Psidium cattleianum mapping and control efforts in West Maui

Jill LaBram
West Maui Mountains Watershed Partnership

October 15, 2015
Weed Management Forum

PROJECT OBJECTIVES

NEW MAP

Our goal is to map the entire WMMWP

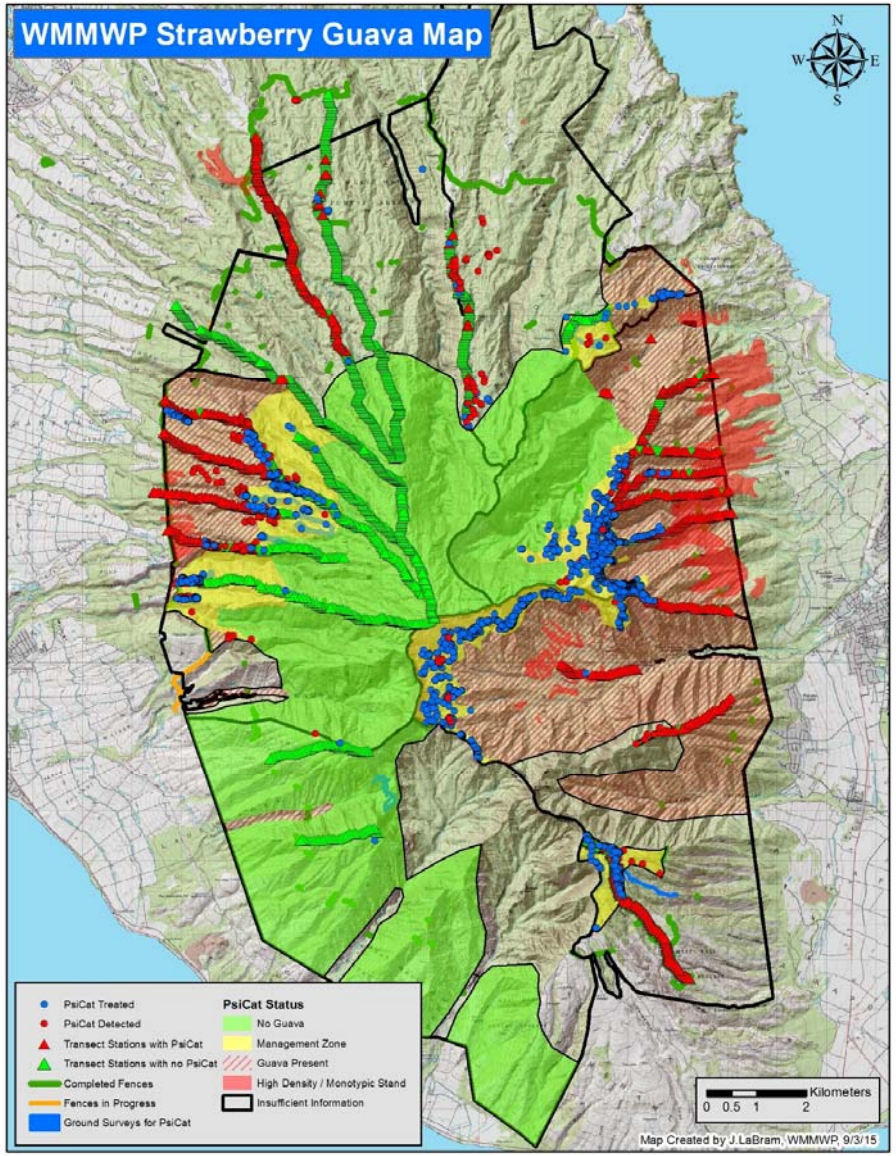
How do we prioritize?

- Protect the CORE – Top down approach
- Weed Management Plan
  - Unit by Unit
  - Prevent / Eliminate / Suppress / Contain

- What are the surrounding areas like / does it make sense?
- What is the control effort for each area?

- Ideally, based on our control efforts, we would like to show a reduction in the elevation extent and in the range

- FIND THE BEST METHOD / COMBINATION OF CONTROL



WEED PROBLEM

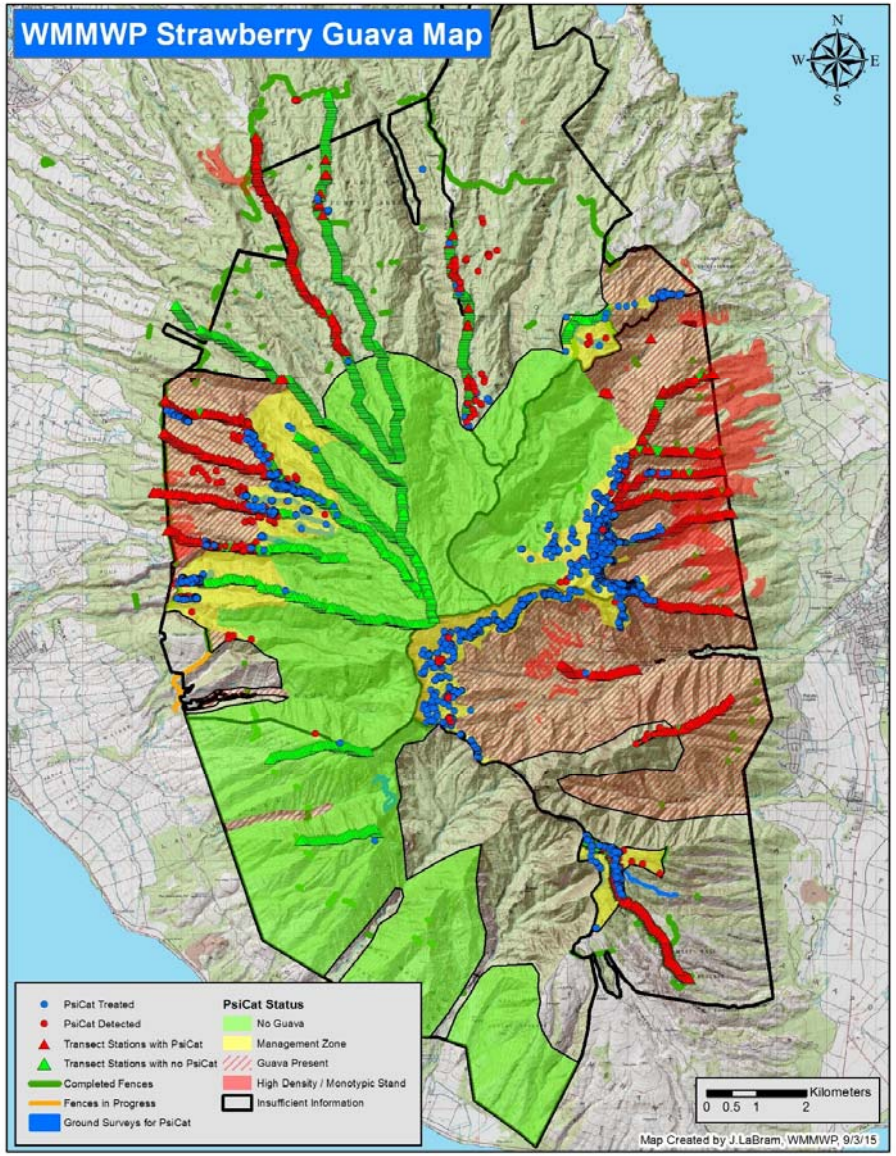
- History – Biology of Plant
  - Brought to HI in 1825 from Brazil as an ornamental
  - Extremely fast growing, resilient, water thirsty, forms monotypic stands

- Strawberry guava may consume 53% more water than native canopy species during drought periods (Giambelluca et. al, 2008)

- Habitat modeling has shown that this species has the ability to invade the entirety of the West Maui watershed if left unchecked.

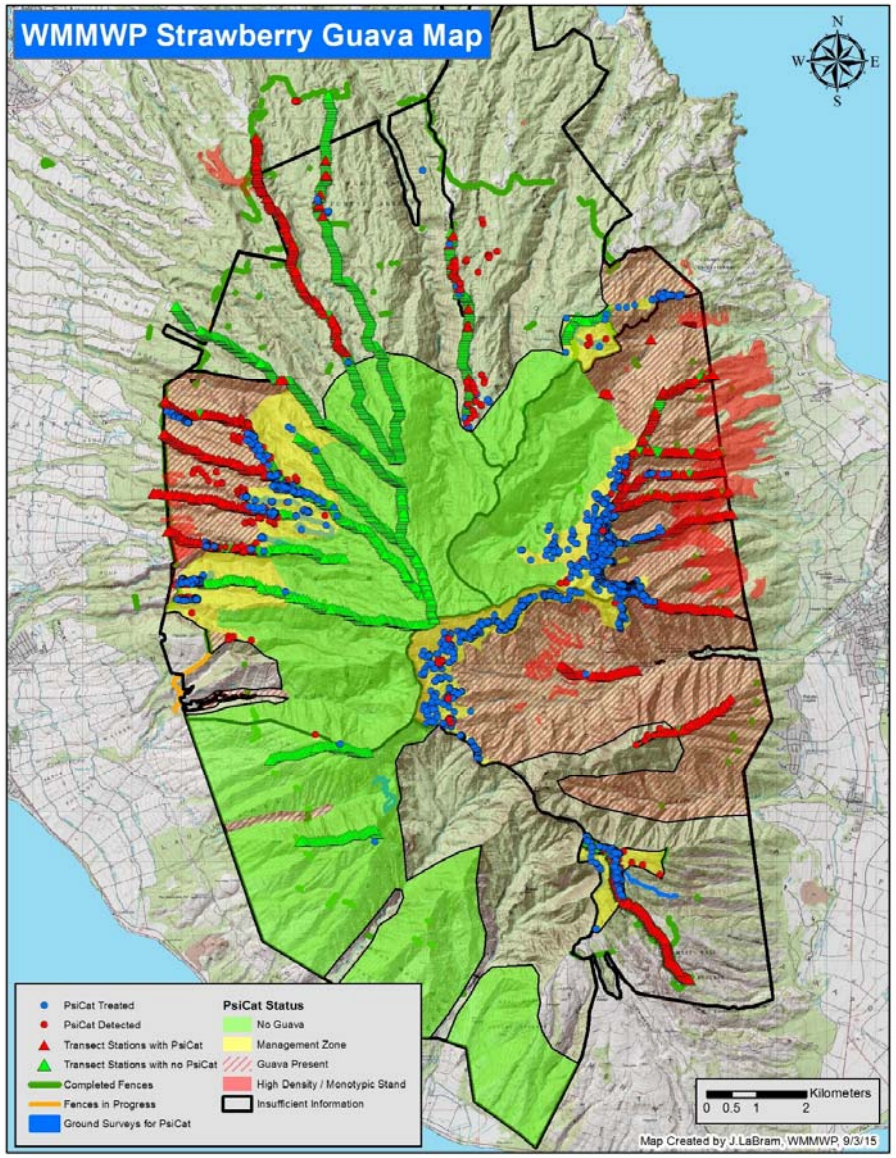
  Within WMMWP – Monotypic stands 3,000–5,000 acres (~10% of total WMMWP area)

