

EXECUTIVE SUMMARY

This report serves as the annual status report to the Implementation Team (IT), and participating landowners on the Makua* Implementation Plan (MIP) Year-6 actions and Oahu Implementation Plan (OIP) Year-3 actions that occurred between 1 September 2009 and 31 August 2010 and also serves to report compliance to the U.S. Fish and Wildlife Service. The Oahu Army Natural Resources Program (OANRP) has just completed implementing its sixth year of the Makua Implementation Plan Addendum (2005) and the third year of the Oahu Implementation Plan (2008). The Makua Implementation Plan (MIP) was finalized in May 2003. In January 2005, the Army completed an Addendum which emphasized management for stability of three population units (PUs) per plant taxon in the most intact habitat and 300 individuals of *Achatinella mustelina* in each genetically identified Evolutionarily Significant Unit (ESU). The 2007 Makua Biological Opinion (BO) issued by the U.S. Fish and Wildlife Service (USFWS) required that the Army provide threat control for all Oahu Elepaio pairs in the Makua action area (AA) and stabilization for 28 plant and one snail species. An amended BO was issued in 2008 that covers additional measures necessary as a result of the 2007 Waialua fire that destroyed individuals and habitat for *Hibiscus brackenridgei* subsp. *mokuleianus*. The OIP was finalized in October 2008, this document outlines stabilization measures for 23 additional plant taxa, the Oahu Elepaio and several extant Koolau *Achatinella* species. For Elepaio, the Army's requirement is to conduct predator control for 75 nesting pairs.

Year 3 of the Oahu Implementation Plan

At the end of June 2010, a Finding of No Significant Impact was issued for the programmatic Environmental Assessment for OIP management. OANRP completed construction of the Ekahanui Subunit III MU which protects eight acres of habitat for *Abutilon sandwicense*. Construction began on an 8.9 acre fence to protect the Waimano population unit of *Cyanea st.-johnii*. In addition, the Waieli subunit III fence was constructed as well as over half of the Manuwai MU fence. Stabilization work for many MIP and OIP taxa is slated for these two fences. Weed control was conducted over approximately 60 hectares within MIP and OIP MUs. In addition, over this reporting period, OANRP have invested in new technique development including the use of a wood chipper in weed control and the application of herbicide ballistic technology. Over this reporting period, OANRP reintroduced 26 individual plants of taxa covered in the OIP and 314 individuals of taxa that are OIP and MIP overlapping taxa. In addition, OANRP assisted a UH Graduate Student with the planting of 730 *Schiedea kaalae*, a taxon covered in both the MIP and OIP. These numbers are a substantial increase since last year, despite greenhouse sanitation issues with snails. OANRP collected from 95 sites of IP species (collections were made on multiple occasions from some of these sites) and completed 927 rare plant observations during this reporting period. OANRP conducted predator control to protect nests within 81 elepaio territories.

Year 6 of the Makua Implementation Plan

Last year, construction of MIP fences was stalled, awaiting completion of Section 106 consultation in accordance with the National Historic Preservation Act. Approval to move forward on a handful of fences was obtained in March and Section 106 consultation letters were prepared and transmitted for many more. The 1.9 acre Napepeiauolelo fence was completed to protect extant *Hesperomannia arbuscula* and a three acre fence was finished, enclosing *Sanicula mariversa*. In addition, the OANRP fence crew completed construction of and initiated ungulate removal from the 23-acre Kaluaa and Waieli Subunit III fence. OANRP have also constructed approximately one-half of the Manuwai fence, totaling 2.6 kilometers of fencing. Extremely steep terrain may require contracting a one kilometer portion of what remains to be completed of the Manuwai unit. Supplemental fencing was installed to protect the Waianae Kai Makai PUs of *Nototrichium humile* and *Neraudia angulata* and OANRP are confident that goats can no longer penetrate the unit. Weed control was conducted over approximately 60 hectares

*Hawaiian diacriticals are not used in this document except in some appendices in order to simplify formatting. Please refer to Appendix 1 *Spelling of Hawaiian Names*.

within MIP and OIP MUs. In addition, over this reporting period, OANRP have invested in new technique development including the use of a wood chipper in weed control and the application of herbicide ballistic technology. Over this reporting period, OANRP outplanted 622 individuals of taxa covered in the MIP and 314 individuals of taxa that are OIP and MIP overlapping taxa. In addition, OANRP assisted a UH Botany graduate student in planting 612 *Schiedea obovata* and 150 *Schiedea nuttallii* within IP MUs as part of an inbreeding and outbreeding study but these will not be considered part of the managed PUs until study results are known. OANRP collected from 95 sites of IP species (collections were made on multiple occasions for some of these sites) and completed 927 rare plant observations during this reporting period. For *Achatinella mustelina*, six of the eight sites slated for management in the MIP have over 300 individuals. Vegetation Monitoring belt transects were installed in three more IP MUs, Ohikilolo, Makaha and Kaluaa and Waieli bringing the total MUs with monitoring in place to six. Six 5-year Ecosystem Restoration Management Unit plans were written this year, bringing the total prepared to fourteen including those prepared last year. An ERMUP will be prepared for the last two actively managed and fenced MUs over the next reporting period along with plans for units where fences are soon to be completed.

