

**Maui Invasive Species Committee
Molokai Invasive Species Committee**



**Informational Briefing
Maui County Council – Water Resources Committee
March 8, 2017**



**MAUI INVASIVE SPECIES COMMITTEE
STRATEGIC PLAN**

STRATEGIC PLAN COMPONENTS

MAXIMIZING PROGRAM IMPACT

GOAL 1: PROTECTING MAUI NUI FROM INVASIVE SPECIES

- EARLY DETECTION
- RAPID RESPONSE
- ERADICATION / CONTROL
- PREVENTION
- BIO-CONTROL

MAXIMIZING PROGRAM QUALITY

GOAL 2: STRATEGIES & ACTIONS ARE SCIENCE-BASED, EFFICIENT & EFFECTIVE

- SCIENCE-BASED
- EFFICIENCY & EFFECTIVENESS
- DATA MANAGEMENT

MAXIMIZING OUR VOICE

GOAL 3: ENGAGING THE PUBLIC

- PUBLIC UNDERSTANDING & SUPPORT
- LITTLE FIRE ANT
- INDUSTRY PARTICIPATION
- EDUCATION

STRENGTHENING OUR CONNECTIONS

GOAL 4: MAUI NUI & STATEWIDE PERSPECTIVE

- MOLOKA'I, LANAI & KAHŌ'ŌLAWE
- ISCS & CGAPS
- PARTNERSHIPS

CREATING FINANCIAL SUSTAINABILITY

GOAL 5: ADEQUATE & STABLE FUNDING

- FINANCIAL STABILITY
- FISCAL RESPONSIBILITY

BUILDING A WORKFORCE TO ACHIEVE OUR VISION

GOAL 6: REWARDING WORKPLACE

- RETENTION
- PROFESSIONAL DEVELOPMENT
- LOCAL RECRUITMENT

Invasive species don't care about boundaries:

- Legal
- Traditional
- Watersheds
- Jurisdictional



Whether they start in a backyard...



...or end up in a Maui watershed



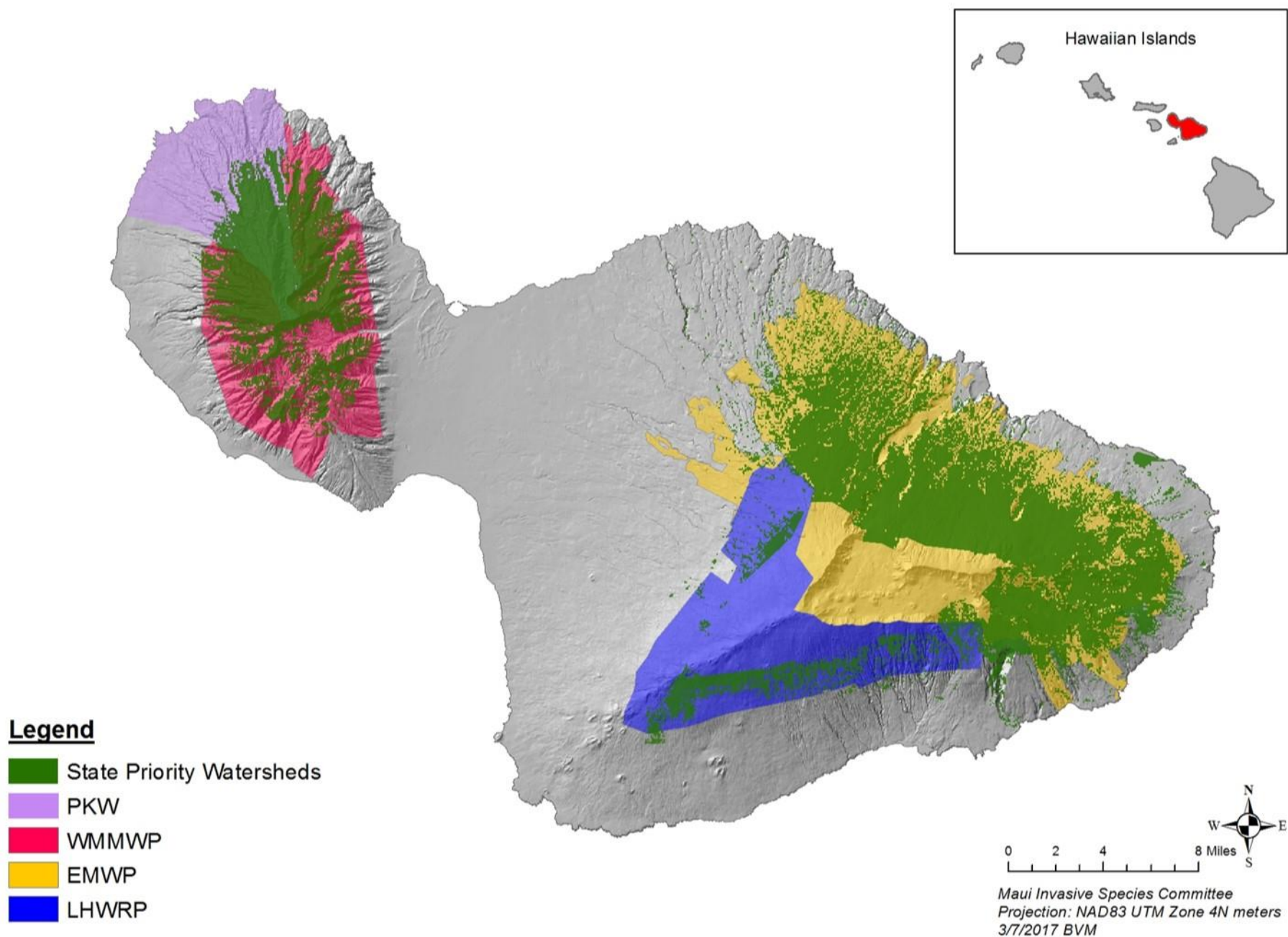
...come in undetected in a plant shipment





...or infest entire gulches.

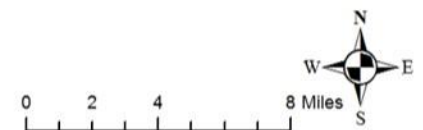
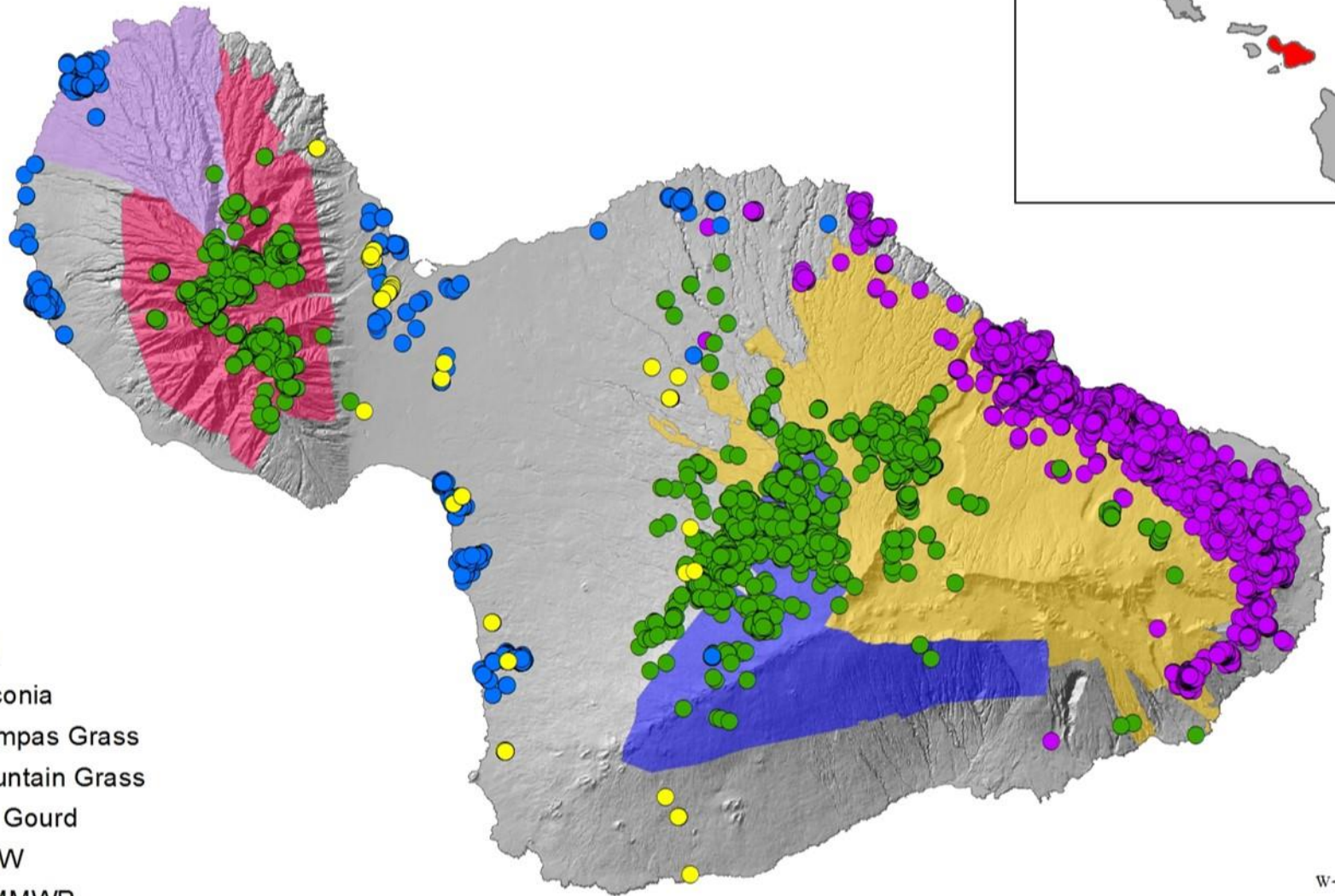
MISC Priority Target Species Control Activity in Watershed Partnerships



