, one keiki appeared and was looking healthy but did not make it past a year. As of 2010, there are a total of 90 plants representing 50 lineages.

Both locations are on an irrigation system and are managed entirely by the State of Hawaii Forestry and Wildlife staff. Efforts are being made to adjust the conditions of the soil at both sites so that they are more favorable for regeneration and growth. This site is monitored twice a month. Access is an issue at this site due to bird nesting and the usage by school groups for outdoor education. During the 2009-2010 reporting period, 10 additional outplantings were planted. The site was weeded and monitored during this period. The 2 seedlings found in 2008-2009 survived for over one year. Twenty-six new seedlings were found in 2009-2010; however, only 17 of those remain. The seedlings will be followed and their survival monitored again during 2010-2011. This site has almost reached capacity; therefore, the only planting planned for the next year is replacement of plants that die.

D. Ewa Villages Golf Course

The Ewa Villages Golf Course is located adjacent to the original wild *Abutilon* site. The Ewa Villages Golf Course population is located within 125 yards of the original wild site; which was the primary reason for choosing this location. Even though this is not a “wild” situation, it is an undisturbed, protected site with favorable conditions, much like the original wild site. Irrigation is present at this site. This site is monitored twice per month. Two additional plants were installed at this site during the 2009-2010 reporting period in order to balance the founders. There are currently 71 total plants at this site

representing 58% of the genetic stock available. The goal for 2010-2011 is to increase the genetic representation with additional number of outplantings.

E. Contingency Reserve Area

The Contingency Reserve Area (CRA) was set up in 2005-2006. During the 2007-2008 reporting period, substantial time was spent maintaining the firebreak around the CRA; which was maintained during 2009-2010. During 2009-2010, 12 additional plants were planted into the CRA. This site is currently weeded every two weeks. There are a total of 65 plants representing 52% of the genetic stock at this site. The goal for 2010-2011 is to continue outplanting additional plants and continue habitat restoration.

F. Kealia Experimental Sites

In 2003, there were approximately twenty-five plants at two sites located near the top of Kealia Trail. There are currently 7 plants at this site. This site proved unfeasible because of weeds and adequate space. During 2006-2007, a new site was established in a less exposed area within a drainage. In February 2007, eleven plants were outplanted to this site. This is an experimental site with no irrigation. No work, other than monitoring, was conducted at this site during this reporting period.

G. Pouhala Marsh

The Pouhala Marsh population is located on City and County property in Waipahu. During April 2007, 63 plants were outplanted, of which half were lost due to tidal fluctuations within the marsh. During 2009-2010, 10 additional *Abutilon menziesii* were outplanted. Currently, there are 31 plants representing 27% of the Kapolei population genetics. Weeds are not really a major problem at this site. The benefit of this site is the opportunity for community involvement and education because the site is so accessible. Common native and endangered plants (*Solanum nelsonii, Scaevola coriacea, Sesbania tomentosa, Capparis sandwichiana, Achyranthes splendens, Argemone glauca,* and *Cyperus trachysanthos*) were outplanted during this reporting period. Management of this site is a cooperative effort between various Division of Forestry and Wildlife Branches and the Research Corporation of the University of Hawaii staff. The goal for 2010-2011 is to continue to increase the representation of the Kapolei plants at this site.

III. Greenhouse

A. Construction

The greenhouse established for *Abutilon menziesii* is located near the base of the Kealia Trail head, just behind the western end of Dillingham Airstrip in Mokuleia. The initial structure was completed in December 2002. The greenhouse is 130 feet long by 40 feet wide by 12 feet tall. It is divided into an upper and a lower section along the entire length and has gravel floor. The site contains two separate Matson container type storage facilities, one is used as office space. The site also contains an additional raised 8-foot by 32 foot storage facility was completed inside the greenhouse structure. During 2009-2010, typical greenhouse upkeep included building maintenance, such as repairing the watering system, repainting, and weeding. Three new benches were also installed during this reporting period to expand the greenhouse planting space. Time was also spent on road maintenance; which included spreading a truckload of large gravel and topping that with a layer of fine gravel from the adjacent quarry. Time was also spent improving road access around the lower gate to the site.

B. Propagation

An ongoing goal of the program, is to continue to collect and propagate *Abutilon menziesii* plants found at the outplanting sites and/or the CRA at Kapolei that were not represented with stock on hand at the Mokuleia nursery. In other words, filling in the gaps between plants on hand at the nursery and plants in the field, which are not represented in the nursery stock. These gaps are due to the time needed for the construction of the Mokuleia nursery, during which there was no propagation of plants. This was due to the lack of facilities to grow and care for them and the time that was needed to complete the greenhouse and the HCP.

C. Issues to be Resolved

A new fuel and pesticide storage area needs to be constructed and will be pursued during the 2010-2011 reporting period.

V. Summary

Table 2. Status of *Abutilon menziesii* populations

	Kaena Point	**Koko Head**	**CRA**	**Honouliuli Reserve**	**Ewa Villages**	**Pouhala Marsh**	**Diamond Head**	**Total**
Mature	0	88	65	90	71	31	117	462
% Genetic Representation	0%	50%	52%	50%	58%	27%	71%	N/A
Seedlings 2004 (Natural Regeneration)	0	N/A	N/A	0	N/A	N/A	N/A	0
Seedlings 2005 (Natural Regeneration)	0	N/A	N/A	0	N/A	N/A	N/A	0
Seedlings 2006 (Natural Regeneration)	0	N/A	N/A	1	N/A	N/A	0	1
Seedlings 2006 (Natural Regeneration)	0	N/A	N/A	0	N/A	N/A	0	0
Seedlings 2007 (Natural Regeneration)	0	N/A	N/A	0	0	N/A	6	7
Seedling 2008 (Natural Regeneration)	0	N/A	N/A	2	0	0	28	30
Seedling 2009 (Natural Regeneration)	0	N/A	N/A	26	N/A	N/A	5	31

Seedling 2010 (Natural Regeneration)	0	N/A	N/A	0	N/A	N/A	0	0
Survival of Seedlings (0 mon.-1 yr.)	0	N/A	N/A	17	N/A	N/A	28	45
Survival of Seedlings (over 1 yr.)	0	N/A	N/A	2	N/A	N/A	16	18

A. Accomplishments for 2009-2010

- Added additional founders to Koko Crater.
- Added additional founders to the Ewa Golf Course.
- Added additional founders to the Contingency Reserve Area.
- Added additional founders to Pouhala Marsh.
- Monitored and weeded all previous outplanting site.
- Air Layers were collected from the Ewa Villages Golf Course and Koko Head.
- Continued collecting and propagating other rare coastal species in the greenhouse.
- Outplanted 493 rare coastal species in cooperation with three separate groups.
- Grew 32 plants for the Army Natural Resource Program.

B. Goals for 2010-2011

- Complete the tracking database for the project.
- Ensure that at least one (as many as possible given space availability) of every Kapolei plant is represented in at least one of the outplanting sites.
- Fully represent the Kapolei plants in the Koko Crater, Diamond Head, and Honouliuli populations.
- Continue to monitor and maintain the plants at all sites.
- Continue to survey for and collect from rare coastal species.
- Continue to outplant rare coastal species within the *Abutilon* populations.
- Establish an additional outplanting site (location unknown at this time).
- Expand Mokuleia Nursery facilities to accommodate a pesticide and fuel storage area.
- Expand existing range of *Sesbania tomentosa*.
- Continue to outplant rare coastal species.
- Continue work on *Schiedea adamantis*.