OISC 2005 Priority workshop
Species Profiles

Definitions:

- Species Classification:
  - OISC Target Species (OTS): Actively targeting for eradication / containment
  - OISC Species to Monitor (OSM): 'eradicated' OTS : controlled all known populations
  - OISC Assess and Map (OAS): species that OISC is considering as a target, evaluating its current establishment on the island.
- Hawaii State Noxious Weed (HSNW): designated as a state noxious weed by HDOA
- Maintenance: Resurvey or re-treating a known infestation.
- High Potential Buffer (HPB): Best guess of an attainable survey (often ground survey) area that would provide a limited area containing the highest probability of our target species spread. This is based on the biology of the given species in conjunction with best available knowledge about a given species distribution and spread pattern.
  - For bird dispersed targets: It is assumed that the Bulbul is the greatest disperser on O'ahu. Thus 800m buffer has been established according to bulbul gut retention studies from Japan and discussions with local avian biologists. For Miconia all of our immature plants have fallen within the HPB (with exception of Maunawili whose source is unknown)
  - For wind dispersed targets: buffer based on best estimate of a geographic area that would serve to contain or inhibit the spread of the given target.
- Low Potential Buffer (LPB):
  - Based on a realistic attainable buffer (often binocular / aerial) that could be surveyed and provide the highest confidence that would catch the species spread beyond the HPSB.
  - NB: HPB /LPB would need to be considered for refining once they have been initially completed for a given species
- Infestation sites: Location where given target species is routinely treated.
  - Monitor: All the known individuals have been controlled
  - Suppression: Target species still being controlled

Miscellaneous information:

- Total Acreage on O'ahu: 382,000
- Suitable habitat: Habitat that given species could infest, based on the best available information at the time.
- # Field days: based on a 4 person 8 hour day: (or 32 hours)
- Disclaimer: All of our costs and time estimates are based on the best available knowledge at the time of projection. Often there is insufficient data and best guess estimates were made. We expect these numbers to reflect a general trend but expect them to change as we refine our estimates.

MICONIA

(Miconia calvescens)

OISC Target Species #1

- Goal: Island wide eradication
- Threat: Currently in lower disturbed rainforest. Potential to decimate and overtake both native and non native forests, leading to erosion and jeopardizing the watershed
- HSNW: Yes

SIZE OF POPULATION		
Total Suitable Habitat		121,194
Percent HPB		10,162 acres / 8.40%
Percent Infested		87 acres / 0.09%
As of 8/1/05	HPB (Ground)	LPB (Aerial)
Total Priority Buffer	7,160	17,316
Acres left to Survey	3,000.20	8,340.00
Percent completed	58%	43%

PROJECTED COSTS	HPB (Ground)	LPB (Aerial)
Cost per acre to survey/treat	$74.42	$14.18
Total Cost of Initial Treatment	$534,821	$245,619
Cost of Remaining Treatment	$224,096	$118,299
Cost of Maintenance 2006	$65,521	none
Remaining Initial treatment: staff hours	5000	993
Maintenance: staff hours	1415	0
Total # of est. days for 2006 (budgeted)	151.5	15
% of total need	75%	50%
Total Need- Miconia ground, 2006	$296,802	$118,314

NB: These numbers do not include the cost of survey/treatment of private residences with in the HPB buffer.

MANAGEMENT:

- High Potential Buffer (HPB): 800m buffer around all known plants, 1 mile down stream of all mature plants, and obvious flyways.
- Low Potential Buffer (LPB): 1 mile buffer around all plants
- Objective: Complete initial survey of HPB (ground) and LPB (aerial). Continue re-surveying areas every 3 years
    - Complete initial survey of HPB
    - Complete initial survey of LPB
    - Maintenance: re-visit HPB within 3 years to exhaust seed bank
  - Other
    - Assess plants that have unknown sources – see if historical nursery etc.
    - Detection of old/abandoned nurseries: use for detecting new locations.

- PR Strategy
    - Strategize method for prioritizing and surveying all TMKS with in HPB and LPB
    - Increase public awareness: through posters, wanted signs etc
    - Work with user groups / present Miconia and increase detection
        - Hunters, hikers, field personnel
        - Nursery groups/growers association to inform about Miccal and see if can assist with any gaps of knowledge of old nurseries or other places that may have had Miconia

---

TOPICS OF DISCUSSION:

- Consider not doing any more re-survey until initial survey complete
- Looking to develop a better strategy of weighted re-visits of areas:
    - ex. If within a mature tree within buffer: every 3 years. If just immature 4 years, if have never seen additional plants within a given HPSB buffer, resurvey in 4-5 years.
- Also need to establish how long need to re-survey for
    - seed bank indicated to last 12 years (Jean-Yves Meyer)
- Need strategy for resurveying aerially
- Strategy for surveying outside buffers (LPB) to ensure not overlooking any populations