Landowner/Agency Communications

The Army continues to work cooperatively under a Memorandum of Understanding (MOU) with both the Board of Water Supply (BWS) and the U.S. Navy for work in Makaha Valley and at Lualualei Naval Magazine.

The Trust for Public Lands transferred ownership of Honouliuli Preserve to the State of Hawaii on 31 March 2010. The Army contributed over three million dollars via the Army's Compatible Use Buffer Program toward the purchase of the Preserve. The Title for the preserve reserves the right for the Army to continue using Honouliuli to conduct IP related management. Honouliuli is currently unencumbered state land managed by the Department of Land and Natural Resources, Land Division. The Army applied for a permit from the Land Division in May 2010 and anticipates obtaining the permit in October after it goes before the Board of Land and Natural Resources. The Nature Conservancy of Hawaii's lease for management of Honouliuli was appraised for approximately \$300,000, which was put into an endowment to be used toward the future management of the preserve.

Negotiations for agreements with other landowners to allow the Army to carry out MIP and OIP work are progressing. OANRP is operating under a signed 3-year license agreement with Kamehameha Schools (KS) for work in the MUs on KS lands. A fully-executed 20-year license is anticipated in September 2010. This long-term license will allow the Army to pursue MIP and OIP fencing on KS lands. In February 2010, the Army obtained a six month right of entry to monitor *Hibiscus brackenridgei* populations on Dole Food Company land; renewal is being pursued. The Army is in the final stages of negotiating a license agreement with Hawaii Reserves Inc. for work at the Koloa MU.

Finally, the Army continues to work toward an agreement to continue conservation work on State of Hawaii lands. The Army is awaiting a response letter from DLNR explaining the fee that the State wants to apply to the Army's work. The Army will then take the justification for the fee to Army Environmental Command for approval and authorization. At this point, the Army would like to enter into a simple MOU with the State of Hawaii for proposed MIP and OIP work. After that document is signed, the proposal is to negotiate a more detailed real estate agreement, such as a right of entry or license, tiered off of this umbrella MOU. Currently the Army holds a current NARS special use permit, a State of Hawaii Threatened and Endangered Species Permit and has submitted a Conservation District Use Permit Application which is slated for issuance early in the 2011 calendar year.

The Army continues to provide support for partner agencies including the Oahu Invasive Species Committee and the Koolau Mountains Watershed Partnership. The Army is also a member of the Koolau Mountains Watershed Partnership and the newly formed Waianae Mountains Watershed Partnership.

Fire

OANRP are authorized by RCUH to take part in fire mop-up operations. Currently, 16 staff are trained to work with the Army Wildland Fire or State of Hawaii, Division of Forestry and Wildlife crews in a fire response capacity. During this reporting period, OANRP helped coordinate fire fighting resources, assisted with mop-up operations and funded helicopter support to extinguish the Makua Valley fire that occurred in July 2010. A summary report for this fire is included as Appendix 2.

Propagation and Seed Storage

All seed collections are processed and stored at the OANRP Seed Lab at the Schofield Barracks East Range facility by OANRP staff. Seeds are germinated there and seedlings grown in growth chambers. Research on dormancy continued in the last year and is discussed in Determining Physical Dormancy in Hard-Seeded Species as Appendix 3. An update and discussion on determining the re-collection intervals for IP species is included as Appendix 4. A new facility for the OANRP Seed Lab, with an adequate back-up power generator to run the growth chambers, freezers and refrigerators during a power loss, a dedicated laboratory area for making agar media and expanded workspace for processing collections, is currently being designed. Plans are to build this facility in fiscal year (FY) 2012. OANRP use shade-houses at the State's Pahole Rare Plant Facility and the Schofield Barracks facility for vegetative propagation, to grow larger plants for reintroductions and to hold living collections for genetic storage. The Lyon Arboretum Micropropagation Lab is used to maintain and clone important collections for genetic storage, reintroductions and to germinate seeds from immature fruit.

Nursery Sanitation

Since November 2008, OANRP have been contending with an infestation of five alien snail taxa in the shade-houses at Pahole and Schofield. Considering the potential consequences of introducing alien snails to natural areas, OANRP made the decision not to reintroduce plants until they were considered "snail-free". This has severely affected production, delayed reintroduction projects, and required the diversion of hundreds of hours of staff time to clean the facilities, search infested benches, and develop control techniques.

