

# Division of Forestry & Wildlife

Invasive Species Info Briefing

Forestry & Wildlife

State Capitol, January 26, 2023



# Introduced Mosquitoes & Malaria

Lainie Berry, Wildlife Program Manager

DLNR-DOFAW

Jeomhee Hasty, Acting Manager

DOH-VCB





# INTRODUCED MOSQUITOES AND MALARIA

- No mosquitoes are native to HI
- Southern House Mosquito introduced in 1826 (Lahaina)
- Avian malaria introduced early 20<sup>th</sup> century
- Leads to rapid mortality of honeycreepers
- Mosquitoes and malaria parasite are cold intolerant
- Climate change has diminished high elevation refugia for honeycreepers

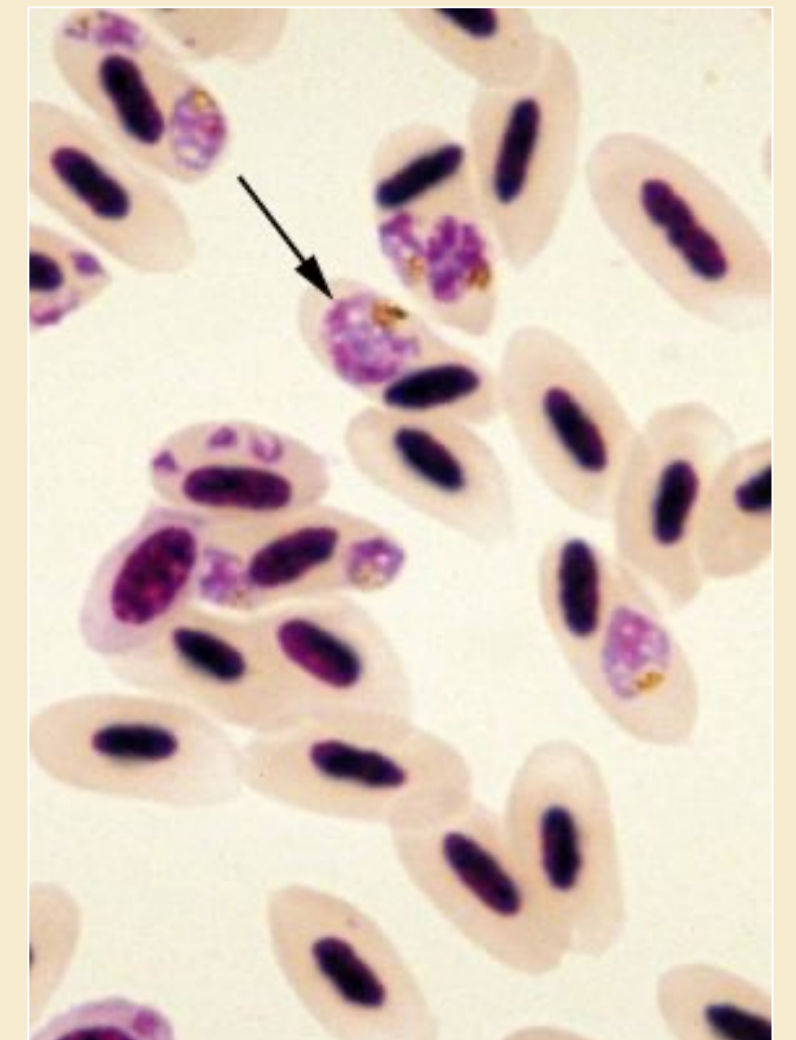


J. Jeffrey



B. Mossman

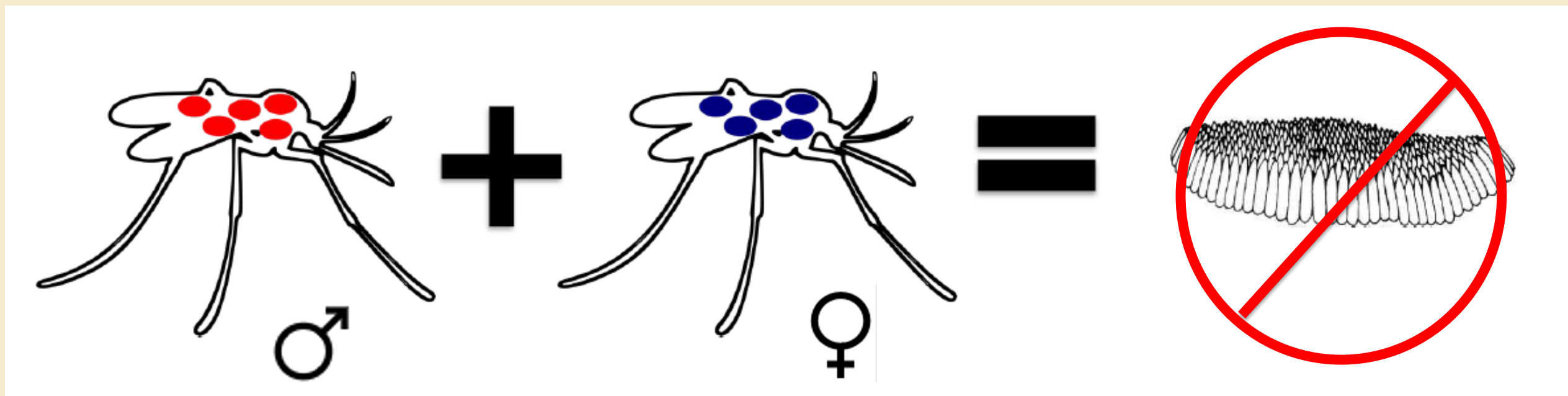
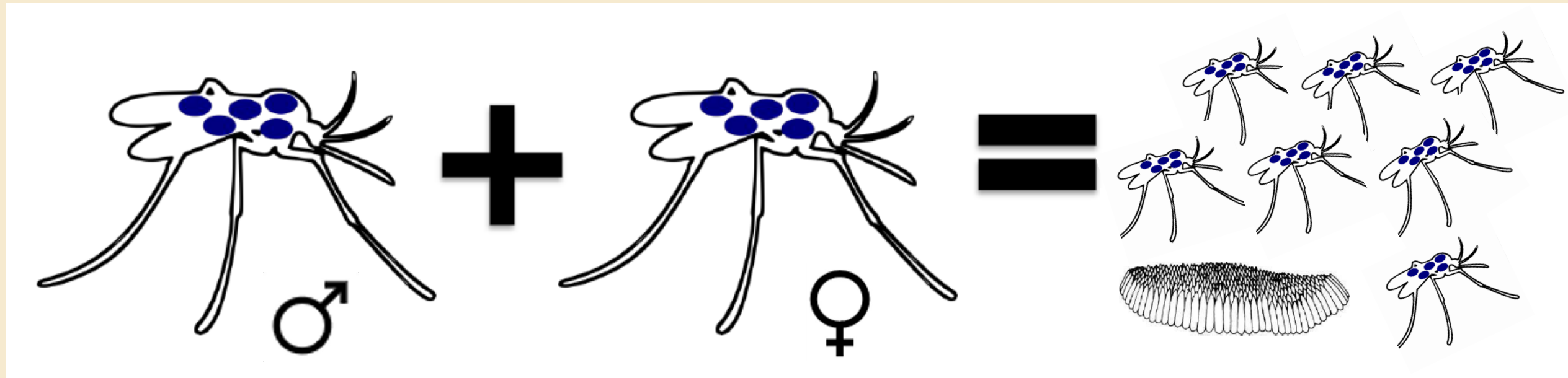
Malaria parasites  
in red blood cells



C. Atkinson, USGS



# WHAT IS INCOMPATIBLE INSECT TECHNIQUE? ("Mosquito Birth-Control")





# Progress to date

- East Maui Environmental Assessment – public review and comment ended 23 January, anticipated completion April 2023
- Kauai Environmental Assessment – Currently being drafted
- Statewide environmental assessment
  - RFP closed on 19 January 2023
  - One bid received from reputable contractor
- Hawaii Department of Agriculture Import permit – Approved by BOA and issued to DLNR
- Plan in place to retrofit an existing DLNR insectary to rear/house mosquitoes
- Cultivating public and private partnerships to leverage funds for project implementation



## Department of Health Vector Control Branch

- Submitted a permit application to import three separate male mosquito species: *Aedes albopictus*, *Aedes aegypti*, and *Culex quinquefasciatus* (Diptera: Culicidae), for Immediate Field Release to suppress Wild Populations of *Aedes aegypti*, *Aedes albopictus*, and *Culex quinquefasciatus*, by the State of Hawaii Department of Health (HDOH).
- Posted the request for proposals (RFP) for the Environmental Assessment of using Wolbachia-based Incompatible Insect Technique to suppress *Aedes aegypti*, *Aedes albopictus*, and *Culex quinquefasciatus* mosquito populations within Hawaii. The deadline for the RFP is January 19, 2023.