---

BACKGROUND Miconia (*Miconia calvescens)*

OISC Target Species #1

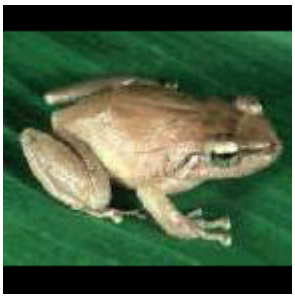
- Dispersal: Bird dispersed
- Control Method: hand pull. Large trees cut stump cover with plastic bag re-visit every 6 months.
- Notes: Held an in house Miconia Working Group (MWG) meeting in 3/05 to review and prioritize work on Miconia. Need to hold another MWG with increased participation from OISC committee to further refine management strategy.
- Biology: All elevations on O'ahu, areas with greater than ~1800 mm avg ann rainfall (Meyer 1997). Miconia grows 1m / year, matures in 3-5 years. Seedbank can survive up to 12 years.

Known Locations

Infested site	Notes / Source
Manoa	◦ Lyon Arboretum
Tantalus/Makiki	◦ Brash Estate
Nuuanu	◦ Marx Estate
Kalihi	◦ Abandoned nursery
Maunawili	◦ UNKNOWN. Closest mature tree is in Waimanalo (1.5 miles).
Waimanalo	◦ presumed abandoned nursery where found 3 mature trees
Kaalaea	◦ Hart and Tagami Art Gallery
Wahiawa	◦ Wahiawa Botanical Garden
Waimea	◦ Waimea Botanical Gardens
Haiku	◦ presumed from abandoned nursery where found large cluster of trees some showing evidence of cut stumps

COQUI FROG

Eleutherodactylus coqui



OISC Target Species #2

- Goal: Island wide eradication, assist with prevention of further introduction
- Threat: Public nuisance / disturbance w/ economic impact. High concentration of populations can disrupt native ecosystems, food source for other potential invaders (e.g. snakes)

SIZE OF POPULATION	
Total Suitable Habitat	Unavailable
Acres Infested	25 acres

PROJECTED COSTS - Wahiawa	HPB (Ground)
Cost per acre to survey/treat (1x)	$1,652
Cost of one treatment (w/citric acid)	$13,592
Cost per acre (w/citric acid)	$32.74
% of total need	67%
Total Need - Coqui 2006	$103,010

NB: These projections are based on the dedicated coqui crew being able to do both nursery work and Wahiawa work with the same resources allocated this year and the addition of a full time vertebrate specialist. OISC staff is only budgeted in for maintaining transects and occasional survey work.

SUMMARY: In 2005 OISC hired a dedicated crew (1 full time supervisor and 4 ½ time field staff) to do systematic spray coverage of Wahiawa. The population fell from estimated several hundred to 2 known individuals. Nursery populations have exploded with out systematic treatment. OISC regular staff began systematic treatment in August. For 2006 it was identified at the Coqui working Group (CWG) as a need to have a full time vertebrate specialist to supervise Wahiawa spray ops year round (using hydrated lime in the day time), coordinate nursery operations, coordinate all single calls and manage the coqui database. This should lead to eradication of existing populations.

MANAGEMENT:

- High Potential Buffer (HPB): Not yet established: using obvious good habitat within 200+ meter radius around all known historical sites.
- Objective: Control to eradicate all known sites, rapid response to any new sites that may arise
  NB: Vertebrate supervisor: OISC is willing to house yet funding remains undecided.
- Wahiawa:
  - Spray: Hydrated lime treatment allows for spraying year round during the day and significantly cheaper chemical.
  - Cover area 3 – 4 x year with hydrated lime regardless of calling frequency
  - Spot spray with citric acid as needed (based on calling frogs) during calling season
  - Systematic survey of Wahiawa : 1 x every 2 weeks
  - Maintain transects between spray applications (OISC/DPW)

- Nurseries
    - Waimanalo:
        - OISC staff: may have to do systematic spray operations
        - Working with individual nurseries to empower to spray and have CWG monitor
        - Systematic survey of HPB: 1 x every 2 weeks
    - N shore nursery: HDOA managing
- Single Calls
    - OISC working with HDOA and pest hotline to receive track and follow up on all calls in coordination with CWG
- Data base
    - OISC maintaining a database of all coqui activity on O'ahu consolidating and tracking all info from CWG

PR Strategy

- Focus PR campaign on educating public on detection and reporting
    - (2005) HISC grant to air PSA on detecting coqui May – September 2005
    - (2005) Worked with HEAR to update and modify website to assist with detection and reporting
- PR campaign to educate / inform nurseries
    - (2005) Mass mailing to all listed nurseries on island with information on detecting and reporting coqui

