

# DOFAW

## Oahu Native Ecosystems Protection and Management

### 2015 Report to the Hawaii Invasive Species Council



#### Control of Invasive Incipient Plants in Oahu Natural Area Reserves

Invasive species are categorized as incipient based on known established range, risk to native ecosystems, and method of dispersal. They are prioritized by their proximity and threat to native ecosystems and control feasibility. Species categorized as incipient maintain a goal of eradication from the specific site location. Number of mature and immature plants, method of control, search time, herbicide name and amount used, along with observations, date, staff present, and weather are all collected and tracked in a DOFAW database. Below details target incipient species and current management status:

*Batis maritima* (Pickleweed): Plants form dense colonies in salt marshes. Established on east shores of Oahu (Makapuu). One known location on the Waianae side of Kaena Point. Control began in January 2012. Initial treatment was successful in reducing population size. Interval treatments conducted twice yearly where re-sprouts are observed. No re-sprouts have been observed on the last three checks. Staff will continue interval treatment and conduct literature searches for determining a conservative eradication goal taking into account seed germination longevity.

FY15 Update: *Batis maritima* was checked in January and June in 2015. No plants were observed. Staff believe the infestation was treated early before establishment made it difficult to eradicate. Staff will continue to monitor the coast line for future intrusions as seeds are adapted for seawater dispersal.

*Ehrharta stipoides* (Meadow rice grass): Plant is considered a fire threat. Awned fruits easily disperse by animals and people. Established in the Southern Waianae range. No known established populations in central or northern Waianae range. DOFAW staff partner with OANRP to control this incipient within Pahole NAR and adjacent Kahanahaiki gulch. Four sites (five acres) in Pahole NAR are monitored quarterly by DOFAW staff. Small isolated patches continue to be discovered along with immature plants at control sites. This species will continue to need regular long term monitoring and search time and/or frequency may need to be increased. Staff will consider utilizing a pre-emergent in future control work to aid in depleting the seed bank with careful consideration of proximity to endangered species.

FY15 update: One immature plant was found at the Olopuia flats site in April 2015. No other plants were detected during FY15. Staff detection confidence is low as sites have become overgrown with *Oplismenus hirtellus* (basket grass). Staff will evaluate survey methods and consider spraying the basket grass to aid in *E. stipoides* detection and control.

*Hedychium gardnerianum* (Kahili ginger): Plants spread rapidly and form dense thickets in undisturbed native forests; seeds are bird dispersed. Control of *H. gardnerianum* in Kaala NAR began in 2012. Due to the high potential of staff spreading *S. palustre*, *H. gardnerianum* had not been previously targeted by DOFAW staff. Staff currently controls mature and immature plants while spraying *S. palustre*. GPS data of plant locations and numbers is collected during control work. *H. gardnerianum* control shall continue in conjunction with *S. palustre* control.

FY15 update: Staff control of *H. gardnerianum* was mostly opportunistic while controlling for *Sphagnum palustre*. A total of 62 mature patches and 243 immature plants were controlled covering a search area of 7,332 m<sup>2</sup>. After initial control of *S. palustre* is completed staff will prioritize efforts in the control of *H. gardnerianum* and plan to begin systematic sweeps of the entire bog in FY16.

*Platymiscium stipulare*: Oahu Early Detection program discovered this species on a road survey in 2012. *P. stipulare* is a member of the fabaceae family which contains many notoriously invasive species to Hawaii. Currently, this site is the only known location on Oahu, and is located directly off the Mokuleia trail head access road (in adjacent Mokuleia Forest Reserve). A total of seven mature and hundreds of immature plants have been controlled since October 2012. Staff will continue checks twice per year to control seedlings and will conduct literature searches on seed bank longevity. A pre-emergent may be considered at this site to aid in seed bank suppression.

FY15 update: *Platymiscium stipulare* was monitored twice in August 2014 and February 2015. A total of 27 and 14 immature plants were treated respectively. Numbers are decreasing and staff will continue efforts in order to deplete the seed bank. More research is needed to assess seedbank longevity for this species.

