

*Early Detection &
Rapid Response
Case Study*

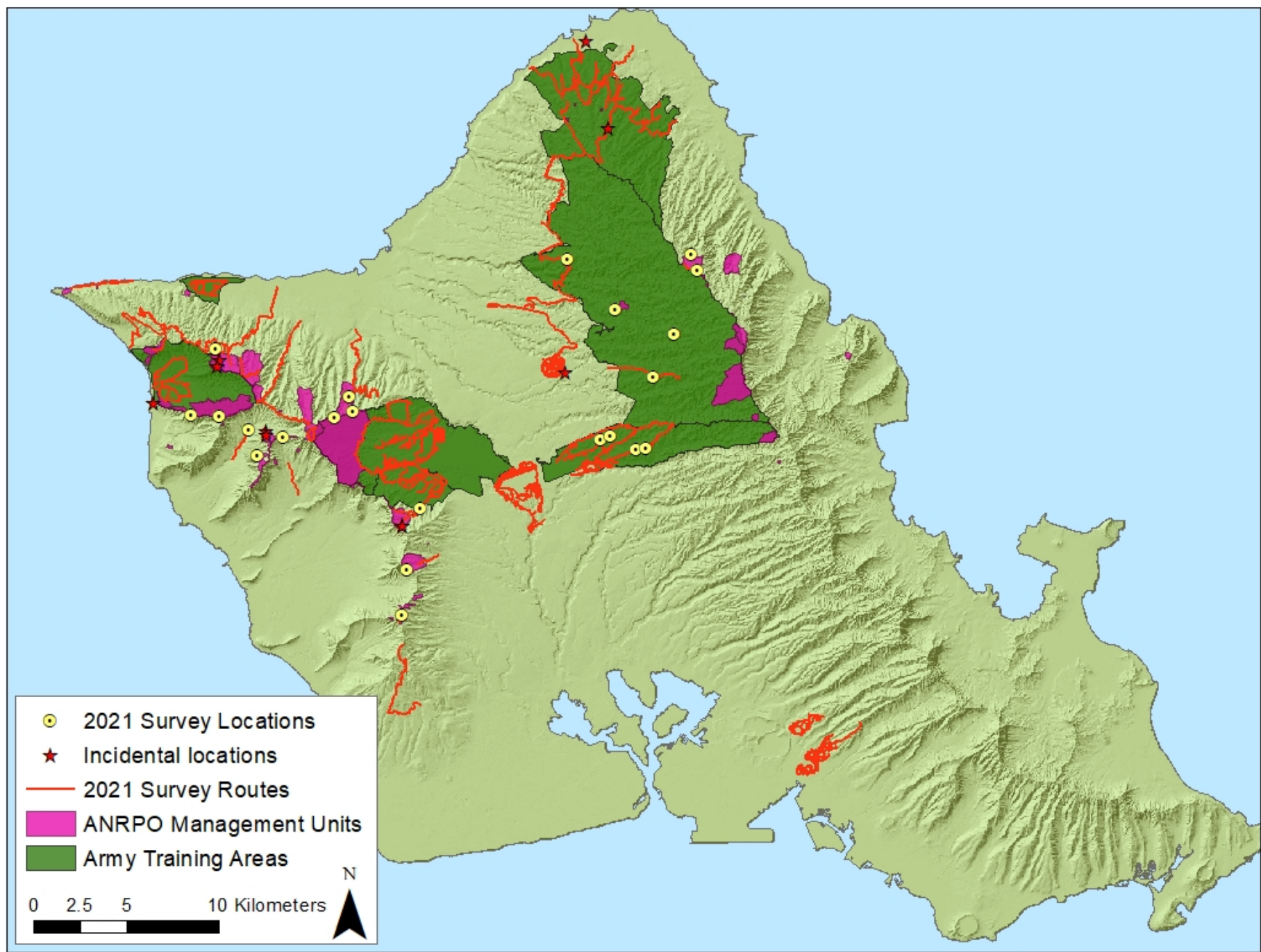
**Devil to pay:
detection and ten years
of management of
Chromolaena odorata
(Devil Weed)
in Hawai'i**



