



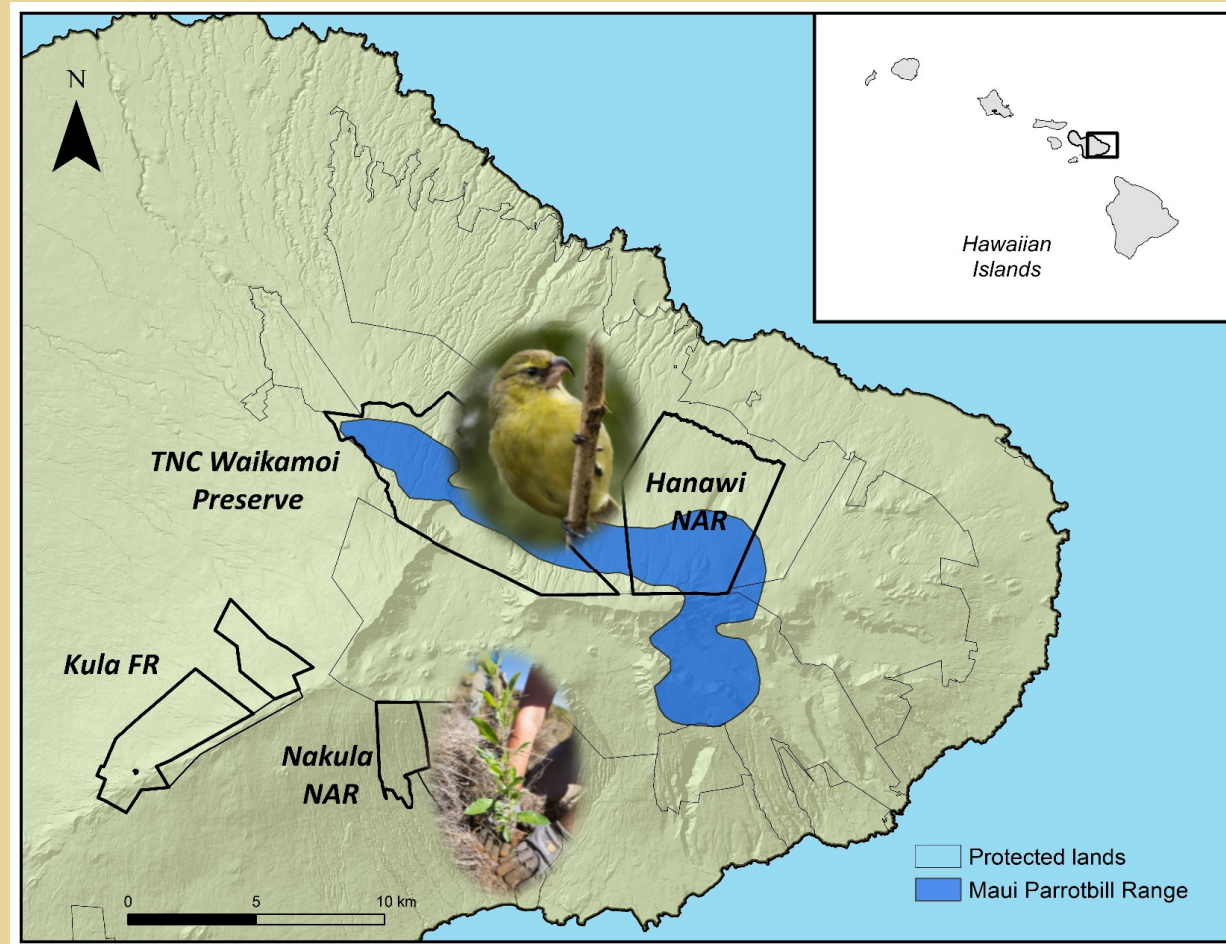
Predator control in The Nature Conservancy's Waikamoi Preserve