- We have found individuals up to 4900' elevation and small satellite populations have become established ~4,000'



STRATEGY AND APPROACH

Four main strategies:



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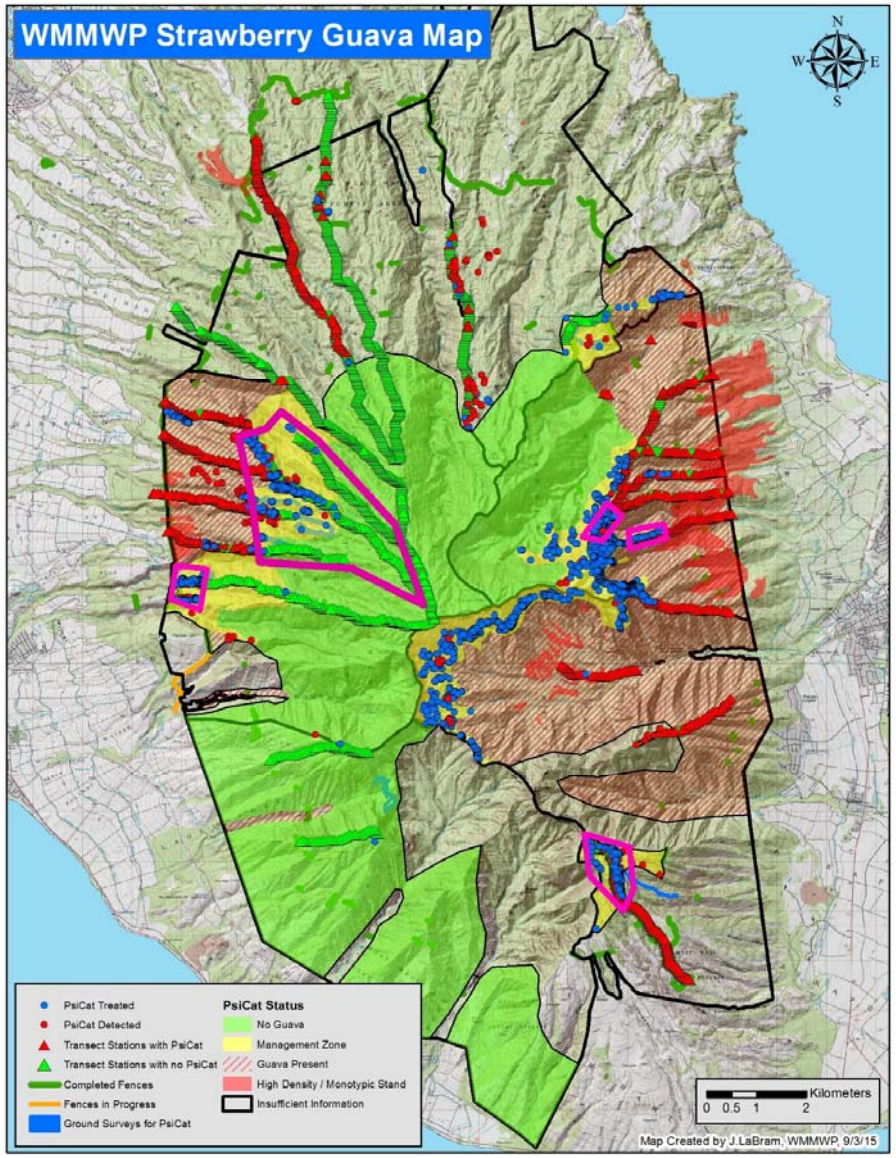
- On the ground staff control
  - Decisions based on previous aerial surveys or ground observations
  - Determine priority areas, outliers, top down approach
    - West Unit: Kapunakea, Wahikuli, Kahoma, Panaewa
    - Southeast Unit: Hanaula
    - East Unit: Keahialoa/Waiehu
  - Triclopyr (Garlon 4 / Element 4) – Different % / surfactants
    - Cut stump / Girdle / Frill / Pull
  - Aminopyralid (Milestone) – Different %
    - Hack and Squirt / Hack and Drops



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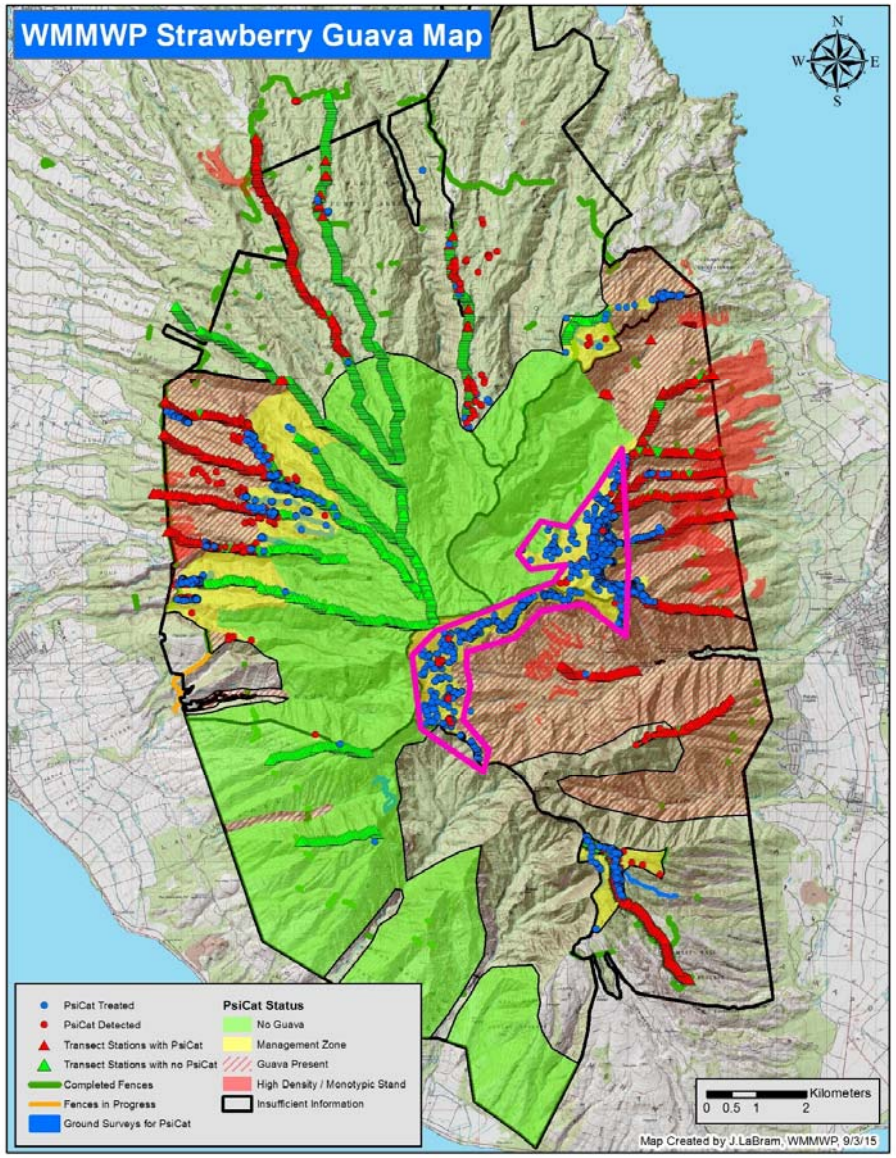
- Aerial surveys / treatment using HBT
  - Collaboration with Dr. James Leary
  - Projectiles containing 16% Triclopyr (Garlon 4 Ultra)
  - Original goal > 2800' elevation: Iao, Keahialoa, Waihe'e, Waiehu



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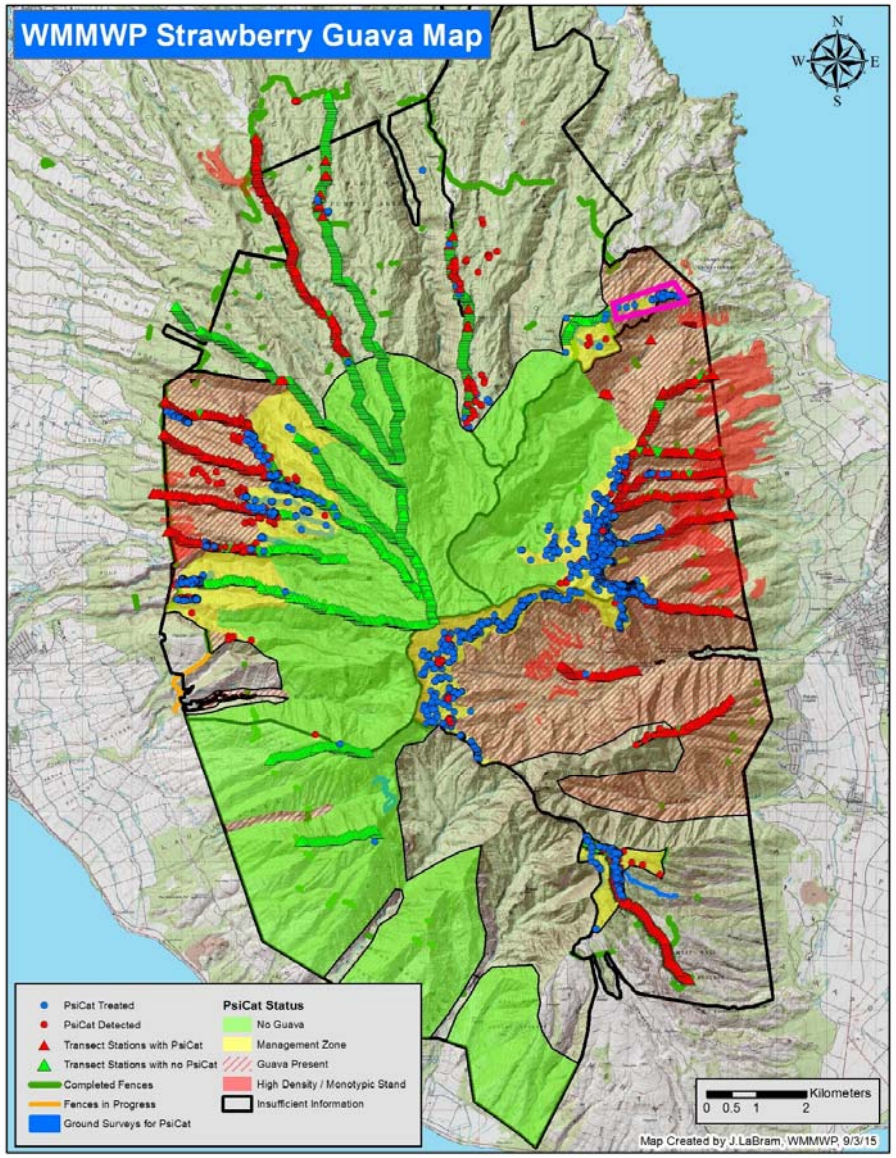
- Volunteer Service Trips
  - Waihe'e Ridge Trail
  - Public, Community Groups, School Classes ~ 12 / year