BACKGROUND COQUI FROG *(Eleutherodactylus coqui)*

OISC Target Species #2

- Control Method: 16% citric acid, 3% hydrate lime, 8% citric and 8 oz pyranyl (half strength) per 100 gal water
- Other: Illegal to knowingly transport inter-island.
- Notes: Coqui Working Group (CWG) composed of HDOA, DLNR, DPW, City and County meet several times a year to review management of coqui eradication.
- Wahiawa: OISC hired a dedicated staff of 5 during calling season to treat
    - 2006 planning on hiring a crew to spray year round during the day w/ hydrated lime. (3-4 treatments / year)

Known Locations

Infested site	Size (acres)	Treatment Time (annual)	Survey time	Notes / Source
Home Depot (Iwilei)	< 1 acre (eradicated)	◦ N/A	◦ N/A	◦ in landscaped area from garden center / worked with Home Depot alter habitat
Kahaluu nursery	Several frogs (unknown size)	◦ N/A	◦ N/A	◦ No frogs confirmed since 5/01 ◦ monitored several times since then
Wahiawa (Schofield E range and residences)	10. 7 acres	◦ 2355 hrs (2620 OISC hrs) ◦ 464 bags citric ~ $20k	◦ unavailable	◦ presumably naturalized from resident w/ plant rental business. ◦ 1.5 treatments in '05
N shore Nursery	◦ unavailable	◦ unavailable	◦ unavailable	◦ HDOA has taken lead, only one frog heard in 3 months
PX	◦ 2 nurseries : ◦ 1 x (30+ frogs) eradicated ◦ 1 x (1 frog) monitoring	◦ unavailable	◦ unavailable	◦ coqui presumably from plants of infested nursery on N shore ◦ work with PX's, HDOA, DLNR, DPW, and OISC
Waimanalo nurseries	◦ 4 nurseries : ◦ 1 (100+ frogs) ◦ 1 (12-30 frogs) ◦ 2 controlled	◦ unavailable	◦ unavailable	◦ inconsistent resources dedicated to nurseries moving to systematic treatment like Wahiawa ◦ working with the nurseries to jointly eradicate ◦ HDOA, DLNR, nursery associations, OISC
Single calls	◦ unavailable	◦ unavailable	◦ unavailable	◦ represent coqui that are presumably spread from contaminated plants from nursery trade

.

HIMALAYAN BLACKBERRY

(Rubus discolor)

OISC Target Species #3

- Goal: Island wide eradication
- Threat: Threatens natural areas by forming dense impenetrable thickets that exclude other native plant species.
- HSNW: No (Other *Rubus* species are listed)

SIZE OF POPULATION	
Total Suitable Habitat	382,000
Percent HPB	1,026 acres / .27%
Percent Infested	25 acres / .0001%

PROJECTED COSTS	HPB (Ground)
Cost per acre to survey/treat	$100.29
Cost of one treatment	$2,005.
Acres per hour	.46
Cost of Maintenance 2006	$3,334.
Cost of Remaining Initial Survey	$4,011.
Total # of est. days for 2006 (budgeted)	5
% of total need	100%
Total Need - Rubdis 2006	$7,345.

SUMMARY: OISC is unable to project the % complete for rubdis until the preferred habitat is assessed and surveyed. To date this is approximately ½ complete, needing an additional 4-6 days. Once complete (by Jan '06) we should have the entire population mapped and treated and have a clear idea of the continuing resources necessary for eradication.

MANAGEMENT:

- High Potential Buffer (HPB): 800m buffer around all plants
- Low Potential Seed Bank (LPB): 1 mile buffer around all plants
  Objective: Complete survey and definition of population boundary, control to eradicate all known sites
- Assess and survey preferred[1] habitat with in HPB:
  - Re-assess every 3 years
  - Resurvey suitable habitat annually
- Consider Aerial survey of LPB to assess preferred[1] habitat
  - Treat all known infestation sites annually

PR Strategy

- Survey residences within HPSB
- Canvass all residences within LPSB

[1]Prefered habitat: for Rubdis is open areas not heavily covered by canopy. The more disturbed the more preferred. NB the majority of area within HBSB is not 'preferred'

BACKGROUND Himalayan blackberry *(Rubus discolor)*

OISC Target Species #3

- Control Method: 2% Round up 3% Garlon 4 cocktail foliar
- Other: Illegal to transport inter-island.
- Biology: may take many years from seedling to mature, as it relies more heavily on vegetative reproduction. Vegetative shoots mature within one year Seed dormancy for both species is likely to last many years When grown in dense shade, most blackberries do not form seeds , disturbed wet sites, trail sides. >760 mm annual rainfall, 1800 m elevation (NB these results all come from temperate zone studies)

