

*Abutilon menzeisii* 2007-2008 Status Report



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## **I. Introduction**

A population of *Abutilon menzeisii* was discovered in late 1996 at Kapolei in the Ewa area, island of Oahu, on former sugarcane land. *Abutilon menzeisii* 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 menzeisii* 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 menzeisii* on Oahu. The end goal is the establishment of three protected off-site populations on Oahu from the single degraded Kapolei population. This 2007-2008 status report serves as a way of monitoring the progress towards this end goal.

To date, *Abutilon menzeisii* has been outplanted at nine different sites: Diamond Head, Honouliuli Wildlife Refuge, Kealia Trail, Kaena Point, Ka Iwi, Ewa Villages Gold Course, Pouhala Marsh, Pahole Nike Site, and Koko Crater Botanical Garden. The entire Kaena Point outplanting site was lost to a fire on August 15, 2007. Three of the remaining sites will be used towards the goal of establishing three self-reproducing wild populations (Ewa Villages Golf Course, Diamond Head, and Honouliuli Wildlife Refuge). The Koko Crater Botanical Garden population will function as a protected repository for the full genetic stock of the Kapolei population. The Kealia Trail, Ka Iwi, Pouhala Marsh, and Pahole Nike sites are experimental sites meant to test the biological requirements of the plant. The main focus for 2007-2008, was to continue to represent the full genetic stock available for this species at each of the reintroduction sites and to look for potential sites for future outplantings.

## **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 menzeisii* 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 menzeisii*. This has resulted in a very healthy population of *Abutilon menzeisii*. 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*.

In 2007-2008, five new plants were outplanted. There are now 119 total plants at Diamond Head representing 74 percent of the Kapolei population. This site is currently monitored and weeded once every other week. Twenty-eight seedlings were recorded during this reporting period. The goal for 2008-2009 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 75 plants representing 59 lineages. 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 2007-2008, extensive thinning of the *Abutilon* stand was completed. Several of the identical genetic reps were removed and destroyed. This will make it easier to keep the genetic material separate and ease the weeding burden. Work was also performed on the irrigation system. An additional 22 plants were outplanted to add genetic representation to the site. The goal for 2008-2009 is to continue to add more plants to the site and to expand the planting area. Work will also be done to remove Kiawe trees that are inhibiting growth of the plants.

## 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 2008, there are a total of 88 plants representing 55 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. No outplanting was performed during the 2006-2007 reporting period. 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 2007-2008 reporting period, no additional outplantings were installed. The site was weeded and monitored during this period. In addition, tree trimming was conducted to create more favorable growing conditions for *Abutilon*. Two seedlings were observed during this reporting period. The seedlings will be followed and their survival monitored. The goal for 2008-2009 is to balance the founders by outplanting plants not currently represented at the site.

## D. Ka Iwi

During 2006, a special use permit was issued by the State Parks to DLNR for use of Ka Iwi State Park as an outplanting site for *Abutilon*. Ka Iwi is located along the road just before Makapuu Beach Park. The Ka Iwi population was established down slope of the Makapuu Lighthouse in a natural drainage. Most of the plants at this site died during the first year. During

the 2007-2008 reporting period, this site was monitored and determined to be unfavorable for this species because it is prone to flooding. The goal for 2008-2009 is to look for a possible alternate site at this location for future outplantings.

E. 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. Weeds will be an issue at this site as well. This site is monitored twice per month. Fourteen additional plants were installed at this site during the 2007-2008 reporting period in order to balance the founders. There are currently 69 total plants at this site representing 66% of the genetic stock available. The goal for 2008-2009 is to increase the genetic representation with additional number of outplantings.

F. Wild Site/Ewa/Kapolei

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. In addition, weeding was conducted around the plants. Time was also spent working with the City and County Fire Department to address access concerns. Finally, the last remaining wild plants were moved to the CRA. The goal for 2008-2009 is to continue maintenance of the site.

G. Kealia Experimental Sites

In 2003, there were approximately twenty-five plants at two sites located near the top of Kealia Trail. There are currently 18 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. Light weeding is conducted every other month. During 2007-2008, this site was monitored. The plants appear to be healthy and surviving without supplemental water. The goal for 2008-2009 is to increase the number of plants at this site and continue to monitor the plans installed during 2007.

