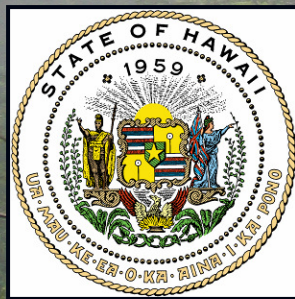
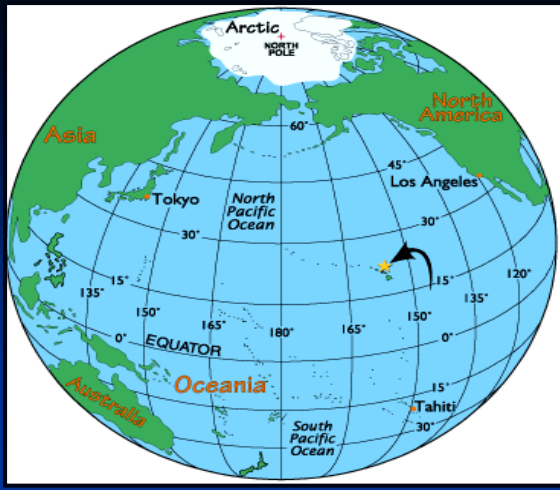


ESTABLISHING A SECOND POPULATION OF MAUI PARROTBILL

(Pseudonestor xanthophrys)

Dusti Becker, Hanna Mounce & David Leonard





Hawaii's Native Forest Birds Have Declined Because:

- Habitat loss
- Arrival of avian pox & malaria
- Alien predators (Rats, cats, mongoose)



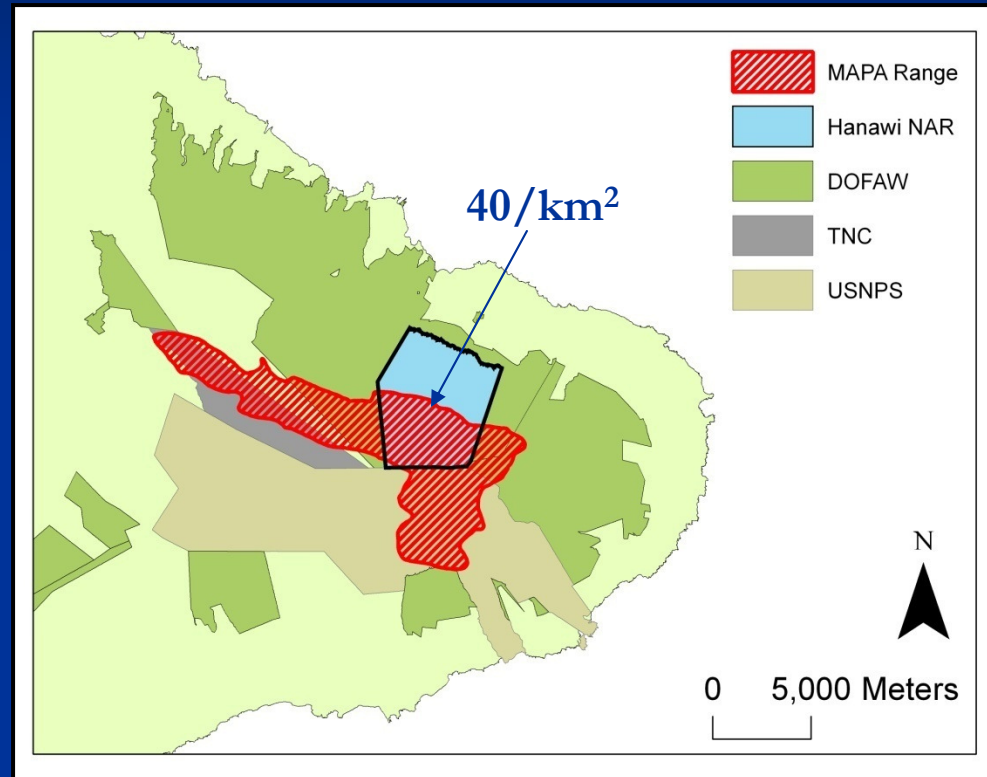


Maui Parrotbill (MAPA)

Critically Endangered

Current Range:
~ 50 km² (19 mi²)