Known Locations

Infested site	Size (acres)	Treatment Time (annual)	Survey time	Notes / source
Lai ridge and Wai'oma'o stream (active)	3	◦ 1 day x 4 people	◦ 2 days x 4 staff (assess and survey HPB every 3 years) ◦ 1 days x 4 staff (annual)	Exposed ridge behind residential area, & along stream trail: unknown spread from residence?
Mau'umae trail (active)	17	◦ 1 day x 4 people + Sierra club ◦ 1 day x 4	◦ 6 days x 4 staff (assess and survey HPB / every 3 years) ◦ 2 days x 4 staff (annual)	Just off the trail ~ 1 mi in: Unknown: intentional

BUSH BEARDGRASS

(Schizachryium condensatum)

OISC Target Species #4

- Goal: Island wide eradication
- Threat: It is a fire promoting grass and could spread and establish on other parts of the island..
- HSNW: No

SIZE OF POPULATION	
Total Suitable Habitat	382,000
Percent Infested	22.16 acres / .0058%

PROJECTED COSTS	Halawa	Temple Valley
Cost per acre to survey/treat	$214.25 (treat)	$28.18 (survey/treat)
Cost of one treatment	$3,492.	unknown
Acres per hour	.22	1.24 (survey/treat)
Cost of Maintenance 2006	$41,906.	$17,781
Cost of Survey for 2006	$2,964.	$5,927.31
Total # of est. days for 2006 (budgeted)	28	12
% of total need	100%	100%
Total Need - schcon 2006	$68,578	

SUMMARY: OISC has noted a dramatic decline in the population structure of the schcon in Halawa valley however finding that that immature plant numbers are remaining stable. Temple Valley shows urgency to finish all the neighborhood survey of residences as crew continually finds more plants outside known treatment area. Projecting to have neighborhood completely surveyed by '06.

MANAGEMENT:

- High Potential Buffer (HPB): Geographic boundary of given population
  - H3: HPB entire Halawa valley)
  - T. Valley: HPB entire neighborhood
- Objective: Complete survey and definition of population boundary, control to eradicate all known sites
- Halawa valley:
  - Assess and survey:
    - Survey all preferred habitat[1] with in LPSB: annual
  - Treatment:
    - Treat all infested sites: monthly
    - Working w/ DOT to post no weed whack signs along road cuts for 3 mo intervals
- Temple Valley
  - Assess and Survey
    - 1 x comprehensive survey of entire neighborhood Ahuimanu to Kahekili Hwy: identify all suitable[2] TMKS and preferred[1] habitat (in wild land areas)
      - surveyed 247 TMKS of 1016 TMKs that need to be assessed
    - Resurvey suitable[2] habitat: every6 months
  - Treatment:
    - Survey and treat all TMKs that have ever had Schcon: monthly
- Utilize database to track TMKs (Temple Valley) and individual sites (Halawa valley)

PR Strategy

- Make OISC Banner for when working in neighborhood
- Door hangers for when residences are not home
    - Self check for residences
- Present at neighborhood board association

TOPICS OF DISCUSSION:

- OISC would like to reduce the treatment frequency of both populations: currently monthly
- Looking for alternative treatment methods for schcon. Considering pre-emergent pesticides, and complete kill of certain road cut areas.
- HDOT considering re-vegetation project along select road cuts with
- Posting no weed whack signs proven to be effective at allowing more of seed bank to grow and treat.
- Need to have feasible and logical buffer (HPB) for Temple Valley population.

---

[1]Prefered habitat: for Schcon is open / exposed areas without canopy cover. Survey of this heavily relies on includes spotting scope and binocular survey

[1]Suitable TMKs: TMKs that are not completely manicured

BACKGROUND Bush Beardgrass *(Schizachryium condensatum)*

OISC Target Species #4

- Control Method: Foliar application of Round-up 2% in water. Remove inflorescences. Evaluating pre-emergent and other herbicides treatments 2%
- Biology: Sch con: 210 - 1310 m along roadsides and open sites in mesic shrubland and grassland (Wagner et al 1999). The study sites for a 1991 study in Volcanoes NP ranged in rainfall between 1400 and 2200 mm, and contained their major infestations at the time.

Known Locations

Infested site	Size (acres)	Treatment Time	Survey time	Notes / source
Halawa valley H3 road cuts and access road (active)	◦ 16 acres	◦ 2 day2 x 4 people x 12 visits	◦ 2 days x 4 people (annual) all suitable habitat in valley	◦ Worst infestation in staging area for H3 construction: presumed contaminated equip. from BI
Temple Valley residences (active)	◦ 6 acres (54 / 247 TMKs have beardgrass)	◦ 1 day x 4 people x 12 visits	◦ 1 day x 4 people x 5 visits assess all TMKS in neighborhood (initial) ◦ 1 day x 4 people x 2 visits (revisit TMKS w/ good habitat)	◦ All in residential areas presumed contaminated equip. from BI ◦ surveyed 247 of 1016 TMKS w/in HPB