H. 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. Currently, there are 36 plants representing 33% of the Kapolei population genetics. Irrigation lines were installed, however; water must be trucked to the site. 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. This project was initiated with the help of volunteers coordinated with Ducks Unlimited. During 2007-2008, *Cyperus trachysanthos* and *Torulinium odoratum* were outplanted to combat erosion issue; however; all plants perished due to mass flooding and the salinity of the soil. Despite the flood issue during this reporting period, additional outplanting will be installed but in area of higher ground. The goal for 2008-2009 is 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. All work on this structure was done in-house mainly by the DLNR horticulturist, Greg Mansker. Installation of the water and electrical systems was completed in 2003. 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. The storage building is built with framed enclosed walls on 3 sides, with a portion on one side remaining open for easy access. In addition to the storage area, at one end of the building a 6-foot by 10 foot covered (roofed) open walled work area was constructed. The open walled work area provides an escape from the sun and rain when work needs to be done. The building is utilized for the storage of growing/potting supplies. The close proximity of the potting supply storage area to the mixing and potting area is ideal and minimizes the time spent moving heavy and bulky materials. It should be noted that the above mentioned storage area was built over a sloped area which otherwise would have been unusable greenhouse space. This area was recaptured using creative and thoughtful construction means. During 2007-2008, typical greenhouse upkeep included building maintenance, such as repairing the watering system, repainting and weeding.

#### **B. Propagation**

Propagation of select rare coastal species including *Sesbania tomentosa*, *Achyranthes splendens*, *Capparis sandwichiana*, and *Cyperus trachysanthos* is currently under way. Eighty-seven *Sesbania tomentosa* were outplanted at Kaena Point NAR along with 20 *Achyranthes splendens* var. *splendens* and 11 *Capparis sandwichiana*. A goal for 2008-2009 is to continue outplanting *Sesbania* and other rare coastal species.

An ongoing goal of the program, is to continue to collect and propagate *Abutilon menziesii* plants found at the outplanting sites and/or the wild population 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 phone line for computer access needs to be installed. An air conditioning unit needs to be purchased for the office container. In addition, a new fuel and pesticide storage area needs to be constructed.

### **IV. Miscellaneous Achievements**

During 2007-2008 I worked cooperatively with DOFAW staff to propagate the off-shore islet species *Solanum nelsonii* and the last known *Sesbania tomentosa* from Kaohikaipu Islet.

## V. Summary

**Table 1. Status of *Abutilon menzeisii* populations**

	<b>Kaena Point</b>	<b>Koko Head</b>	<b>Honouliuli Reserve</b>	<b>Ewa Villages</b>	<b>Pouhala Marsh</b>	<b>Diamond Head</b>	<b>Total</b>
<b>Mature</b>	0	75	88	69	36	119	741
<b>% Genetic Representation</b>	0%	59%	53%	66%	33%	74%	98%
<b>Seedlings 2004 (Natural Regeneration)</b>	0	N/A	0	N/A	N/A	N/A	0
<b>Seedlings 2005 (Natural Regeneration)</b>	0	N/A	0	N/A	N/A	N/A	0
<b>Seedlings 2006 (Natural Regeneration)</b>	0	N/A	1	N/A	N/A	0	1
<b>Seedlings 2006 (Natural Regeneration)</b>	0	N/A	0	N/A	N/A	0	0
<b>Seedlings 2007 (Natural Regeneration)</b>	0	N/A	0	0	N/A	6	7
<b>Seedling 2008 (Natural Regeneration)</b>	0	N/A	2	0	0	28	30
<b>Survival of Seedlings (0 mon.-1 yr.)</b>	0	N/A	2	N/A	N/A	28	30
<b>Survival of Seedlings (over 1 yr.)</b>	0	N/A	0	N/A	N/A	0	0

A. Accomplishments for 2007-2008

- Added additional founder to Koko Crater
- Added additional founders to Diamond Head
- Added additional founder to the Ewe Golf Course
- Monitored the second Kealia Trail experimental outplanting site for *Abutilon*
- Monitored the experimental *Abutilon* outplanting site near the Pahole Nike Site
- Monitored and weeded all previous outplanting site
- Outplanted new individuals of *Sesbania* at Kaena Pt.
- Outplanted *Capparis sandwichiana* at Kaena Point NAR.
- Outplanted *Achyranthes splendens* var. *splendens* at Kaena Point NAR..
- Thinned the Koko Head *Abutilon* population
- Air Layers collected from Koko Head, Diamond Head, and Kapolei plants
- Continued collecting and propagating other rare coastal species in the greenhouse

B. Goals for 2008-2009

- Establish a phone line and purchase an air conditioning unit for the greenhouse.
- 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 at 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.