N = 500 ± 117
(SE)

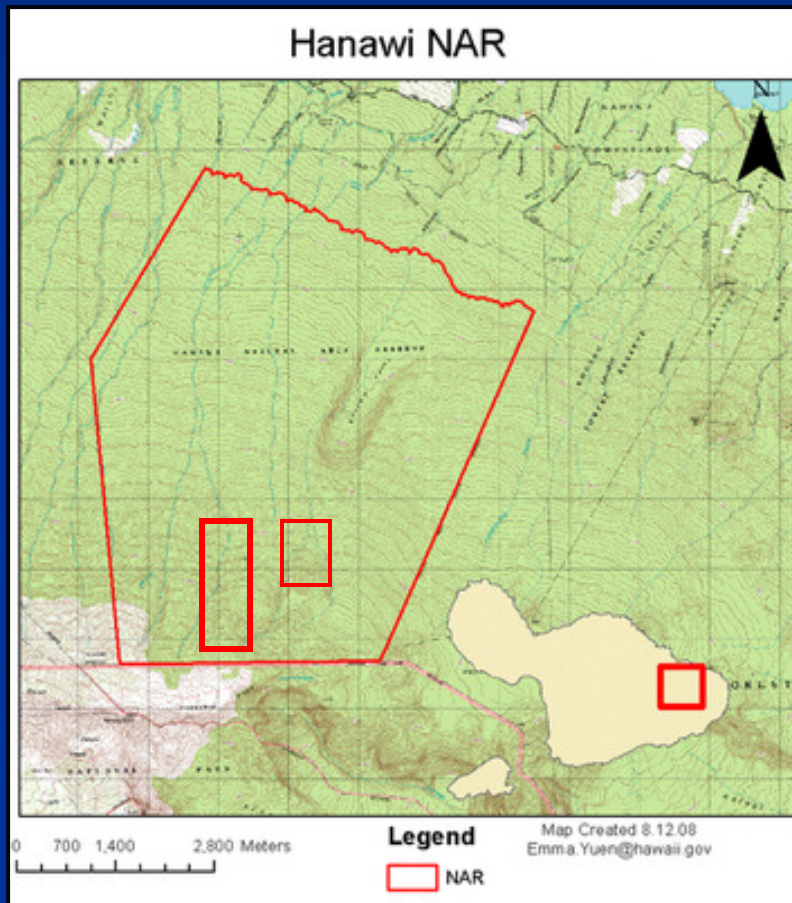


Management at Hanawi

- 1) Ungulates removed & fenced out of 634 ha (1500 acres)
- 2) Rats & mongoose reduced in a small experimental area ~ 35 ha grid (86 acres)



Demography and population dynamics of Maui parrotbill (MAPA) at Hanawi



SURVIVAL

PRODUCTIVITY

2005-2009

Survival Data comes from Mark-Re-sight



MAUI PARROTBILL - Survival



N=103 Maui parrotbill

Hatch-year: $76 \pm 0.09\%$

Adults: $84 \pm 0.04\%$

Garvin *et al.* (2008)