Laura Berthold, Chris Warren,
Hanna Mounce, and Alison Cohan

Native Bird Research and Recovery

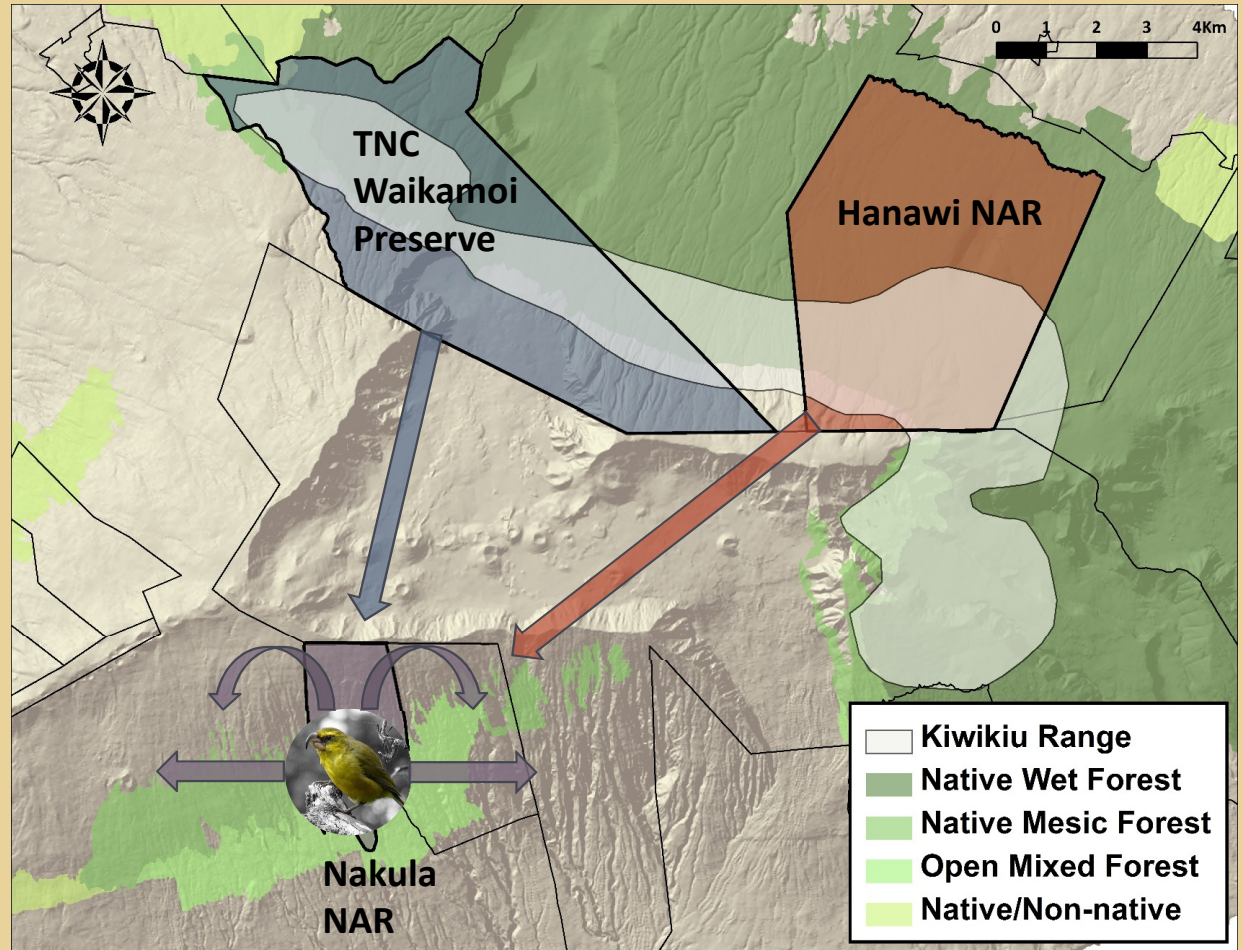
- **Kiwikiu (Maui Parrotbill)**

- Endangered Hawaiian Honeycreeper
- Threats: habitat degradation/loss, non-native predators, introduced mosquitoes and avian disease, climate change
- ~500 individuals on windward slope
- Next recovery goal: establish second population on leeward slope



Kiwikiu Reintroduction

- Both wild and captive Kiwikiu will be used for **reintroduction**
- Captive population only represents **eastern portion**
- Some wild birds will need to be sourced from **western portion**
 - Need to ensure most robust Kiwikiu population possible prior to removing individuals



Introduced Predators

- Climb trees and depredate eggs, nestlings, and nesting females
- Predator observations in The Nature Conservancy's Waikamoi Preserve