MISC Priority Target Species Control Activity in Watershed Partnerships

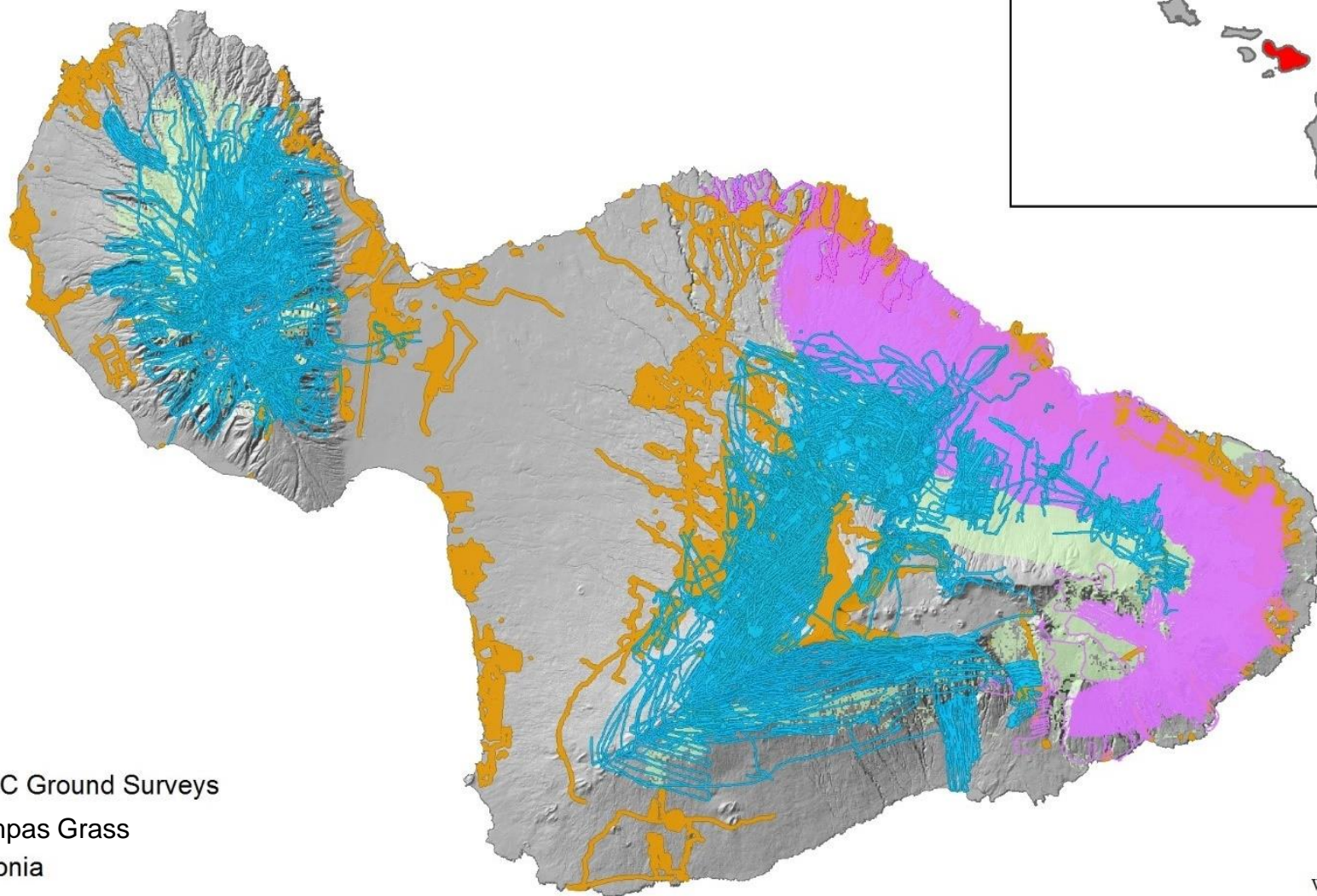
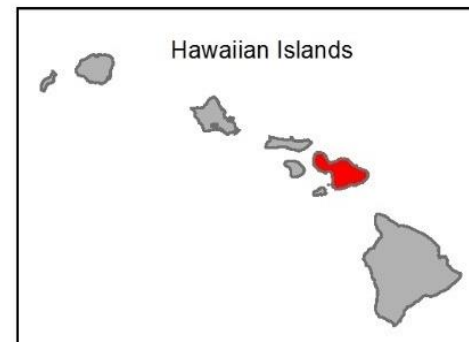
Legend

- Miconia
- Pampas Grass
- Fountain Grass
- Ivy Gourd
- PKW
- WMMWP
- EMWP
- LHWRP



Maui Invasive Species Committee
Projection: NAD83 UTM Zone 4N meters
3/7/2017 BVM

MISC Target Species Survey Activity



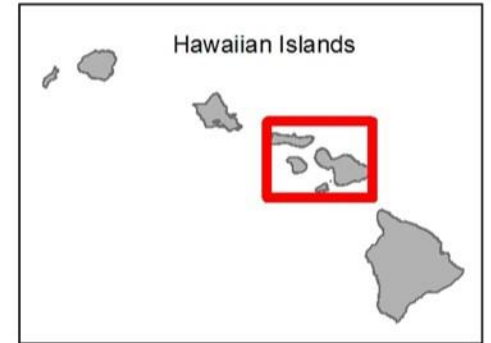
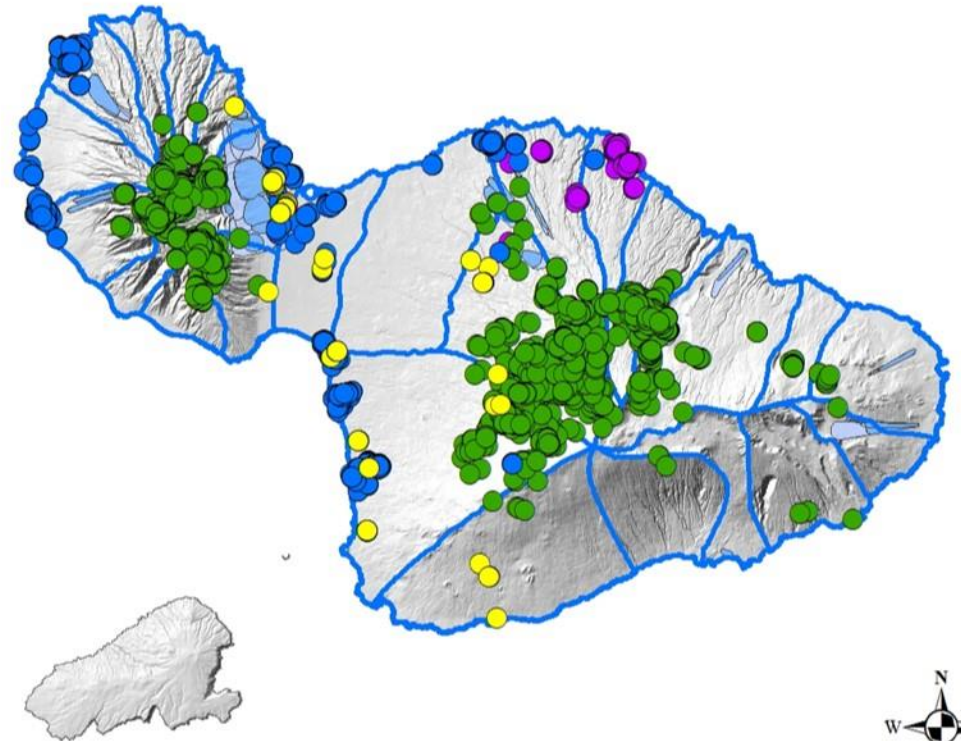
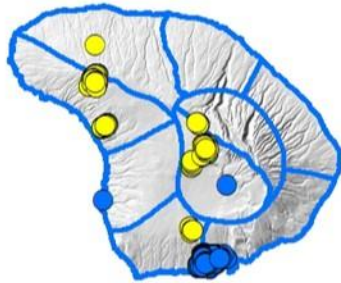
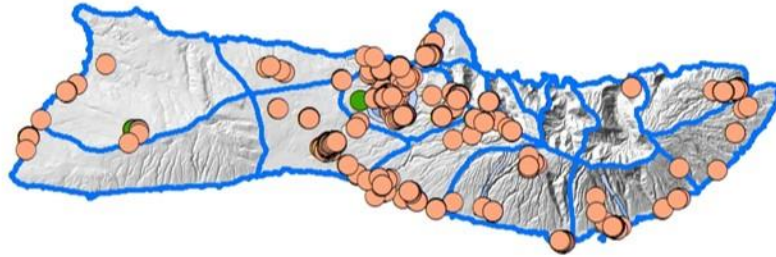
Plants