Productivity: nest & pair success



MAUI PARROTBILL – Nest Success



Hatch-year MAPA with new bands

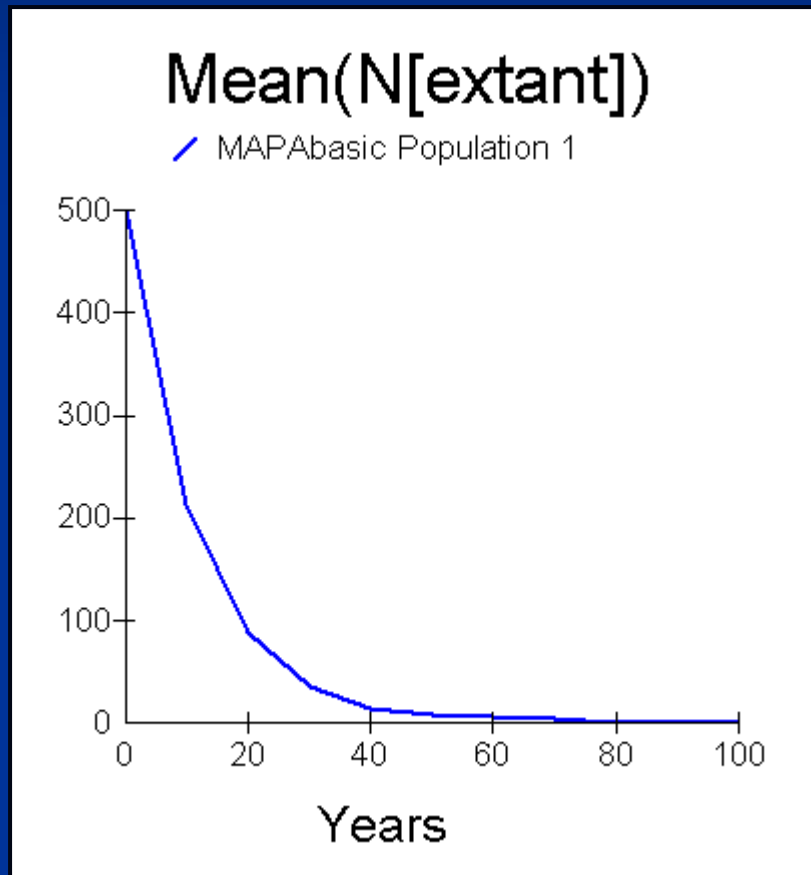
- Nests found with an egg
- Followed to fledge

2005	33%	N = 3
2006	50%	N = 2
2007	17%	N = 5
2008	50%	N = 4
2009	17%	N = 6

All known nests (N=44)
36% ± 24

NEST SUCCESS IS POOR!

Population Viability Model



All 500 simulations go extinct.
Probability of extinction = 100%

Time to first extinction = 48 yrs



Nest Success = 36% ; Mortality: Juvenile = 24%; Adult = 16 %

Evidence is contrary to “rapid decline”



- 27 pairs found in ~ 120 ha study site - 2009
- 15 juveniles produced - 2009
- Hanawi density ~ steady at 40/km² for 30 yr
- Second year birds consistently found
- A 2 chick clutch found in 2009