Photo by TNC Hawai'i

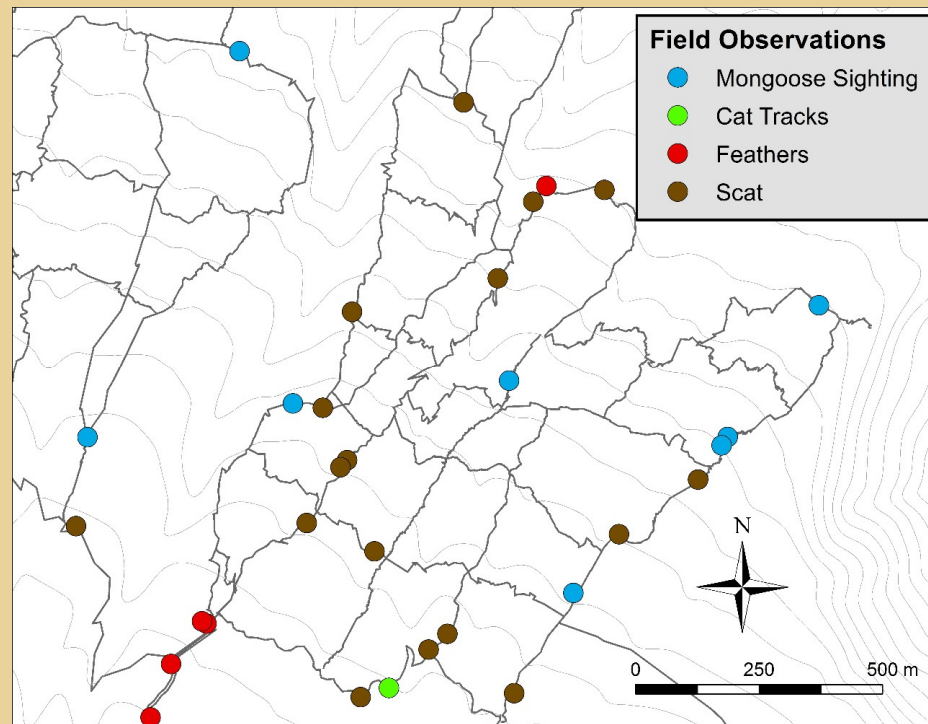
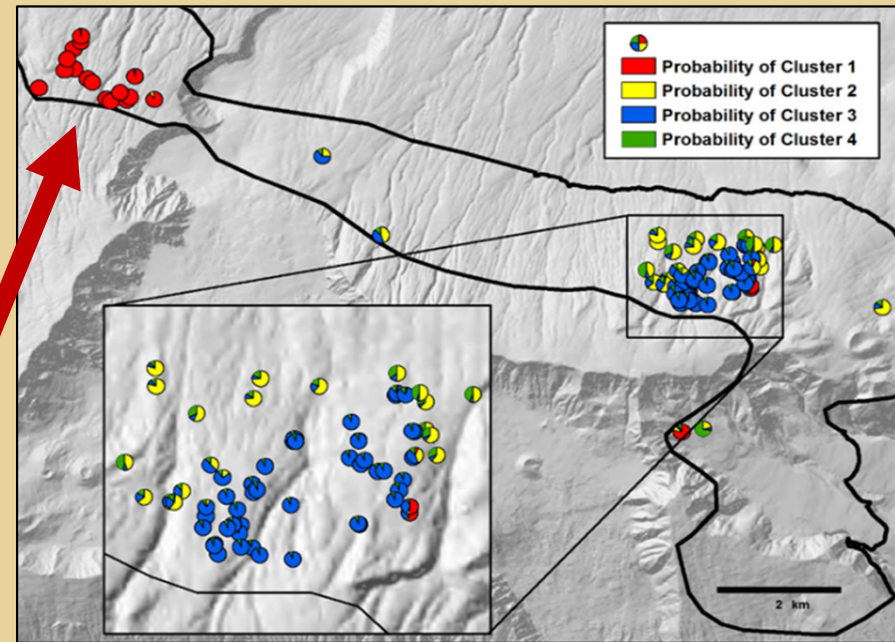


Photo by Jack Jeffrey

Predator Reduction Program

- Essential component of endangered species and habitat management
- No broad scale method to reduce or eliminate predators across Kiwikiu territory
- This predator reduction program focuses on localized area of TNC's Waikamoi Preserve
 - Edge of Kiwikiu range
 - Selection of individuals for reintroduction
 - Genetically distinct Kiwikiu population



Kiwikiu assignment probabilities to population genetic clusters from STRUCTURE. Mounce et al. 2012.