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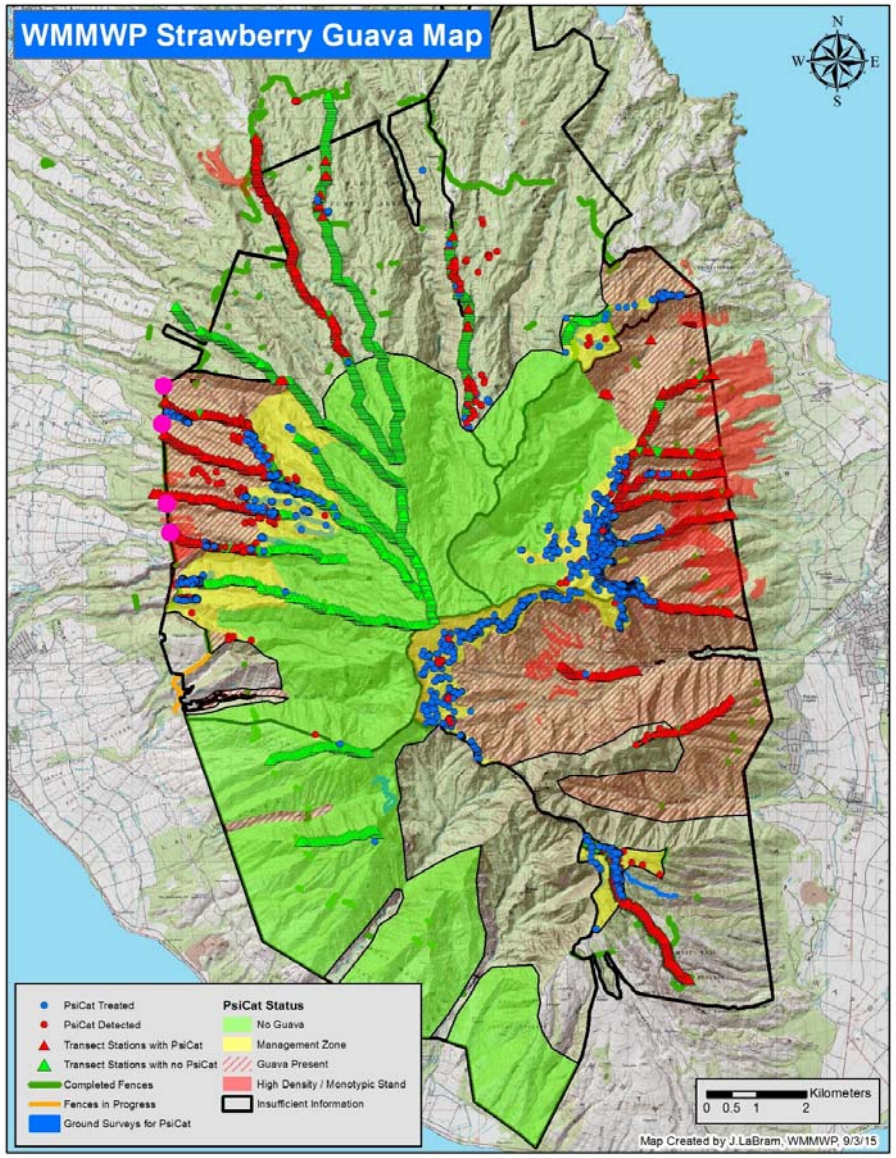
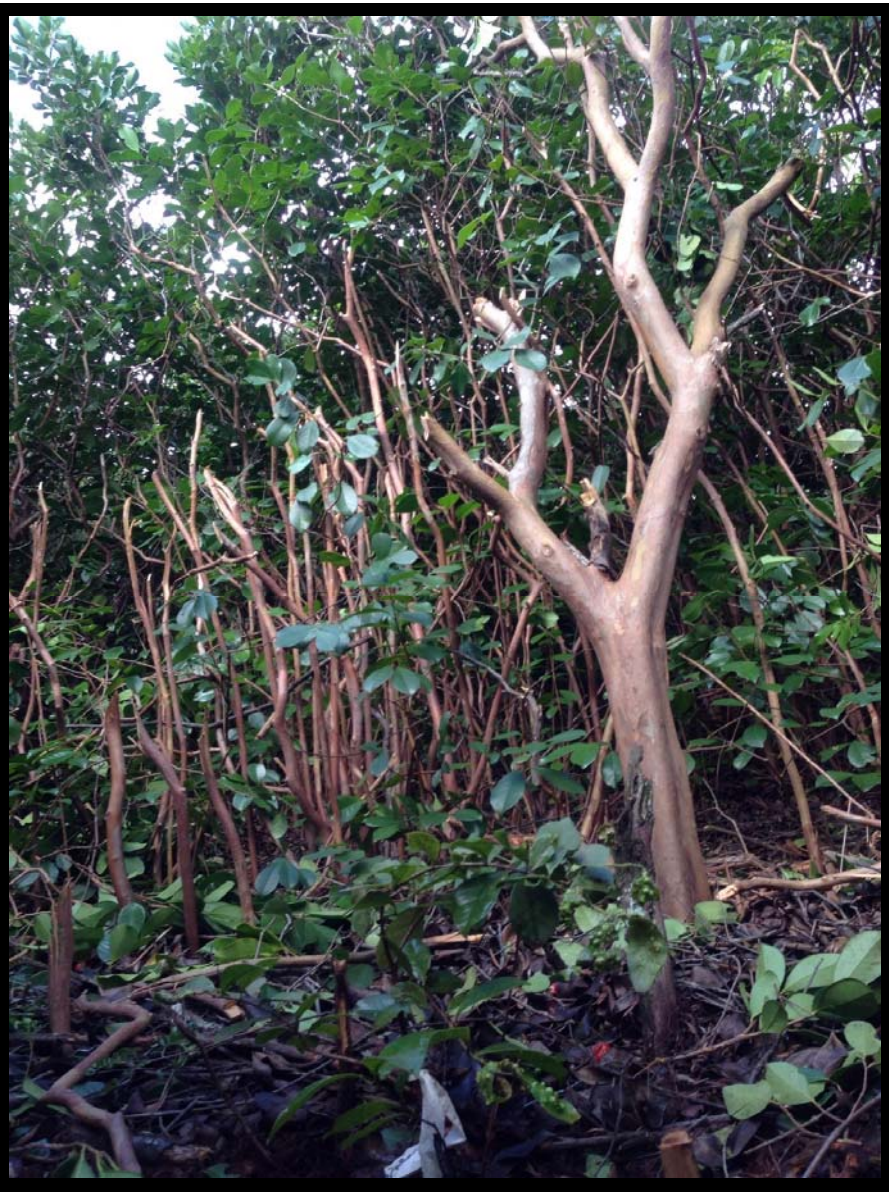
  - Waihe'e Ridge Trail
  - Public, Community Groups, School Classes ~ 12 / year
- Release of the biological control, *Tectococcus ovatus*
  - 2 release sites on State land / Kapunakea
  - 1 release site in Wahikuli
  - Prepped 1 site in Kahoma

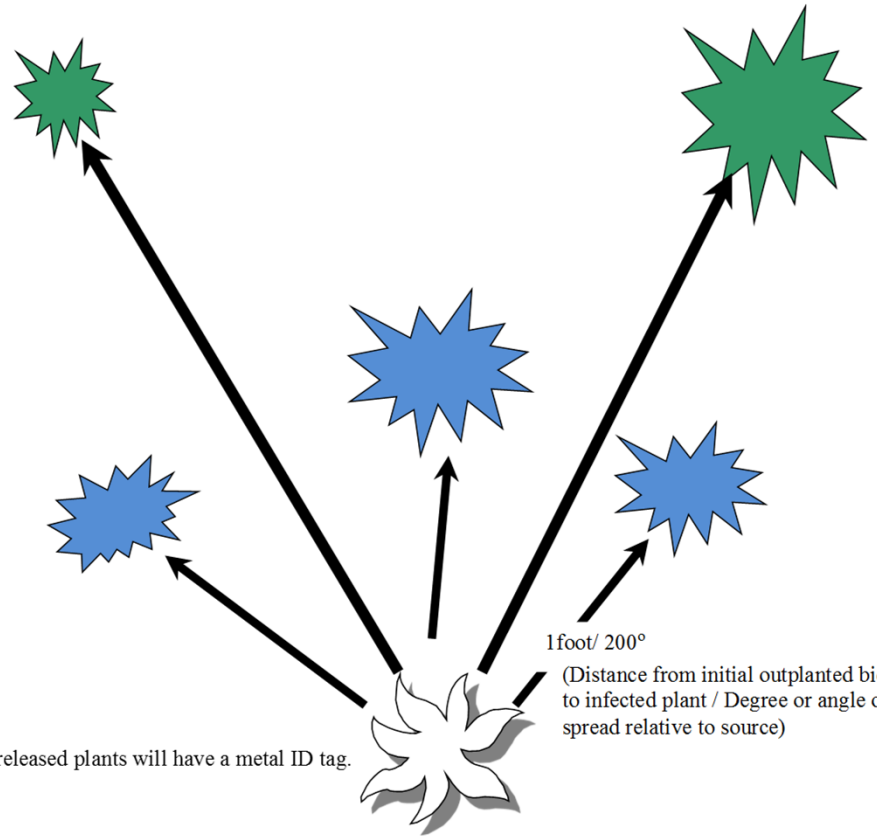




Tectococcus Spread - Sample Map

Key:
White- First Bio Control Plant
Blue- Plants infected by control plant at 1st check up date.
Green- Additional plants infected by control plant at 2nd check up date.