Pair Productivity > Nest Success

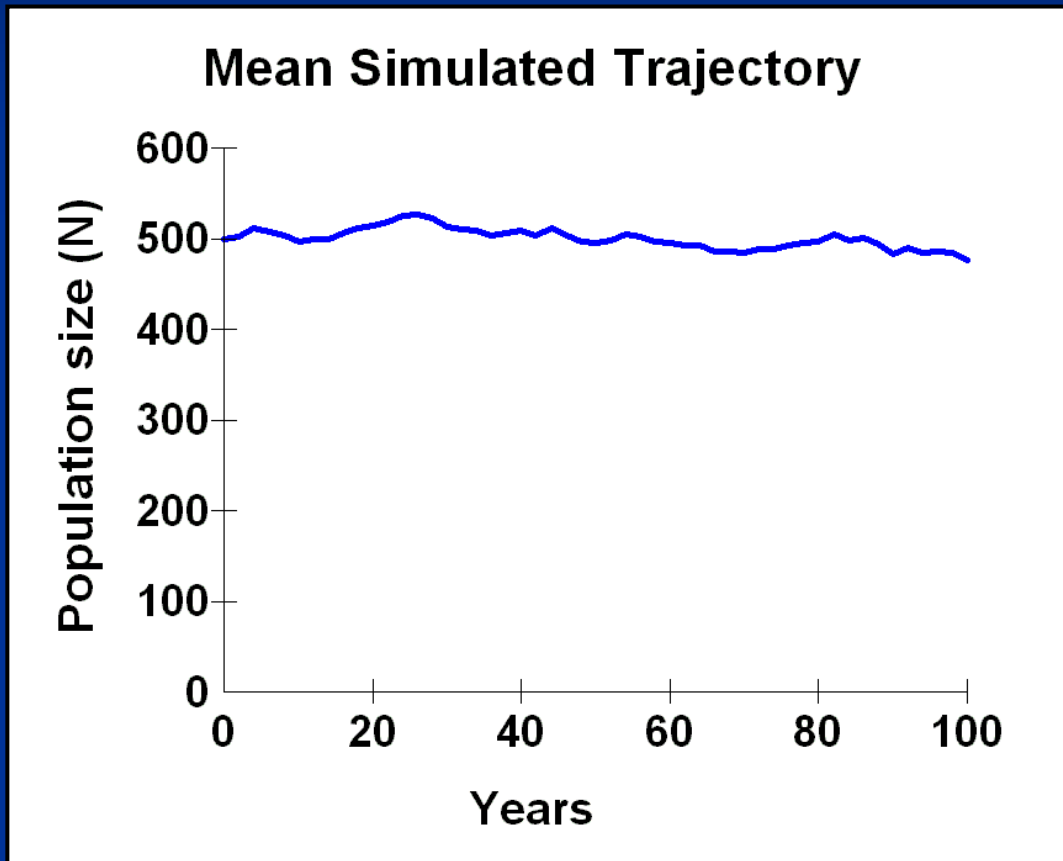


Proportion of pairs with a fledgling

2007	0.38	N = 8
2008	0.83	N = 6
2009	0.55	N = 27

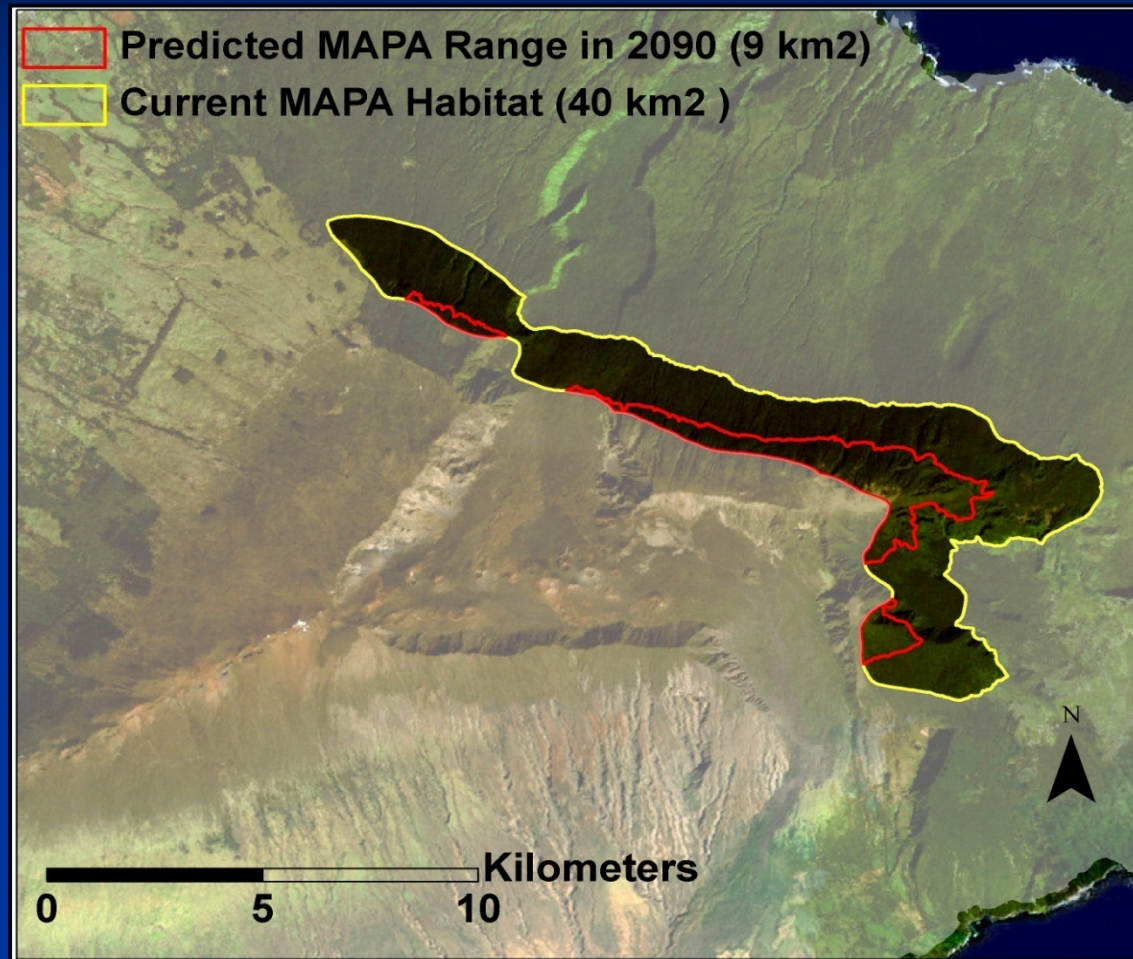
Average = 0.59

What productivity is required for a stable population? ($r = 0$)