The snails were first observed in the shade-houses following the delivery of plants from two local nurseries (Laaui Hawaii and Hui Ku Maoli Ola) that had been contracted by OANRP to grow plants for restoration projects. Laaui Hawaii had observed an unknown species of small alien snails at their facility and alerted OANRP to the potential that the plants (palapalai) that had already been delivered (and outplanted) were infested. OANRP staff searched the delivered plants remaining at the nursery and the nursery at Laaui Hawaii and confirmed the presence of *Liardetia doliolom* at both sites. Following the delivery of plants to be used on restoration projects in Kahuku, Kahanahaiki and Kaluakauila, two other new alien snail species were observed at the Schofield and Pahole facilities (*Zonitoides arboreus*, *Succinea tenella*). Surveys of the nursery (Hui Ku Maoli Ola) that was contracted to grow the plants found *Succinea tenella*.

In June 2009, OANRP, with the help of USDA-ARS Biologist Robert Hollingsworth, initiated studies to determine the most effective methods for detecting the presence of and eradicating snails while minimizing phytotoxic effects to the plants. Phytotoxicity and efficacy trials were conducted with five different molluscicides, Slug-Fest (All Weather Formula RTU, OR-CAL Inc., Crop Services Production), a liquid metaldehyde, was the most effective while being less toxic to plants and humans. Two searching methods were tested to find the quickest, most efficient way to check for the presence/absence of snails. By August 2009, there was a 95% decline in the detection of alien snails. In October 2009, many plants were determined to be clean and over 3,000 plants were reintroduced in this report year.

All snails have been eradicated from the facilities except *Zonitoides arboreus*. Currently only a few benches are suspected to have lingering individuals of *Z. arboreus*. All benches are isolated from each other using barriers of salt pellets to prevent movement onto clean areas. All plants are inspected for presence of snails using lettuce bait and infested plants are treated regularly using metaldehyde. The

remaining infested stock will be cloned and replaced with clean stock in the coming year. All plants to be used in reintroductions in the coming year have been inspected at least once a month for a year or more and no snails have been found.

Research

During this reporting period, intensive effort was spent refining the barrier for *Euglandina* with respect to endangered snail enclosures. A variety of barriers were tested to determine their effectiveness. Also, additional work was conducted with *Euglandina* detection dogs. The research section also covers resource monitoring results related to the newly installed snap trap grid at Kahanahaiki. In addition, a safe and effective *Sphagnum* moss control method was found. OANRP are in the final stages of securing a special local label for applying Sluggo in forest settings for protection of rare native seedlings and the research chapter includes an update on this process.

OANRP continues to support work by researchers from the University of Hawaii on taxa covered by the MIP/OIP. In the last year, OANRP has worked to facilitate research by Lauren Weisenberger (*Schiedea*), Dr. Cliff Morden (*Chamaesyce, Stenogyne kanehoana*), Melody Euaparadorn (*Chamaesyce celastroides* var. *kaenana*-her research proposal is Appendix 5) and Richard Pender (*Cyanea superba* subsp. *superba, Delissea waianaeensis*). OANRP also contributed leaf collections from the nursery stock of *Viola chamissoniana* to Dr. Chris Havran (Campbell University). Research on threats to MIP/OIP taxa are discussed in detail in the Species Status Summary for each taxon.

Funding and staffing levels

There are currently a total of 50 staff comprising three field crews, a fence crew, a nursery and seedbank management crew and various foundational support staff; similar to last year's staffing. The Army received \$3.5 M for MIP and \$4.4 M for OIP in FY2010. The \$4.4 M for the OIP includes \$2M for the Lihue fence construction. The OANRP is still hiring to achieve the staffing level for the MIP and OIP. The major difficulties associated with increasing staff numbers are the lack of senior staff to orient new hires in the field, finding qualified hires, and the lack of space to house this large number of field crew and field supplies.

Designs for the OIP office building and a Seed Conservation Laboratory are expected in April 2011. Construction of the OIP office building is planned for FY 2011 and for the Seed Laboratory in FY 2012. With the addition of these buildings, OANRP will have the space necessary to increase staffing to full OIP and MIP levels.

OANRP continue to utilize the scheduling database. This year OANRP used the data summaries to guide field actions more efficiently and to analyze time expenditures by program area. This detailed tracking allows senior program staff to realign and reprioritize program priorities and create more realistic plans. Over the next year OANRP will begin to use the data to refine and update cost estimates.