-  MISC Ground Surveys
-  Pampas Grass
-  Miconia
-  Priority Watershed Areas



Maui Invasive Species Committee
Projection: NAD83 UTM Zone 4N meters
8/17/2016 BEB

MISC & MoMISC Priority Target Species Control Activity and Hawaii Aquifers



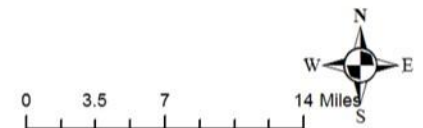
Legend

- Molokai Targets
- Miconia
- Pampas Grass
- Fountain Grass
- Ivy Gourd

□ Hawaii aquifers (DLNR)

Wellhead Protection Zones

- B
- C



Maui Invasive Species Committee
Projection: NAD83 UTM Zone 4N meters
3/7/2017 BVM

Pampas Grass

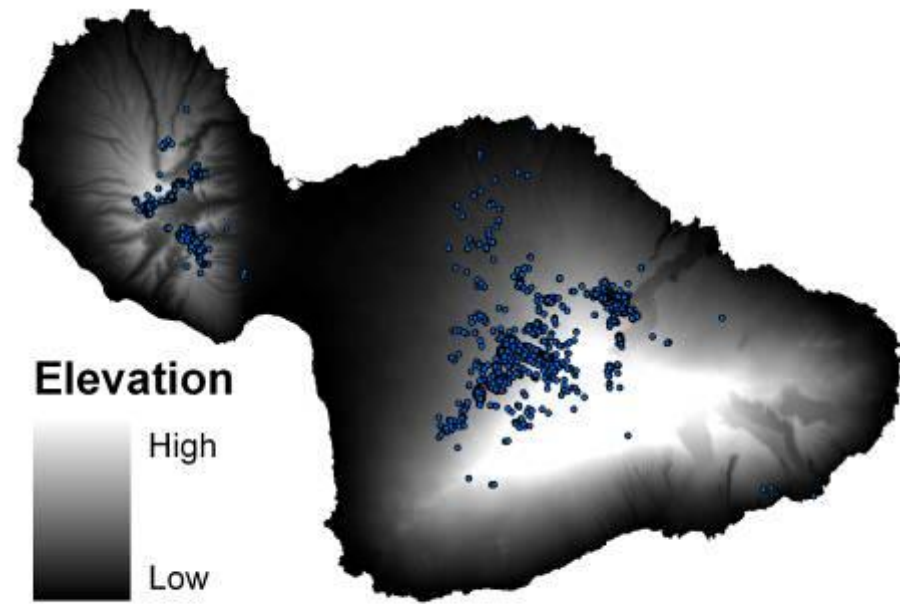
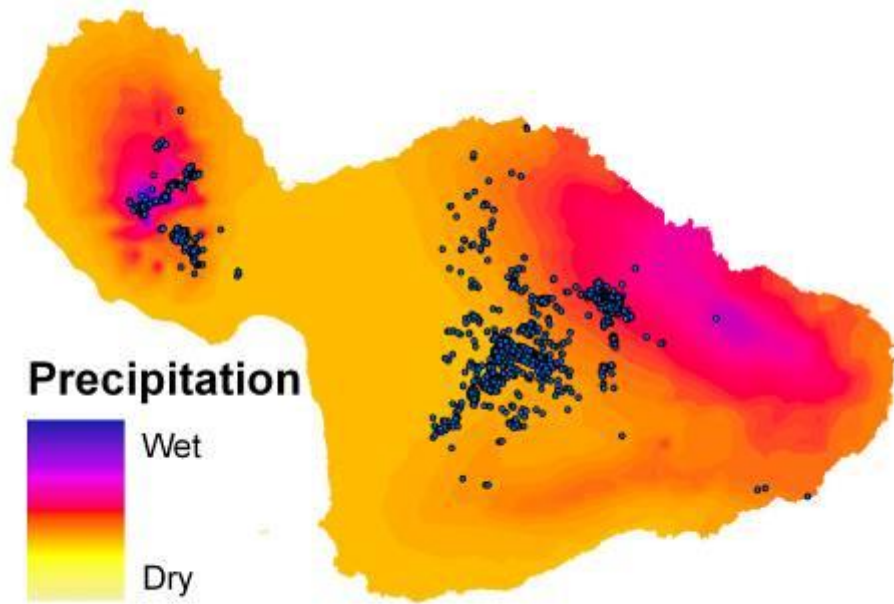
- Large tussock grass in the genus *Cortaderia* native to South America
- Popular ornamental, showy flower head plumes
- Can often reach heights of 3 meters or more
- Wind dispersed



General Impacts:

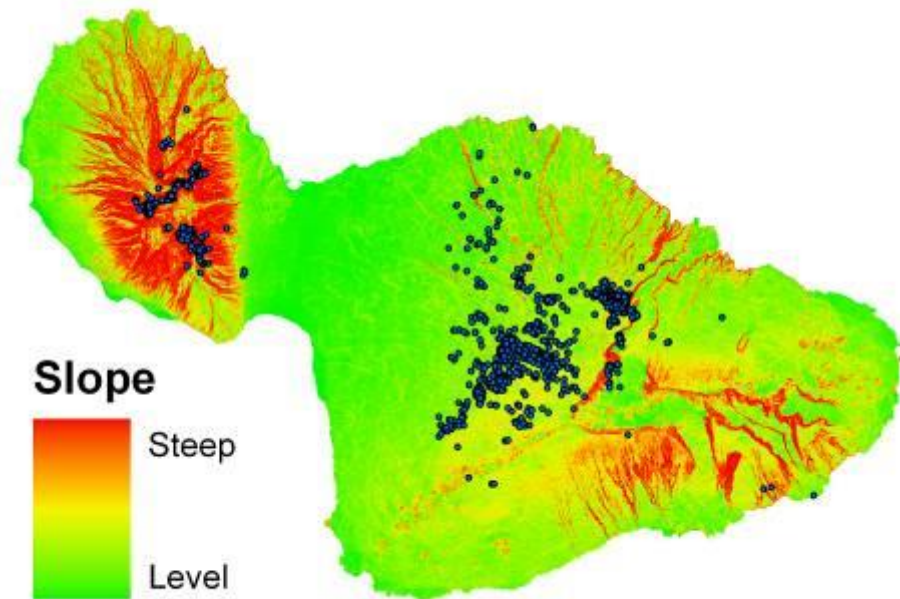
- Rapid growth
- Highly competitive against native plants
- Substantial threat to ecological quality of preserves
- Damaging even at low densities because of cover occupied
- Fire hazard - large amount of dry matter produced