SMOKE BUSH / BUTTERFLY BUSH

(Buddleia madagascariensis)

OISC Target Species #5

- Goal: Island wide eradication
- Threat: Threatens native forest. Buddleia has aggressively naturalized in
- Kokee State Park, Kauai.
- HSNW: Yes

SIZE OF POPULATION	
Total Suitable Habitat	382,000
Percent HPB	1,763 acres / .46%
Percent Infested	2.5 acres / .001%

PROJECTED COSTS	HPB (Ground)
Cost per acre to survey/treat	$23.48
Acres per hour (survey)	15.03
Survey Cost - 2006	$4,445.5
Maintenance Cost - 2006	$1,482.
Total # of est. days for 2006 (budgeted)	4
% of total need	100%
Total Need - budmad 2006	$5,927.31

SUMMARY: OISC has systematically treated all known plants and in nearing completion of surveying all the HPB in the wildland areas. In addition, we plan to use a PR campaign to 'survey' the Wahiawa residences within the buffer. Barring any new findings, OISC will consider this species controlled and move it from OISC Target to OISC species to Monitor.

MANAGEMENT:

- High Potential Buffer (HPB): 800m buffer around all plants, streams and obvious flyways 2km.
- Low Potential Buffer (LPB): 1 mile buffer around all plants
- Objective: Complete survey and definition of population boundary, control to eradicate all known sites
    - Finish remaining survey within HPB
    - Re-survey every 3 years
    - Treat all known infestation sites annually

PR Strategy

- Survey residences within HPB
- Canvass all residences within LPB

BACKGROUND Smoke Bush/ Butterfly Bush *(Buddleia madagascariensis)*

OISC Target Species #5

- Control Method: 2% Round up 3% Garlon 4 cocktail foliar
- Biology: Budmad may seed viability and maturation rates have not been studied. However a related species, B. davidii, may be somewhat indicative. Where it has invaded in France, B. davidii has matured withn a year from seedling, and seed dormancy for "many years." matures in one year from seedling naturalized on Maui, elvation ranges from 1200-4000 ft, and rainfall ranges from 760 mm in Kula, to 5080 mm in Hana. Wet disturbed sites in proximity to "human dispersal."
- Unverified Sites: Manoa: Woodlawn Dr. (BM record)

Known Locations

Infested site	Size (acres)	Treatment Time (annual)	Survey time	Notes / Source
Tantalus Dr. (controlled)	1.75	◦ ½ day x 2 people	◦ covered with Miconia surveys	◦ Naturalized population, presumably ornamental
Schofield East Range & Wahiawa (active)	.75	◦ ½ day x 2 people	◦ 2 days x 4 staff (initial) ◦ 6 days x 4 staff (every 3 years)	◦ Small clump of plants presumably recruitment from unknown ornamental source (Wahiawa neighborhood) ◦ 2 non reproductive plants found naturalizing ~ ½ mile away

TOPICS OF DISCUSSION:

- Resurvey strategy of 3 years. Is this sufficient given budmad's presumed reproductive cycle

FIREWEED

(Senecio madagascariensis)

OISC Target Species #6

- Goal: Island wide eradication
- Threat: Agricultural threat as it is toxic to cattle and horses, less so to sheep and goats. Large infestations have ruined pasturelands on the Big Island
- HSNW: Yes

SIZE OF POPULATION	
Total Suitable Habitat	382,000
Percent Infested	~10 acres / .0026%

PROJECTED COSTS	Ground
Cost per acre to treat	Varies, min.- $129.40
Acres per hour (treat)	varies
Survey Cost - 2006	$3,149.
Maintenance Cost -2006	$2,408.
Total # of est. days for 2006 (budgeted)	3.75
% of total need	100%
Total Need - Senmad 2006	$5,557.

SUMMARY: OISC has been collaborating with partner agencies to ensure systematic treatment of all known populations. Once we have finished assessing / and surveying the suitable habitat within the buffer we will should be able to move this species to OISC Target to OISC species to Monitor, as all populations will have been controlled.

MANAGEMENT:

- High Potential Buffer (HPB): 800m buffer around all plants
- Low Potential Seed Bank (LPSB): N/A
- Objective: Complete survey and definition of population boundary, control to eradicate all known sites
    - Check unverified site
    - Assess and survey suitable habitat with in HPSB
        - Resurvey suitable habitat annually
    - Work with partner agencies to systematically treat infested sites

PR Strategy

- Increase outreach
    - Nurseries
    - Other projects that may get contaminated soil

BACKGROUND Fireweed *(Senecio madagascariensis)*

OISC Target Species #6

- Control Method: Roundup Pro at 2.5% concentration in 2-3 week intervals
- Biology: Seed to mature in 2 weeks, seed bank persists in soil for an extended time. Sen mad: grows in a wide range of rainfall and elevation gradients, but requires disturbed soils for establishment, as well as open sun and moderate rainfall to flourish. The most major infestations in Hawaii seem to occur in higher elevation ranchlands or open areas such as Makawao and Saddle road (BI).