Table I. Status summary of MIP plant species for Year-6. Final MIP numbers are presented this year (-- indicates that the population was not known during IP preparation, **n/a** = the population unit is being started via reintroduction). **Bold** = reached that stabilization goal. The genetic storage goal for a PU is considered met if collections have been secured from all available founders which, in some cases, are less than 50. If greater than 50 founders are known, genetic collections will not be considered complete until at least 50 are represented.

Makua Implementation Plan					
Taxon Code	Population Unit	# plants in Final MIP	Status mature/immature/seedling (# mature goal) includes augmentations	Genetic Storage (> 50 seeds from 50 individuals, >3 clones in propagation from 50 individuals)	Ungulate free
<i>Alectryon macrococcus</i> var. <i>macrococcus</i>	Kahanahaiki to West Makaleha	8	35/7/0 (50)	0	Partial
	Makua	15	20/0/0 (50)	1 (individuals represented by airlayers)	Partial
	Central Kaluaa to Central Waieli	53-58	17/6/0 (50)	0	Partial
	Makaha	77	63/5/2 (50)	0	Partial
<i>Cenchrus agrimonioides</i> var. <i>agrimonioides</i>	Kahanahaiki to Pahole	37	358/52/118 (50)	52 (clones + seed)	Partial
	Central Ekahanui	20	87/22/39 (50)	16 (ind w/ clones)	Partial
	Makaha and Waianae Kai	12	8/0/0 (50)	4 (ind w/ clones)	Partial
<i>Chamaesyce celastroides</i> var. <i>kaenana</i>	Makua	40	125/2/0 (25)	59 (>50 seeds)	Yes
	Kaena	375-525	300/0/0 (25)	55 (>50 seeds)	n/a
	Kaena East of Alau	26	26/1/0 (50)	20 (>50 seeds)	n/a
	Puaakanoa	157	132/16/0 (25)	7 (>50 seeds)	n/a
<i>Chamaesyce herbstii</i>	Kapuna to Pahole	170	64/87/1 (25)	13 (>50 seeds)	Partial
	Makaha (reintro)	n/a	19/124/26 (25)	n/a	Yes
	West Makaleha (reintro)	0	0/0/0	n/a	No
<i>Cyanea grimesiana</i> ssp. <i>obatae</i>	Pahole to W Makaleha	13	40/15/4 (100)	10 (>50 seeds)	Yes
	Central Kaluaa	2	24/17/0 (100)	1 (>50 seeds)	Yes
	Palikeya (South Palawai)	28	97/30/1 (100)	13 (>50 seeds)	Yes
	Makaha	--	1/0/0 (100)	1 (>50 seeds)	Yes
<i>Cyanea</i>	Kapuna to W	66	41/18/0 (75)	16 (>50 seeds)	Partial

Makua Implementation Plan					
Taxon Code	Population Unit	# plants in Final MIP	Status mature/immature/ seedling (# mature goal includes augmentations	Genetic Storage (> 50 seeds from 50 individuals, >3 clones in propagation from 50 individuals)	Ungulate free
<i>longiflora</i>	Makaleha				
	Pahole	114	63/64/11 (75)	42 (>50 seeds)	Yes
	Makaha and Waianae Kai	7	3/8/0 (75)	2 (>50 seeds)	Yes
<i>Cyanea superba</i> ssp. <i>superba</i>	Kahanahaiki	1	48/285/67(50)	3 of 3 available founders	Yes
	Central and East Makaleha (reintro)	n/a	0/0/0 (50)	n/a	No
	Makaha (reintro)	n/a	0/95/0 (50)	n/a	Yes
	Pahole to Kapuna (reintro)	0	121/183/9 (50)	n/a	Yes
<i>Cyrtandra dentata</i>	Pahole to Kapuna to West Makaleha	300	577/615/238 (50)	50 (>50 seeds)	Partial
	Kawaiiki	50	15/31/39 (50)	0	No
	Opaeula	26	16/12/0 (50)	0	No
	Kahanahaiki	97	65/142/0 (50)	22 (>50 seeds)	Yes
<i>Delissea waianensis</i>	Kahanahaiki to Keawapilau	10	171/47/0 (100)	11 (>50 seeds)	Yes
	Ekahanui	14	127/163/0 (100)	6 (>50 seeds)	Yes
	Kaluaa	1	181/142/2 (100)	5 (>50 seeds)	Yes
	Manuwai (reintro- Palikea gulch stock)	n/a	0 (reintro to begin after fence completed)	6 (>50 seeds)	Yes
<i>Dubautia herbstobatae</i>	Ohikilolo Makai	700+	358/0/0 (50)	0	Yes
	Ohikilolo Mauka	1300+	382/6/0 (50)	1 (>3 clones)	Yes
	Makaha	--	36/1/0 (50)	12 (>3 clones)	No
<i>Flueggea neowawrae</i>	Kahanahaiki to Kapuna	6	7/64/0 (50)	2 (>3 clones)	Partial
	Central and East Makaleha	6	5/0/0 (50)	2 (>3 clones)	No
	Makaha	5	10/25/0 (50)	2 (>3 clones)	Partial
	Manuwai	1	0/0/0 (50)	n/a	No
<i>Gouania vitifolia</i>	Keaau	new	60/1/0 (50)	36 (>50 seeds)	No