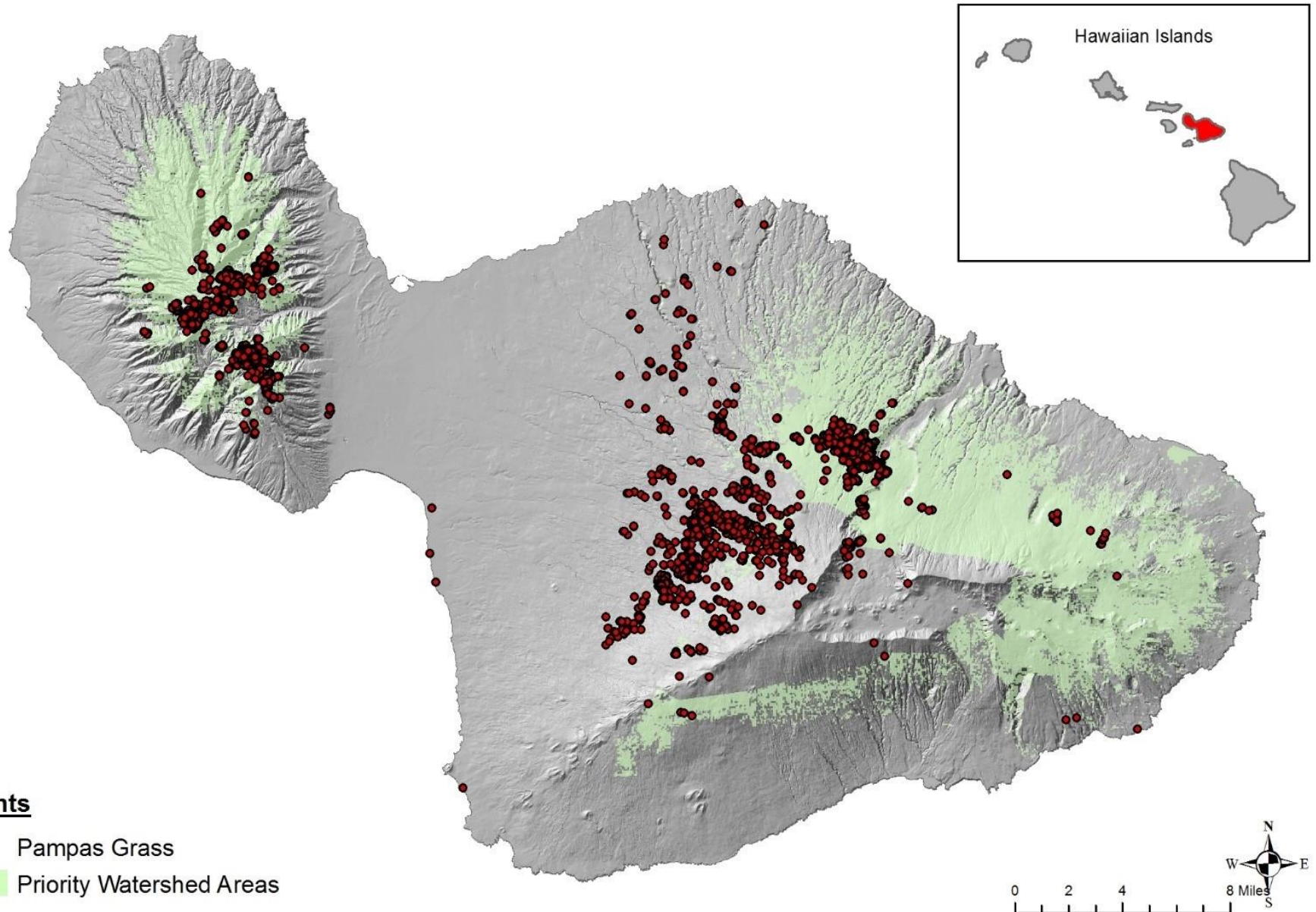


Pampas grass on Maui occupies a wide range of environments/terrain

- Precipitation: 20 – 295 inches per year
- Elevation: Sea level – 9,593 feet
- Slope: Flat - Cliff

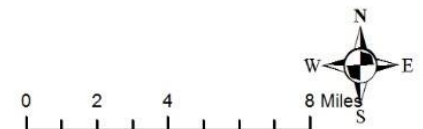


MISC Pampas Grass Control



Plants

- Pampas Grass
- Priority Watershed Areas



Maui Invasive Species Committee
Projection: NAD83 UTM Zone 4N meters
8/19/2016 BEB

Aerial vs Ground Control: Pros & Cons

Aerial

- Access remote locations easily
- Cover lots of area
- Cannot survey residential areas
- Cannot identify immature plants effectively

Ground

- Remote access difficult
- Ground coverage is time-consuming
- Only way to access private residences
- Very thorough; can eliminate the smallest plants