Juv survival	0.76 ± 0.05
Adult survival	0.84 ± 0.04
Productivity	0.59 ± 0.10
Pop size	500
K	1800

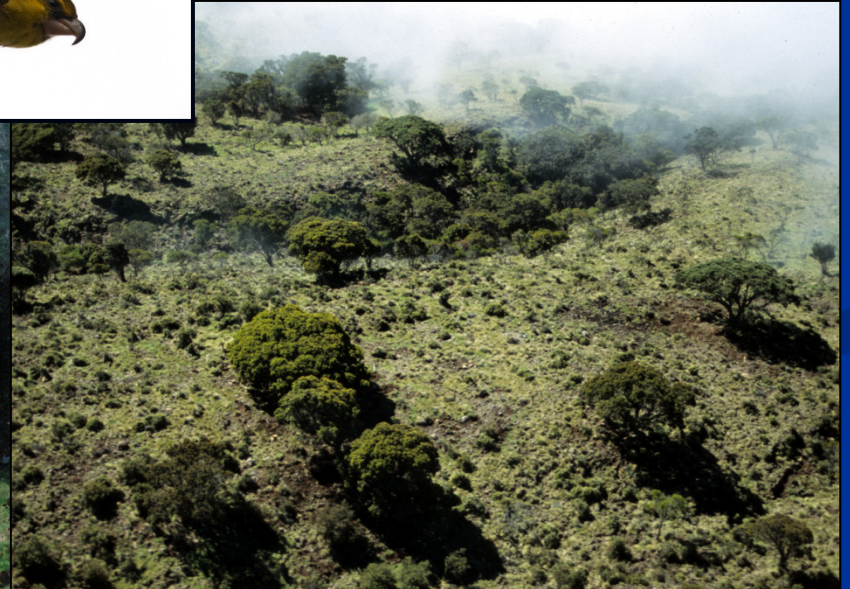
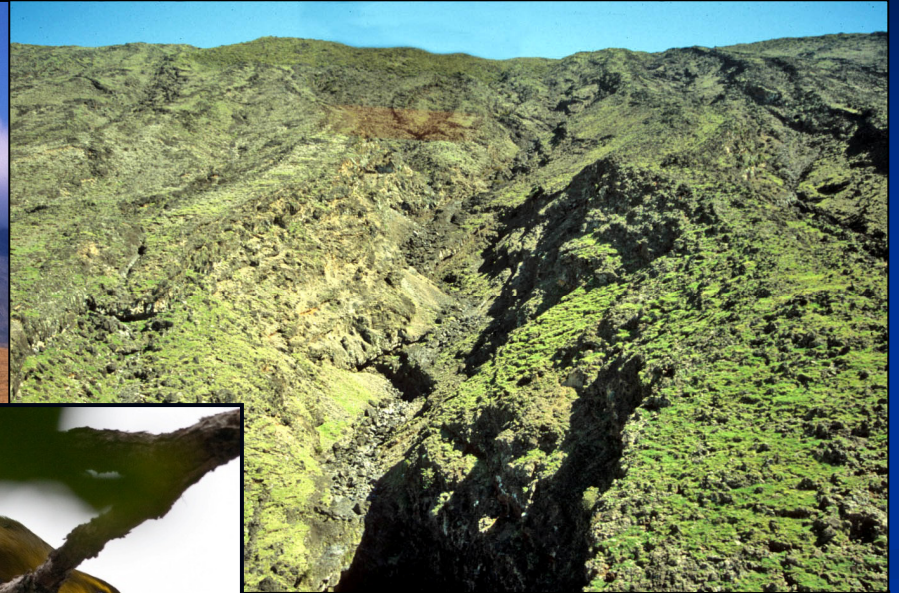
1. Single small population 2. Climate change and malaria