# Project Timeline

## Research & Community Engagement

**2020**

Planning, permitting, & community engagement

**2022**

HDOA import permit  
Submit EPA Sect. 18  
Publish draft East Maui EA  
Initiate drafting of Kauai EA

**2024**

Landscape-Scale Releases on East Maui & Kaua'i  
Planning, permitting, & community engagement for other islands



**2021**

Planning, permitting, & community engagement  
Begin informal & formal EA process

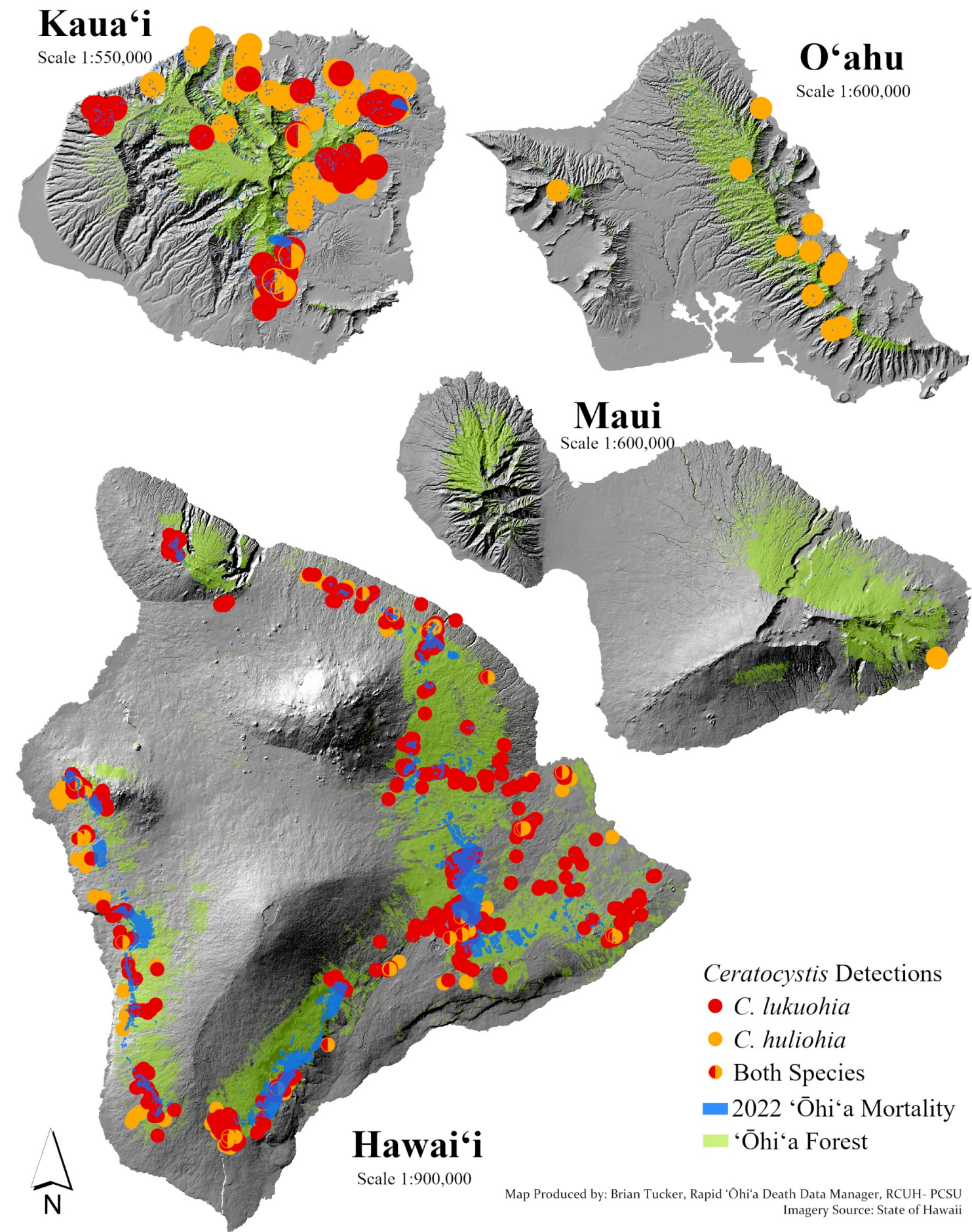
**2023**

Finalize East Maui and Kauai EAs  
Initiate statewide EA  
Conduct MRR to inform control program  
DLNR Facility permitting



# Rapid 'Ōhi'a Death

Rob Hauff, State Protection Forester  
DLNR-DOFAW



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# ROD Research

- 42 scientific publications
- UH and federal agencies; ISU; University of Arizona; international collaborators

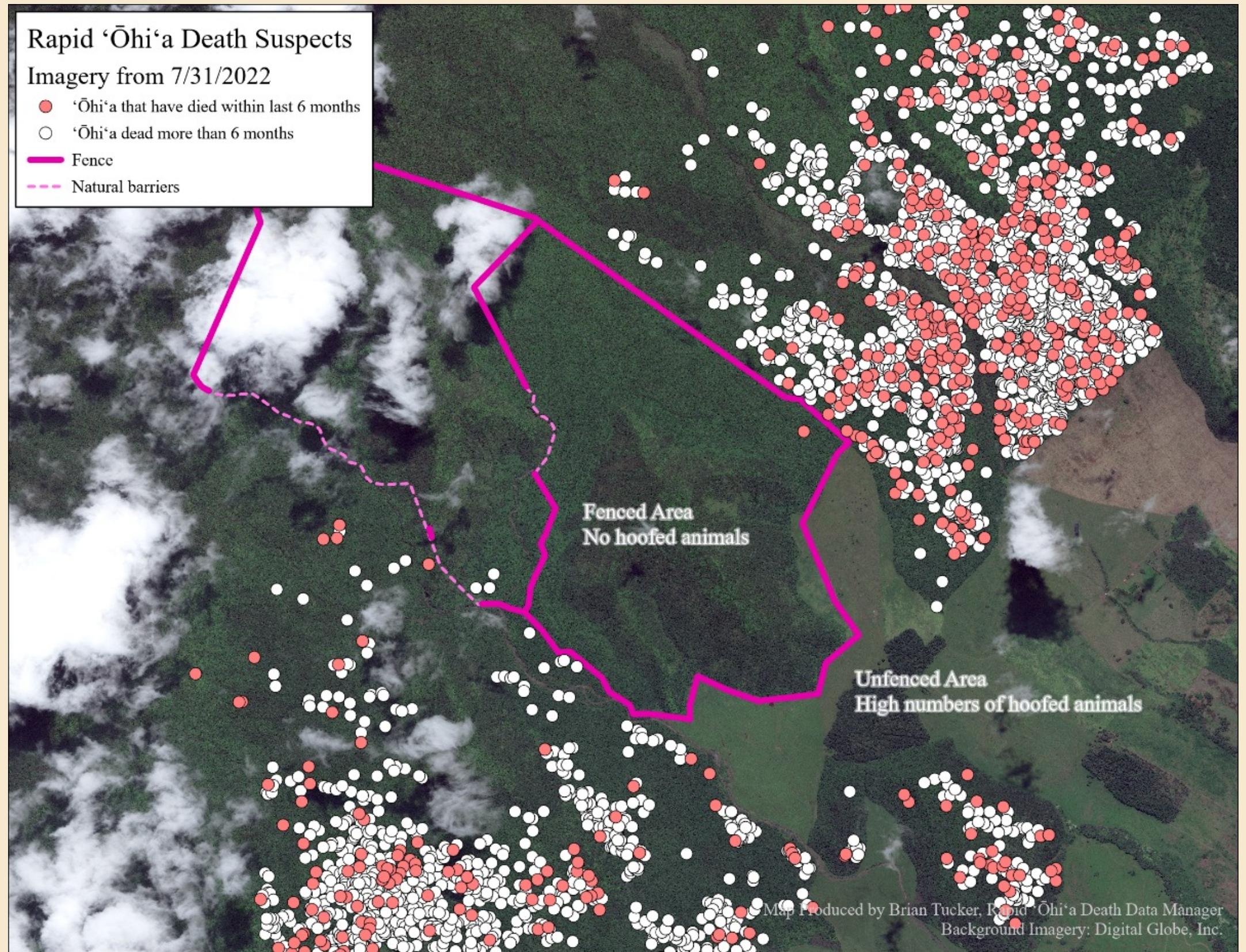


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# Long-term Forest Health Management Tools





