Nā Koa Manu Conservation

U.S. Fish & Wildlife Service

American Bird Conservancy

Forestry and Wildlife Hawaii

Pacific Cooperative Studies Unit PCSU 1973 University of Hawaii at Manoa

Maui Forest Bird Recovery Project

Kiwikiu Conservation Translocation and How Disease Thwarted Everything

Presented by Laura Berthold
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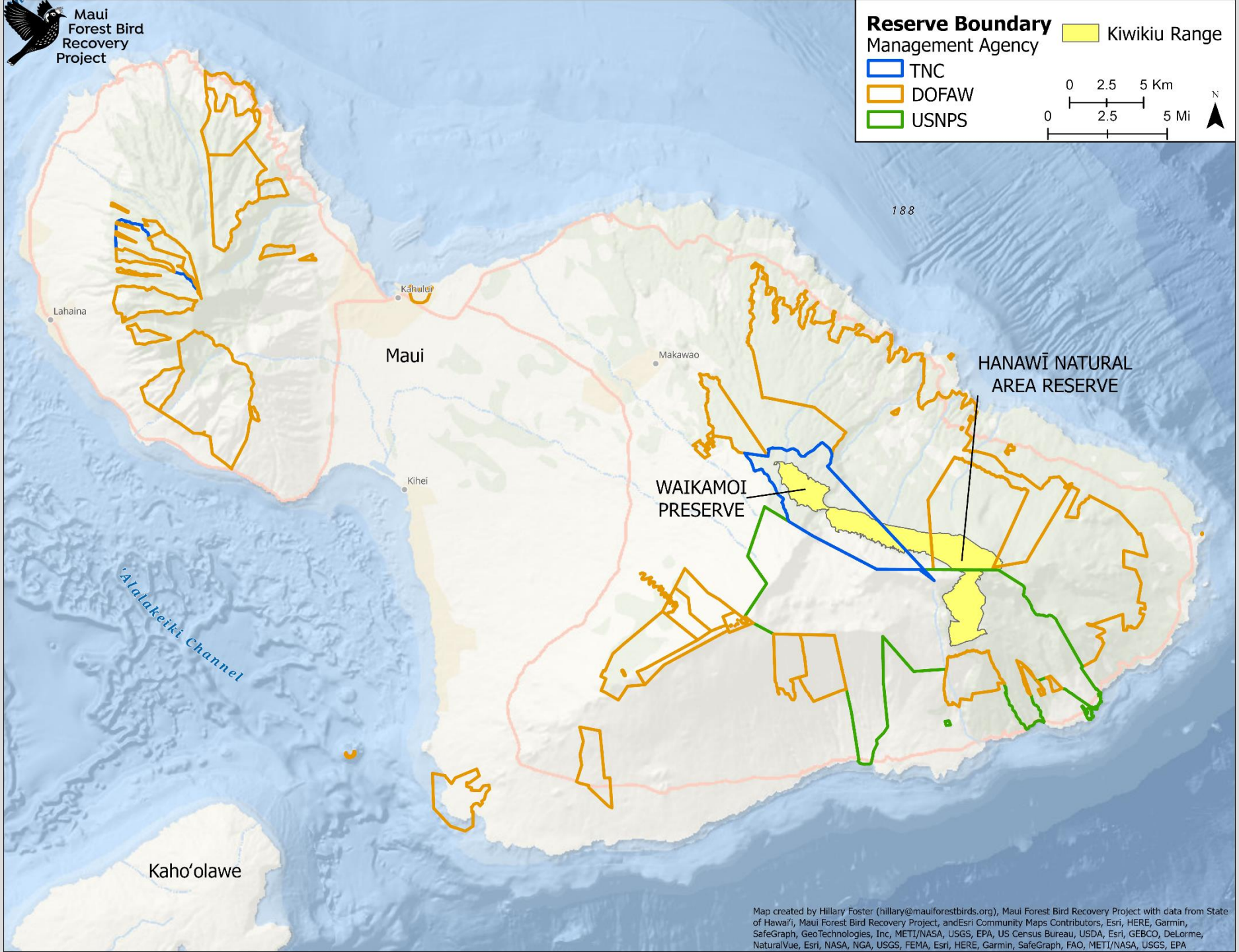
Kiwikiu (Maui Parrotbill) (*Pseudonestor xanthophrys*)

- Endemic to Maui
- **Endangered** Hawaiian Honeycreeper
- Insectivorous specialist
- Slow population growth
  - Single egg clutch
  - 1 offspring/year

Threats

- Habitat degradation/loss
- Non-native predators
  - Cat, rats, mongooses
- Introduced mosquitoes and disease
- Climate change
- Small, isolated range