Combination of both methods is ideal



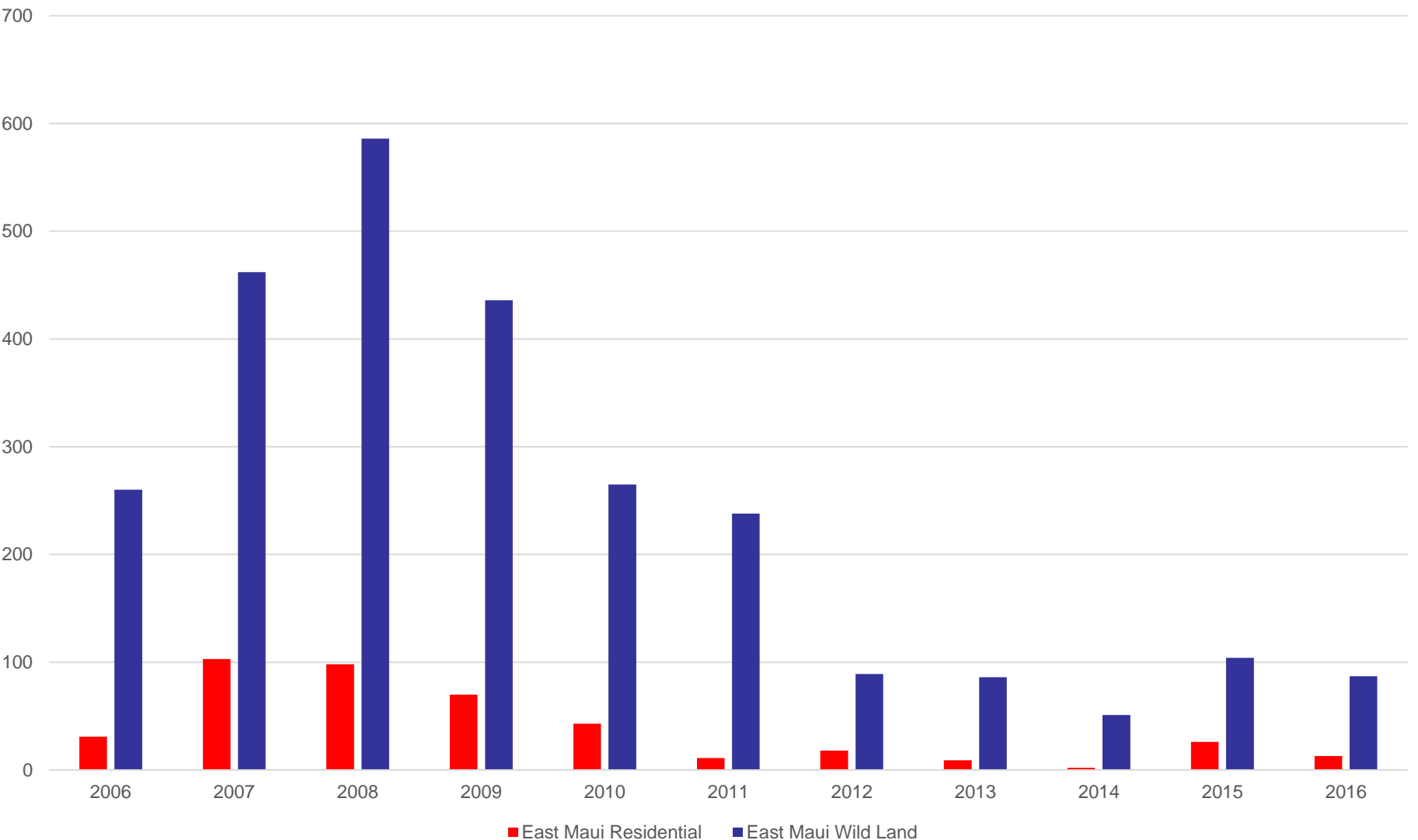
Pampas grass on a ridge

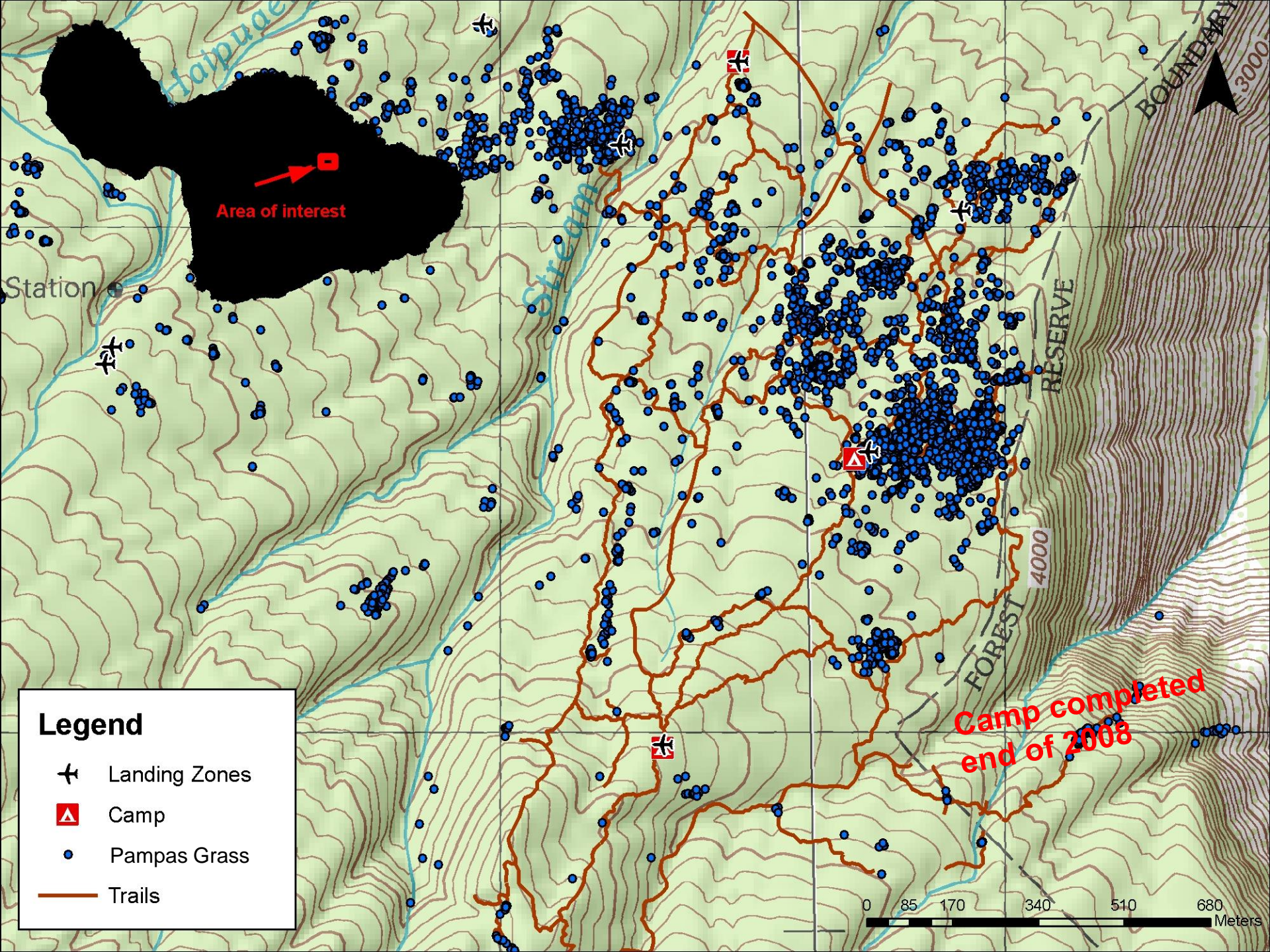
East Maui Wildland: Varied Terrain



Comparing Zones

Mature pampas grass control by year/zone





Area of interest

Station

Stream

RESERVE

BOUNDARY

3000

4000

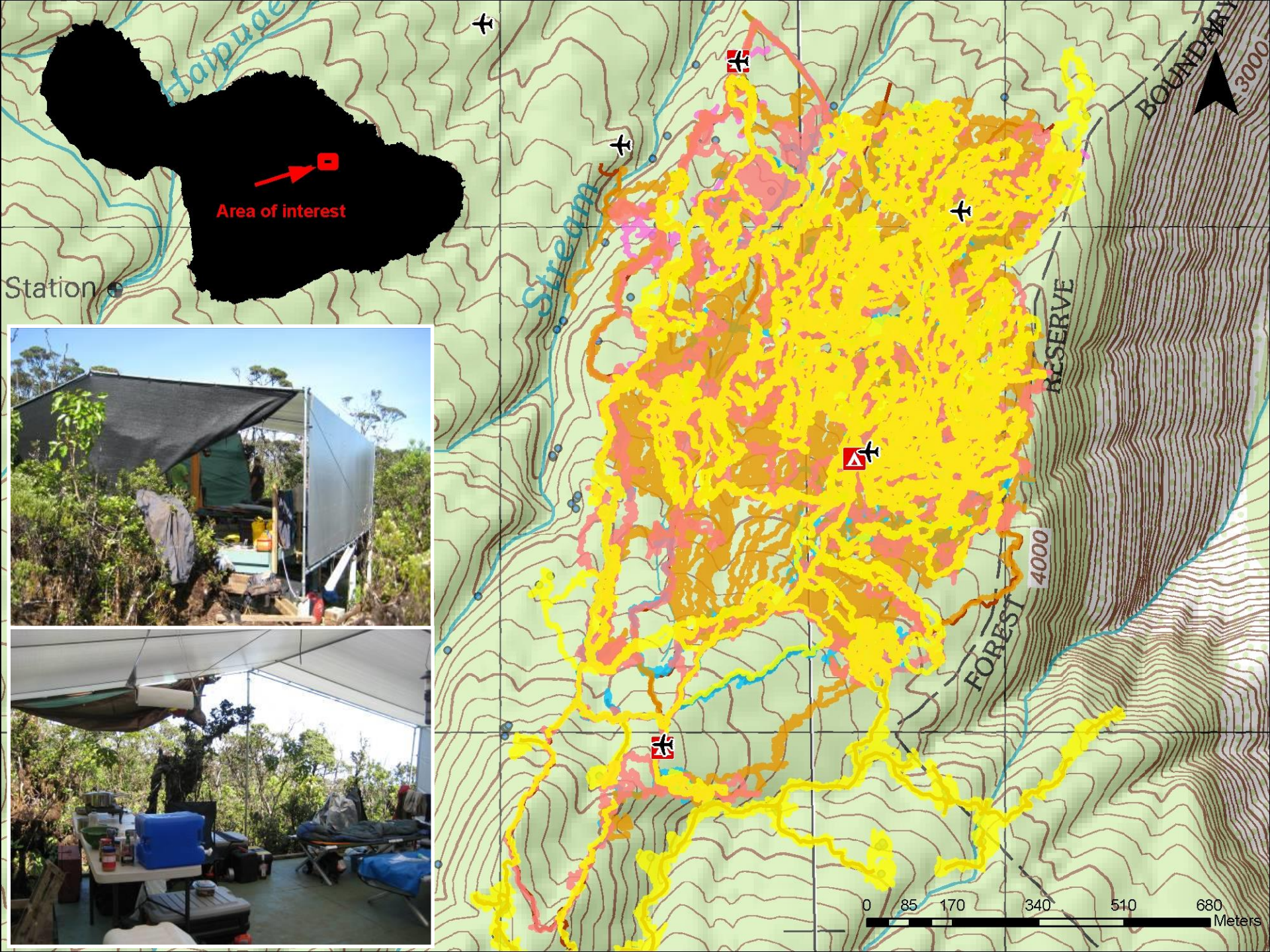
FOREST

Legend

- ✈ Landing Zones
- ▲ Camp
- Pampas Grass
- Trails

Camp completed
end of 2008

0 85 170 340 510 680 Meters



Pampas: Status & Future Strategy

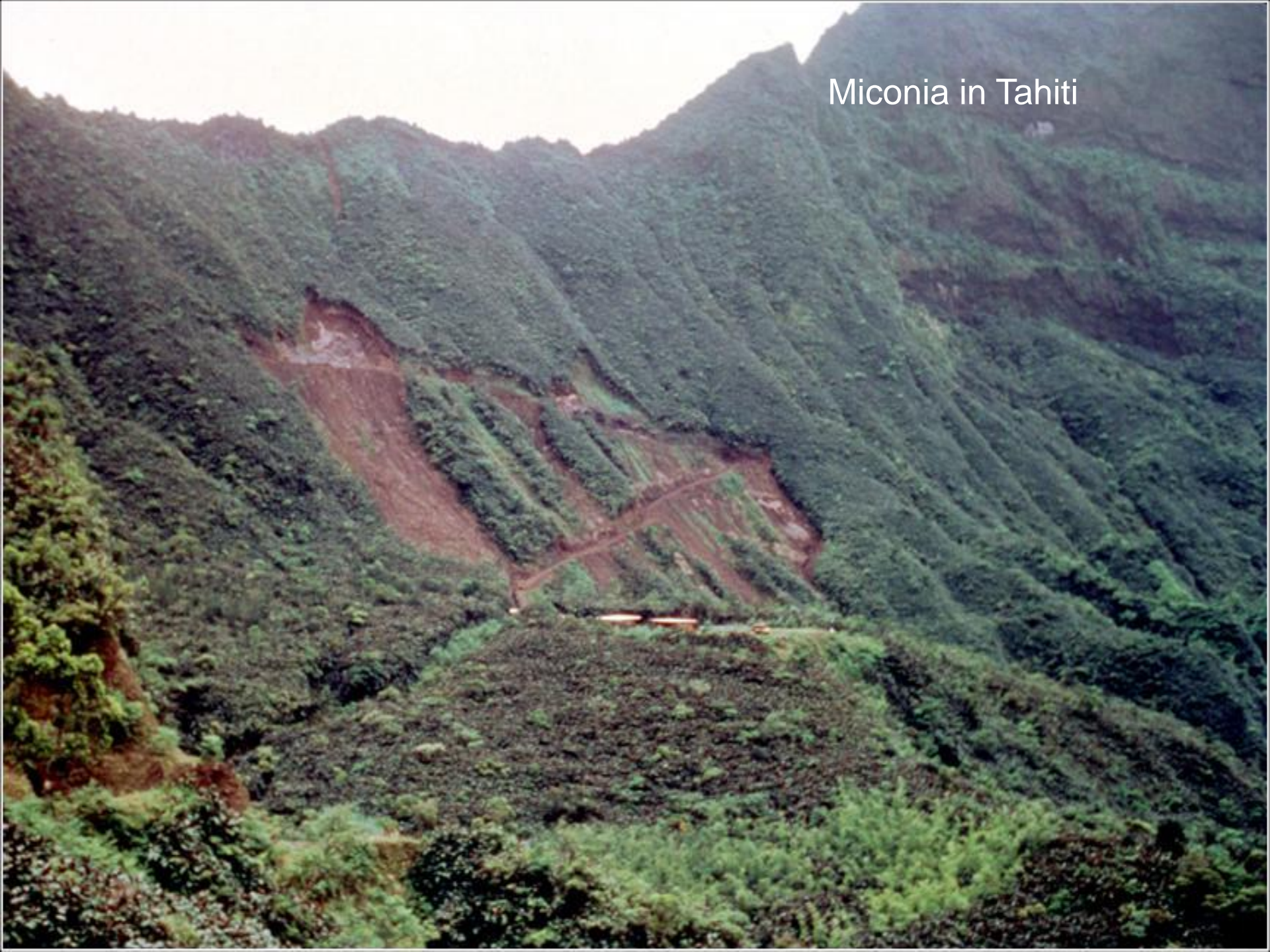
- Initial years: control strategy not working
- Increased effort and combined ground-air strategy highly effective, despite complex land characteristics (residential, wildland, and backcountry sites)
- Adaptive strategy for remote back-country sites allowed successful interruption of reproductive cycle
- Remaining challenges:
 - maintain momentum (long-term, consistent funding)
 - more effective aerial control techniques
 - address new introductions