Makua Implementation Plan					
Taxon Code	Population Unit	# plants in Final MIP	Status mature/immature/ seedling (# mature goal includes augmentations	Genetic Storage (> 50 seeds from 50 individuals, >3 clones in propagation from 50 individuals)	Ungulate free
	Makaha (reintro- Waianae Kai stock)	new	0/0/0 (2 in waianae kai)	0	No
	Makaleha or Manuwai (reintro)	new	0/0/0	n/a	No
<i>Hedyotis degeneri</i> var. <i>degeneri</i>	Kahanahaiki to Pahole	161	186/204/100 (50)	32 (>50 seeds)	Partial
	Alaiheihe and Manuwai	60	21/2/0 (50)	26 (>50 seeds)	No
	Central Makaleha and West branch of East Makaleha	47	23/33/4 (50)	28 (>50 seeds)	No
<i>Hedyotis parvula</i>	Ohikilolo	67	120/28/40 (50)	78 (>50 seeds)	Yes
	East Makaleha (reintro)	0	0/0/0 (50)	0	No
	Halona	64-79	97/35/19 (50)	62 (>50 seeds)	Yes
<i>Hesperomannia arbuscula</i>	Pahole NAR	7	0/15/0 (75)	n/a	Yes
	Haleauau	--	1/0/0 (75)	0	Yes
	Makaha	14	3/3/0 (75)	1 plant represented in nursery	Yes
	Pualii	n/a	0/24/0 (75)	n/a	Yes
<i>Hibiscus brackenridgei</i> ssp. <i>brackenridgei</i>	Makua	7	30/35/23 (50)	29 (>3 clones)	Partial
	Haili to Kawaii	4	0/1/0 (50)	7 (>3 clones)	No
	Kaimuhole to Palikea Gulch	8	13/153/5 (50)	19 (>3 clones)	No
	Keaau	--	3/7/0 (50)	3 (>3 clones)	No
<i>Melanthera tenuifolia</i>	Ohikilolo	2016	1233/0/0 (50)	13 (>50 seeds)	Yes
	Kamaileunu and Waianae Kai	1285- 1955	883/269/297 (50)	0	No
	Mt. Kaala NAR	250	300/0/0 (50)	0	No
<i>Neraudia angulata</i>	Makua	31	48/38/5 (100)	13 (>3 clones)	Yes
	Manuwai	12	0/0/0	2 (>3 clones)	No
	Waianae Kai Mauka	46	16/4/0 (100)	4 (>3 clones)	No
	Kaluakauila	n/a	125/3/0 (100)	n/a	Yes

Makua Implementation Plan					
Taxon Code	Population Unit	# plants in Final MIP	Status mature/immature/ seedling (# mature goal includes augmentations	Genetic Storage (> 50 seeds from 50 individuals, >3 clones in propagation from 50 individuals)	Ungulate free
	(reintro)				
<i>Nototrichium humile</i>	Kaluakauila	200-400	198/35/0 (25)	4 (>3 clones)	Yes
	Makua (south side)	120-140	62/1/0 (25)	0	Partial
	Kaimuhole and Palikea Gulch (Kihakapu)	54	55/4/0 (25)	22 (>3 clones)	No
	Waianae Kai	200-320+	199/105/0 (25)	2 (>3 clones)	Partial
<i>Phyllostegia kaalaensis</i>	Keawapilau to Kapuna	4	0/0/0 (50)	1 (3 clones)	Yes
	Makaha (reintro)	n/a	0/1/0 (50)	n/a	Yes
	Manuwai (reintro)	n/a	0/0/0 (50)	n/a	No
	Pahole	10-15	0/0/0 (50)	2 (3 clones)	Yes
<i>Plantago princeps</i> var. <i>princeps</i>	Ohikilolo	14	11/0/0 (50)	10 (>50 seeds)	Yes
	Ekahanui	23	29/37/7 (50)	49 (>50 seeds)	Partial
	North Mohiakea	30	10/16/2 (50)	12 (>50 seeds)	Partial
	Halona	50-100	29/43/0 (50)	22(>50 seeds)	No
<i>Pritchardia kaalae</i>	Ohikilolo	165	77/1024/12 (25)	11 (>50 seeds)	Yes
	Ohikilolo East and West Makaleha (reintro)	n/a	0/209/0 (25)	n/a	Yes
	Makaleha to Manuwai	141	102/10/2 (25)	14 (>50 seeds)	No
<i>Sanicula mariversa</i>	Ohikilolo	143	3/112/0 (100)	19 (>50 seeds)	Yes
	Keaau	141	11/300/40 (100)	31 (>50 seeds)	Yes
	Kamaileunu	26	11/637/343 (100)	34 (>50 seeds)	Yes
<i>Schiedea kaalae</i>	Pahole	3	37/12/13 (50)	2 (>50 seeds)	Yes
	Maakua	4	10/0/0 (50)	4 (>50 seeds)	No
	South Ekahanui	0	28/0/0 (50)	13 (clones/seeds)	Yes
	Kaluaa and Waieli (reintro)	2	72/6/0 (50)	1 (>50 seeds)	Yes
<i>Schiedea nuttallii</i>	Kahanahaiki to Pahole	47-48	130/22/115 (50)	32 (clones/seeds)	Yes