Known Locations

Infested site	Size (acres)	Treatment Time (annual)	Survey time	Notes / Source
Schofield S. Range (active)	◦ 1	◦ 2 days x 1 staff ITAM monitoring / OISC assist semi annually	◦ N/A : Army DPW performs ¼ ly road surveys	Found along training area road. Presumably from Army transport from the BI
Kunia (controlled)	◦ unavailable	◦ N/A (TNC staff monitors)	◦ 1 day x 3 staff (initial recon.)	Kalua'a trailhead: 15 mature plants 2003 / 1.5 miles from Schofied population. No recruitment
Castle Junction (active)	◦ unavailable	◦ 4 days x 1 staff work w/ HDOA	◦ ½ day x 1 staff (initial recon.)	14 original plants from contaminated hydro mulch / consistent recruitment
Manana Trail (controlled)	◦ unavailable	◦ 1 day x 2 staff (monitor)	◦ 1 day x 2 staff (initial recon.)	2 large mature plants found: no recruitment/ presumed from Kamuela nursery contaminated Koa plantings
Pali Hwy (controlled)	◦ unavailable	◦ ½ day x 1 staff (monitor)	◦ 1 day x 1 staff (initial recon.)	Presumed from Kamuela nursery contaminated Koa plantings

FOUNTAIN GRASS

(Pennisetum setaceum)

OISC Target Species #7

- Goal: Eradication and prevention in the Wai'anae range, containment in the Ko'olau range.
- Threat: Threatens all dry forest areas, pasture lands. It is a fire promoting grass.
- HSNW: Yes

SIZE OF POPULATION	
Total Suitable Habitat	382,000
Percent HPB	18,906 acres / 5%

PROJECTED COSTS	Waianae	Koolau
Cost per acre to treat	unavailable	unavailable
Acres per hour (treat)	.36	.36
Survey Cost - 2006	$8,892	$2,222.
Maintenance Cost -2006	$1,297	$5,927.
Total # of est. days for 2006 (budgeted)	7	5.5
% of total need	100%	100%
Total Need - Penset 2006	$18,338	

SUMMARY: OISC is focused on eradicating fountain grass in the Waianae range and containment in the Ko'olau range. In the Waianae, OISC has performed several large scale surveys and has not identified any new FG locations. In the Ko'olau OISC is collaborating with partner agencies to eradicate satellite populations and mitigate spread on the established populations.

MANAGEMENT:

- High Potential Buffer (HPB): Geographic boundary of given population (ex. Makaha HPB would be entire Makaha valley
- Wai'anae Objective: Complete survey and definition of population boundary, control to eradicate all known sites
  - Survey:
    - Complete habitat assessment of and survey of preferred habitat[1] within HPB:
      - complete 1 x assess interval afterwards
    - Road surveys
      - complete road surveys of HPB
        - complete 1 x assess interval afterwards
    - Assess burn sites
      - if outside of HPB consider if want to survey
  - Treatment
    - Treat all known sites annually
- Ko'olau Objective: Eradicate satellite populations, remove FG from high traffic areas.
  - Satellite populations:
    - Satellite populations treat and respond to any new satellite populations:
    - Annual survey of satellite populations that partner agencies are managing
  - Established populations:
    - Annual clearing of high traffic areas (Diamond Head / Lanikai)

        - Bellows AFB: annual survey to identify and map all FG locations
            - Partner agencies expected to manage identified FG sites with in Bellows quarterly

PR Strategy

- Empower landowners to control own populations
    - Diamond Head residences
    - Chaminade university
- Increase public outreach / relations with military regarding FG spread from BI

[1]Prefered habitat: for Penset is open / exposed areas without canopy cover. Survey of this heavily relies on includes spotting scope and binocular survey

BACKGROUND Fountain grass *(Pennisetum setaceum)*

OISC Target Species #7

- Control Method: 2% Round up / 5% Velpar
- Biology :Wide elevational range, <50 in average annual rainfall (Jacobi and Warshauer 1992)