Maui Forest Bird Recovery Project
Reserve Boundary
Management Agency
TNC
DOFAW
USNPS
Kiwikiu Range
0 2.5 5 Km
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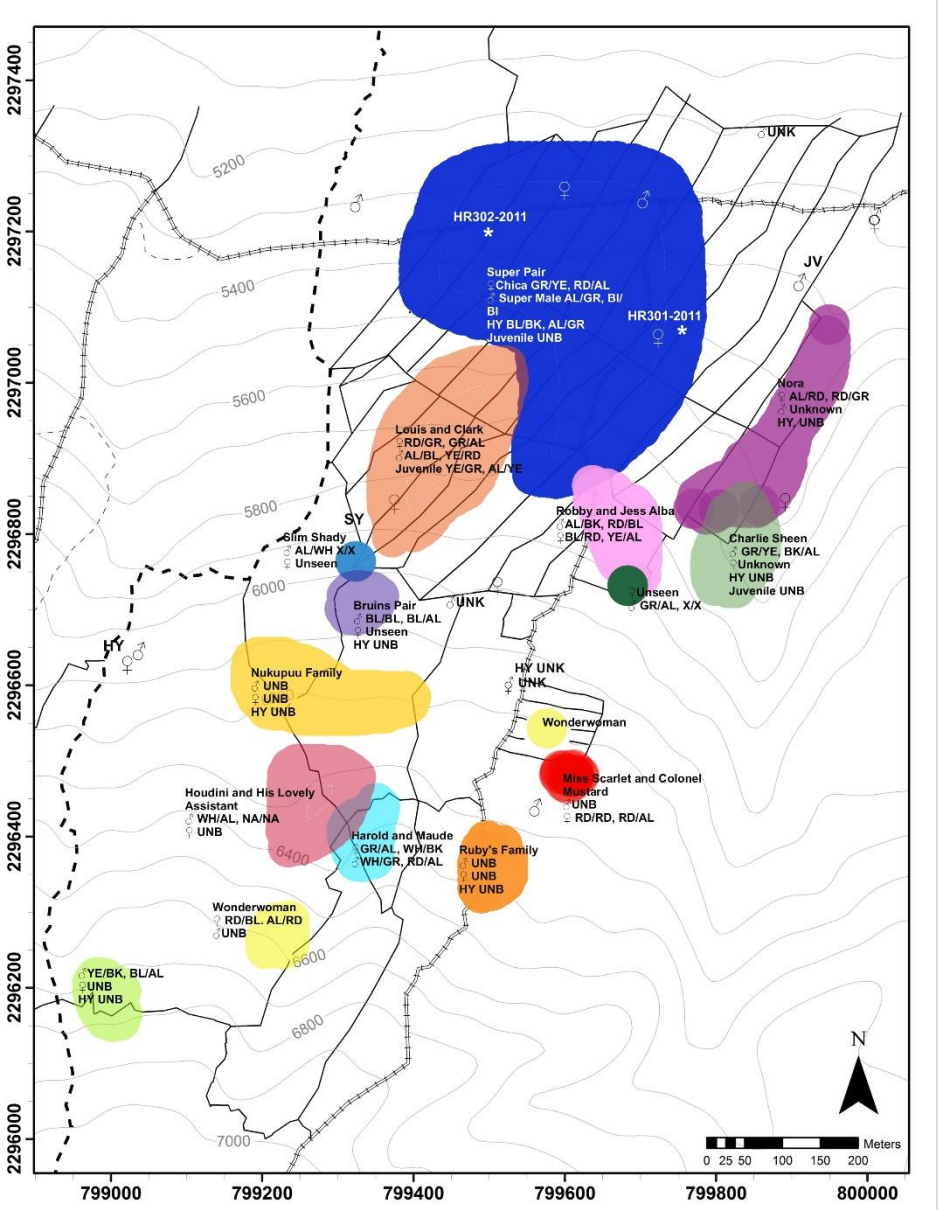
N
188
Lahaina
Kāhului
Maui
Makawao
Kihei
HANAWĪ NATURAL AREA RESERVE
WAIKAMOI PRESERVE
'Alalakeiki Channel
Kaho'olawe
Map created by Hillary Foster (hillary@mauiforestbirds.org), Maui Forest Bird Recovery Project with data from State of Hawai'i, Maui Forest Bird Recovery Project, andEsri Community Maps Contributors, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, US Census Bureau, USDA, Esri, GEBCO, DeLorme, NaturalVue, Esri, NASA, NGA, USGS, FEMA, Esri, HERE, Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA

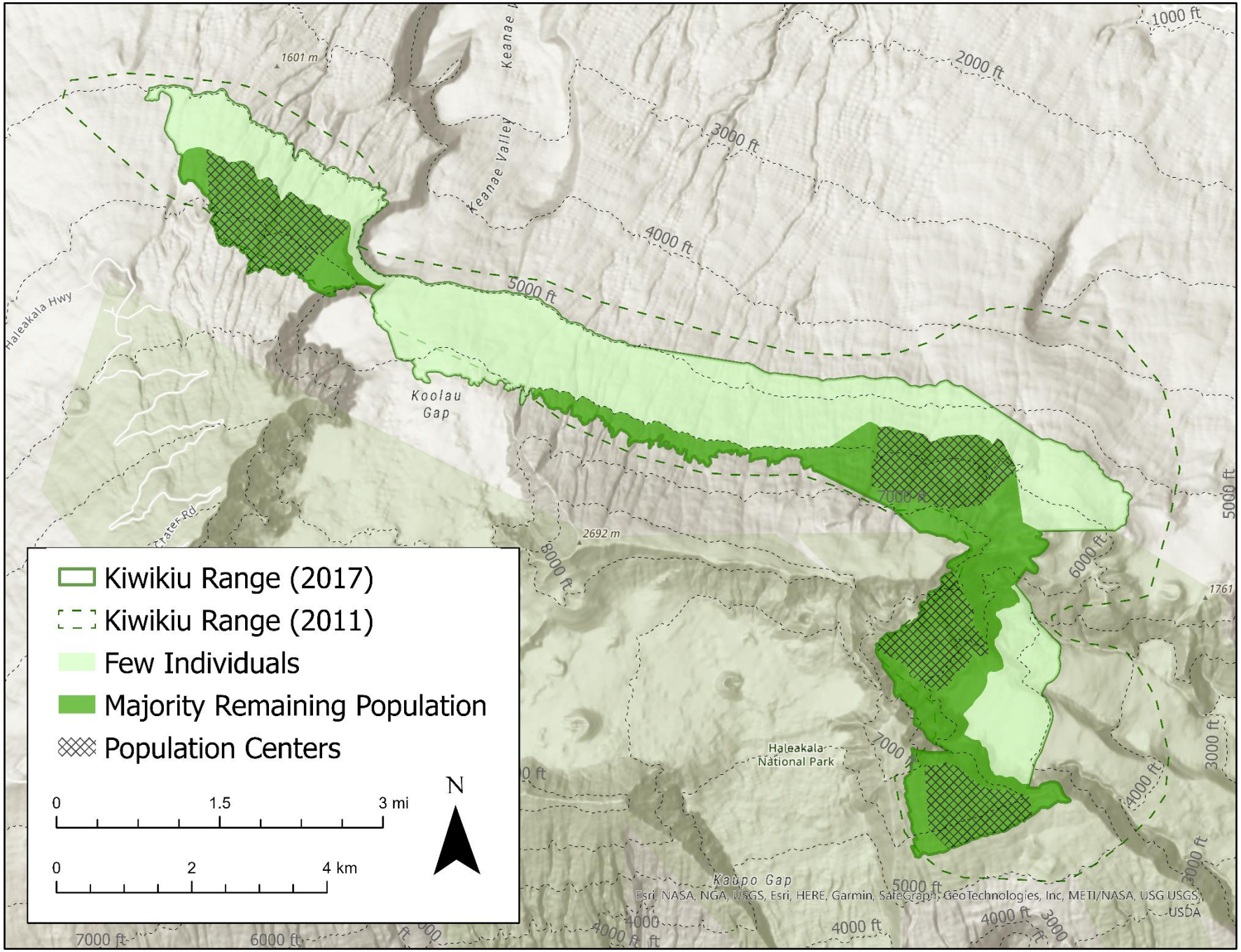
Research: Survival & Productivity



Population Estimates

- Range updated
- 157 ± 67 individuals

  (Judge et al. 2019)
