

Abutilon menziesii 2015-2016 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 was located within the 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 2015-2016 status report serves as a way of monitoring the progress towards this end goal.

The main focus for 2015-2016 was to establish a new outplanting site at State Department of Agriculture lands located at Kahuku and provide better and safer (i.e. from fire threat) habitat at the Contingency Reserve Area through revegetation efforts with common natives to attempt to reduce the weed pressure around the *Abutilon* and create green firebreaks. In addition, extensive seed collection to refresh the collection at Lyon Arboretum was completed. In addition, 110 new *Abutilon* were outplanted at various sites.

Propagation of select rare coastal species continued during this reporting period. Cooperative outplanting projects were completed in coordination with US Fish and Wildlife Service, Oahu Plant Extinction Prevention, and Division of Forestry and Wildlife.

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 % of the genetics from the Kapolei population. A low flow, low maintenance irrigation system is in place that utilizes the municipal water supply. The only plants on irrigation are new outplantings. 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*.

During 2015-2016, two new plants were outplanted. There are a total of 74 plants at Diamond Head representing 61% of the Kapolei genetic stock. This site is currently monitored once a month and selectively weeded (i.e. weeding only the high threat species). This weeding strategy emphasizes control versus elimination. There were no new seedlings during the reporting period. The seedlings that came up during the last reporting period died. Of the seedlings seen during previous reporting periods, four seedlings have survived for four years, one seedling has survived for five years, and 8 seedlings have survived for six years. The goal for 2016-2017 is to maintain and monitor the outplantings and seedlings.

B. Koko Crater Botanical Garden

The plants at Koko Head Botanical Garden are thriving. There are 84 plants representing 76% of the Kapolei genetic stock. Eighteen new plants were outplanted during the reporting period. During 2015-2016, the focus of work was to produce air layers and outplant additional founders. Over 100 successful air layers were produced during the reporting period. 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 2016-2017, work will continue to expand the founders, maintain the vegetation around the plants, and replace any plants that senesce.

C. Honouliuli

The Honouliuli outplanting site is located along the western edge of the West Loc of Pearl Harbor and was established in 2002 and 2003. 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 37 acres of fenced land, much of which is occupied by two ponds. The land 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. 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.

Both locations have been removed from irrigation. 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 once a month and weeded as needed. Access is an issue at this site due to bird nesting and the usage by school groups for outdoor education. There were no new seedlings during the report period. There are 5 seedlings that have survived more than two years, 5 that have survived for three years, 20 that have survived for four years, 65 that have survived for 5 years, and 33 that have survived for 6 years. This site has reached capacity; therefore, the only plantings planned in the future are for replacement of plants that die. Although all plants at this site produce seeds, a large percentage of the plants are also reproducing vegetatively by mounding (i.e. lower branches root on contact with the ground). As of 2016, there are a total of 73 adult plants representing 54% of the genetic stock available. During 2016-2017, a small expansion of the population will be pursued with the US Fish and Wildlife Service. This will be dependent on favorable weather conditions.

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 once a month. There are currently 77 total plants at this site representing 70% of the genetic stock available. One plant senesced during this reporting period and fifteen new plants were outplanted. The goal for 2016-2017 is to increase the genetic representation with additional number of outplantings (however, this site is reaching capacity) and maintain the current population.

E. Contingency Reserve Area

During 2005-2006, 35 plants were moved to the Contingency Reserve Area (CRA). Only one plant was lost during the move. Once the plants were moved, a perimeter fence was installed by the Department of Transportation contractors around the CRA site. A firebreak was also installed prior to the construction of the fence. The firebreak consists of a weed free gravel barrier. The perimeter fence and firebreak require regular and consistent weed control. During 2006-2007, one of the plants that had been previously moved to the CRA died. Unfortunately, this was one of the new plants located in 2002 and it is not represented in any of the outplanting sites or in genetic storage.

On October 31, 2005, a small fire occurred in the CRA taking out approximately one acre. The fire was quickly contained and no *Abutilon* were damaged. A meeting was held with the Waipahu/Ewa Fire Department at the CRA site to determine possible wildfire issues and to familiarize them with the site. At this time, more than three quarters of the perimeter of the CRA is protected by a green firebreak.