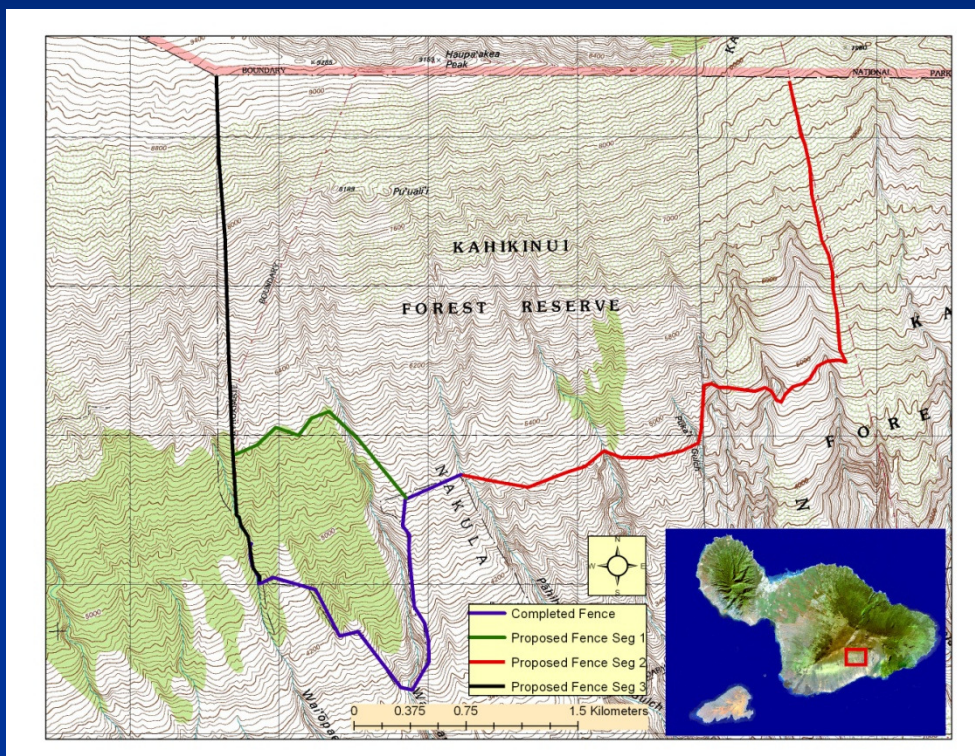
75% loss in habitat by 2090 as avian malaria responds to warming trends

Hammond *et al.* 2009

URGENT NEED TO IMPLEMENT THE USFWS RECOVERY PLAN FOR
Reintroduction to Leeward Maui - Kahikinui



Strategy for establishing a second population



- Landscape scale fencing
- Ungulate eradication
- Control of alien plants and predators
- Out-planting of native vegetation
- Release of an experimental MAPA population