- Declining



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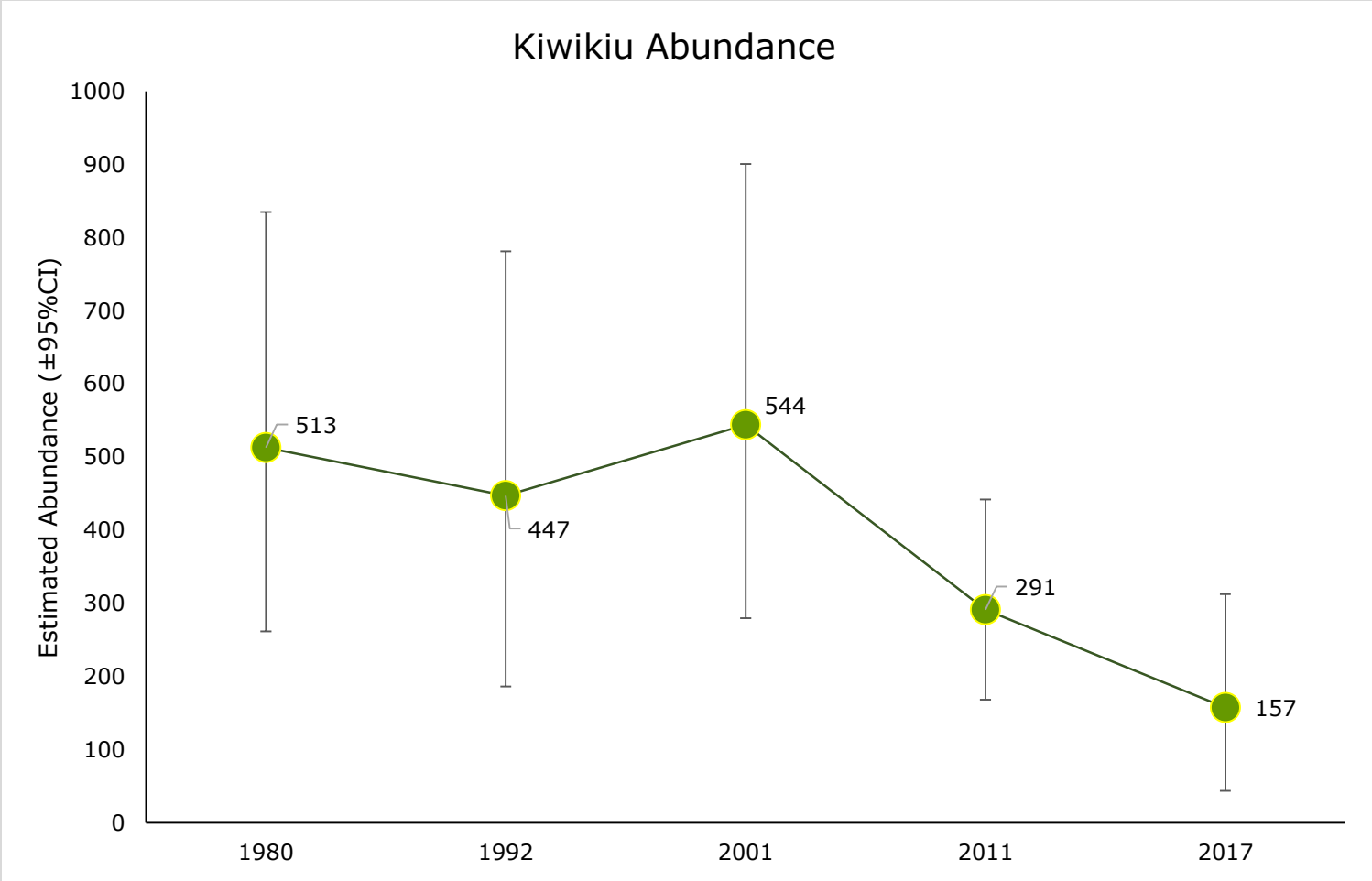
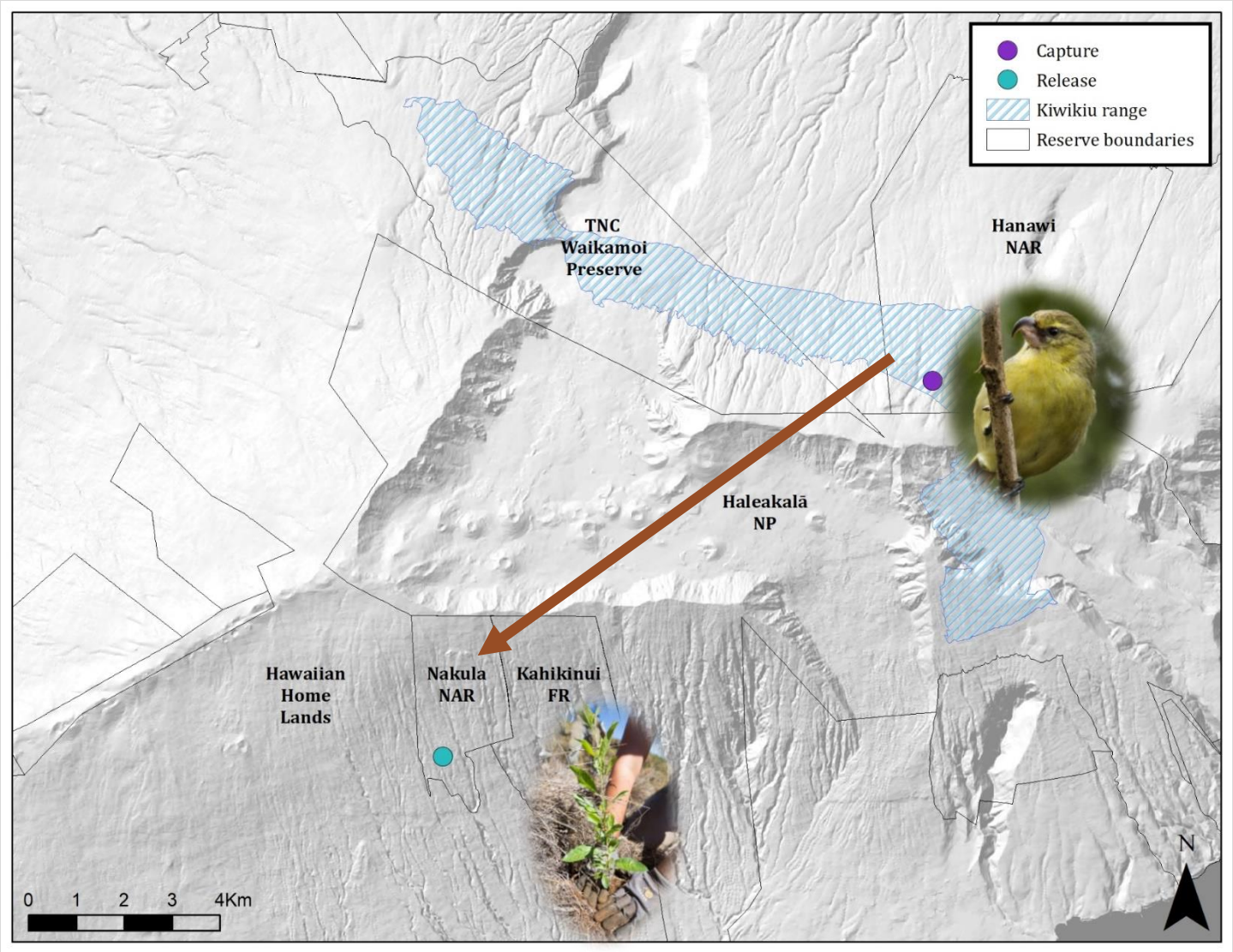