# Community Outreach



# ATTENTION!

**Please brush  
your shoes before  
& after you hike.**



**Disease and invasive plant seeds  
can stick on shoes and gear.**



Department of Land and Natural Resources  
Division of Forestry and Wildlife



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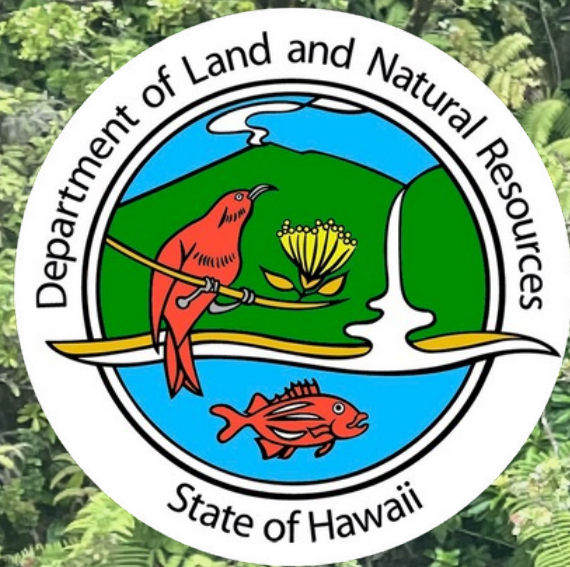
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# 30x30 Watershed Initiative

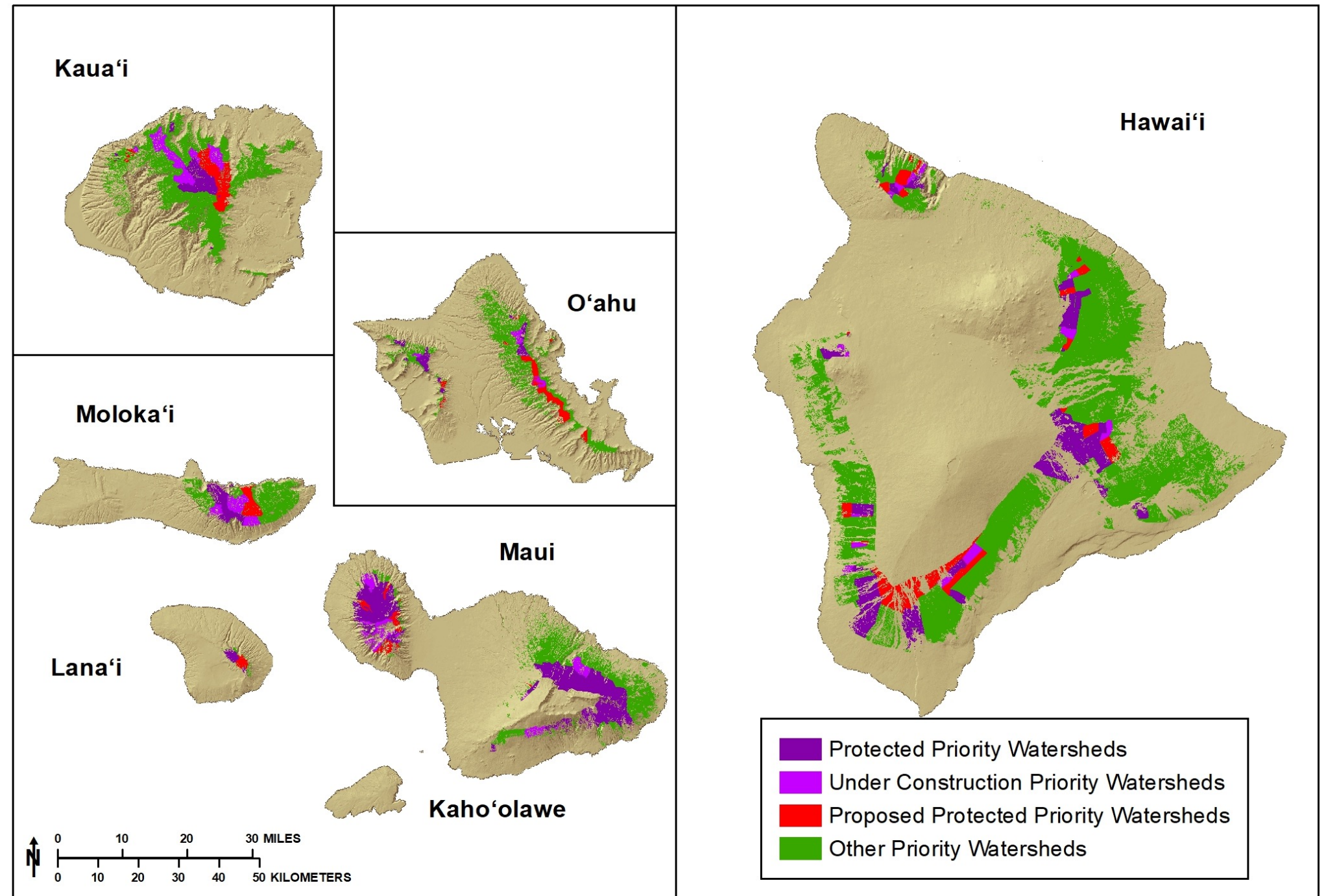
Emma Yuen, NEPM Program Manager







# 30x30 Watershed Plan



Features approximate and subject to change. DOFAW 587-4170.



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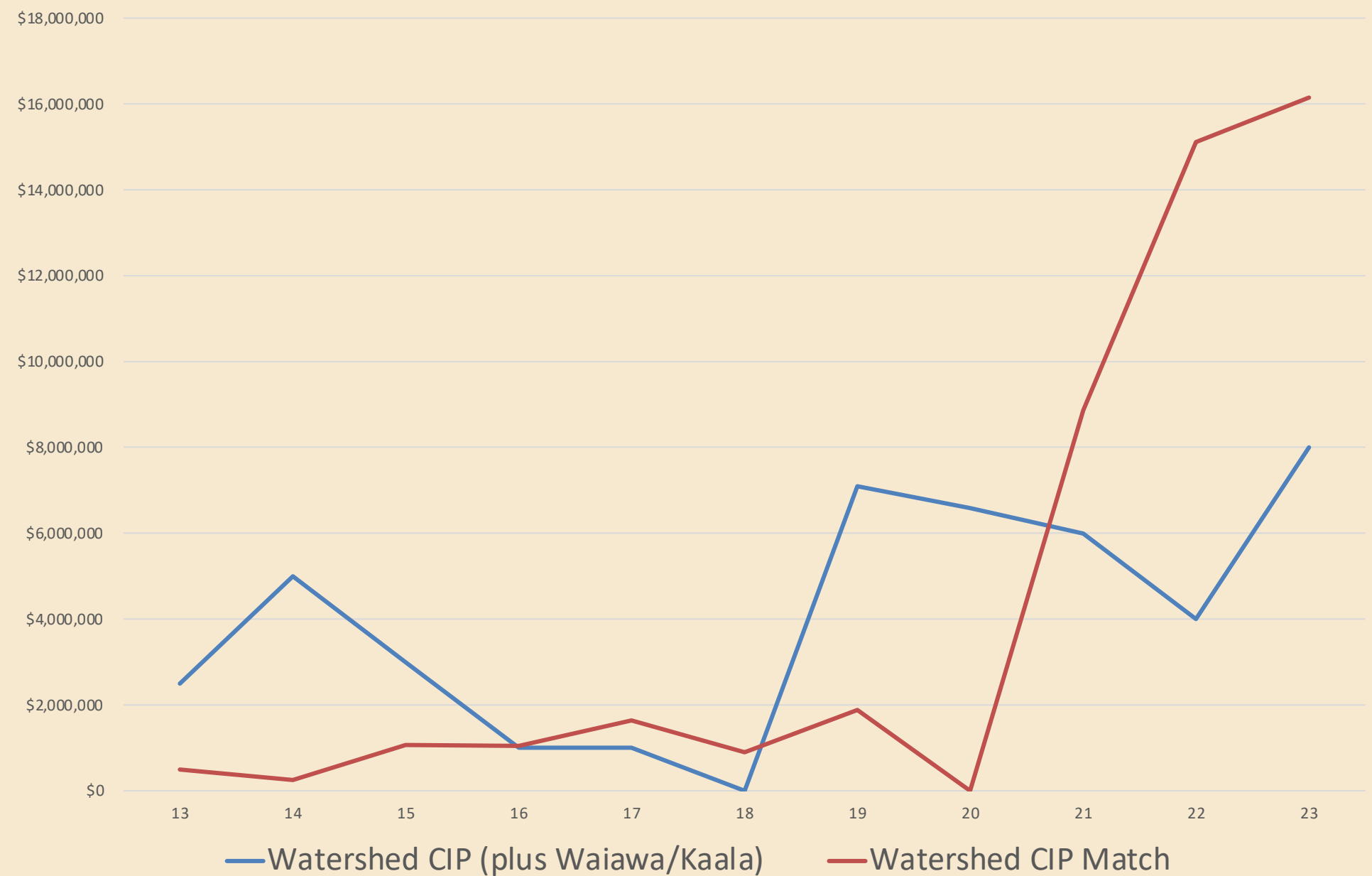
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# Watershed CIP Attracts Matching Funds

- The Watershed CIP has enabled DOFAW to get over \$40m in matching Federal funds since FY13.
- DOFAW is aggressively seeking BIL and IRA funds