Weeds are a huge problem at this site. During 2015-2016, time was spent planting common natives to complete the green firebreak and controlling grass. Over 400 plants were planted in an effort to complete the green firebreak. Species include *Dodonea viscosa* (aalii), *Gossypium hirsutum* (mao), and *Myoporum sandwicense* (naio).

There are a total of 72 plants representing 66% of the genetic stock at this site. Thirty-four new plants were outplanted this year. Outplanting of thousands of common native species has taken place over the past few reporting periods. The idea was to add additional plants to the habitat to reduce the incoming light to reduce weed pressure. The hope was that this would increase seedling success. Unfortunately, there has been no *Abutilon* seedling recruitment at this site for many years. During 2016-2017, work will continue to increase the number of founders and common natives at this site.

F. 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 this report period 14 new *Abutilon* were planted. Forty-one new plants were outplanted this year. Currently, there are 81 plants representing 75% 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. 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 2016-2017 is to continue to increase the representation of the Kapolei plants at this site; however, the site is reaching capacity.

G. Additional Sites

During this reporting period, outplanting did not take place as planned due to unforeseen access issues. DLNR has completed the land use agreement; however, there are questions remaining about the boundary. The hope is that boundary issues are clarified in 2017, allowing for outplanting to begin in 2017.

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 2015-2016, typical greenhouse upkeep included building and road maintenance, such as repairing the watering system, repairing damage from rock falls, and weeding.

B. Propagation

Propagation of select common and rare coastal species including *Sesbania tomentosa* (ohai), *Myoporum sandwicense* (naio), *Dodonea viscosa* (aalii), and *Gossypium hirsutum* (mao) is ongoing.

During this reporting period, work continued in cooperation with the Oahu Plant Extinction Prevention Program (OPEP) on *Schiedea adamantis*. This species' distribution is restricted to Diamond Head. During 2012, 49 plants were planted in the crater. During 2014-2015, 29 plants were planted in the crater. During 2015-2016, additional plants were outplanted; however, all perished in a fire.

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.

IV. Summary

Table 3. Status of *Abutilon menziesii* populations

Tracking Measures	Wild Sites			Other Sites			Total
	Diamond Head	Honouliuli Reserve	Pouhala Marsh	Ewa Villages	CRA	Koko Head	
Initial Outplants	104 (2004)	22 (2002)	63 (2007)	57	35	62	343
Initial Outplant Genetic Representation	65%	21%	61%	47%	34%	45%	100%
2016 Mature (Reproductive) Plants	74	73	81	77	72	84	461
2016 % Genetic Representation	61%	54%	75%	70%	66%	76%	100%
2016 Seedlings	13	128	0	0	0	0	141
Seedlings surviving at least 5 years (as of 2016)	9	98	0	0	0	0	107
Date Irrigation Ceased	2012	2011	Ongoing	Ongoing	Ongoing	Ongoing	N/A
Reproductive Plants Present After Irrigation Ceased (best 5 year average)	71	73	N/A	N/A	N/A	N/A	N/A

A. Accomplishments for 2015-2016

- Founders were added to the populations at Pouhala Marsh, Diamond Head, Ewa Villages Golf Course, Koko Head, Pouhala Marsh and the Contingency Reserve Area. A total of 110 plants were outplanted.
- Extensive collection of seeds to refresh the seed collection housed at Lyon Arboretum.
- Outplanted over 400 common natives at the CRA.
- Monitored and weeded all previous outplanting site.
- Installed weed matt around many of the smaller *Abutilon* plants at the CRA to give them a competitive edge and lessen the weed pressure on the plants.
- Over 100 air Layers were collected from the Ewa Villages Golf Course and Koko Head.
- Continued collecting and propagating other rare coastal species in the greenhouse.

B. Goals for 2016-2017

- Continue pursuing additional planting sites
- Continue extensive revegetation of the CRA
- 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.
- Continue to monitor and maintain the plants at all sites.
- Continue work on *Schiedea adamantis*.
- Outplant *Abutilon* into the new Kahuku site.
- Complete the green firebreak at the CRA.