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Roads [26, 300km]

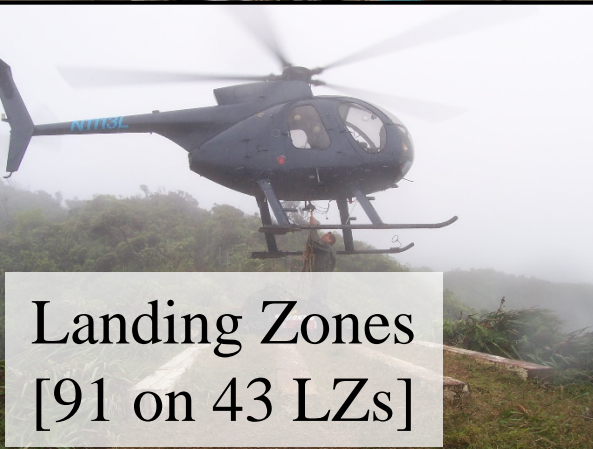


Other Ingress Points
[22 @ 11 sites]



Early Detection

Incidental Observations



Landing Zones
[91 on 43 LZs]

Transects [14]

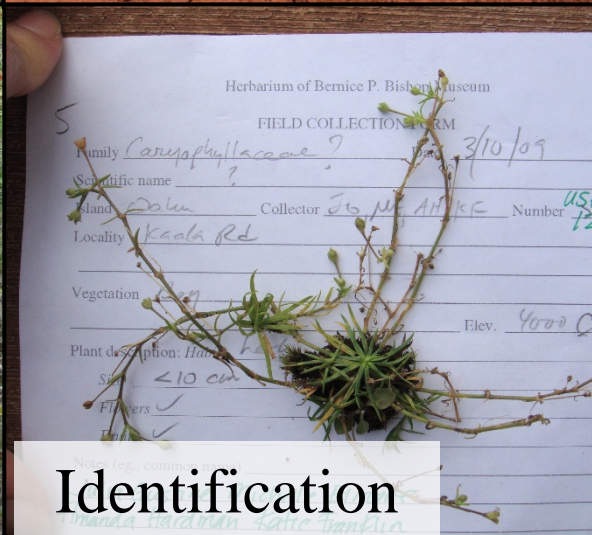


Bishop Museum
Submissions

New State Records = 15

New Island Records = 37

New Records of
Naturalization = 17



Identification

Management Decision Factors



Distribution	Invasiveness	Location	Evaluation Considerations	Management Actions
Widely naturalized	High	In MU high value area	Acreage	Target for eradication
Locally naturalized		In MU	Availability of effect. control methods	Local incipient, target for control
New State/ Island record	Low	Adjacent to MU	Land ownership	Control as part of habitat rest. efforts
		Army Training Area	Partners available	Onsite: monitor & map, no control
		Area not managed by ANRPO	Current resources/funding	Offsite: monitor & map, share info w/ partners
			Location type (terrain, accessibility)	No control

Cenchrus setaceus

- High impact & HPWRA = 26
- Limited distribution
- Seeds persist < 1.5yrs
- Target for eradication
- 11 sites eradicated



Sphaeropteris cooperi

- High impact & HPWRA=17
- Widespread, forms dense stands but disperses widely
- Control during habitat restoration efforts



Plantago rugelii

- Low impact
- Widespread?
- No control



Blechnopsis orientalis

- High impact & HPWRA=11
- New, but widely dispersed, in dense native forest
- Target for eradication in high value areas
- Map elsewhere
- Share with partners