(Additional colors may be added for future check up dates. Each color represents a new monitor date. Colors will be represented in field using color ties. These maps are intended for initial beginning stages due to slow rate of spread. When bio control extends to a feasible radius, GPS tracks around the infected perimeter will then be used and later inputted into GIS to calculate area and construct relative maps.)



All released plants will have a metal ID tag.

RESOURCES AND LOGISTICS

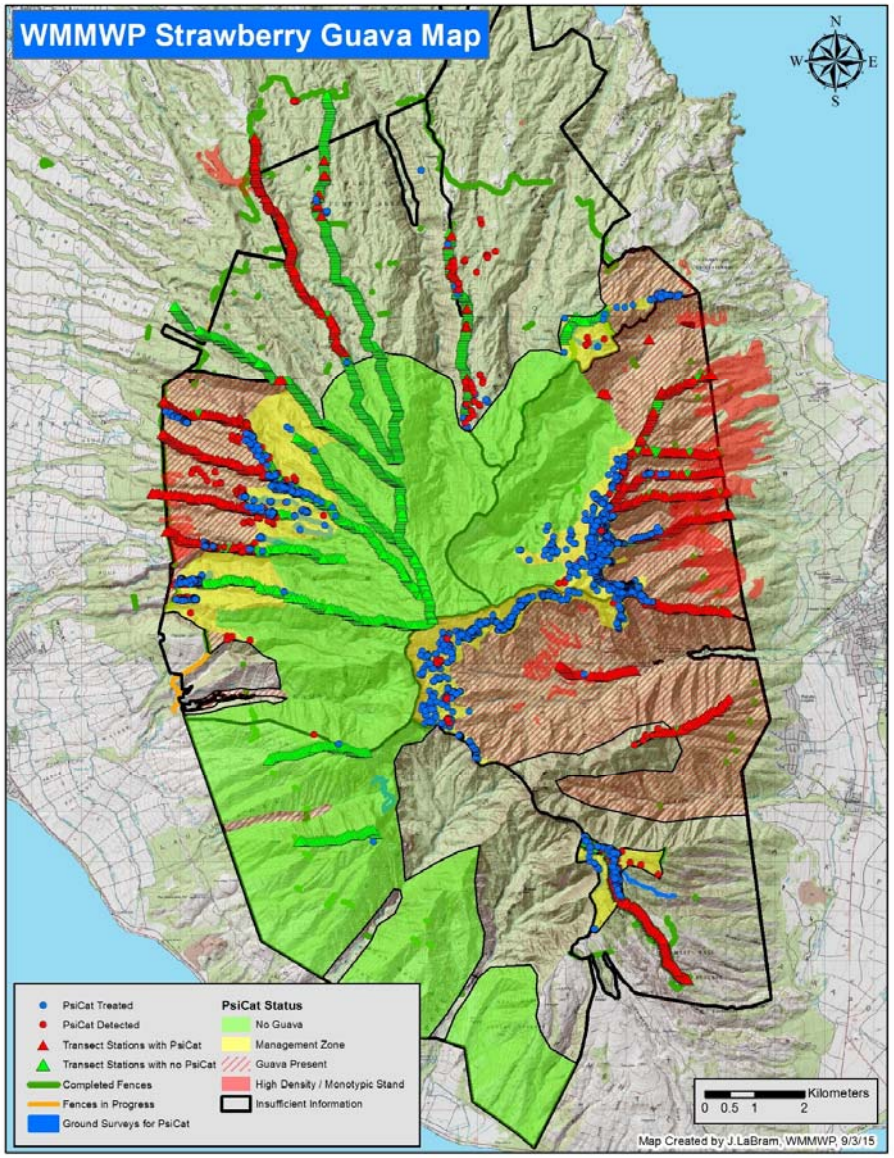
WMMWP = ~47,321 acres

Total Field Staff – Full time = 5, Half time = 1

- Americorps intern starts next week

Our sites

Fly in, fly out (day trip or camp)
Fly in, hike out
Drive up– hike in and out
Aerial only



CURRENT CHALLENGES AND LIMITATIONS

Challenges with PsiCat in general:

- HARD TO KILL!!
- Re-growth from branch or trunk cut and thrown aside
- Re-growth in wet areas
- Aerial root growth
- Cut stump vs. Girdle / Frill
- Environmental differences within different sites
- Herbicide Type: Milestone (aminopyralid) vs. Garlon 4 (triclopyr)
  - Milestone (7 ounces / acre / year)
  - Concentration

CURRENT CHALLENGES AND LIMITATIONS

- On the ground staff control
  - Lot of time and effort
  - Re-growth
  - Different herbicide / Concentration
    - Milestone challenges
  - Efficacy – re-treatments
  - Accessibility, Steep slopes
- Aerial surveys / treatment using HBT
  - Expensive
  - Inclement weather / Cancellations
  - Collateral damage?
  - Assessment of efficacy
- Volunteer Service Trips
  - Staff working on weekends
  - People to sign up
  - Need a new site with easy accessibility
- Release of the biological control, *Tectococcus ovatus*
  - Funding
  - Staff time to prep and monitor release sites
  - Amount of time to get established

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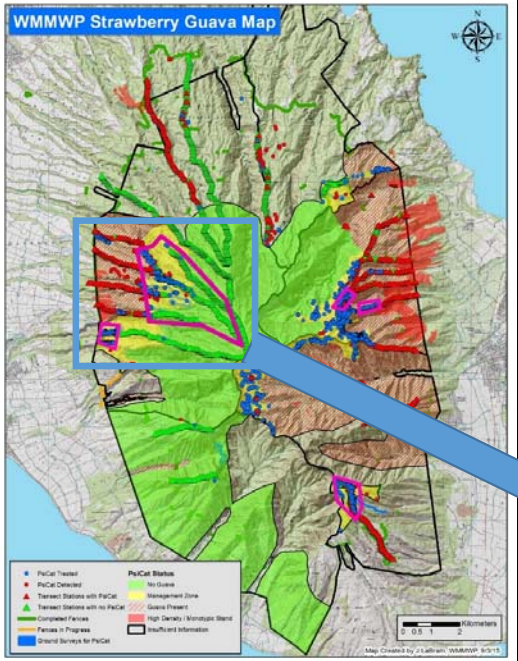
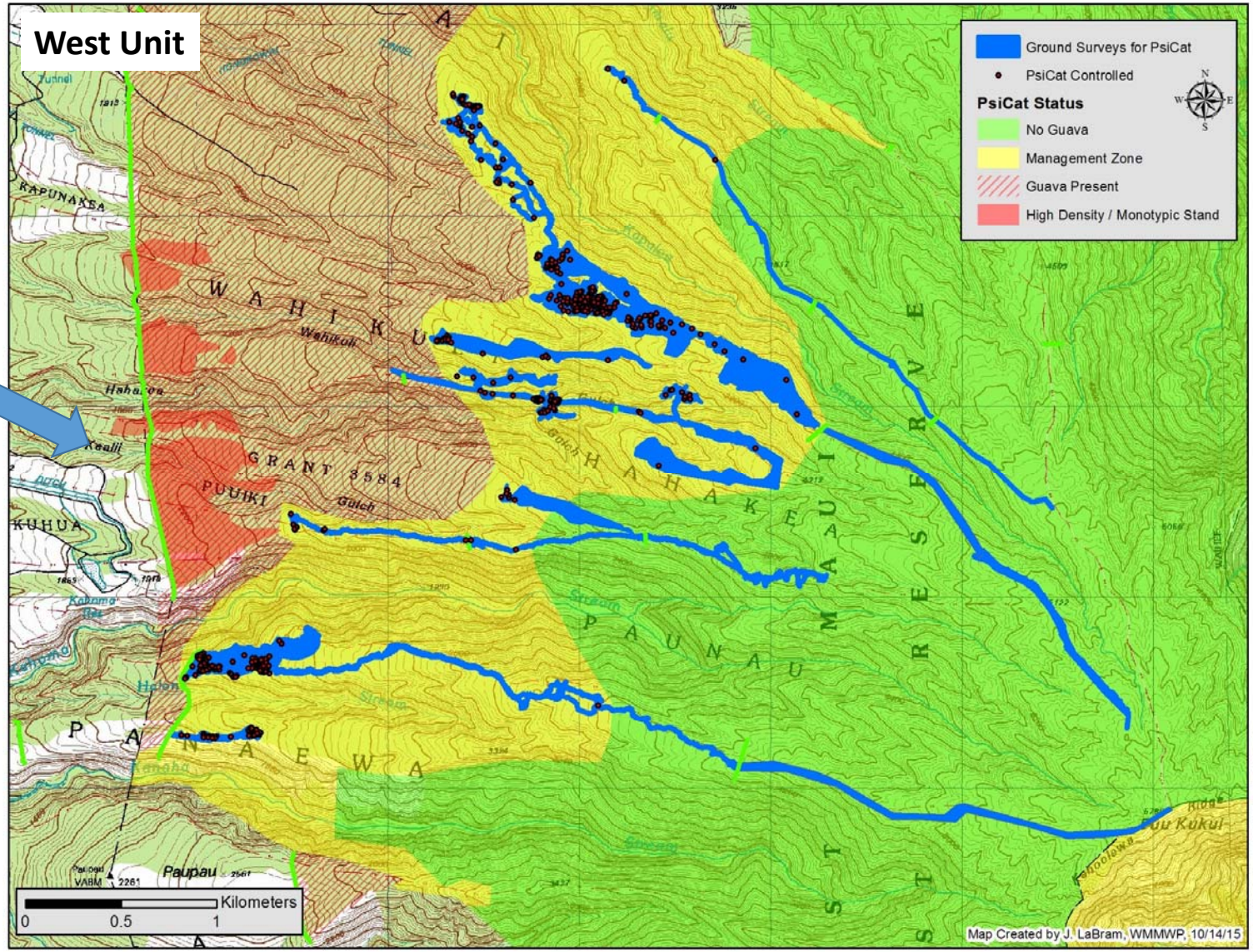
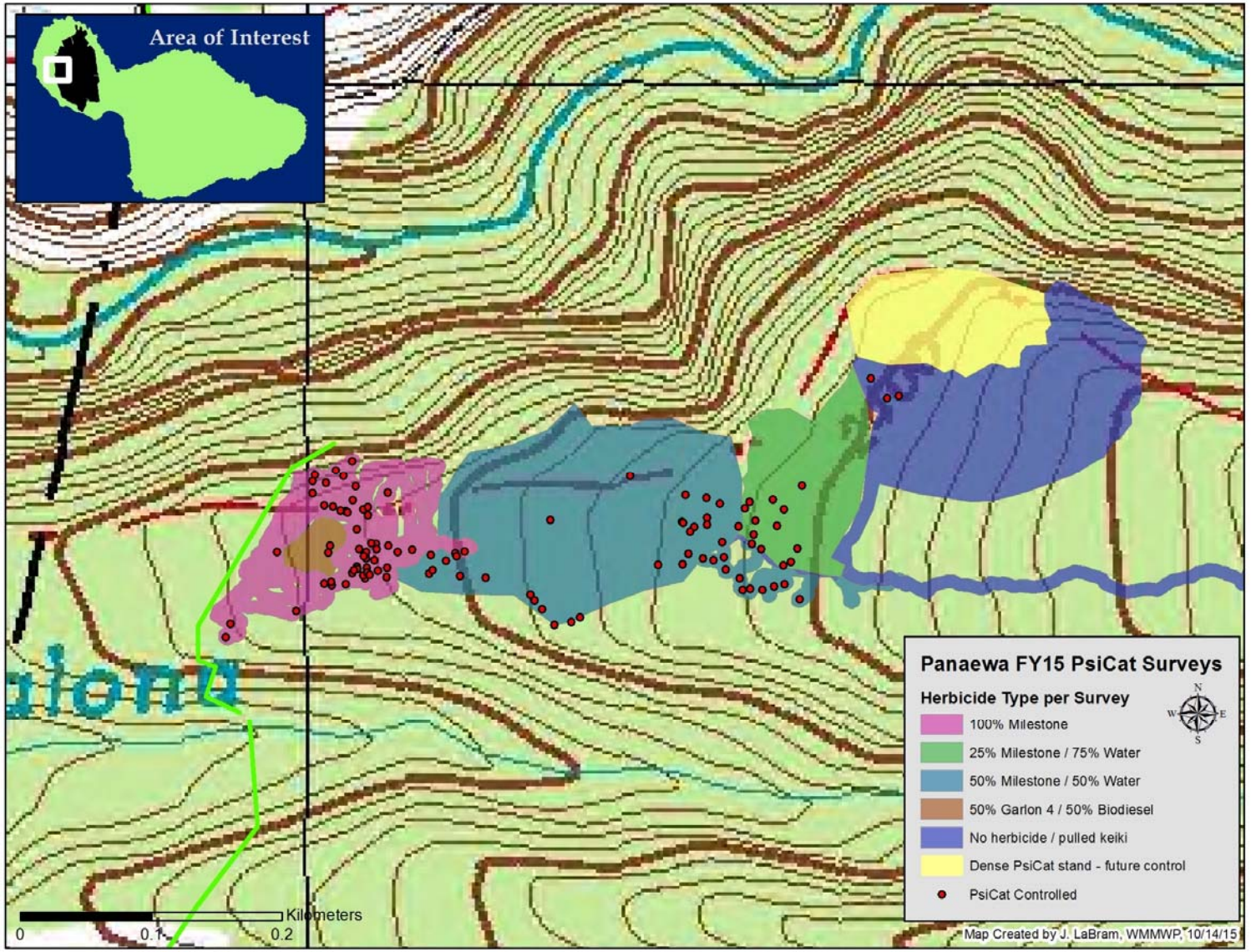
2015 OUTCOMES / INFO TO DATE