Makua Implementation Plan					
Taxon Code	Population Unit	# plants in Final MIP	Status mature/immature/seedling (# mature goal) includes augmentations	Genetic Storage (> 50 seeds from 50 individuals, >3 clones in propagation from 50 individuals)	Ungulate free
	Kapuna-Keawapilau ridge	3	0/0/0	0 (no founders available)	Yes
	Makaha (reintro)	n/a	21/0/0 (50)	n/a	Yes
<i>Schiedea obovata</i>	Kahanahaiki to Pahole	0	191/358/297 (100)	5 (>50 seeds)	Yes
	Keawapilau to West Makaleha	3	261/412/829 (100)	72 (>50 seeds)	Partial
	Makaha (reintro)	n/a	0/0/0	n/a	Yes
<i>Tetramolopium filiforme</i>	Kalena	--	9/0/6 (50)	7 (>50 seeds)	No
	Ohikilolo	5000+	2542/582/21 (50)	39 (>50 seeds)	Yes
	Puhawai	12	3/2/0 (50)	5 (>50 seeds)	n/a
	Waianae Kai	0	30/8/8 (50)	0	No
<i>Viola chammisoniana</i> ssp <i>chammisoniana</i>	Ohikilolo	250	435/10/0 (50)	2 (>50 seeds)	Yes
	Puu Kumakalii	20	44/0/0 (50)	11 (>50 seeds)	Yes
	Halona	3	41/3/0 (50)	2 (>50 seeds)	No
	Makaha	50	37/2/0 (50)	0	Partial

Table II. Status summary of OIP plant species for Year-3. Bold = reached that stabilization goal

Oahu Implementation Plan					
Taxon Name	Population Unit	# of plants in Final OIP (mature/immature /seedling)	Status mature/immature/ seedling (# mature goal)	Genetic Storage (> 50 seeds from 50 individuals, >3 clones in propagation from 50 individuals)	Ungulate free
<i>Abutilon sandwicense</i>	Kaawa to Puulu	36/88/6	47/72/2 (50)	0 (>50 seeds)	No
	Kaluakauila	0/4/0	0/13/0 (50)	n/a (>50 seeds)	Yes
	Makaha Makai	73/27/6	73/27/6 (50)	8 (>50 seeds)	No
	Ekahanui and Huliwai	14/30/0	14/27/11 (50)	6 (>50 seeds)	Partial
<i>Chamaesyce rockii</i>	Helemano	7/1/0	7/1/0 (50)	0 (>50 seeds)	Yes
	Kawainui to Koloa and Kaipapau	48/25/4	37/13/2 (50)	0 (>50 seeds)	No
	Waiawa and Waimano	15/0/0	15/0/0 (50)	0 (>50 seeds)	No
<i>Cyanea acuminata</i>	Helemano-Punaluu Summit Ridge to North Kaukonahua	59/13/7	59/13/7 (50)	4 (>50 seeds)	No
	Kahana and South Kaukonahua	2/0/0	2/0/0 (50)	0 (>50 seeds)	No
	Makaleha to Mohiakea	85/33/0	103/43/0 (50)	0 (>50 seeds)	Partial
<i>Cyanea crispa</i>	Kawaiiki	2/4/0	2/4/0 (50)	0 (>50 seeds)	No
	Kahana and Makaua	6/0/0	7/7/0 (50)	3 (>50 seeds)	No
	Wailupe	5/1/0	5/1/0 (50)	5 (>50 seeds)	No
<i>Cyanea koolauensis</i>	Kaipapau, Koloa and Kawainui	51/25/6	55/16/6 (50)	0 (>50 seeds)	No
	Kaukonahua	11/1/0	14/2/0 (50)	0 (>50 seeds)	No
	Opaeula to Helemano	10/3/0	13/8/0 (50)	0 (>50 seeds)	Partial
<i>Cyanea st.-johnii</i>	Helemano	6/0/0	4/1/0 (50)	4 (>50 seeds)	Yes
	Ahuimanu-Halawa Summit Ridge	14/0/20	8/3/0 (50)	3 (>50 seeds)	No
	Waimano	14/5/0	14/5/0 (50)	4 (>50 seeds)	No
<i>Cyrtandra subumbellata</i>	Kaukonahua	2/0/1	0/0/0 (50)	0 (>50 seeds)	No
	Kahana	8/7/0	8/7/0 (50)	0 (>50 seeds)	No
	Punaluu	200/0/0	201/0/0(50)	0 (>50 seeds)	No