*Pterolepis glomerata* (Pterolepis): A wide spread invasive in the Koolau mountain range and member of the notoriously invasive Melastome family, there are no known established populations in the Waianae range. *P. glomerata* thrives in wet forests and establishes in undisturbed areas. There is a high potential of introduction and spread via hikers and staff. Very small seeds easily carried by mud, as well as wind-dispersed; have a long lived seed bank. Mature plants have been observed along the Kaala boardwalk, shelter and camp site and along Kumaipo trail near the summit of Kaala. Four sites at Kaala checked twice per year and a pre-emergent utilized to assist in seed bank suppression. One site at Pahole NAR is monitored twice per year. DOFAW is partnering with OANRP to control this known highly invasive weed.

FY15 update: *P. glomerata* at Pahole was monitored in August 2014 and February 2015. No plants were observed in August and 5 immature plants were observed in February. Few plants were observed at Kaala. Kumaipo ridge (where it was believed to have been brought in) continues to be a source of plants and all plants controlled in FY15 (1 mature and 3 immatures) at Kaala were at this site.

*Sphagnum palustre* (Sphagnum): Contributes to the formation of saturated nutrient-poor acidic soils and grows in a dense blanket over native vegetation. Easily spreads vegetatively via hikers and staff. Negatively impacts rare native snail species. In 2013, results of a UH snail lab

study found that native snails become entrapped and die in moss hummocks. In 2011, OANRP developed a control method and successfully treated all moss on the east side of the boardwalk. DOFAW secured herbicide and equipment needed to begin baseline management in 2012 and began delineating the core boundary of the infestation. In 2013, infrastructure improvements were completed to implement large scale control and a more efficient control method was developed using power sprayer equipment (efficiently covers large areas while minimizing trampling impact to the forest structure). In 2014, DOFAW purchased power sprayer equipment and staff will begin large scale control utilizing volunteers as appropriate. DOFAW will continue to partner with OANRP for support and control work. GPS track logs of the controlled areas are recorded in conjunction with the database.

FY15 update: Staff worked towards completing the initial spray treatment of *S. palustre* utilizing volunteers whenever possible. A total of 400 onsite spray hours (not including travel and/or prep time) was conducted in FY15. A total of 2099 liters of Saint Gabes Moss Killer solution was sprayed totaling an estimated area of 2099 m<sup>2</sup> of *S. palustre* sprayed (1L/m<sup>2</sup>) much of which were spot treatments. A total survey area of 7,332 m<sup>2</sup> was controlled. Figure 1 depicts the area surveyed and controlled in FY15.

*Thymophylla tenuiloba* (Dahlberg daisy): Ornamental plant that thrives in sandy soils and tolerates extreme heat. No known established populations. One mature plant found in Pahole NAR and controlled in July, 2013. No further plants have been observed. DOFAW will continue to monitor the location and conduct literature reviews to establish a conservative protocol for eradication based on seed bank longevity.

FY15 update: *Thymophylla tenuiloba* was checked in January and June 2015. No plants were detected. Staff believe the plant was controlled before it had the opportunity to reproduce. Staff will continue checks for 1 additional year and if no plants are detected will consider it eradicated.

Table 1 details the number of incipient sites monitored and frequency of checks along with summarizes matures and immatures controlled in FY15.

Table 1: Incipient Targets sites at Pahole and Kaala NAR

	SPECIES	# of sites monitored	Area (acres)	Frequency of checks	Total Matures Controlled	Total Immatures Controlled
PAHOLE	<i>Ehrharta stipiodes</i>	4	5.1	quarterly	0	1
	<i>Pterolepis glomerata</i>	1	0.001	biyearly	0	5
	<i>Platymiscium stipulare</i>	1	0.005	biyearly	0	41
KAALA	<i>Pterolepis glomerata</i>	4	0.175	quarterly	1	3
	<i>Sphagnum palustre</i>	1 (Summit bog)		infrastructure in place, control work begun	A total of 2099 liters of solution was sprayed covering a control area of 7,332 m <sup>2</sup>	

	<i>Hedychium gardnerianum</i>	1 (Summit bog)		Control as seen while spraying <i>S. palustre</i>	62	243
KAENA	<i>Batis maritima</i>	1	0.01	Biyearly	0	0
	<i>Thymophylla tenuiloba</i>	1	0.0001	Biyearly	0	0

Figure 1: Survey and Control Area for *S. palustre* at Kaala bog \*

\*Note *H. gardnerianum* was controlled as seen when spraying for *S. palustre*