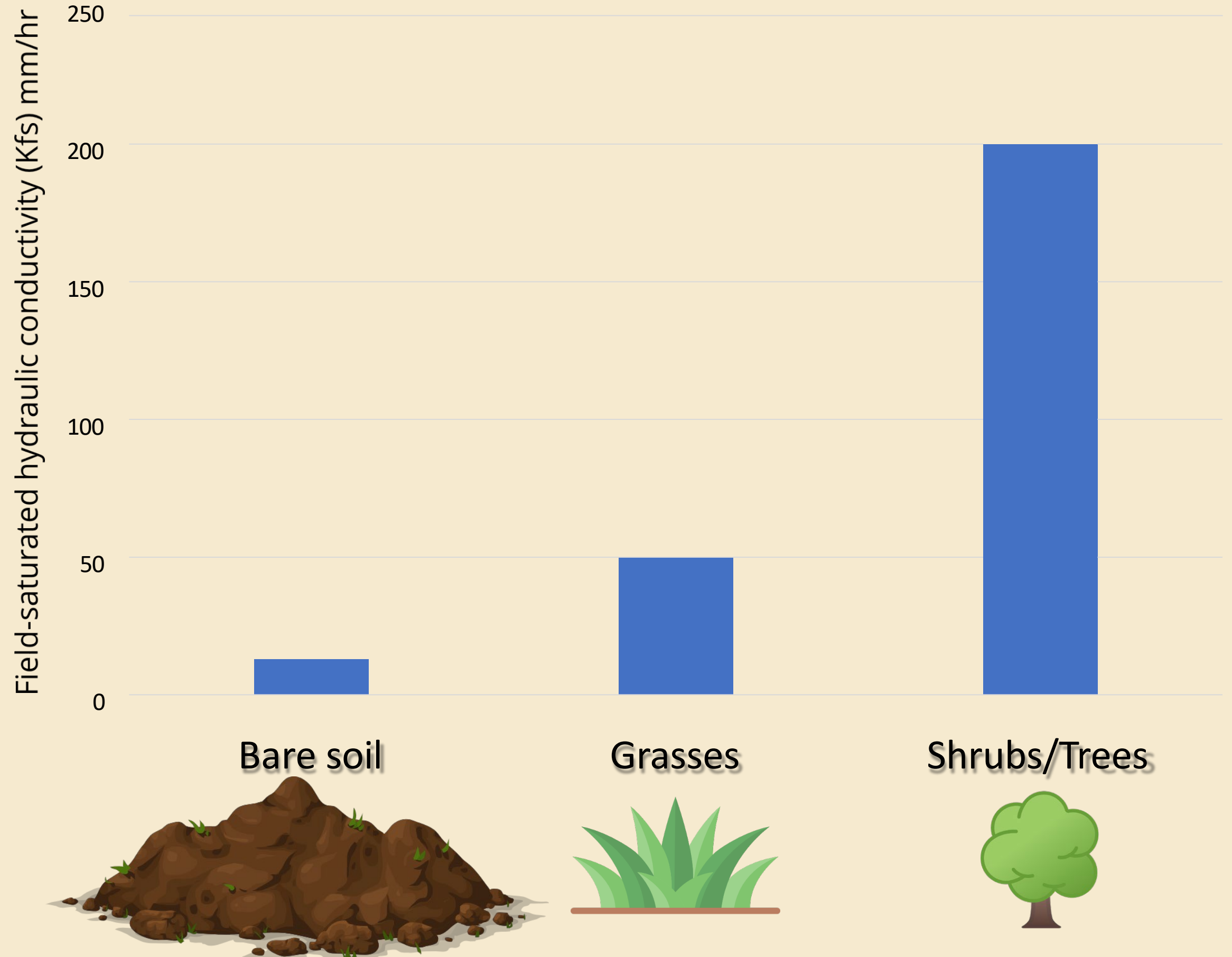
Watershed CIP Funding



# Forests Reduce Flooding



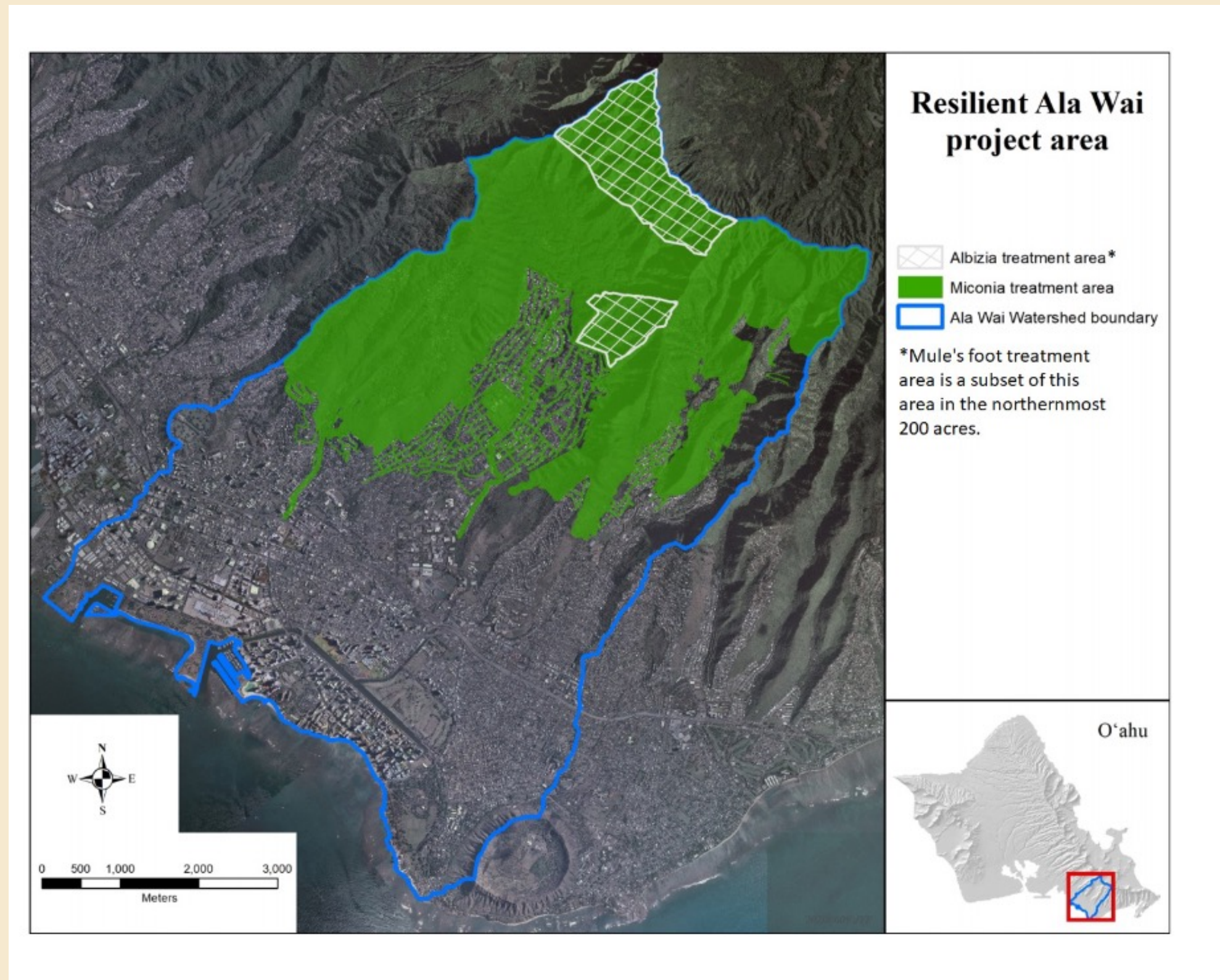
## Infiltration Rates



Perkins, K., J. D. Stock, J. R. Nimmo. 2018. Vegetation Influences of Infiltration on Hawaiian Soils. *Ecohydrology*.  
<https://onlinelibrary.wiley.com/doi/abs/10.1002/eco.1973>



# \$1.64m Grant from NFWF for Coastal Resilience to reduce flooding in Ala Wai watershed



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# Carbon Sequestration

- Forest protection is the top recommended land use action for greenhouse gas sequestration in Hawaii
- \$5.3m grant from NRCS for climate change resilience, partnering with Ranches and others to remove invasive species and plant trees.
- Cooperative projects with ranches