Oahu Implementation Plan					
Taxon Name	Population Unit	# of plants in Final OIP (mature/immature /seedling)	Status mature/immature/ seedling (# mature goal)	Genetic Storage (> 50 seeds from 50 individuals, >3 clones in propagation from 50 individuals)	Ungulate free
<i>Cyrtandra viridiflora</i>	Helemano and Opaepala	45/15/6	39/13/6 (50)	5 (>50 seeds)	Partial
	Kawainui and Koloa	21/5/1	16/4/0 (50)	1 (>50 seeds)	No
	South Kaukonahua to Kipapa Summit	0/2/0	2/0/0 (50)	0 (>50 seeds)	No
<i>Eugenia koolauensis</i>	Kaunala	48/93/6	59/111/137 (50)	0 (>1 clone)	Yes
	Oio	18/56/0	22/17/15 (50)	1 (>1 clone)	Yes
	Pahipahialua	57/234/1	50/33/377 (50)	2(>1 clone)	Yes
<i>Gardenia mannii</i>	Haleauau	2/0/0	4/0/0 (50)	0	Partial
	Helemano and Poamoho	18/0/0	14/0/0 (50)	0	No
	Lower Peahinaia	37/1/0	37/1/0 (50)	0	No
<i>Hesperomannia arborescens</i>	Kamananui to Kaluanui	54/45/14	56/46/14 (50)	0	No
	Kaukonahua	76/51/122	76/56/124	0	No
	Lower Opaepala	9/15/0	9/15/0	0	No
	Palikea Gulch	0/0/0	0/0/0	0	No
<i>Huperzia nutans</i>	Kahana and North Kaukonahua	6/0/0	5/0/0 (50)	0	No
	Koloa and Kaipapau	3/0/0	3/2/0 (50)	0	No
	South Kaukonahua	1/0/0	1/0/0 (51)	0	No
<i>Labordia cyrtandrae</i>	East Makaleha to North Mohiakea	84/16/2	85/17/0 (100)	10 (>3 clones)	Partial
	Manana	1/0/0	1/0/0 (100)	0	No
<i>Lobelia gaudichaudii</i> ssp. <i>koolauensis</i>	Kaukonahua	3/45/2	1/29/1 (100)	3 (>50 seeds)	No
	Kipapa	0/100/20	0/100/20 (100)	0	No
	Waiawa to Waimano	0/200/0	0/200/0 (100)	0	No
<i>Melicope lygatei</i>	Kawaiiiki and Opaepala	43/0/0	42/0/0 (50)	0	No
	Kaiwikoele-	3/0/0	3/0/0 (50)	1 (>3 clones)	No

Oahu Implementation Plan					
Taxon Name	Population Unit	# of plants in Final OIP (mature/immature /seedling)	Status mature/immature/ seedling (# mature goal)	Genetic Storage (> 50 seeds from 50 individuals, >3 clones in propagation from 50 individuals)	Ungulate free
	Kawainui Ridge				
<i>Myrsine juddii</i>	Kaukonahua to Kamananui-Koloa	455/0/0	455/0/0 (75)	0	Partial
<i>Phyllostegia hirsuta</i>	Haleauau to Mohiakea	6/12/0	8/10/0 (100)	1 (>3 clones)	No
	Laie and Puu Kainapuaa	0/0/0	0/0/0 (100)	0	No
	Hapapa to Kaluaa	11/9/7	3/10/1 (100)	2 (>3 clones)	Partial
<i>Phyllostegia mollis</i>	Ekahanui	36/0/0	4/0/0 (100)	1 (3 clones)	Partial
	Kaluaa	38/11/0	17/7/0 (100)	0	Yes
	Pualii	0/0/0	0/0/0 (100)	1 (3 clones)	Yes
<i>Pteris lidgatei</i>	Helemano	0/2/2	0/2/2 (50)	0	n/a
	Kawaiiki	3/0/0	3/0/0	0	n/a
	South Kaukonahua	6/0/0	6/0/0(50)	0	No
<i>Sanicula purpurea</i>	North of Puu Pauao	0/21/0	0/21/0 (100)	0	No
	Poamoho Trail Summit	2/10/12	2/10/12 (100)	0	No
	Schofield-Waikane Trail Summit	2/25/0	2/40/0 (100)	0	No
<i>Schiedea trinervis</i>	Kalena to East Makaleha	180/196/31 8	179/198/318 (150)	48 (>50 seeds)	Partial
<i>Stenogyne kanehoana</i>	Haleauau	1/0/0	1/0/0 (100)	1 (>3 clones)	Yes
	Kaluaa	0/79/0	7/57/0 (100)	1 (>3 clones)	Yes
	Makaha (reintro)	n/a	0/0/0 (100)	n/a	No
<i>Viola oahuensis</i>	Helemano and Opauala	162/145/22	163/146/22 (50)	0	Partial
	Kaukonahua	25/0/0	25/0/0 (50)	0	No
	Koloa	36/9/6	31/8/6 (50)	0	No