- On the ground staff control
  - Totals to DATE = 24,496 controlled, 338 acres (since 2010)
    - FY13 –6,570 controlled – 54.1 acres in Hanaula, Wahikuli, Waihe'e, Kapunakea, and Keahialoa
    - FY14 – 2,736 controlled – 74.1 acres in Kahoma, Pana'ewa, Hanaula, Pu'u Kane, Kapunakea, and Keahialoa
    - FY15 – 2,6987 controlled – 47.7 acres in Pana'ewa, Keahialoa, Kapunakea, Kahoma, Pu'u Kane


WMMWP Strawberry Guava Map


West Unit
Ground Surveys for PsiCat
PsiCat Controlled
PsiCat Status
No Guava
Management Zone
Guava Present
High Density / Monotypic Stand
WAHIKU
GRANT 3584
PUUIKI
KUHUA
PAUNAU
NAEWA
MAUI FOREST RESERVE
Paupau
Kilometers
0
0.5
1
Map Created by J. LaBram, WMMWP, 10/14/15


Area of Interest
Panaewa FY15 PsiCat Surveys
Herbicide Type per Survey
100% Milestone
25% Milestone / 75% Water
50% Milestone / 50% Water
50% Garlon 4 / 50% Biodiesel
No herbicide / pulled keiki
Dense PsiCat stand - future control
PsiCat Controlled
N
W
E
S
Kilometers
0
0.1
0.2
Map Created by J. LaBram, WMMWP, 10/14/15

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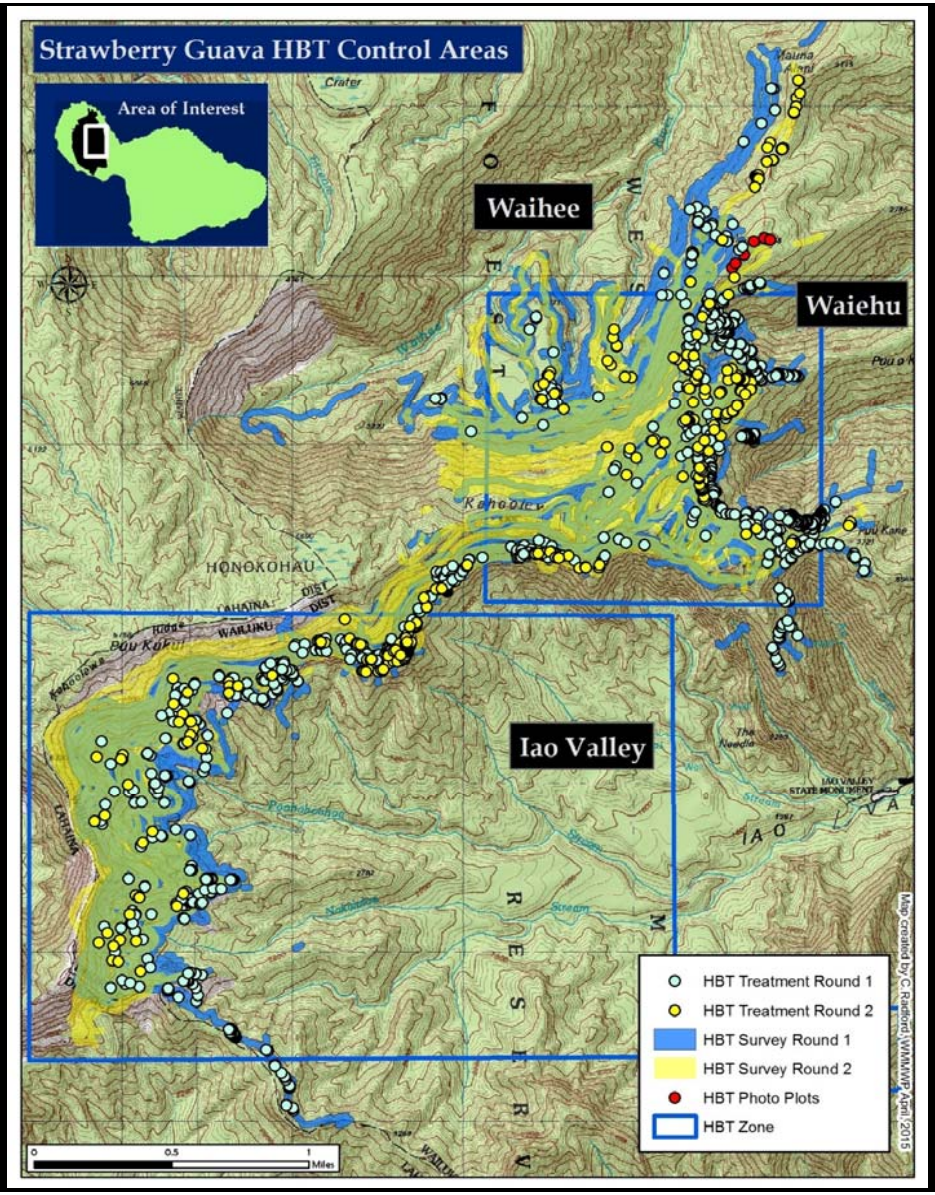
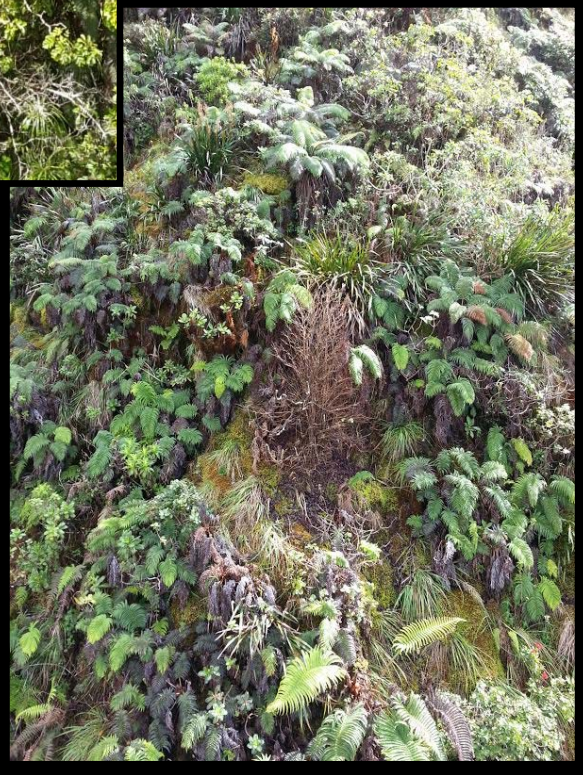
- Aerial surveys / treatment using HBT
  - 1/8/13 – 3/17/15: ~74 hours flight time. Total 1602 targets (33 re-treats)
    - 2 rounds (DOH / DWS funding) – 70.1 hours flight time
      - Round 1 = 1064 targets (6 re-treats); 50 hours heli time; 2,031 acres with overlap
      - Round 2 = 329 targets (27 re-treats); 20.1 hours heli time; 1,370 acres with overlap
    - Photo plots (Ground / Air)