Miconia

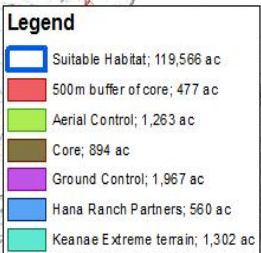
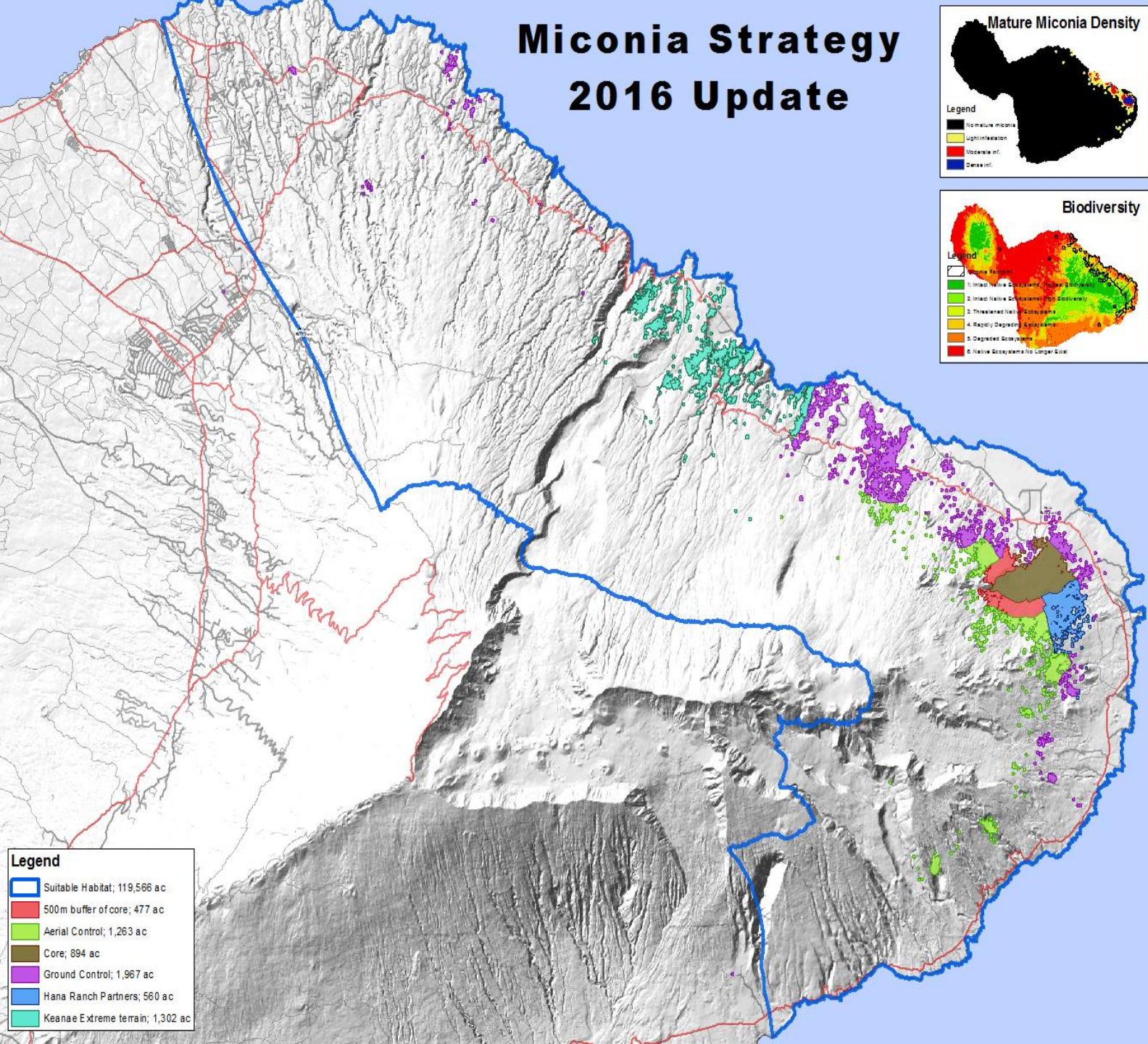
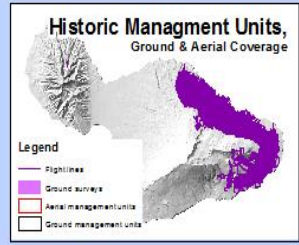
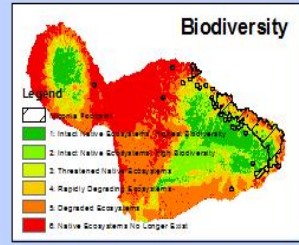
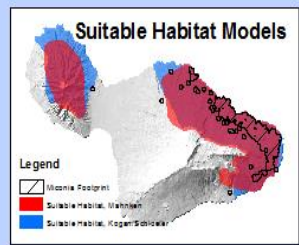
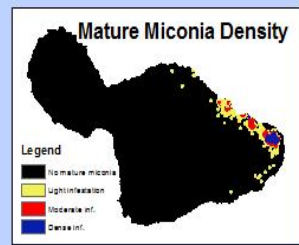
- Grows to > 50 feet
- Huge leaves shade out understory
- Shallow rooted
- Forms monotypic stands