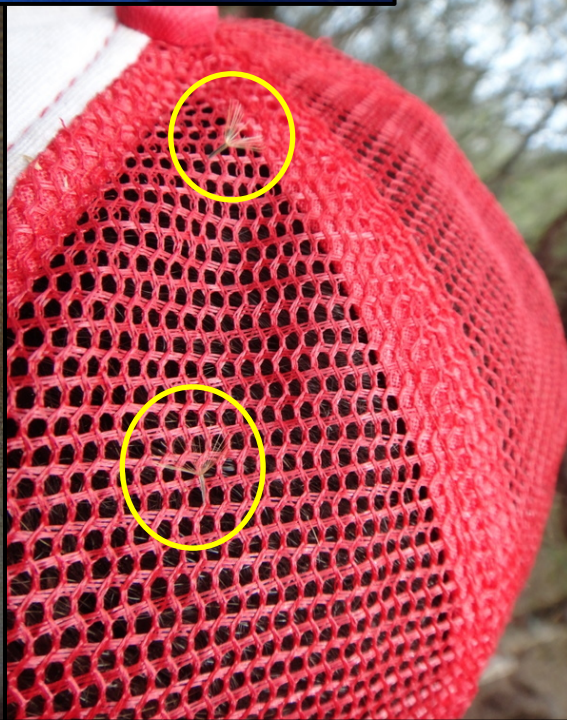




Chromolaena odorata

2011: First discovery in State
(Kahuku Training Area)





Initial Response

- Delimiting surveys
- Control at known locations
- Seed longevity research
- Prevent spread from Kahuku
- Notify conservation community
- Outreach





Control



Preventing spread from training activities



**AREA CLOSED
TO TRAINING**

This area is infested with an invasive species.
The infestation is being actively controlled by DPW.

DO NOT ENTER!

Questions?