KAHIKINIUI Restoration Site

Experimental Release Plan

1. **Release Protocol (up to 6 birds)**

Work out holding, transport, & release

2. **Monitor response to release (6-12 birds)**

Determine movement, habitat use, survival

3. **Re-establish Population (> 12 birds/cohort)**



Population Genetics

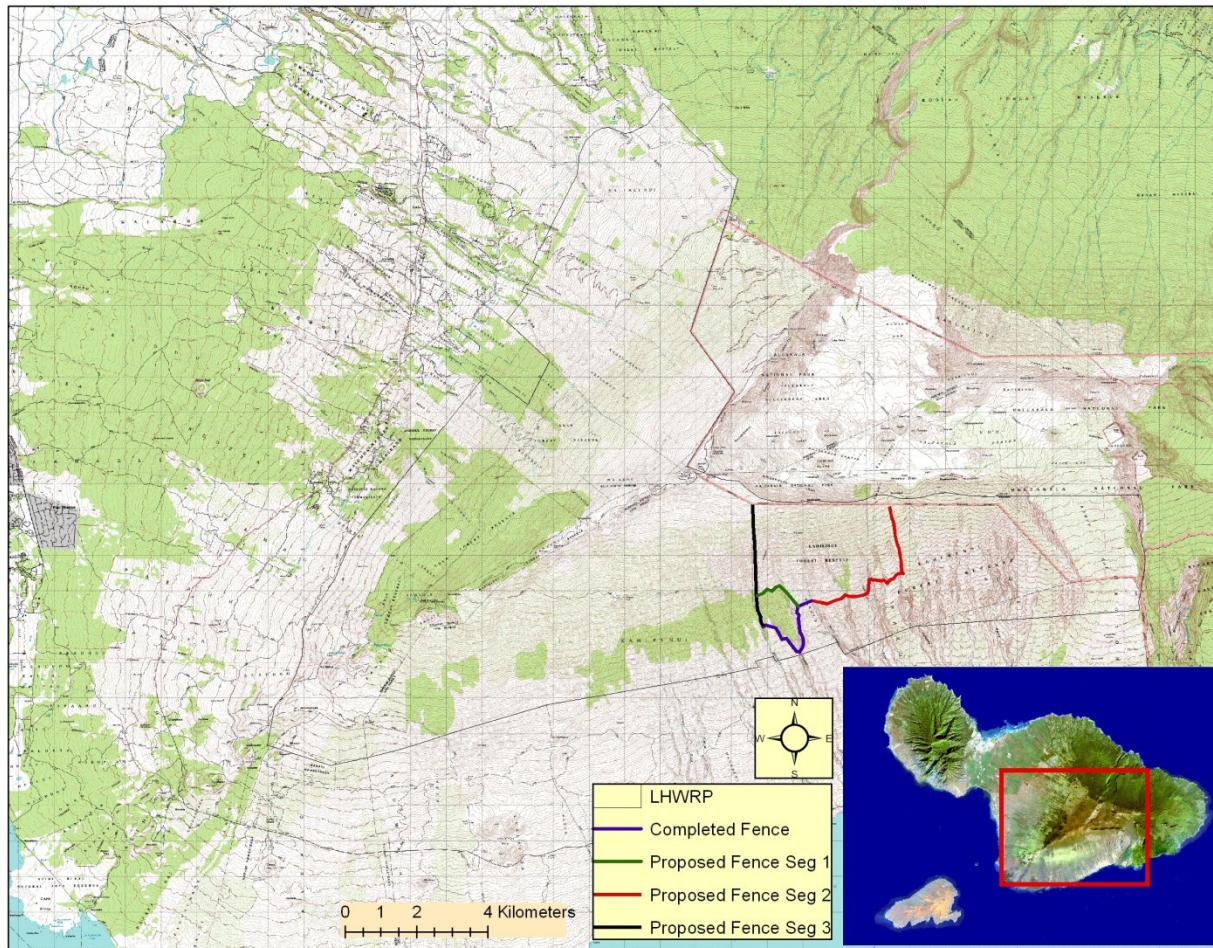
Goal: Compare genetic diversity and structure in current & historical MAPA populations

- **microsatellite & mitochondrial DNA**
- **33 historic samples (toe pad clippings)**
- **> 50 modern samples (feathers)**



Demographic and evolutionary genetic data will provide guidance for selecting individuals for translocation

Kahikinui Project Area



Part of a 10,000 ha protected landscape

Data gaps



MAPA use of Koa?

Nest sites?



Food availability?

Predation?

Disease – avian malaria & pox?

Summary

- Need to establish a second MAPA population to reduce extinction risk
- **ACTIONS NEEDED**
 - **Continue monitoring core MAPA population**
 - Complete genetic study
 - Fence and start restoration trails
 - Develop translocation protocols
 - Assess role of captive propagation
- **Needs:**
 - Sustainable long-term funding
- **Abilities and experience:**
 - Fencing
 - Ungulate Removals
 - Avian Translocation
 - Avian population monitoring
 - Forest Restoration



Mahalo to:

DLNR/Div. of Forestry & Wildlife

Natural Area Reserve System

US Fish & Wildlife Service

Pacific Cooperative Studies Unit

Pacific Helicopters

Windward Aviation

Haleakala National Park

Haleakala Ranch

The Nature Conservancy

USGS-PIERC *HI Interagency Database*

Mike Neal - photos



**MFBRP Field Teams
& Volunteers**