Strawberry Guava HBT Control Areas
Area of Interest
Waihee
Waiehu
Iao Valley
HBT Treatment Round 1
HBT Treatment Round 2
HBT Survey Round 1
HBT Survey Round 2
HBT Photo Plots
HBT Zone
Map created by C.Radford,WMMWP, April, 2015
0
0.5
1
Miles

Iao Valley 77 days after Tx



HBT Photo Plot
Accessible on ground

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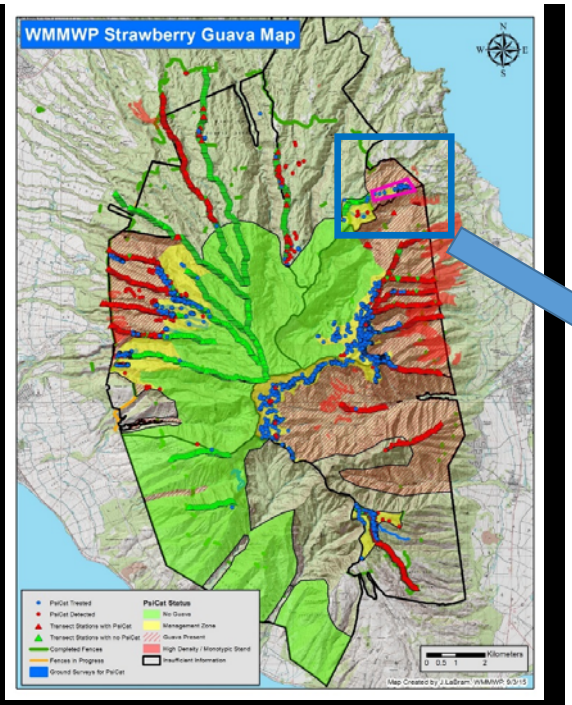
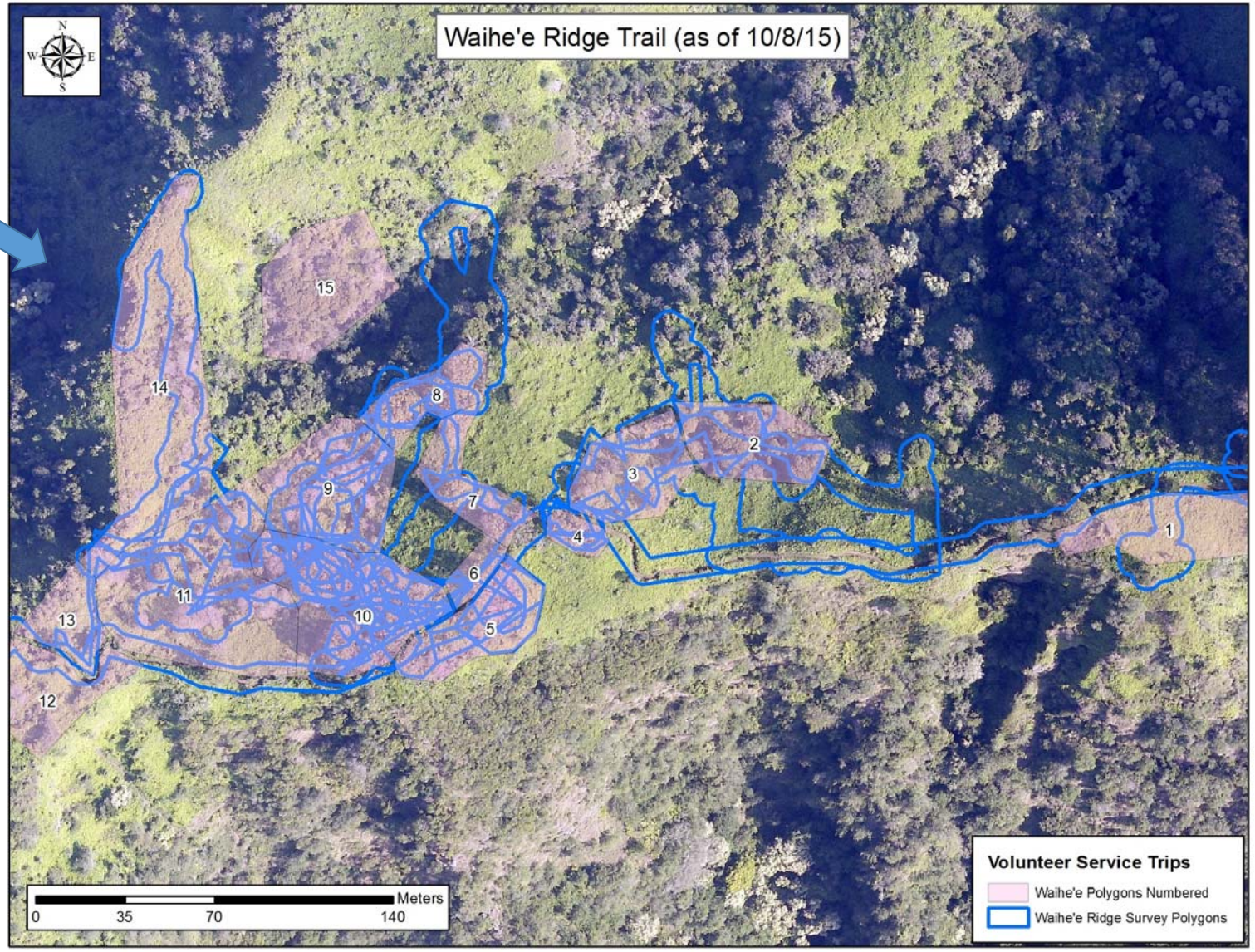
- Volunteer Service Trips
  - Photo plots (Ground / Air)
  - Started November 2012
  - 1278 volunteer hours
  - 8.6 acres "swept"
  - 10,342 treated (5,372 mature) – 394 have been re-treated


WMMWP Strawberry Guava Map
PsiCat Status
Kilometers


Waihe'e Ridge Trail (as of 10/8/15)
15
14
8
2
3
9
7
4
1
6
11
10
5
13
12
Meters
0
35
70
140
Volunteer Service Trips
Waihe'e Polygons Numbered
Waihe'e Ridge Survey Polygons

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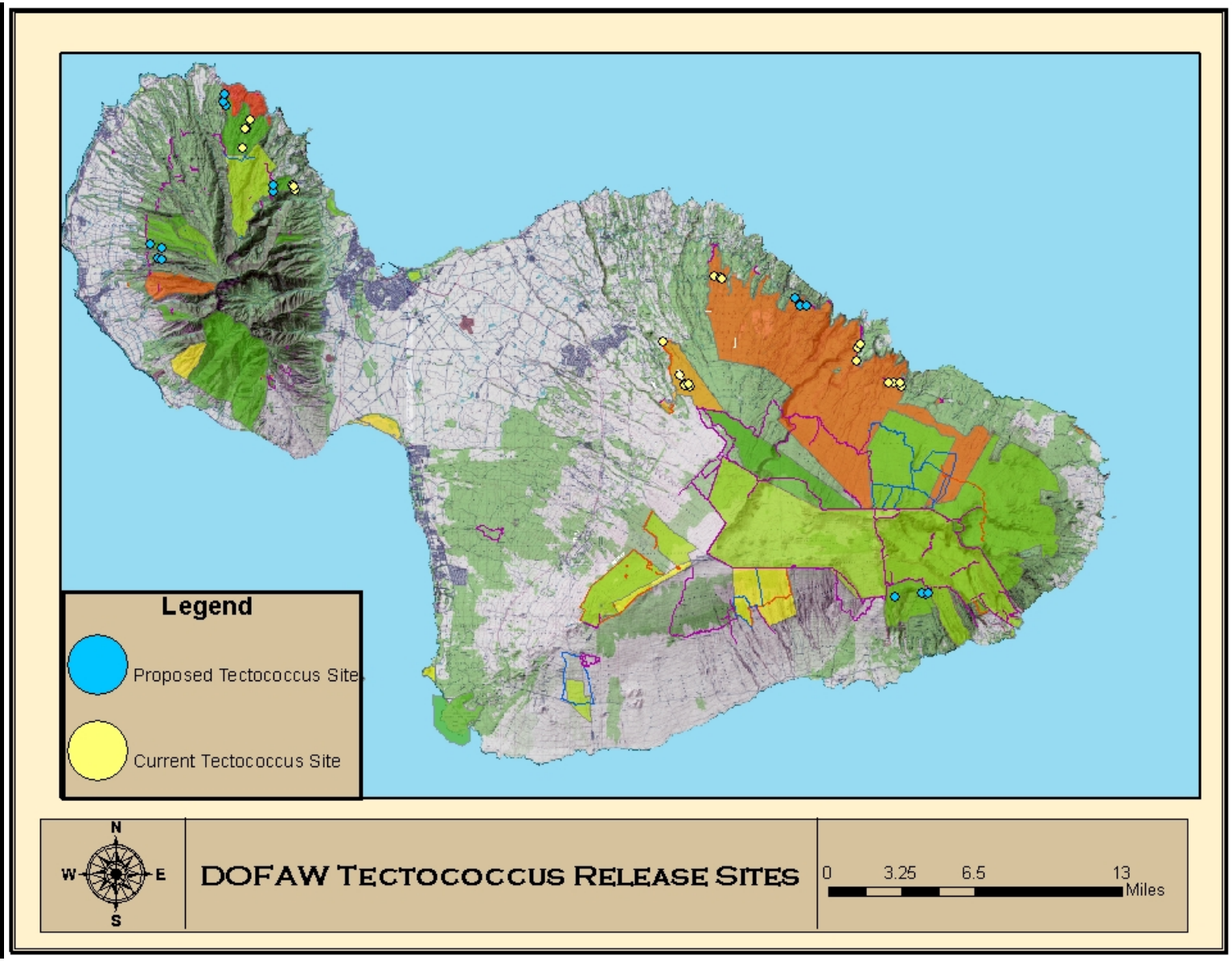
  - 2 Kapunakea sites released 12/4/14: – up to 30' dispersal on 15 new plants
  - Wahikuli site just released on 9/17/15


Legend
Proposed Tectococcus Site
Current Tectococcus Site
N
W
E
S
DOFAW Tectococcus Release Sites
0
3.25
6.5
13
Miles

Infected Psidium cattleianum plants

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WE HAVE BEEN IN DATA COLLECTION MODE, NOW WE NEED TO MOVE TO ASSESSMENT MODE!