Ko'olau Range

Location	Size (acres)	Treatment Annual	Survey
Diamond Head(e)	200	◦ 1 day x 4 staff (w/ HIARNG and Parks)	◦ HIARNG
Lanikai(e)	150	◦ 1 day x 4 staff	◦ N/A
Palolo(e)	18	◦ Chaminade	◦ ¼ day x 1 staff
BWS Sierra Drive (s)	< 1 acre	◦ HBWS	◦ ¼ day x 1 staff
Pali Highway (s)	< 1 acre	◦ ½ day x 1 staff x 2 visits (w/ DPW)	◦ N/A
Punchbowl (s)	25 acres	◦ 1 day x 1 staff x 4 visits (w/ HDOA)	◦ N/A
Airport area (s)	< 1 acre	◦ 1 day x 1 staff x 4 visits (w/ HDOA)	◦ N/A
Kalanianiole HWY (s)	< 1 acre	◦ ½ day x 1 staff x 2 visits (w/ HDOA)	◦ N/A
He'eia (s)	eradicated	◦ N/A	◦ Friends of He'eia
Bellows AFB (e)	30-50 plants w/in 500 acres	◦ HIARNG, MCBH, AFB	◦ 1 day x 4 staff (with Bellows partners)
Schofield E range (s)	1 plant	◦ DPW	◦ DPW
Kahuku Military (s)	<1 acre (Few plants remaining)	◦ DPW	◦ DPW
Dillingham Military (s)	< 1acre (may be eradicated)	◦ DPW	◦ DPW

Wai'anae Range

Location	Initial Size	Treatment (annual)
Makaha Hei'au	Several hundred plants	◦ ½ day 2 people
Ka'ala Learning center	Several hundred plants	◦ ½ day 2 people
Lualualei	6-10 plants	◦ ½ day 2 people
Ko'olina (H-1)	Few plants	◦ ¼ day 2 people

(s) denotes satellite population
(e) denotes established population

PAMPAS GRASS

(Cortaderia spp.)

OISC Target Species #8

- Goal: Island wide eradication
- Threat: Crowd out native plants, damage grazing lands, and create a fire hazard.
- HSNW: *C. jubata*: Yes. *C. Selloana*: No

SIZE OF POPULATION	
Total Suitable Habitat	382,000
Percent Infested	negligible

PROJECTED COSTS	HPB (Ground)
Total # of est. days for 2006 (budgeted)	.5
% of total need	100%
Total Need - Corspp. 2006	$740.91

NB: The projected costs do not include the resources it will take to treat pampass grass as it is budgeted under PR outreach.

SUMMARY: To date OISC has held off on active management of Pampas grass until we have the outreach resources. With an OISC PO person coming on board, we intend to target this species primarily through our outreach person.

MANAGEMENT:

- High Potential Seed Bank (HPSB): N/A
- Low Potential Seed Bank (LPSB): N/A
- Objective: Eradicate before it naturalizes on O'ahu.
    - Map all locations
    - Verify and map all unverified sites
    - Determine species / sex of all plants and re-assess if further surveys are needed
        - Work with Bishop museum
    - Assist with efforts to list as noxious weed.

PR Strategy

- PR campaign to work with landowners to have voluntary removal of plants
- Check with other ISCs to see if ever done a plant swap…
- Increase public awareness, detection, reporting
- Work with nursery industry to prevent further re-introductions

BACKGROUND Pampas grass *(Cortaderia spp.)*

OISC Target Species #8

- Control Method: Foliar application of Round-up 2% in water
- Biology: There is no known *Cortaderia spp*. Naturalizing on O'ahu. It is presumed (but unconfirmed) that all of the plants here are female *C. selloana.* Potential habitat for Pampas Grass may include the whole island. Infestations occur in both wet and dry lowland areas, as well as wet to arid mountainous areas. Seed dispersal by wind up to 20 miles

Known Locations

Infested site	Size (acres)	Notes / Source
Aiea (residence & Aiea state park)	◦ single clump	◦ presumed ornamental planting
Manoa (residence)	◦ single clump	◦ presumed ornamental planting
Nu'unanu (residence)	◦ single clump	◦ presumed ornamental planting
Pupukea (residence)	◦ single clump	◦ presumed ornamental planting
Schofield E range (golf course)	◦ single clump	◦ presumed ornamental planting
Wilhelmina Rise (residence)	◦ single clump	◦ presumed ornamental planting

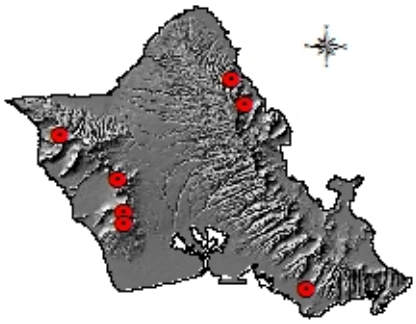
Unverified Sites: Koolina (D. Sailor), Nu'uanu Pali golf course

FIRE TREE

(Morella faya)

OISC Target Species to Monitor

- Goal: Island wide eradication
- Threat: Forms dense single species stands / displaces natives changes soil composition
- HSNW: Yes



SIZE OF POPULATION	
Total Suitable Habitat	unknown
Percent Infested in Koolaus	negligible

PROJECTED COSTS	HPB (Ground)
Total # of est. days for 2006 (budgeted)	3.5
% of total need	100%
Total Need - morfay 2006	$5,186.40

SUMMARY: Many of the fire tree plantings have little information associated with them making comprehensive surveys difficult and time consuming. OISC is monitoring the tree on Maumae trail to see if it produces fruit to help determine if other trees in area as the tree is dioecious.