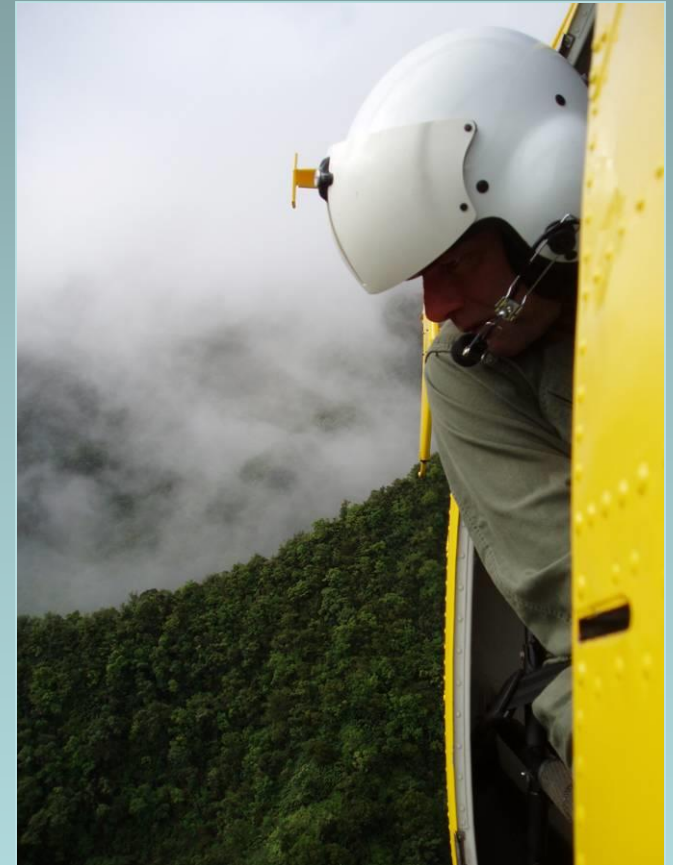
Miconia in Tahiti



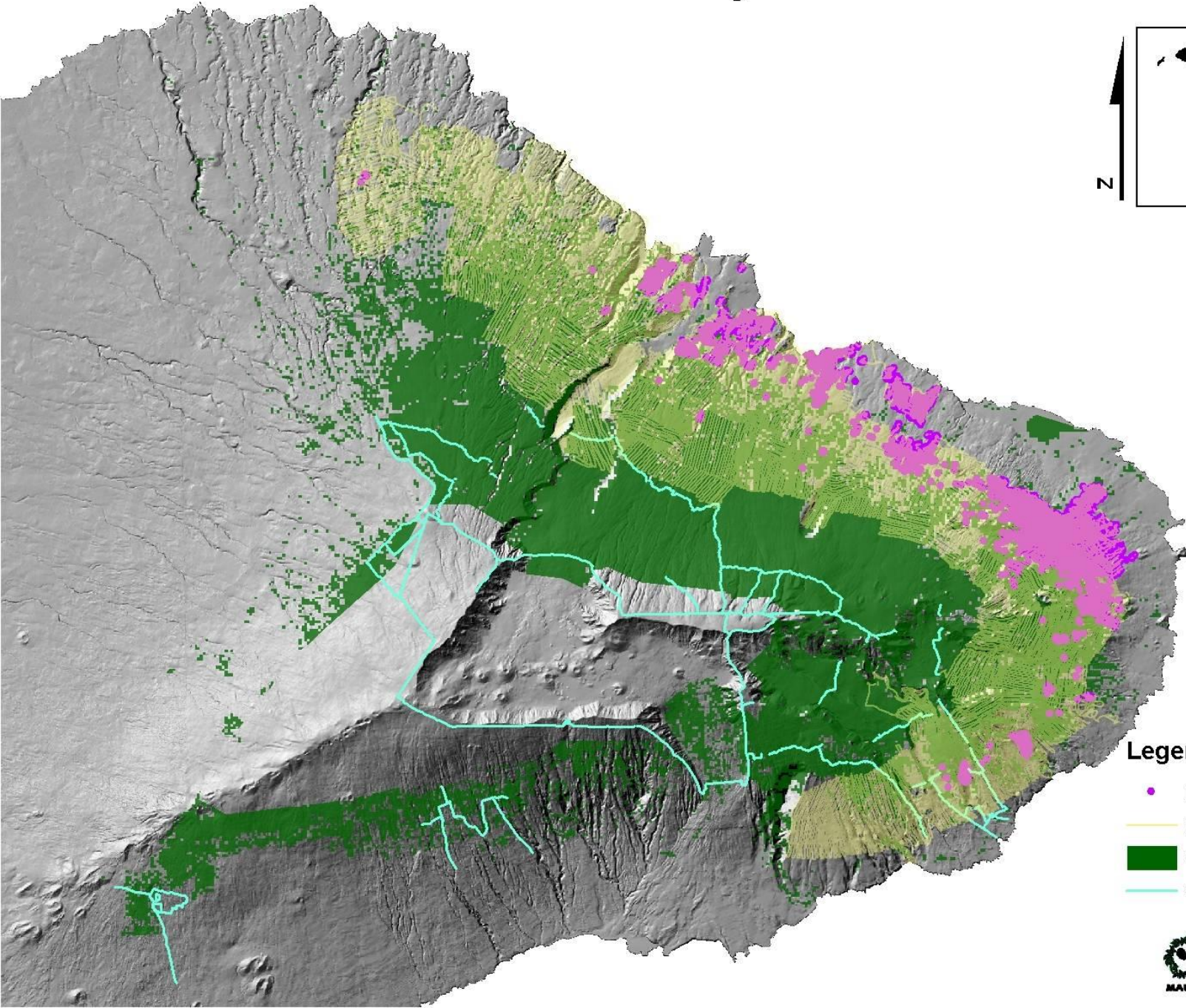
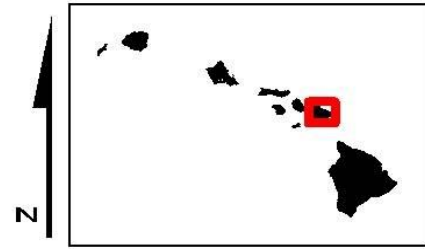
Miconia Strategy 2016 Update



Ground & Air Strategy



Aerial Surveys - Miconia



Legend

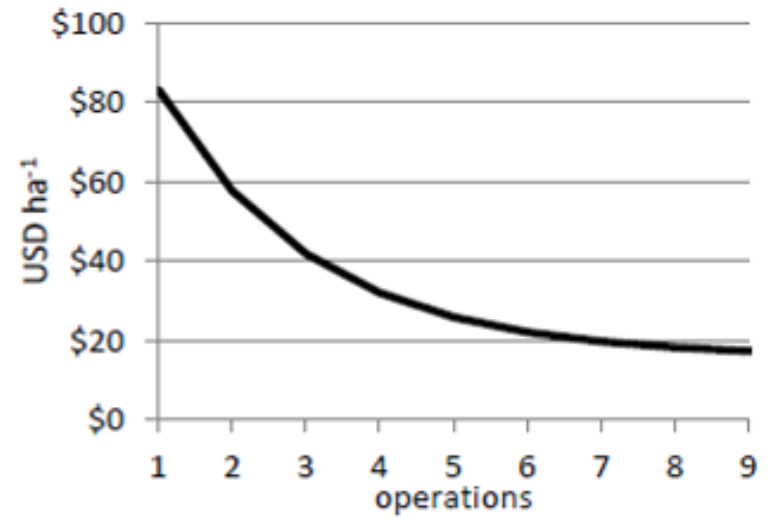
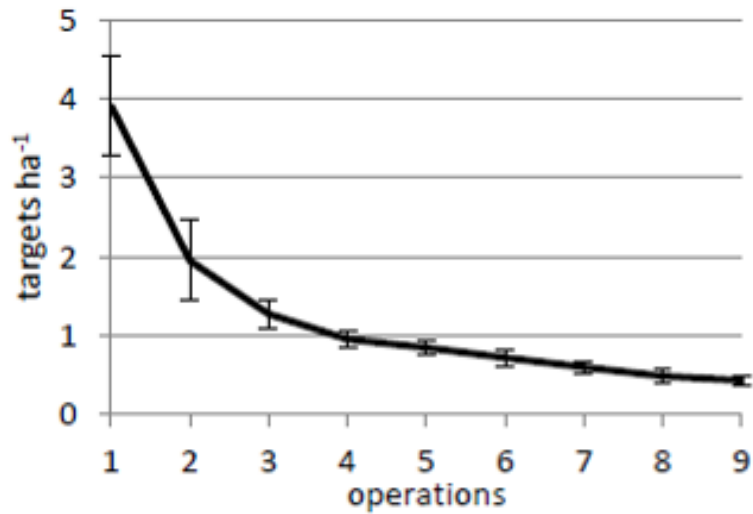
- Miconia - Aerial Control
- Flight Lines - Miconia
- RFTF - Priority I & II Areas
- Conservation Fences

Miconia on Maui





Miconia: HBT Results

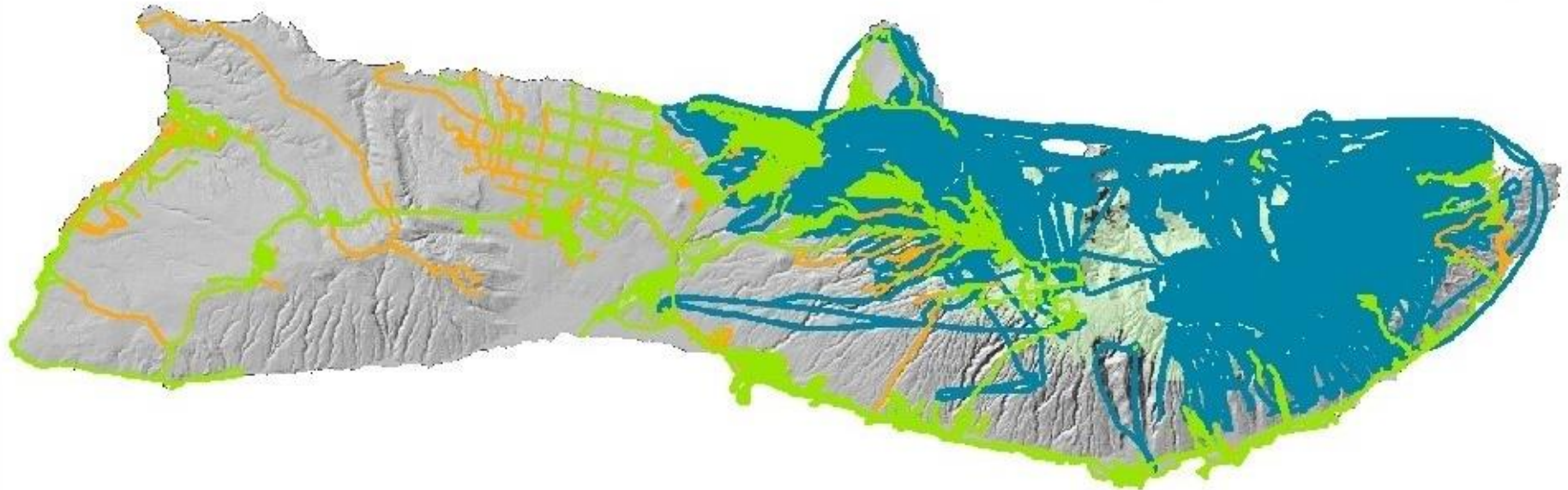





Miconia density (A) and variable cost* (B) reductions measured from nine operations conducting over a 16-month time period deploying the HBT platform. *Cost factors include flight time, projectile consumption and crew wage.