2016 and FUTURE GOALS

- Maintain these efforts
- Revisit control sites
- Assess the efficacy of treatments / Refine our herbicide techniques
- Assess the efficacy of re-treatments (looking at person hours, number treated, area covered, range reduced)

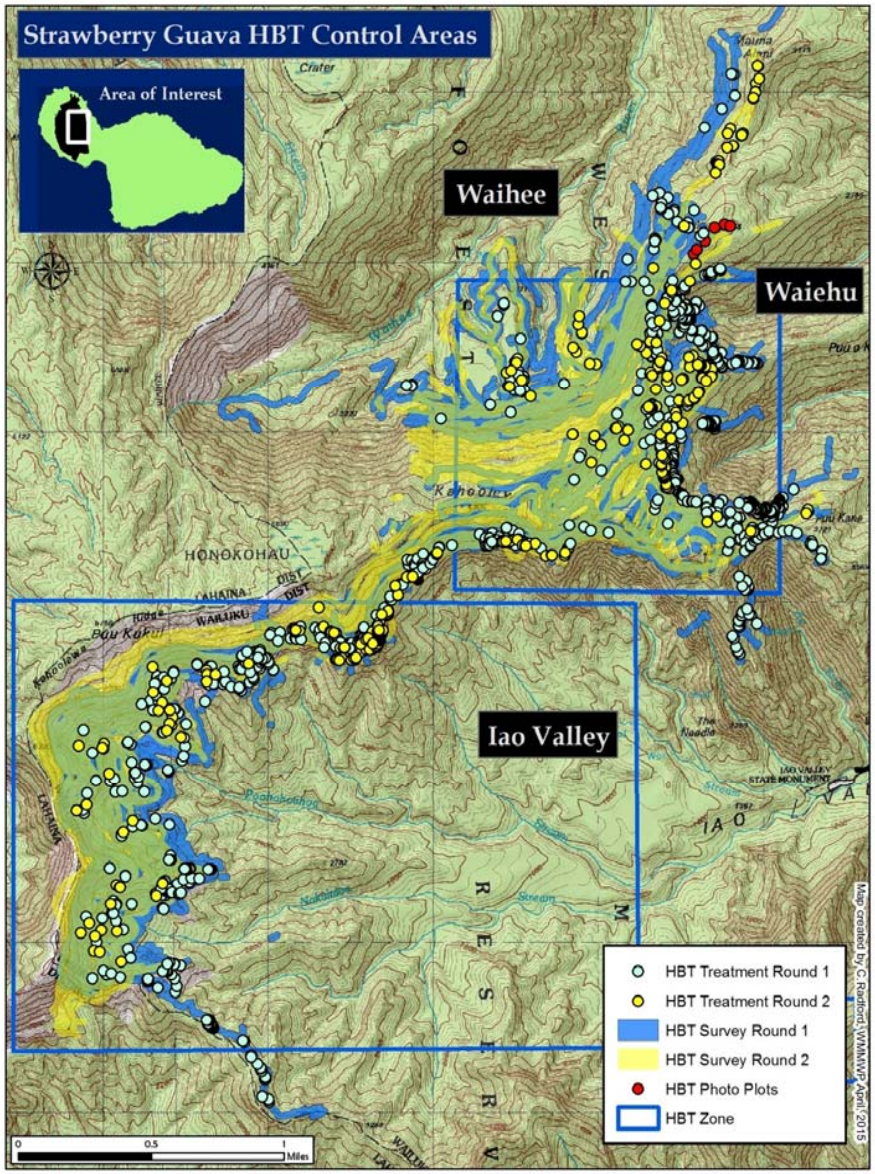
  EFFECTIVELY SHOW OUR SUCCESS
- Evaluate bio-control / More release sites
- Finding the time to accomplish these goals ☺
- BASICALLY NO MATTER WHAT METHOD WE USE, WE HAVE TO RE-SWEEP AND ASSESS
  - We have seen re-growth, not 100% effective
- Ideally in the future-Treatment in conjunction with Biocontrol
- **WE WOULD APPRECIATE ANY RECOMMENDATIONS / IDEAS YOU HAVE**

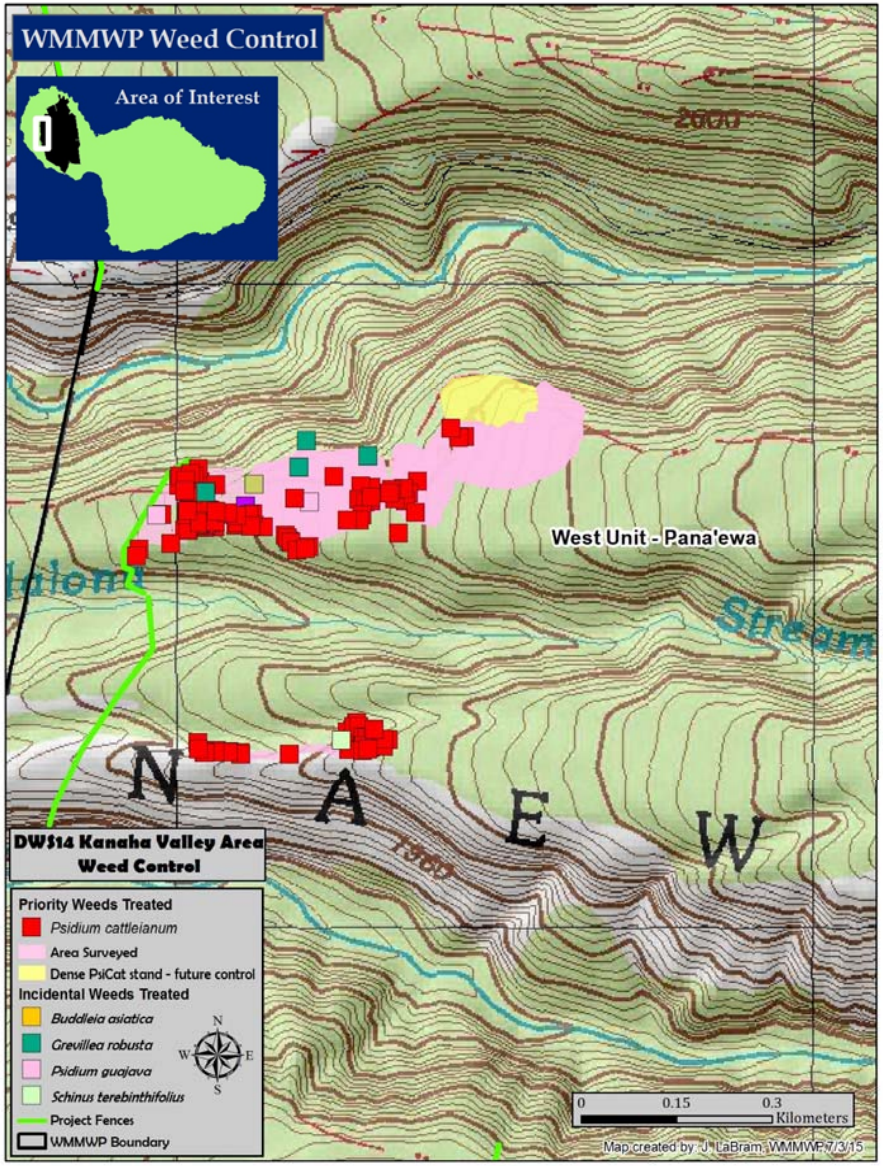
Mahalo!