Recovery Action: Translocation



- High priority to safeguard population
- Location: South slope
  - Previously found there
  - Remnant high elevation forest

Restoration of habitat

- 250,000 plants/16 native species outplanted
- Arthropod abundance compared to occupied range (Peck et al. 2015)
- Disease and mosquito surveys (Warren et al. 2019)
- Predator & mosquito control

Translocation

- 7 wild from Hanawi and 7 from San Diego Zoo Wildlife Alliance on Maui

- Soft release: birds in aviaries in Nakula for 1-2 weeks then released
- Food Supplementation
- Post-release monitoring: Transmitters

Translocation Results

- All but 3 died from avian malaria
  - One alive in captivity
  - One unknown
  - One possibly still alive in Nakula
- Average Survivorship: ~20 days

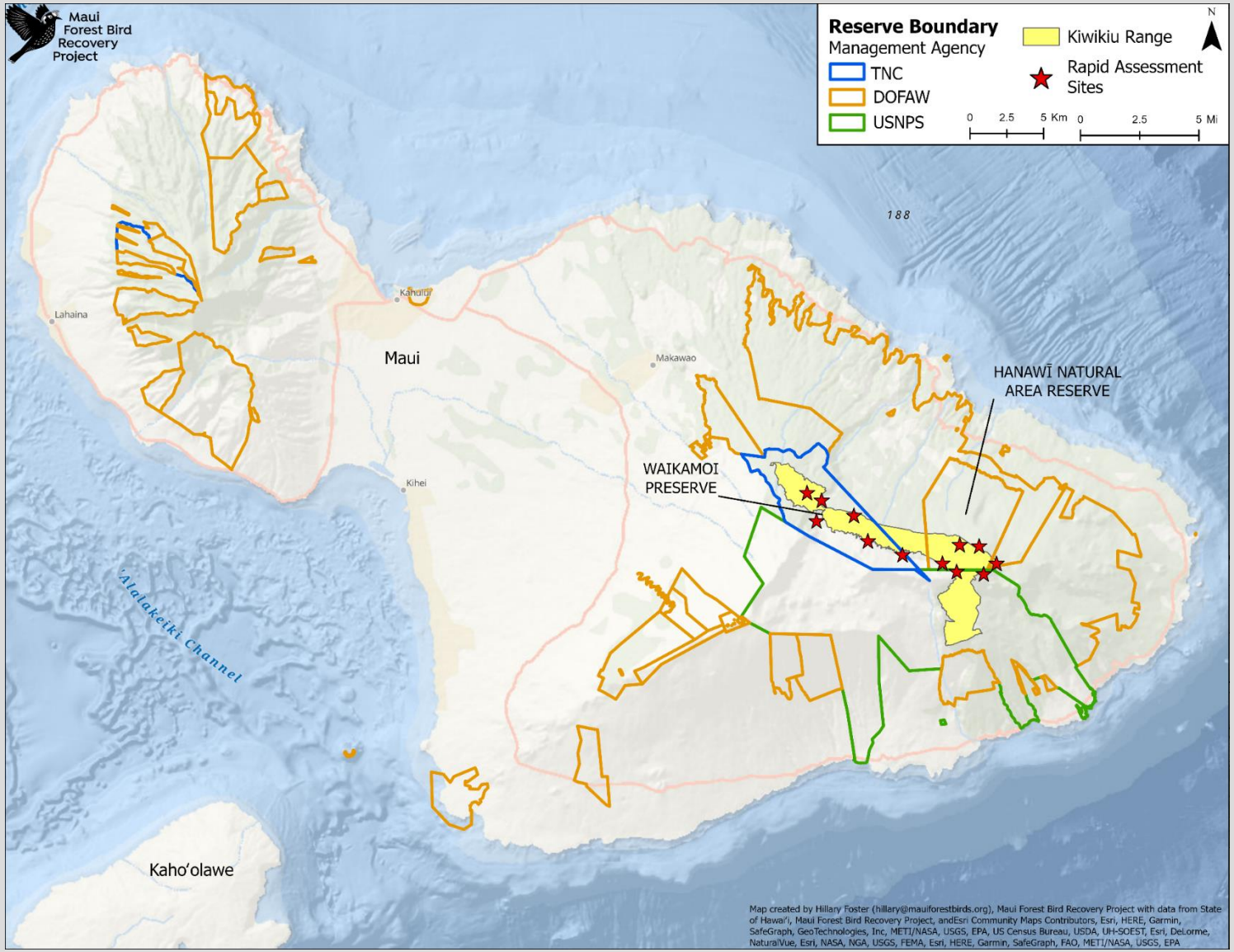
Warren et al. 2021. 2019 Kiwikiu Conservation Translocation Report. Pacific Cooperative Studies Unit Technical Report #203. University of Hawai‘i at Mānoa.