MANAGEMENT:

- High Potential Buffer (HPB): 800m buffer around all known plants.
- Low Potential Buffer (LPB): 1 mile buffer around all plants
- Objective: Verify unverified sites, monitor remaining trees in Ko'olau range to see if fruit /flower. Monitor Hau'ula population to exhaust seed bank.
    - Verify unverified sites:
    - Monitor HPB (Hau'ula population)
    - One day to assist w/ TNC Morfay and train staff on ID
- Need to know how frequent should monitor trees to see if fruiting/flowering

PR Strategy

- Compile list of people /agencies that work within the given forest reserves to increase detection in these areas.

TOPICS OF DISCUSSION:

- How long and for how often should we monitor tree to see if fruiting / flowering

---

BACKGROUND Fire Tree *(Morella faya)*

OISC Species to Monitor

- Control Method: frill cut and herbicide with Garlon 4 (50% crop oil). Hand pull seedlings.

Known Locations

Infested site	Size (acres)	Treatment Time (annual)	Survey time	Notes / Source
Hau'ula Waipilopilo Ridge	5 trees	N/A	◦ 1 day x 4 people (every 3 years)	◦ one large tree and several smaller recruitment
Wa'ahila Ridge	Single tree (eradicated)	N/A	N/A	◦ one large tree killed in '99 may have been *M. cerifera* as noted in the forestry records ◦ no recruitment: eradicated
Maumae Ridge	Single tree (monitoring)	N/A	◦ monitor when doing Rubdis in area	◦ one large tree; monitoring phenology since 2003 never flower/fruit
Wai'anae Range	Extensive population	N/A	◦ 1 day x 4 people every 3 years (assist TNC w/ Morfay to train staff on ID before Hau'ula surveys)	◦ Extensive population, beyond scope of OISC

Unverified Sites: Kipapa Trl: Hawaii Loa [2 days x 3 staff]
Previous Forestry Plantings: Pupukea, Waiahole, Kuliouou, Kolowalu.
OISC has performed preliminary surveys of the Forest Reserves for MorFay (none found), presume Wa'ahila ridge tree from Kolowalu planting

GLORY BUSH

(Tibouchina urvilleana)

OISC Target Species to Monitor

- Goal: Island wide eradication
  Threat Crowd out native plants, threatening native and introduced forests.
- HSNW: Yes

SIZE OF POPULATION	
Total Suitable Habitat	382,000
Percent Infested	negligible

PROJECTED COSTS	HPB (Ground)
Total # of est. days for 2006 (budgeted)	.5
% of total need	100%
Total Need - Tiburv. 2006	$740.91

SUMMARY: All known sites have been controlled.

MANAGEMENT:

- High Potential Seed Bank (HPSB): N/A
- Low Potential Seed Bank (LPSB): N/A
- Objective: Ensure eradication on O'ahu..
  - Annual visits to all sites
  - Quarterly monitoring of Whitmore village site
  - DPW take lead

PR Strategy

- Increase public awareness
- Educate nursery industry

OISC Species to Monitor

- Control Method: Foliar application/ cut stump using 2% Garlon 4.
- Biology: Presumed that pollinator is not present in Hawaii, only vegetative reproduction to date..

Known Locations

Infested site	Size (acres)	Notes / Source
Kahalu'u resident	◦ single plant	◦ presumed ornamental planting / ◦ no recruitment
Miliani Mauka	◦ 100+ plants	◦ Ornamental landscape on new housing development. Worked HDOA to remove and address issue with contractor ◦ no recruitment
Tantalus (resident)	◦ single plant	◦ presumed ornamental planting ◦ no recruitment
Navy land (Whitmore village area)	◦ 100+ ?? plants	◦ presumed from the abandoned nursery ◦ only site on O'ahu w/ recruitment…all vegetative to date ◦ DPW managing

Unverified Sites: Nuuanu Valley – Upside down falls (Bishop Museum Record) follow up surveys produced no tiburv.

WEST NILE VIRUS

OISC Rapid Response

- Goal: Island-wide prevention and rapid response
- Threat: human health threat, potential to decimate all native avian fauna

---

PROJECTED COSTS	HPB (Ground)
# of est. days for 2006	26, ½ days, 1 person
Total Need - WNV. 2006	~ $4,816.

SUMMARY: DOH managing overall prevention and rapid response. OISC is assisting with DLNR / DOFAW obligation to do dead bird pick ups that will then be tested for occurrence of WNV.

MANAGEMENT:

- . OISC is on call for 1 day/week to do dead bird pick-ups
    - If there is an increased public outreach, it could lead to a dramatic rise in dead bird pick ups