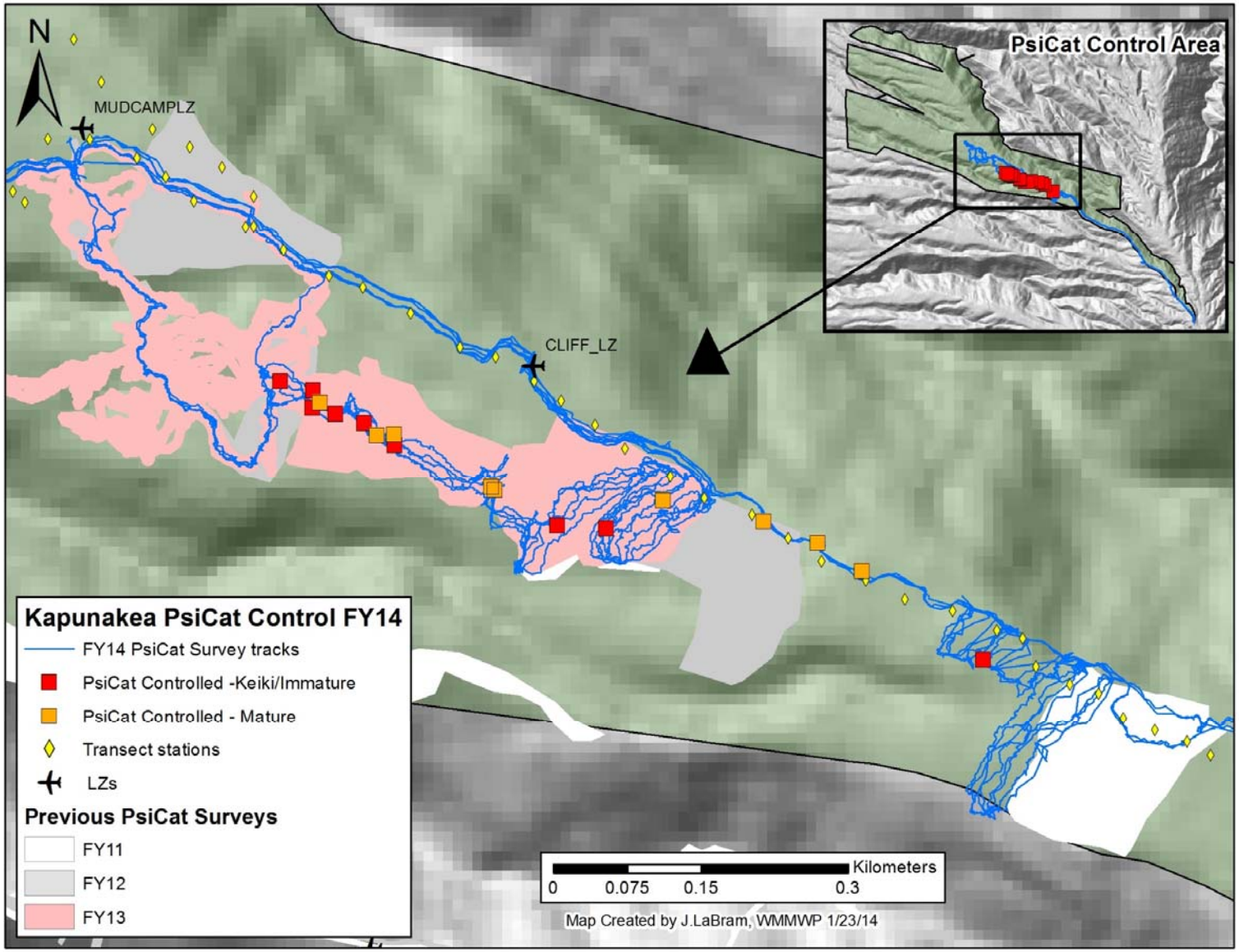


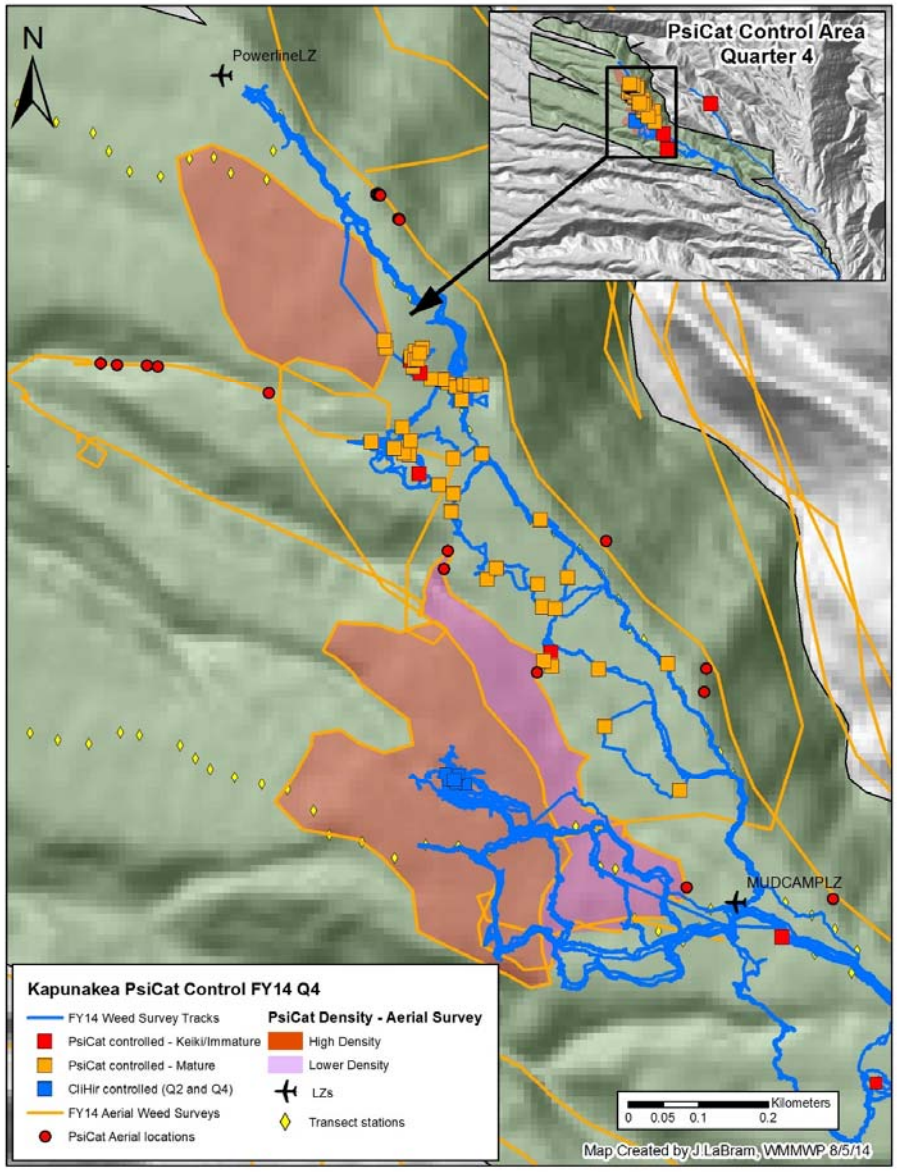
WMMWP Crew
Dr. James Leary
Windward Aviation
RCUH/PCSU
All WMMWP Landowning Partners

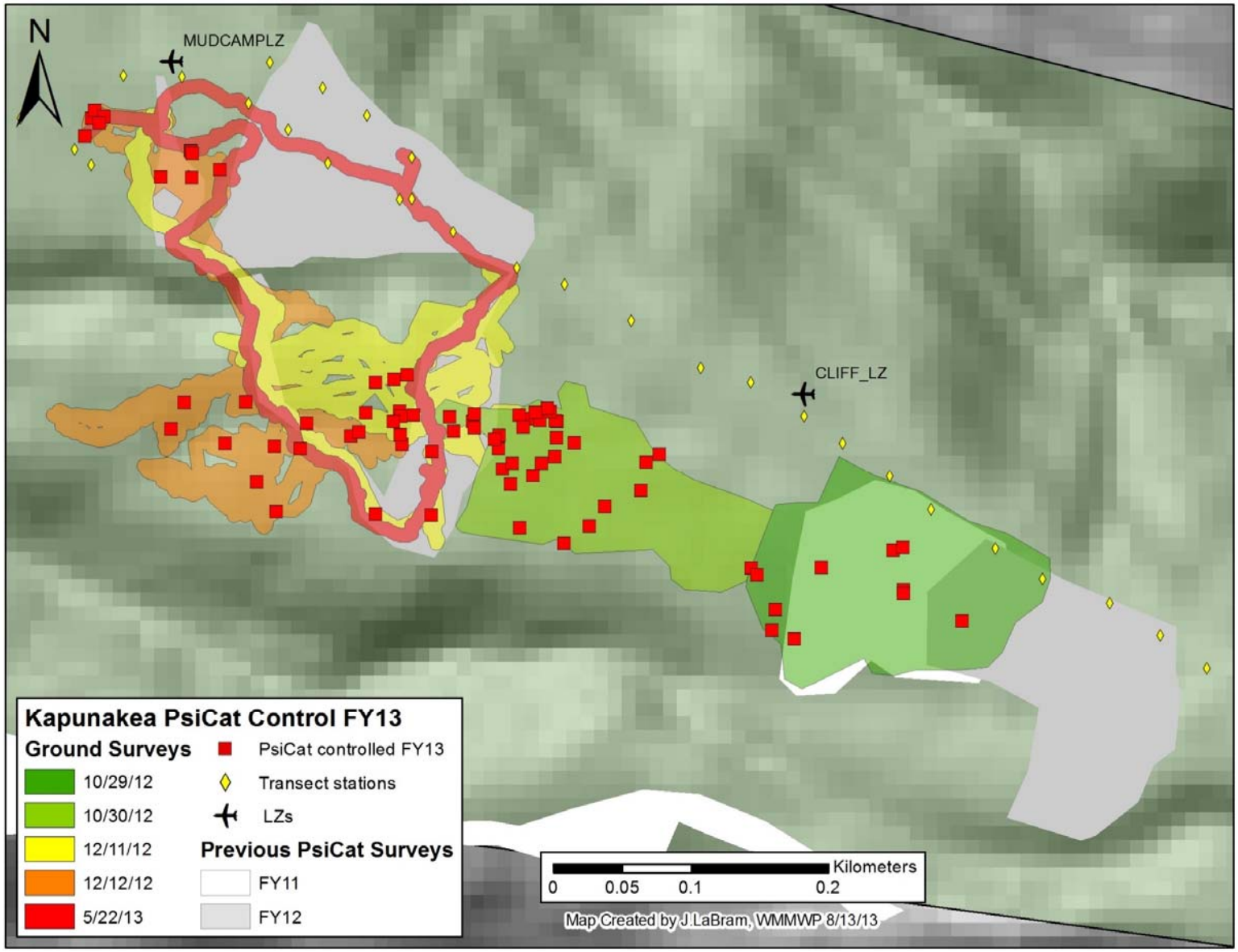
Extra slides / maps


Strawberry Guava HBT Control Areas
Area of Interest
Waihee
Waiehu
Iao Valley
HONOKOHAU
HBT Treatment Round 1
HBT Treatment Round 2
HBT Survey Round 1
HBT Survey Round 2
HBT Photo Plots
HBT Zone
Map created by C. Rainford, WMMWP, April 2015


WMMWP Weed Control
Area of Interest
West Unit - Pana'ewa
DW$14 Kanaha Valley Area Weed Control
Priority Weeds Treated
Psidium cattleianum
Area Surveyed
Dense PsiCat stand - future control
Incidental Weeds Treated
Buddleia asiatica
Grevillea robusta
Psidium guajava
Schinus terebinthifolius
Project Fences
WMMWP Boundary
Kilometers
Map created by J. LaBram, WMMWP, 7/3/15


N
MUDCAMPLZ
CLIFF_LZ
PsiCat Control Area
Kapunakea PsiCat Control FY14
FY14 PsiCat Survey tracks
PsiCat Controlled -Keiki/Immature
PsiCat Controlled - Mature
Transect stations
LZs
Previous PsiCat Surveys
FY11
FY12
FY13
Kilometers
0
0.075
0.15
0.3
Map Created by J.LaBram, WMMWP 1/23/14


N
PowerlineLZ
PsiCat Control Area
Quarter 4
MUDCAMPLZ
Kapunakea PsiCat Control FY14 Q4
FY14 Weed Survey Tracks
PsiCat controlled - Keiki/Immature
PsiCat controlled - Mature
CliHir controlled (Q2 and Q4)
FY14 Aerial Weed Surveys
PsiCat Aerial locations
PsiCat Density - Aerial Survey
High Density
Lower Density
LZs
Transect stations
Kilometers
0 0.05 0.1 0.2
Map Created by J LaBram, WMMWP 8/5/14


N
MUDCAMPLZ
CLIFF_LZ
Kapunakea PsiCat Control FY13
Ground Surveys
10/29/12
10/30/12
12/11/12
12/12/12
5/22/13
PsiCat controlled FY13
Transect stations
LZs
Previous PsiCat Surveys
FY11
FY12
Kilometers
0
0.05
0.1
0.2
Map Created by J.LaBram, WMMWP 8/13/13