Translocation Lessons

- Prey available
- Successful at caring for and transporting wild individuals
- Mosquitoes 28x greater even w/ larvicide application
- Disease level greater than previously thought

Rapid Assessments 2020-present

- Searches for kiwikiu
- Observed in 7/12 sites
  - 77 individuals detected including females & juveniles
- Further range contraction
  - Not detected in lower east or within the Ko'olau Gap
  - Mosquitoes and disease moving up



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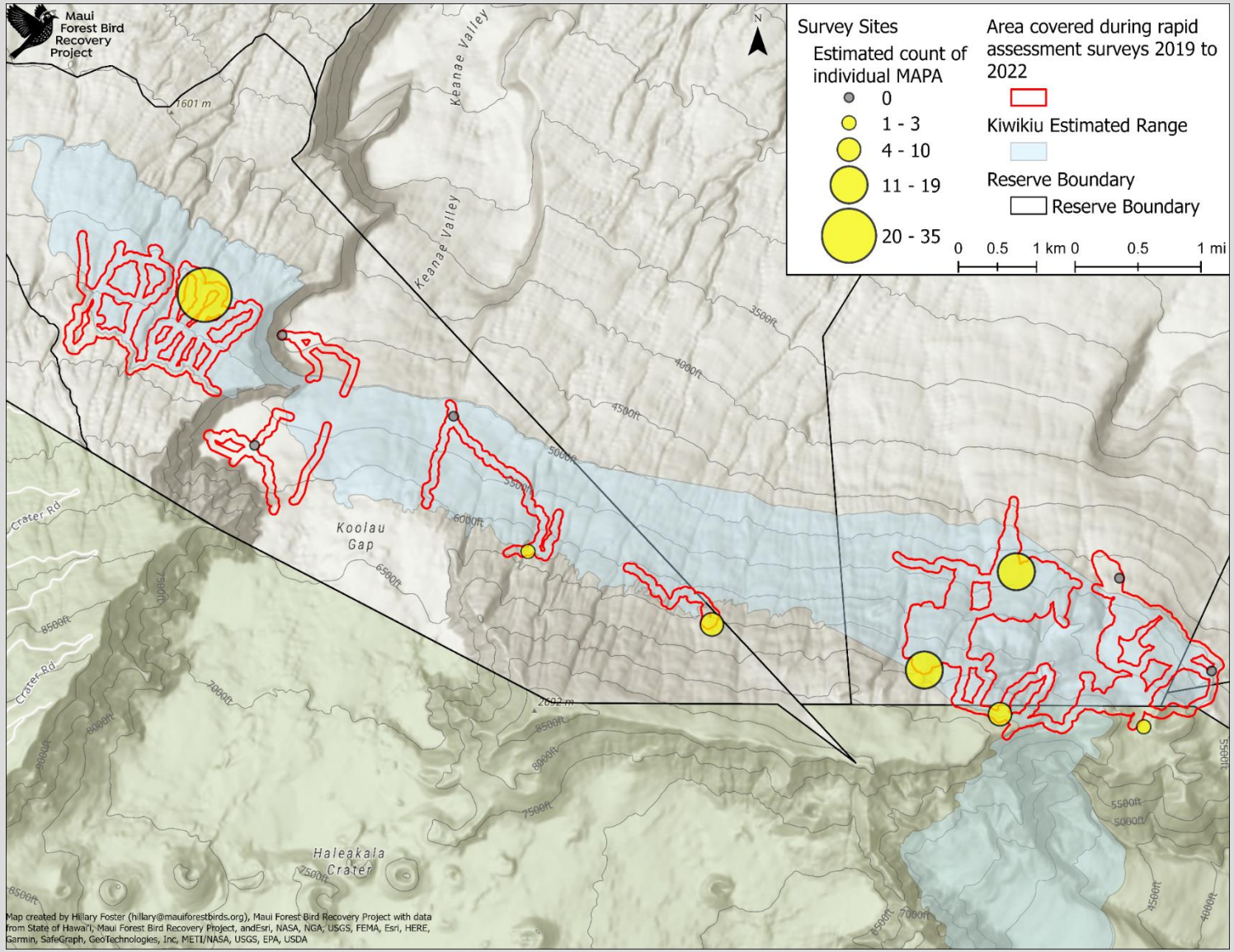