# Civil Service Positions Needed

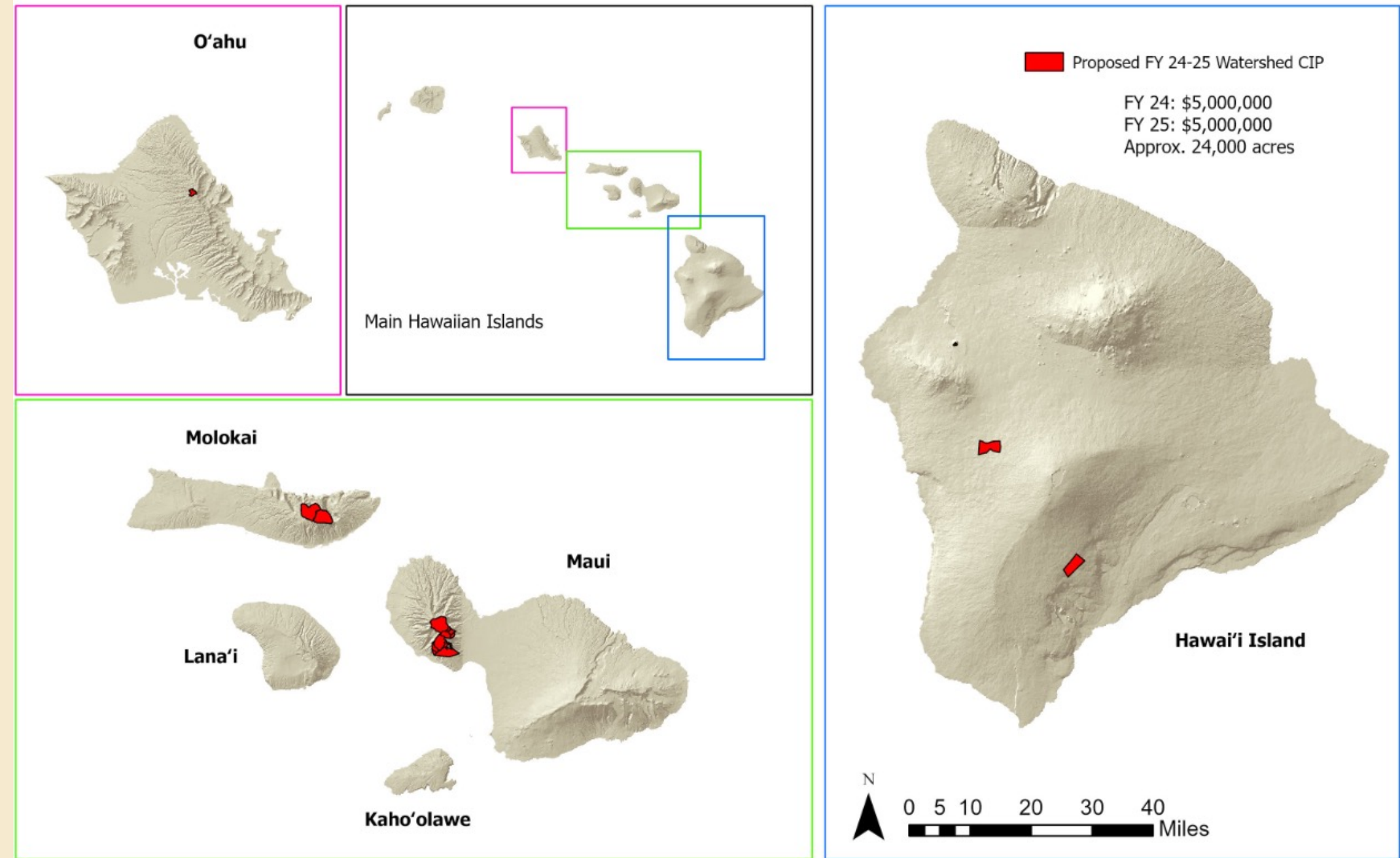
- Existing positions are overseeing many multi-million \$ grants and projects.
- Need more capacity to take on additional Federal funding opportunities
- Full-year funding for existing positions
- Additional Natural Resource Management Specialists are critically needed