Call 655-9175 or 655-9191





Preventing
spread
from other
vectors



Modifications

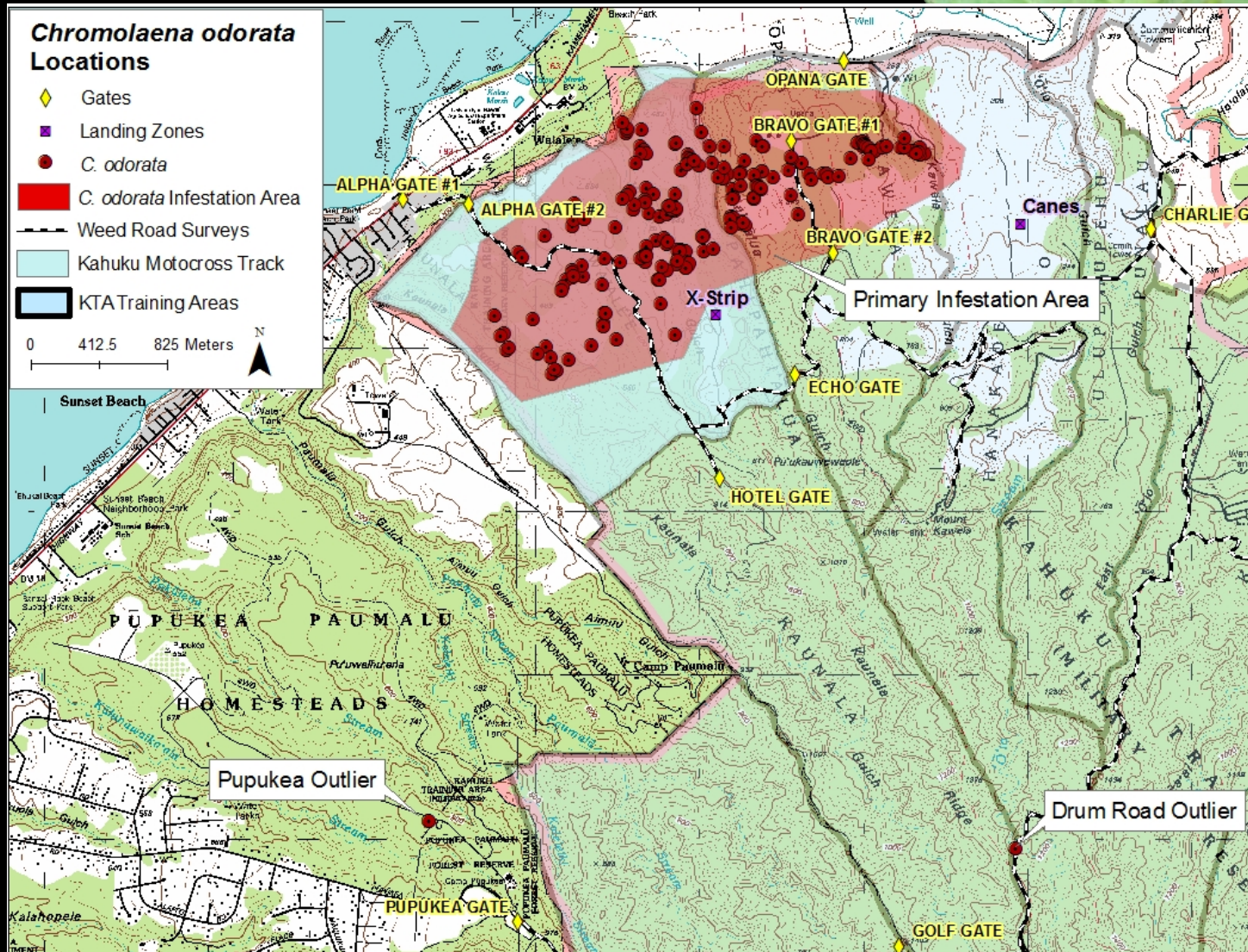


- Herbicides: pre-emergent & long -lasting
- OISC: contract for motocross track
- Strategy: focus shift between sweeps, core, hotspots, trails, outliers
- Buffer surveys: priority in new watersheds
- Aerial spot spray
- Military: regular education, enforcement
- Dedicated gear
- Partnerships