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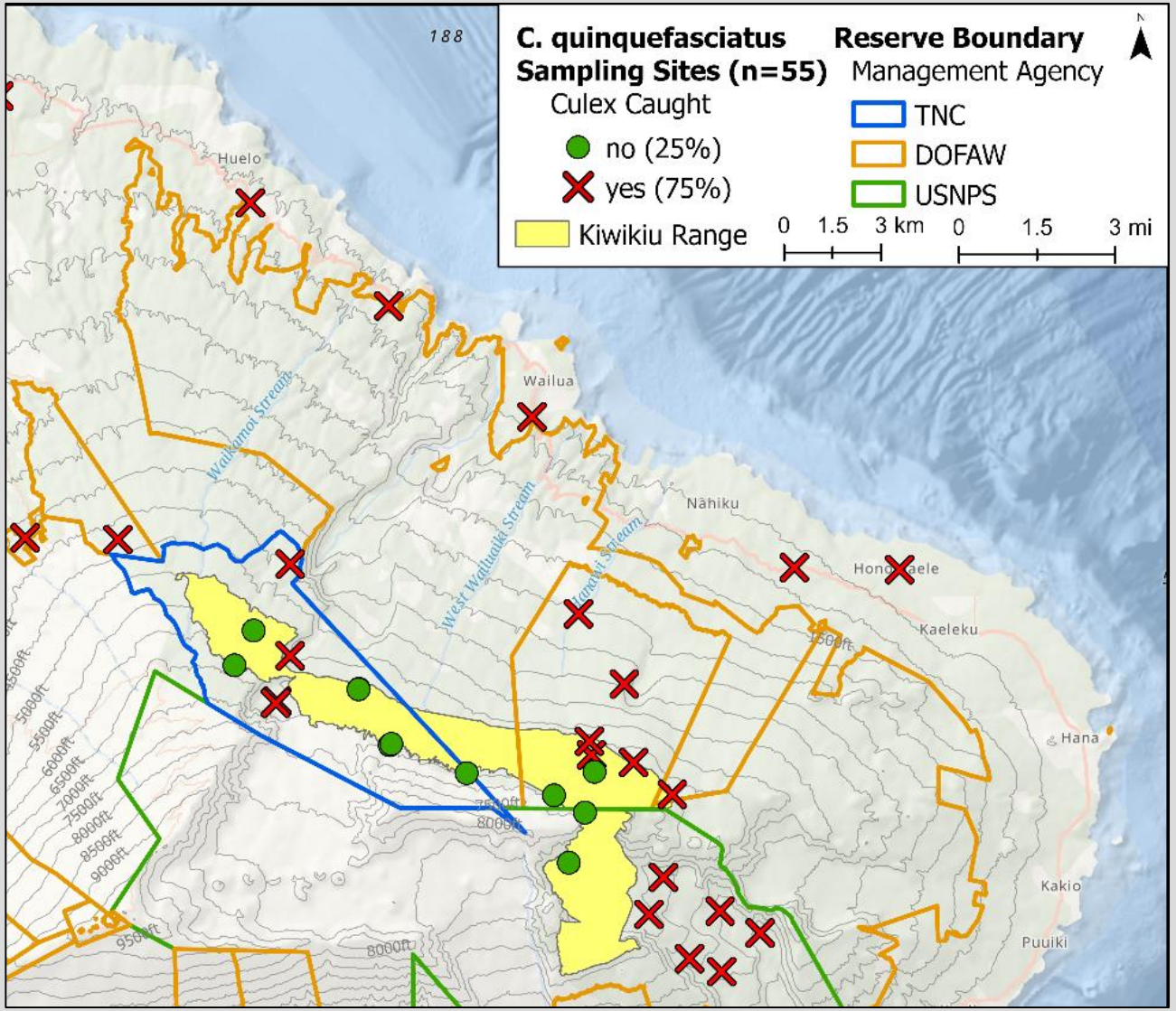
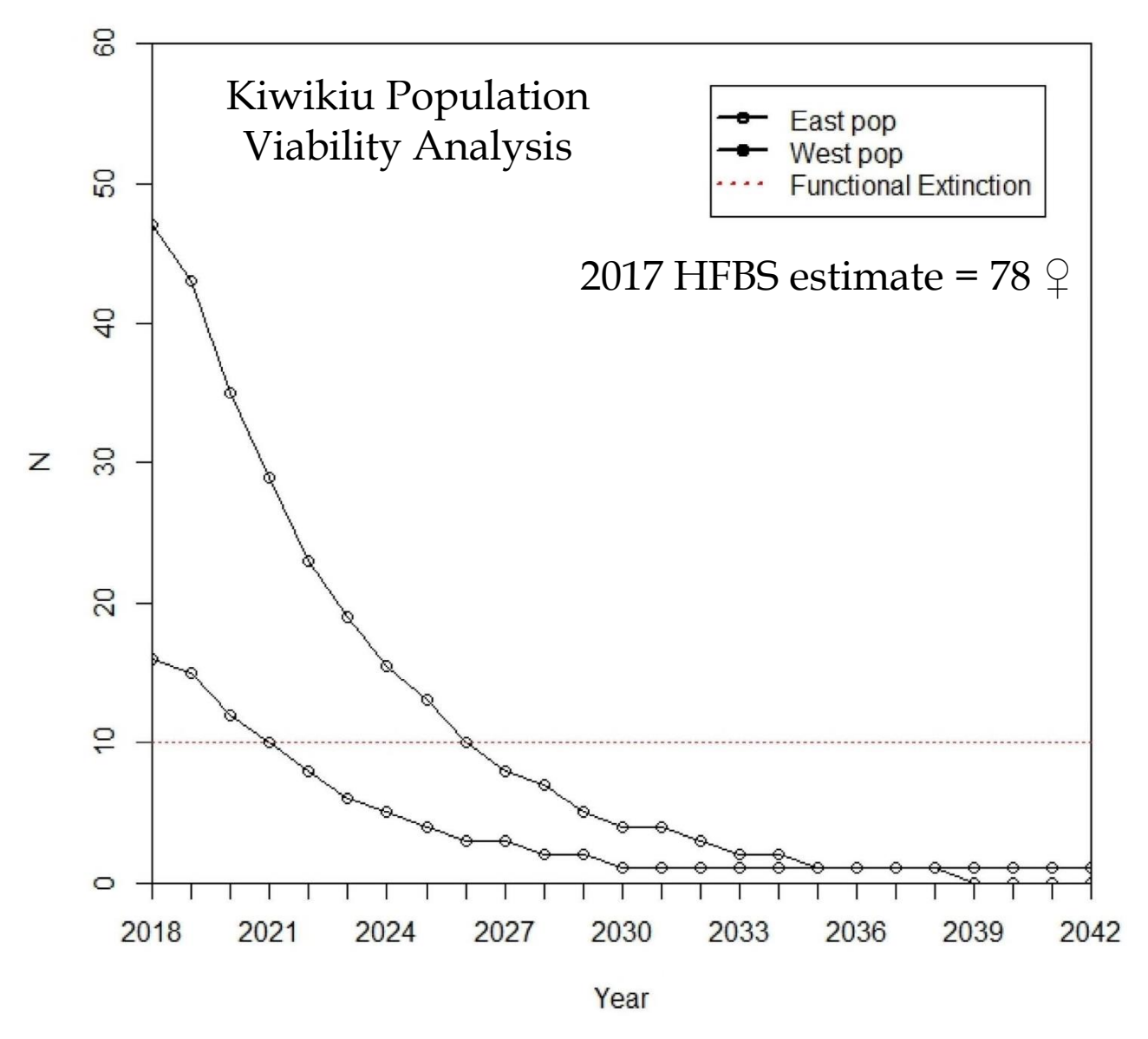