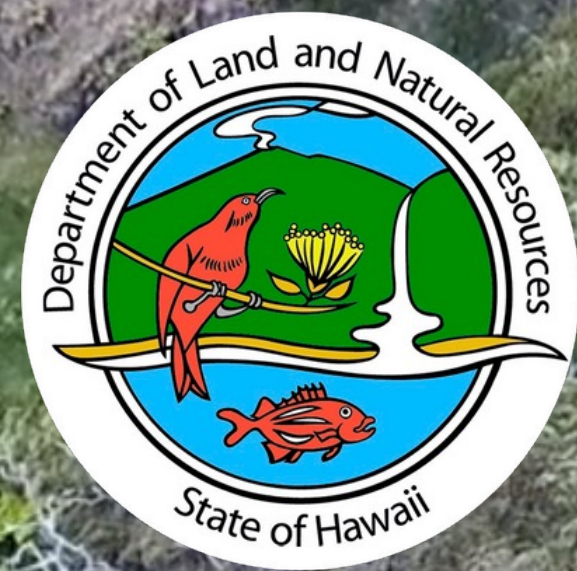


## Watershed Protection & Initiatives, SW FY 24-25 CIP Request - LNR 407



DLNR's top priority CIP Request  
FY24: \$5m  
FY25: \$5m  
Lump Sum CIP





# MAUI AXIS DEER

Emma Yuen, NEPM Program Manager  
DLNR-DOFAW

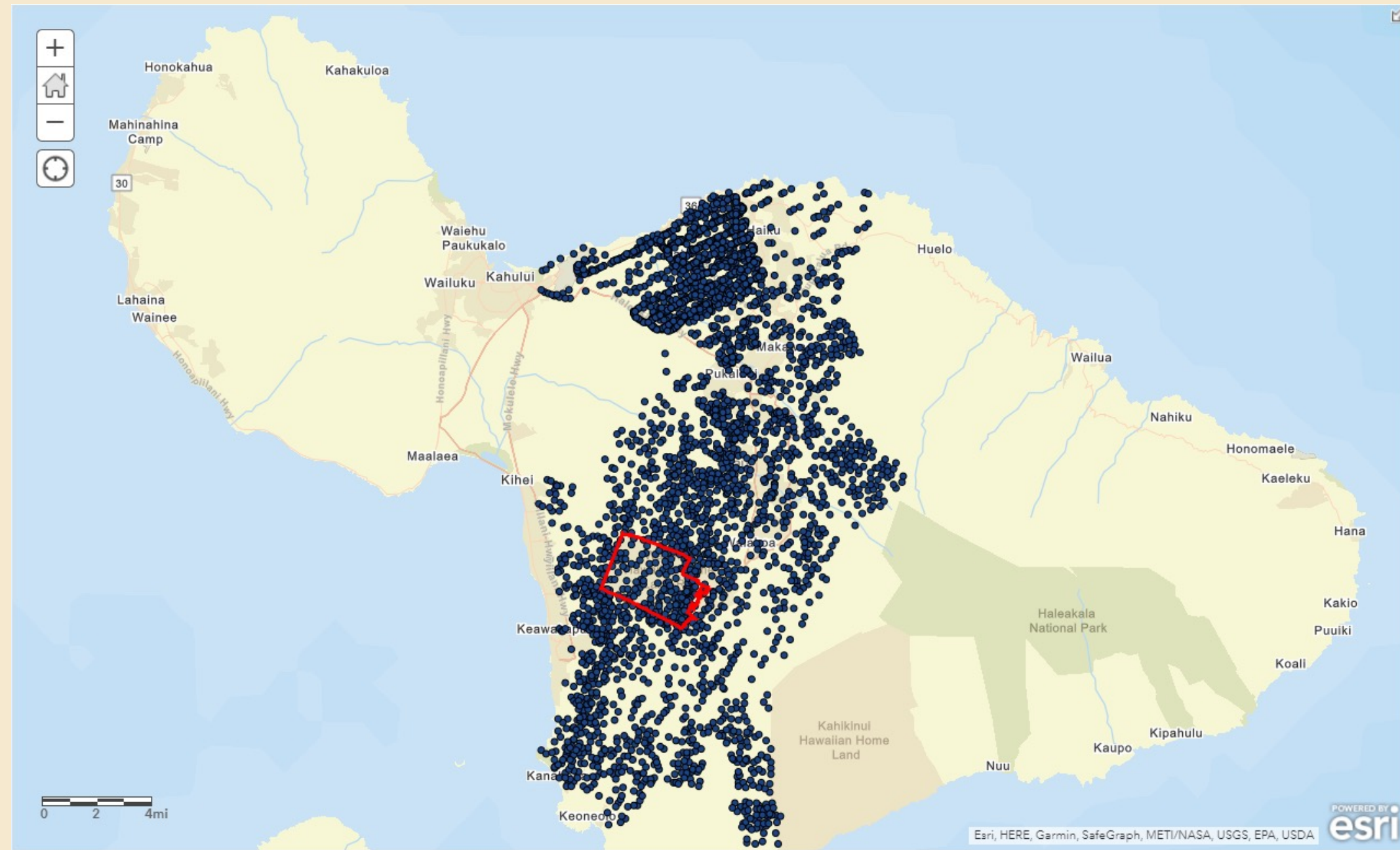
Inside fence

Outside fence



# Population Growth

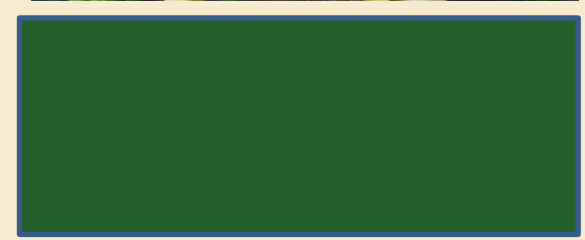
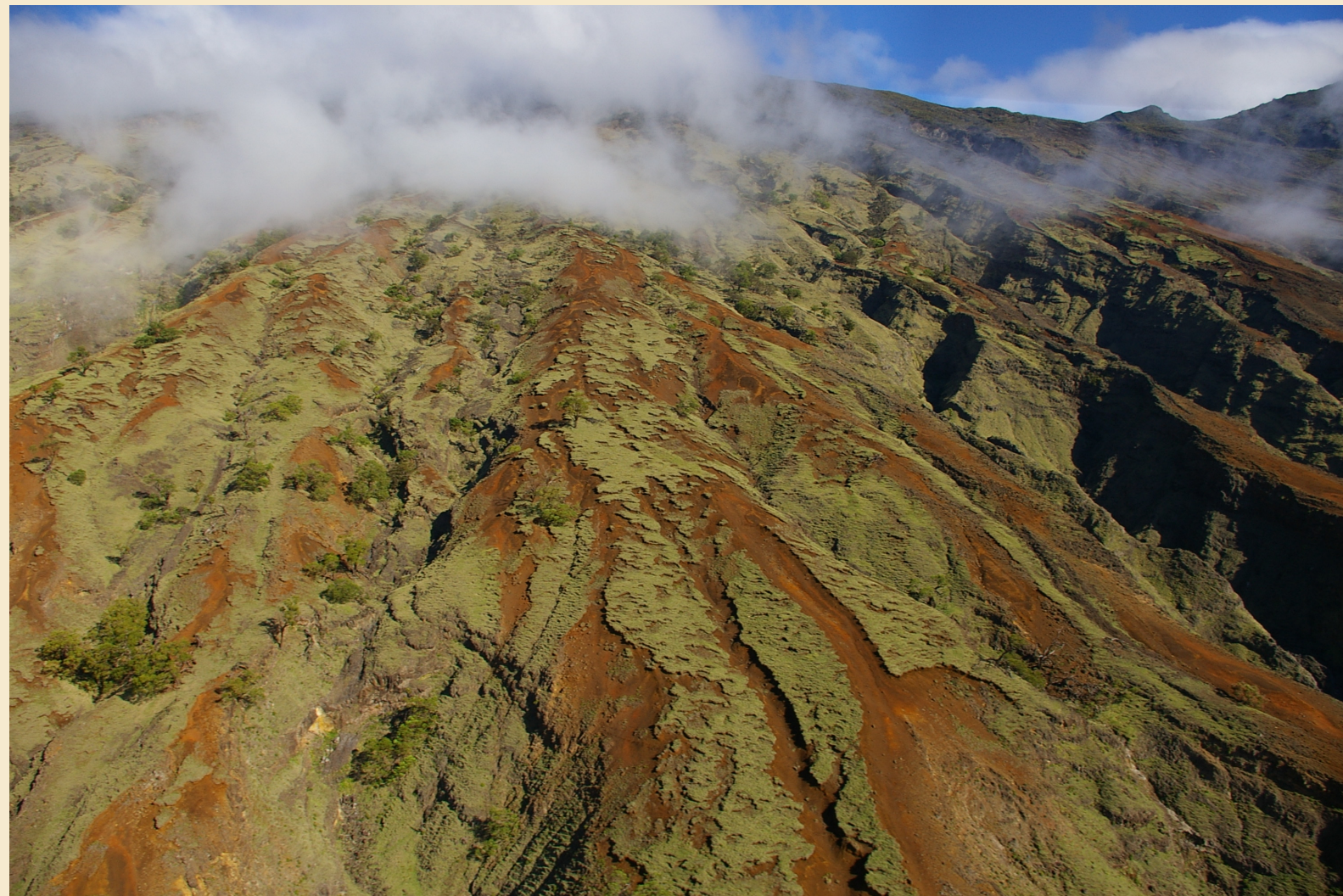
- Core area survey:  
>46,000 on Maui in 2021
- No natural predators
- Rapid population growth
- Rate of harvest insufficient for effective control
  - Year-round, daily, no bag limits
  - Private lands





# Impacts

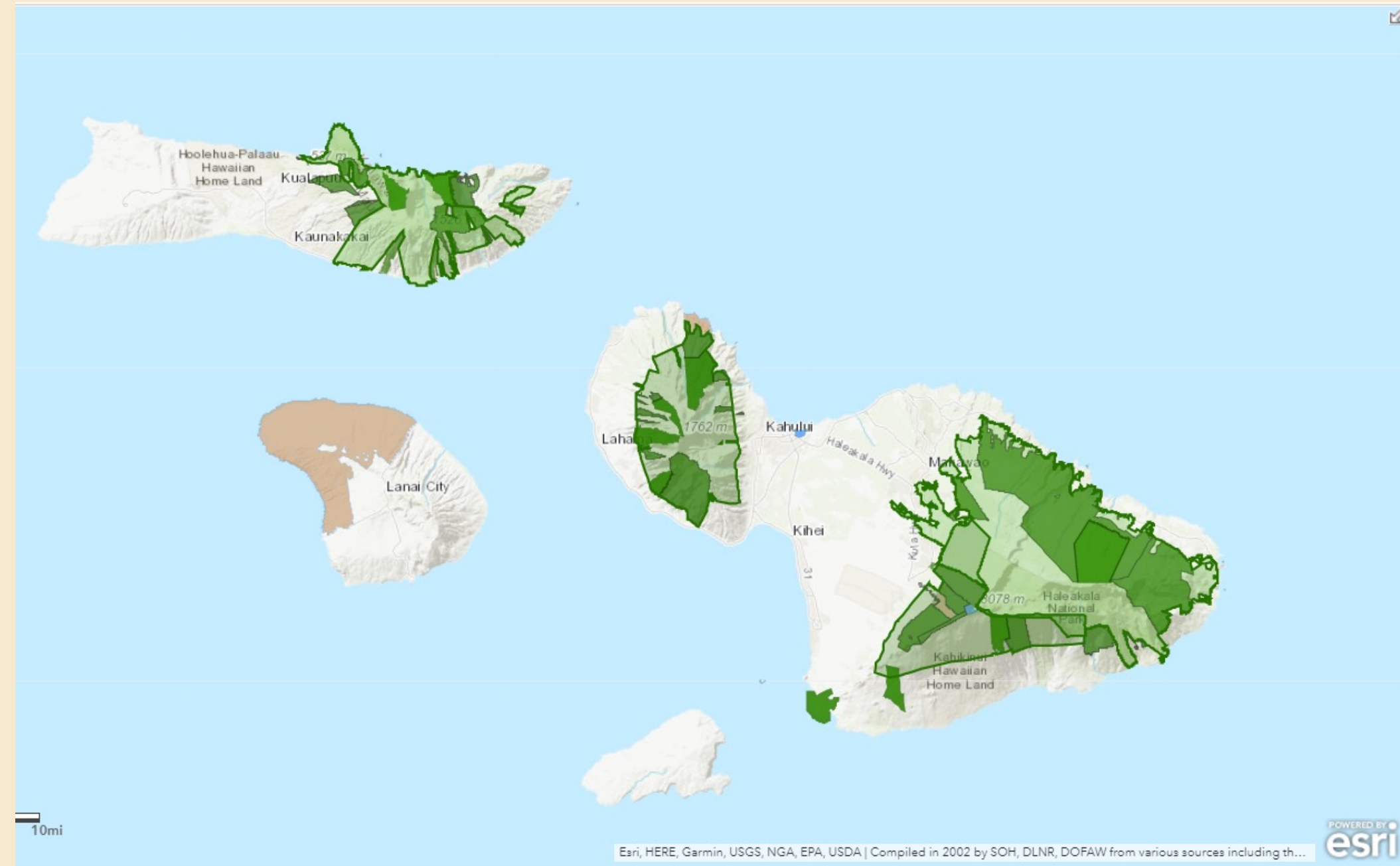
- Native Ecosystems
- Watersheds
- Erosion, coral reefs
- Farms, ranches
- Residential areas
- Roadways, runways





# Forestry & Wildlife's Core Mission

- Native Ecosystems
- Biodiversity
- Endangered Species
- State conservation reserves
- Partner agency & NGO reserves
- Landowner partnerships
- Promote public access and hunting