High Effort

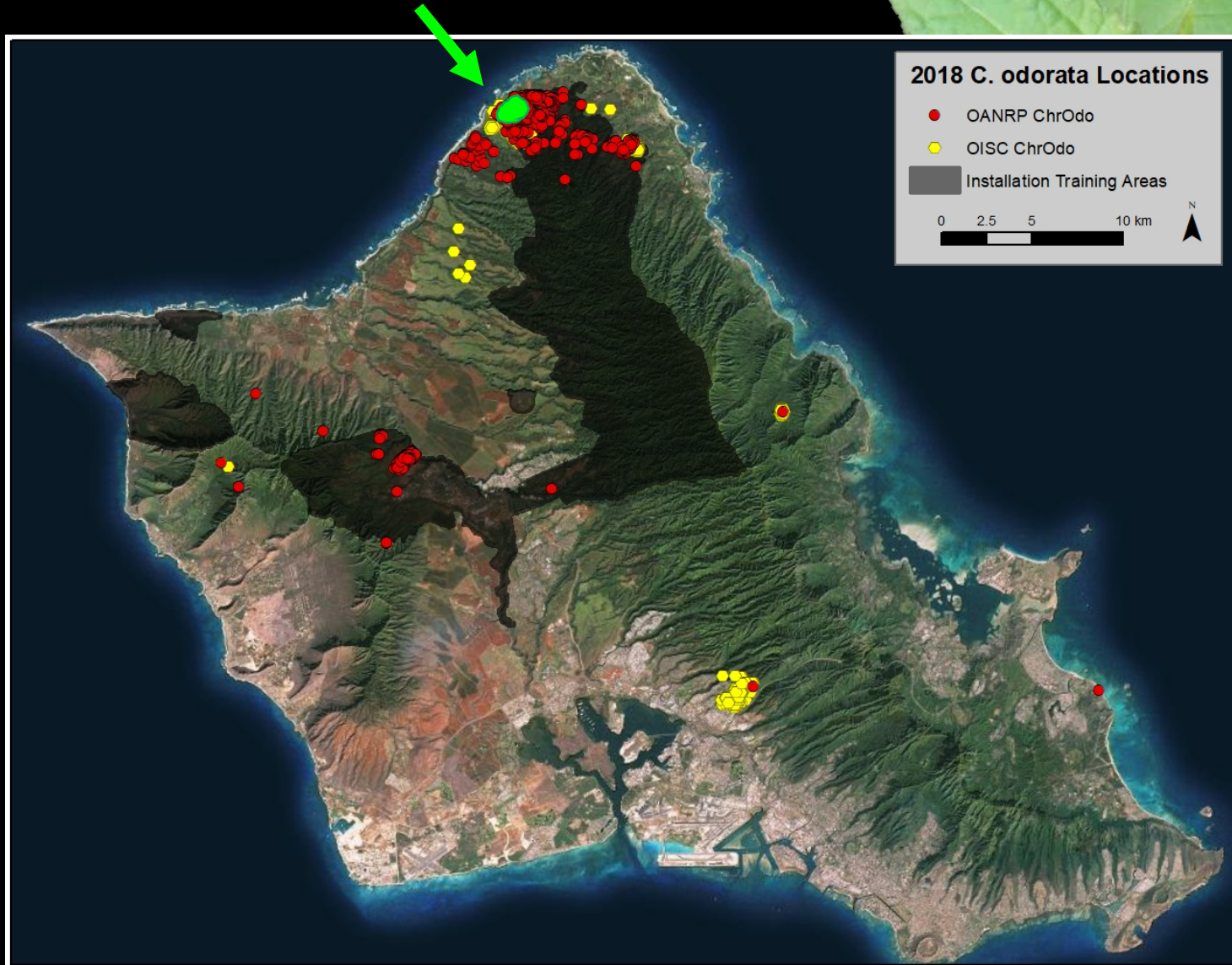
Report Year	Effort (person hours)
2011	92
2012	430
2013	396
2014	419
2015	525
2016	1,030
2017	1,130
2018	1,148
2019	1,380
2020	1,199
2021	1,118

Geographic Expansion



2011

Geographic Expansion



2018

Kahuku Training Area										
2011	2012	Schofield Barracks West								
		Kahana								
		2013	2014	Schofield Barracks East						
				'Aiea/Camp Smith						
				Keamanea						
				2015	2016	Lanikai				
						Manuwai				
				2017	Kaluaʻā					
					Mākaha					
					Pūpukea-Paumalū					
					Mālaekahana					
				2018	Kamāʻili					
					Makaleha					
					Kamananui					
					Hauʻula & Lāʻie					
				2019	2020	Helemano				
						Pahole				
<i>Hawaiʻi Island</i>										
					2021					
2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021

Challenges

- Highly invasive characteristics of *C. odorata*
- Human vectors
- Steep terrain
- Dense vegetation
- Bees
- UXO
- Resource and staffing limitations
- Anti-herbicide activists



Status of Control



Status of Control

Chromolaena odorata . . .

. . . Wish you weren't here.





Research

C. odorata Phenology
Seed Biology
Organic Herbicides



Biocontrol

Cecidochares connexa



Interagency

C. odorata Working Group



Dept of Land & Nat. Res.
Hawaii Dept of Ag
USDA Forest Service, IPIF
USFWS



Control

Suppression,
Minimize Spread:
Vectors, Trails,
Hotspots, Selective
Aerial, Outliers



Biocontrol Status

Biotype Confirmed

Asian/West African

South African



Import
Agent

Prep for Host
Specificity Testing



Release!





Mahalo to partners:
OISC, DLNR-DOFAW, HDOA, FWS,
USDA-FS, Bishop Museum, HISC,
BIISC, UH, USARHAW, BWS,
WMWP, MCBH, and many others

For questions or info
on *C. odorata*:
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