Extinction Estimates

- PVA: 5 years
  (Mounce et al. 2018)
- Expert elicitation: 4 years
  (Paxton et al. 2022)

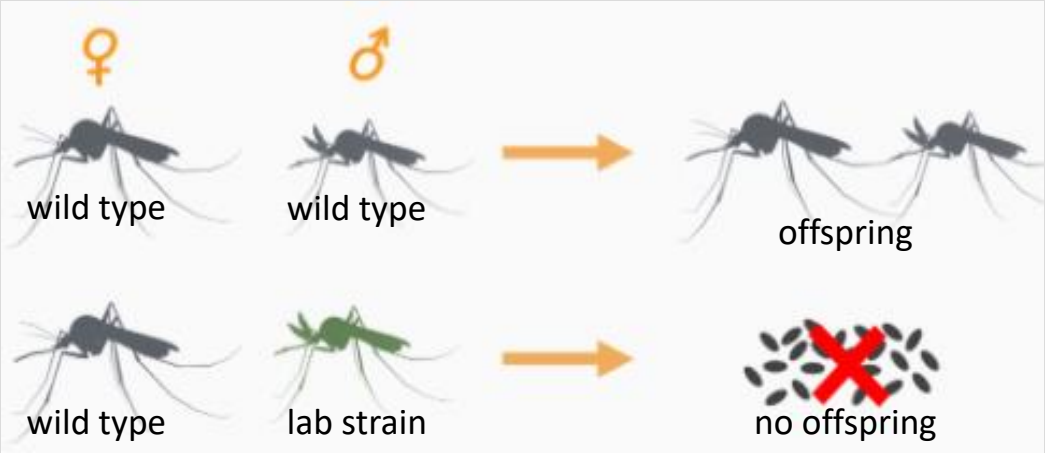


NEXT STEPS

1. Landscape-scale mosquito control
2. Safe-guard species in captivity
3. Management in the wild
4. Protection and restoration of high elevation native forests
5. Investigate a translocation to another high elevation island

Mosquito Control

- Landscape-level mosquito control via Wolbachia incompatibility
- Collecting avian blood samples and mosquitoes for disease prevalence, distribution, and genomics



I OLA NĀ MANU NAHELE
BIRDS
NOT MOSQUITOES

Safeguard Species in Captivity

- Bring up to 20 pairs into captive care
- Limits to captive care but species may not last until mosquito control
- Eventual release back into the wild (once mosquito control success parameters are met)

Management

- Management in the Wild
  - Predator control
  - Population monitoring

- Protecting and restoring high-elevation forests
  - Increasing ungulate-free areas, invasive species control, outplanting

Translocation?

- Investigate a translocation to Big Island
- Assess sites for habitat suitability and species interactions

Acknowledgements

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