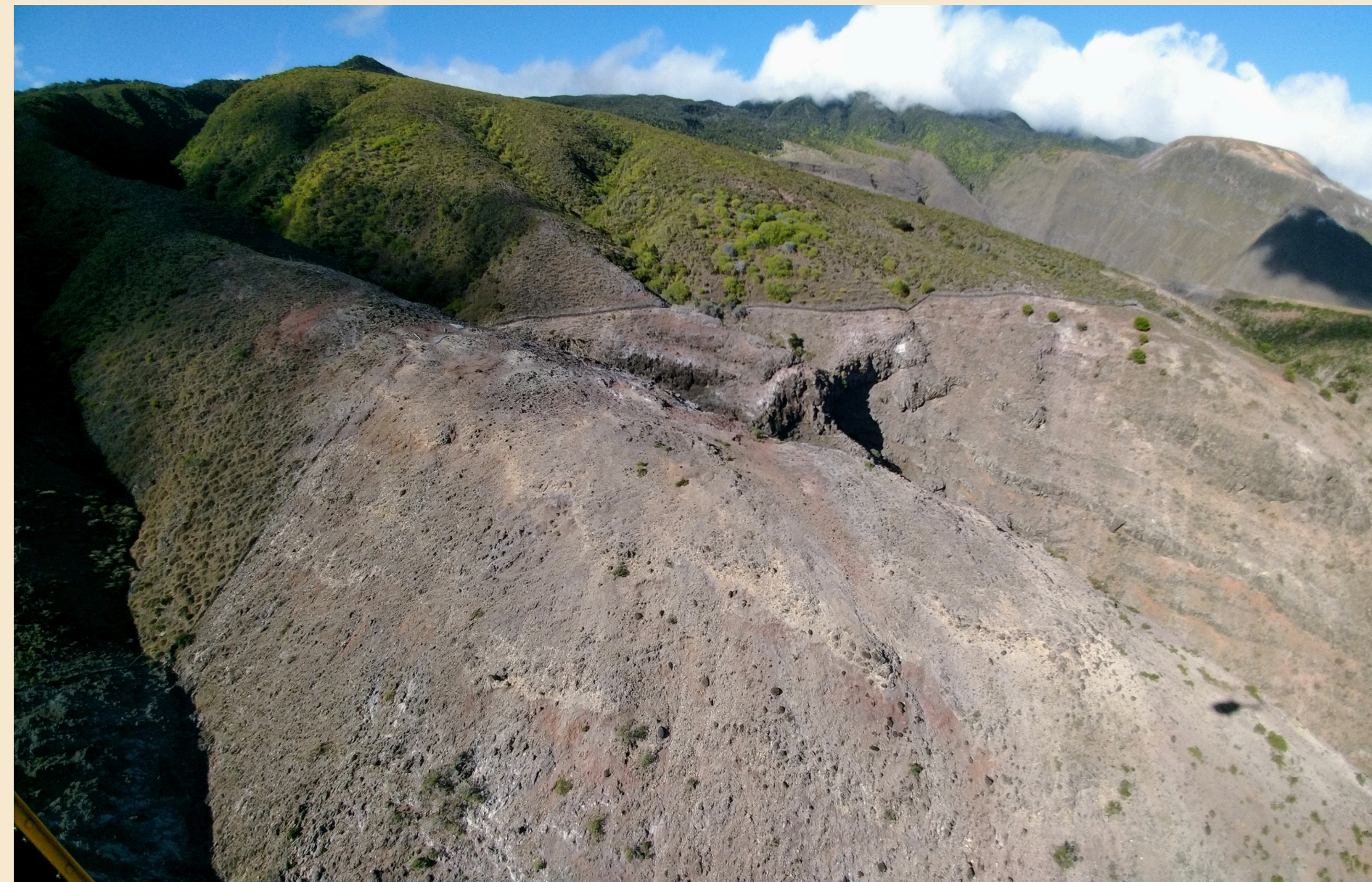
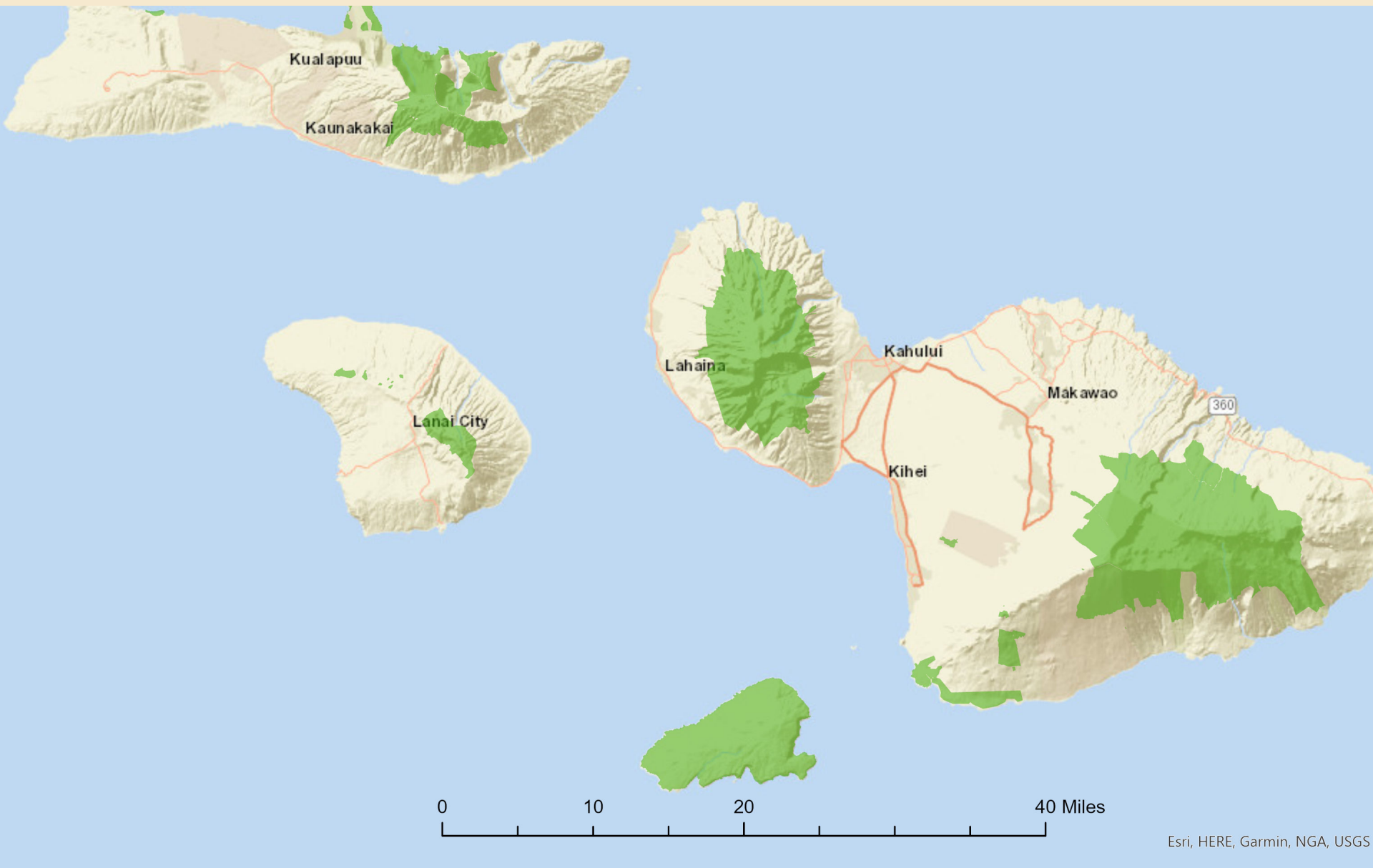
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# Status of Managed Areas

- >110,000 acres fenced
- Maintain ungulate control within the fences
- Identify which additional areas need fencing