Table III. Status summary *Achatinella mustelina* for Year-6. Bold = reached that stabilization goal. Goal for MIP snails is 300 total (all age classes) per ESU. No *ex situ* numerical goal define so none bold.

Makua Implementation Plan					
Taxon Name	Evolutionarily Significant Unit (ESU)	# snail in Final MIP	Status adult/subadult/ juvenile (goal)	<i>ex situ</i> #s adult/subadult/juvenile (# of sites represented)	Ungulate free
<i>Achatinella mustelina</i>	ESU A (Kahanahaiki/Pahole)	105	274/52/65 (300)	0/0/2 (1)	Yes
	ESU B1 (Ohikilolo)	300	293/37/42 (300)	0/10/1 (2)	Yes
	ESU B2 (East/Central Makaleha)	40	289/114/68 (300)	0/1/0 (1)	No
	ESU C (SBW/Alaiheihe/ Palikea)	50	33/10/3 (300)	0/17/2 (3)	Partial
	ESU D1 (North Kaluaa to SBS, Kaala)	86	184/91/105 (300)	0/8/2 (2)	Partial
	ESU D2 (Makaha)	17	118/26/22(300)	0/2/6 (1)	Yes
	ESU E (Puu Kaua/Ekahanui)	12	315/72/77 (300)	0/0/5 (1)	Yes
	ESU F (Puu Palikea/Mauna Kapu)	40	330/86/46 (300)	0/3/0 (1)	Yes

Table IV. Status summary Koolau *Achatinella* spp. for Year-3. Bold = reached that stabilization goal. Goal for OIP snails is 300 total (all age classes) per GU. No *ex situ* numerical goal defined so none bold.

Oahu Implementation Plan					
Species	Geographic Unit (GU)	# snails in OIP	Status	<i>ex situ</i> #s adult/subadult/juvenile (# of sites represented)	Ungulate free
<i>Achatinella apexfulva</i>	n/a	0	Lab (Poamoho Trail)	0/2/0 (1)	No
<i>Achatinella bulimoides</i>	n/a	2	5	9/19/4 (1)	No
<i>Achatinella byronii/decipiens</i>	GU A (East Range)	6	6	0	No
	GU B (Puu Pauao)	16	16	0	No
	GU C (Poamoho)	69	259	0	No
	GU D (Punaluu Cliffs)	3	7	0	No
	GU E (North Kaukonahua)	175	445	0/5/1 (1)	No
<i>Achatinella lila</i>	GU A (Poamoho Summit)	39	15	0/287/129 (1)	No
	GU B (Peahinaia Summit)	11	11	0	Partial
	GU C (Opaepala-Punaluu Summit)	45	66	0	No
<i>Achatinella livida</i>	GU A (Crispa Rock)	60	86	0	No
	GU B (Northern)	5	9	0	No
	GU C (Radio)	83	37	8/44/2 (1)	No
<i>Achatinella sowerbyana</i>	GU A (Kawainui Ridge)	2	0	0	No
	GU B (Kawaiiki Ridge)	3	29	0	No
	GU C (Opaepala-Helemano)	344	370	2/6/0 (1)	Yes
	GU D (Poamoho Summit and Trail)	302	319	0	No
	GU E (Poamoho Pond)	90	35	0	No

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	GU F (Poamoho- North Kaukonahua Ridge)	2	2	0	No
	GU G (Lower Peahinaia)	40	5	2/2/4 (1)	No

Table V. Status summary Oahu Elepaio for 2010.

Oahu Implementation Plan		
Site Name	# of pairs protected from rats	# fledglings documented
Ekahanui	30	3
Moanalua	17	7
Palehua	18	4
Schofield Barracks West Range	22	25
TOTALS	87	39