Miconia: Status & Future Strategy

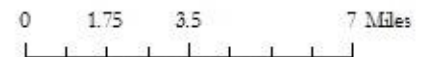
- Success for now = Containment
- We are not able to cover areas need to cover on the ground or by air.
- Miconia density is increasing within the “core” area, despite earlier years of effort. Frustrating for Hana-based ground crew, but focus has to be on outlier and higher elevation populations.
- HBT work is proving what we knew: we miss plants; more intensive revisit schedule is needed.
- We have moved to a three-pronged approach: ground, spray-ball, and HBT.
- Enhanced resources needed for air and ground operations.

MoMISC Survey Activity



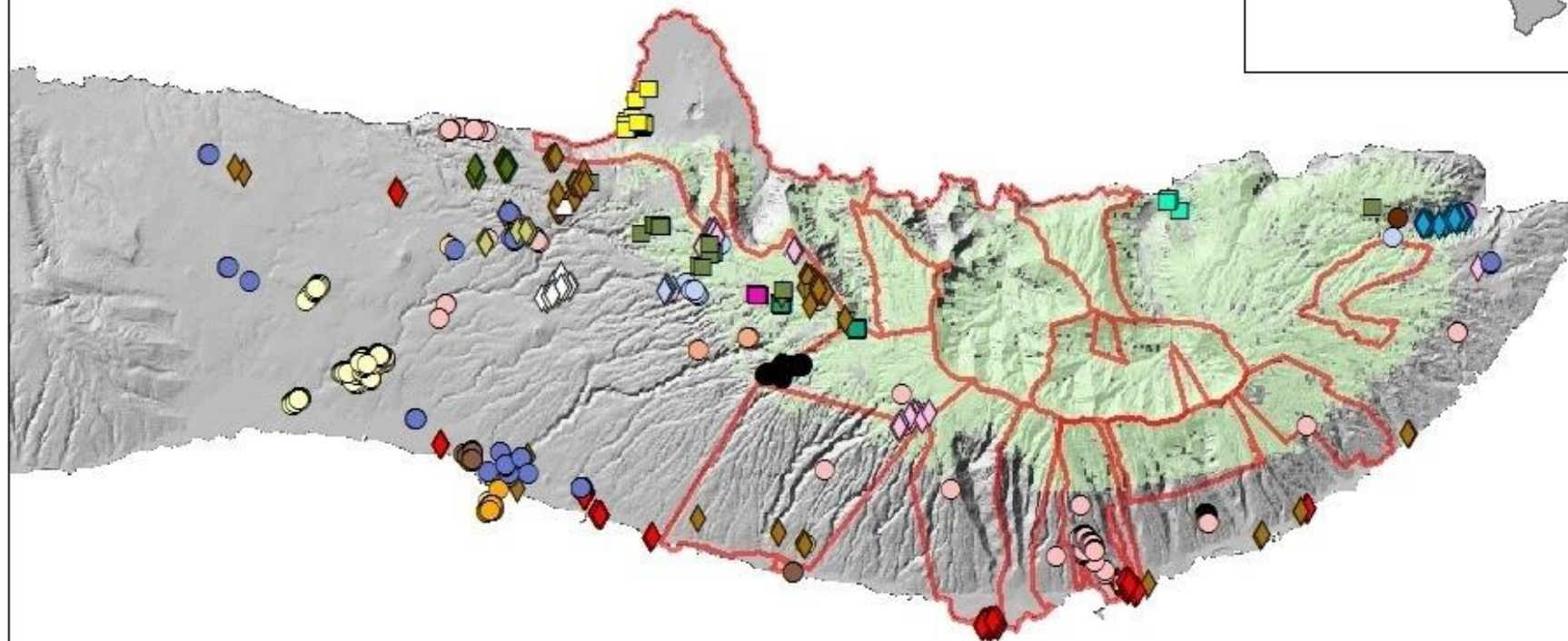
-  Ground Surveys
-  Roadside Surveys
-  Aerial Surveys

 Priority watershed areas



8/18/2016 KTP

MoMISC Species Control Activity in Watershed Partnerships



Plants

- | | | | |
|------------------------|--------------------|---------------------|----------------|
| ◆ Albizia | ● Fountain grass | ■ Mules foot fern | ◆ Rubber vine |
| ◆ Australian tree fern | ● Glorybush | ■ Multifloral rose | ● Soap bush |
| ◆ Barbados gooseberry | ● Gorse | ◆ New Zealand flax | ◆ Tree daisy |
| ● Black wattle | ● Gourka | ■ Palm grass | ● Tumbleweed |
| ● Bo tree | ● Honey mesquite | ● Pampas grass | □ White fig |
| ◆ Cat's claw | ■ Kudzu | □ Parasol leaf tree | ◆ White ginger |
| ● False awa | ● Long-thorn kiawe | ● Quail bush | ◆ Wood rose |
| ● Fireweed | ■ Mexican poppy | ● Red mangrove | |

East Molokai Watershed Partnership
 Priority watershed areas

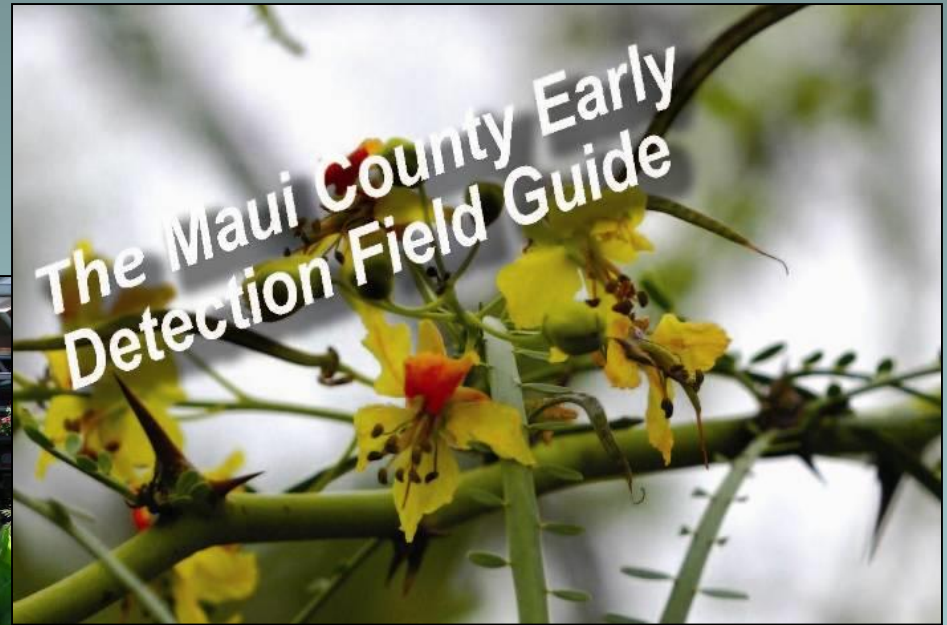


0 1.5 3 6 Miles

8/18/2016 KTP

Early Detection & Working with the Public

- Early detection surveys
- Workshops
- Informative guide



Snake Sightings & Reports on Maui call:
HDOA office:
873-3962 from 7:45am to 4:30pm
872-3848 from 4:30pm to 10:00pm
After 10pm, on holidays, weekends, & furlough days:
Maui Police Department *
244-6400 (non-emergency)
**MPD will contact the Snake Response Team*

Engaging the next generation...



& teaching the teachers



Hō'ike o Haleakalā Curriculum

High school science curriculum designed by Maui teachers and field biologists



ALPINE /
AEOLIAN



RAIN
FOREST



COASTAL



MARINE



INVASIVE
SPECIES

Unit
1 From Evolution in
Isolation to
Globalization

Unit
2 Invasive Species
Impacts: Why
Care?

Activity #1 "In Our Lifetime": Kūpuna
Stories

Activity #2 Raindrops and Watersheds:
Size Matters

Activity #3 Frogs on Floor Four

Activity #4 Plagues: Past and Present



Raindrops and Watersheds: Size Matters

May 21, 2013 by Hoike [Leave a Comment](#)

Unit 2 – Invasive Species Impacts: Why Care?

Activity 2 – Raindrops and Watersheds: Size Matters

Download Teacher Pages PDF



Download Student Pages PDF



Materials & Setup

SUCSESSES

- **12 plant eradications with 10 more on track for eradication**
- **Eradication of veiled chameleons**
- **Eradication of 12 coqui populations**
- **Containment of miconia**
- **Thousands of students, visitors and residents reached annually**
- **Brand recognition**
- **Strong partnerships and networking**
- **UH support**

Effective Partnerships = Key to Success



**MISC & MoMISC are projects of the
Pacific Cooperative Studies Unit – University of
Hawai'i**



Mahalo nui loa!