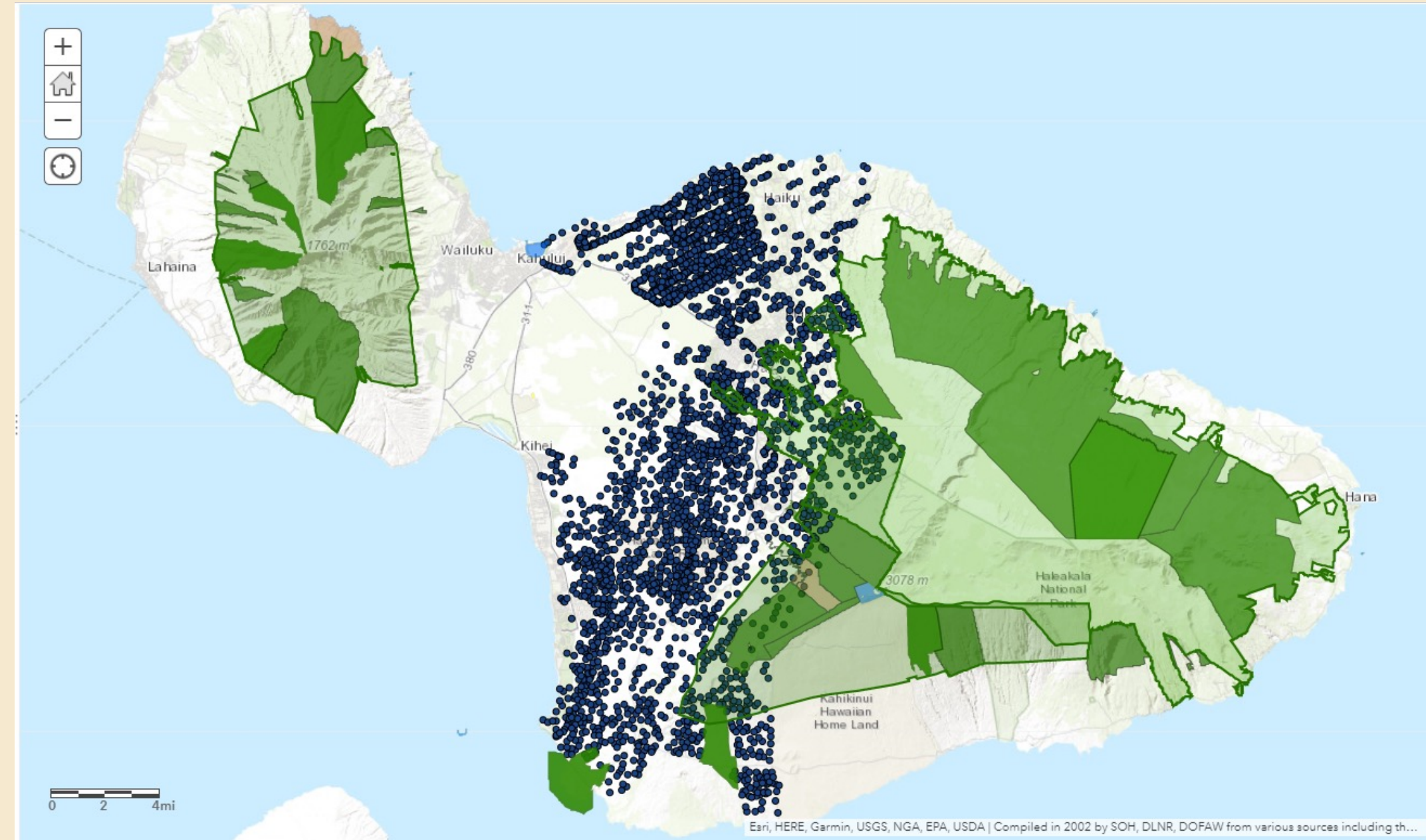
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# Island-wide Impacts

- Private lands
- Farms
- Ranches
- Residential
- Resort
- Roads
- Airports
- Public safety



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# Maui Axis Deer Task Force

Collaboration and  
Stakeholder Engagement

- 1990s Maui axis deer working group
- 2012 Management strategy
- 2020 Maui Axis Deer Task Force
- Action Plan (in prep)



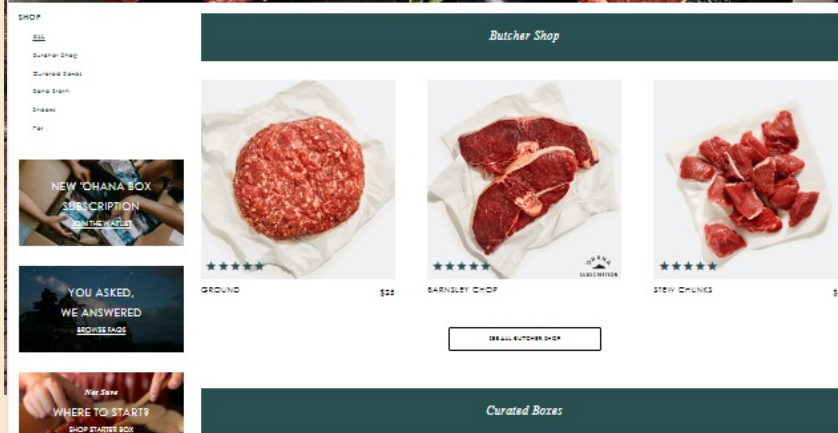
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# Current Maui Harvest >10,000 deer/yr

- Landowner incentives
- Public hunting
- Commercial version harvest
- Wildlife control permits (night)
- Landowner
- Contractor
- Trapping
- Fences
- Staff control

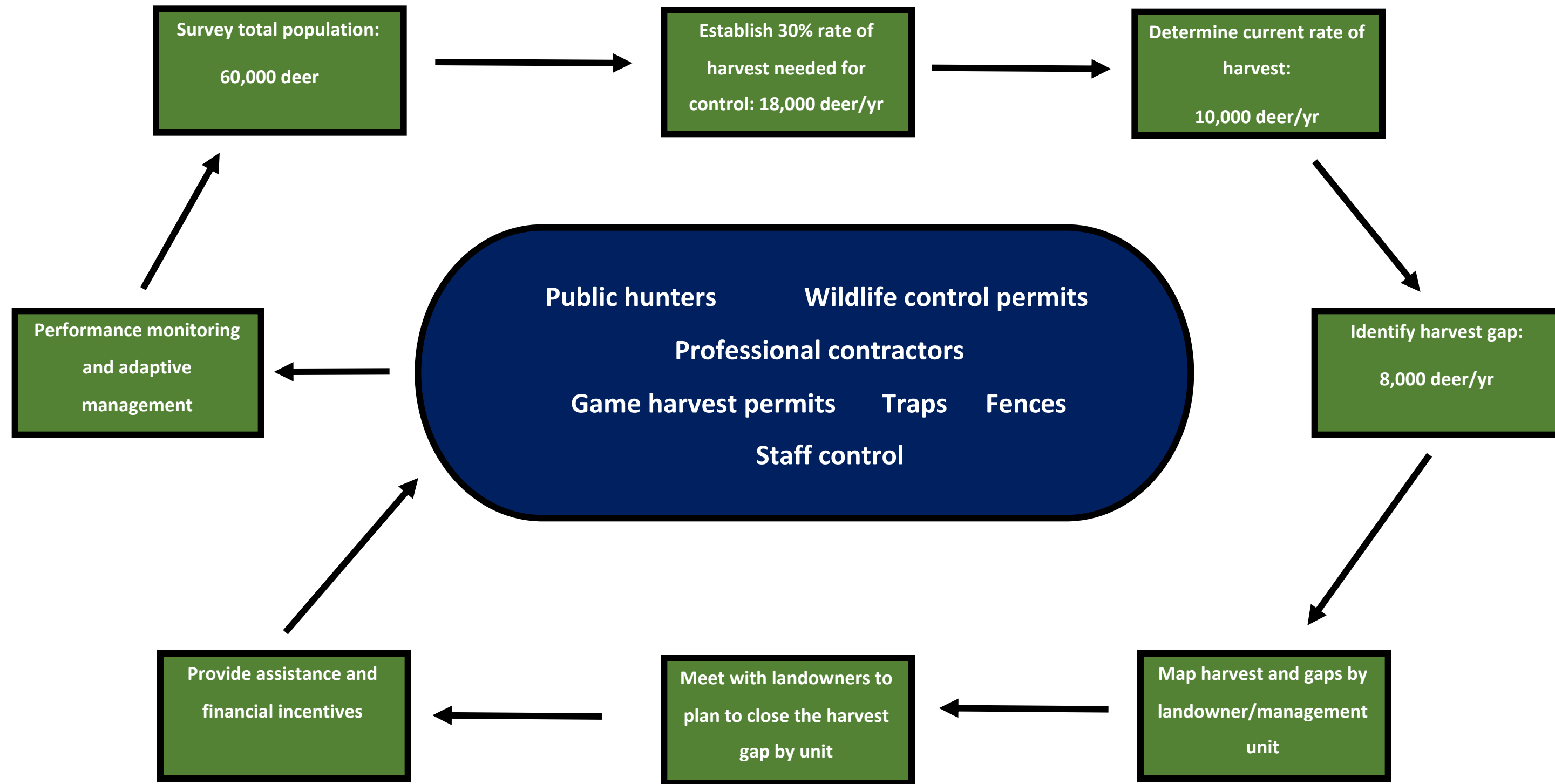


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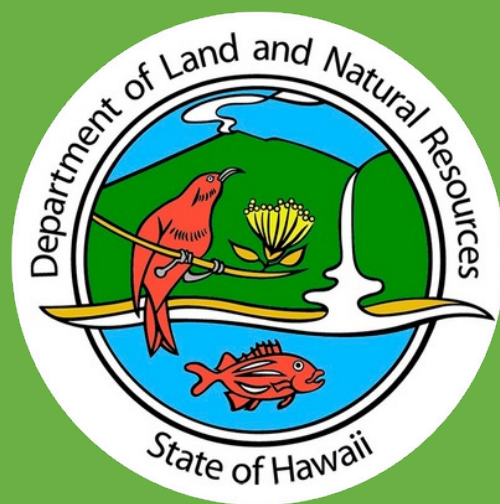
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Maui axis deer management strategy: Annual workflow, concept draft only







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