The Nature Conservancy's Waikamoi Preserve

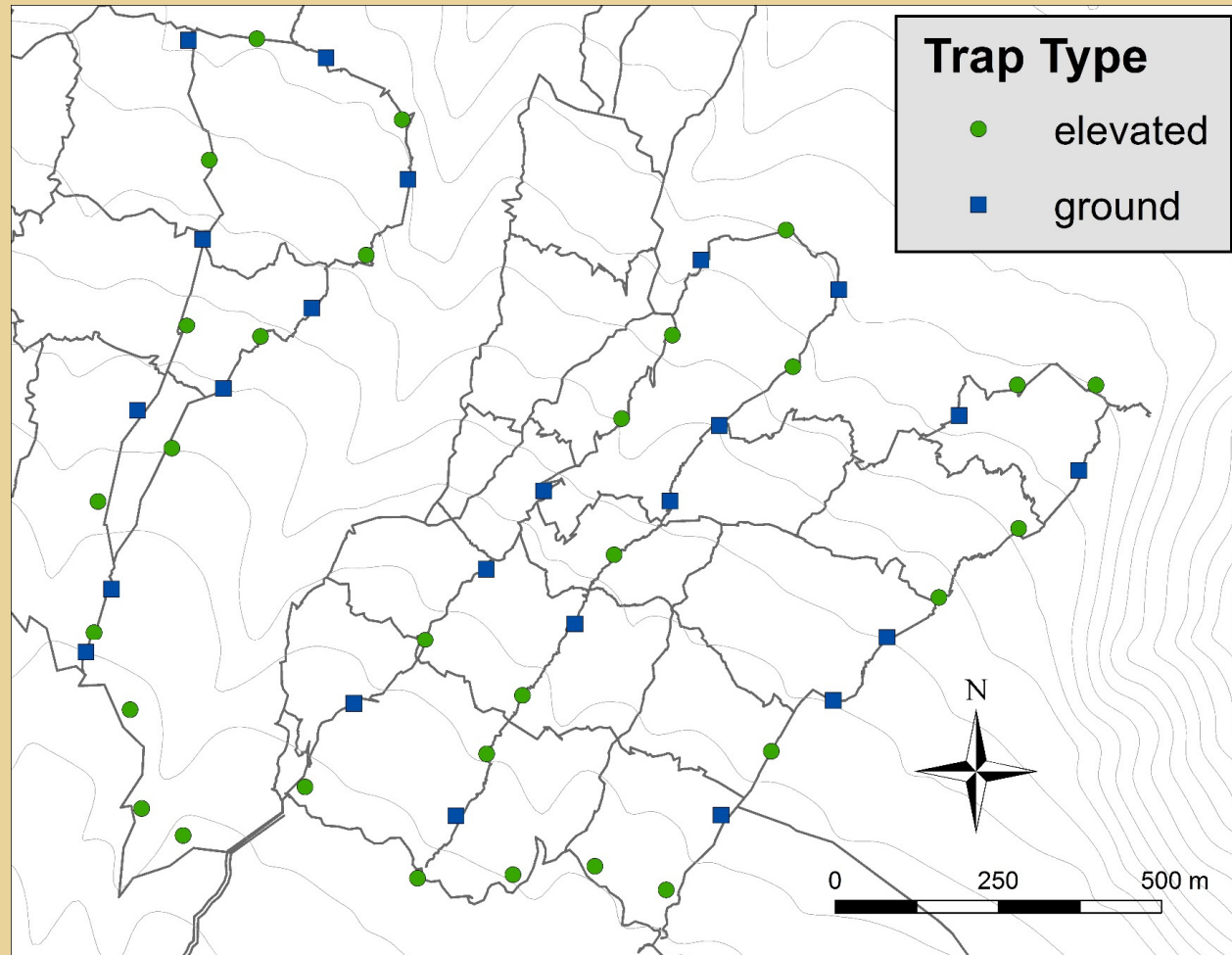
- Established in 1983
- Transitional wet-mesic native forest
- Kiwikiu demographics researched 2011-2014



Photo by Zach Pezzillo

Trapping Methods

- Conibear 220 traps
- Trapping area:
 - 178.5 ha (1.78 km²)
 - 5300-6200 ft
 - Over 50 stations incl. 70-80 Conibears, stations 100-150 m apart



“Ground” and “Elevated” trap styles



Bait and Lures

- Behind the trap **vs** tied to the whiskers
- Variety of bait and lures



BAITS	LURES
Greased cat food	Catnip
Sardines	Feathers
Hot dogs	Tinsel
Pro baits	Clam juice
Wax blocks	Oyster Sauce
Cat treats	Fish juice

Game Cameras



Trapping Results

- November 2015-May 2017
 - 26 checking sessions
 - 13-55 days in between sessions



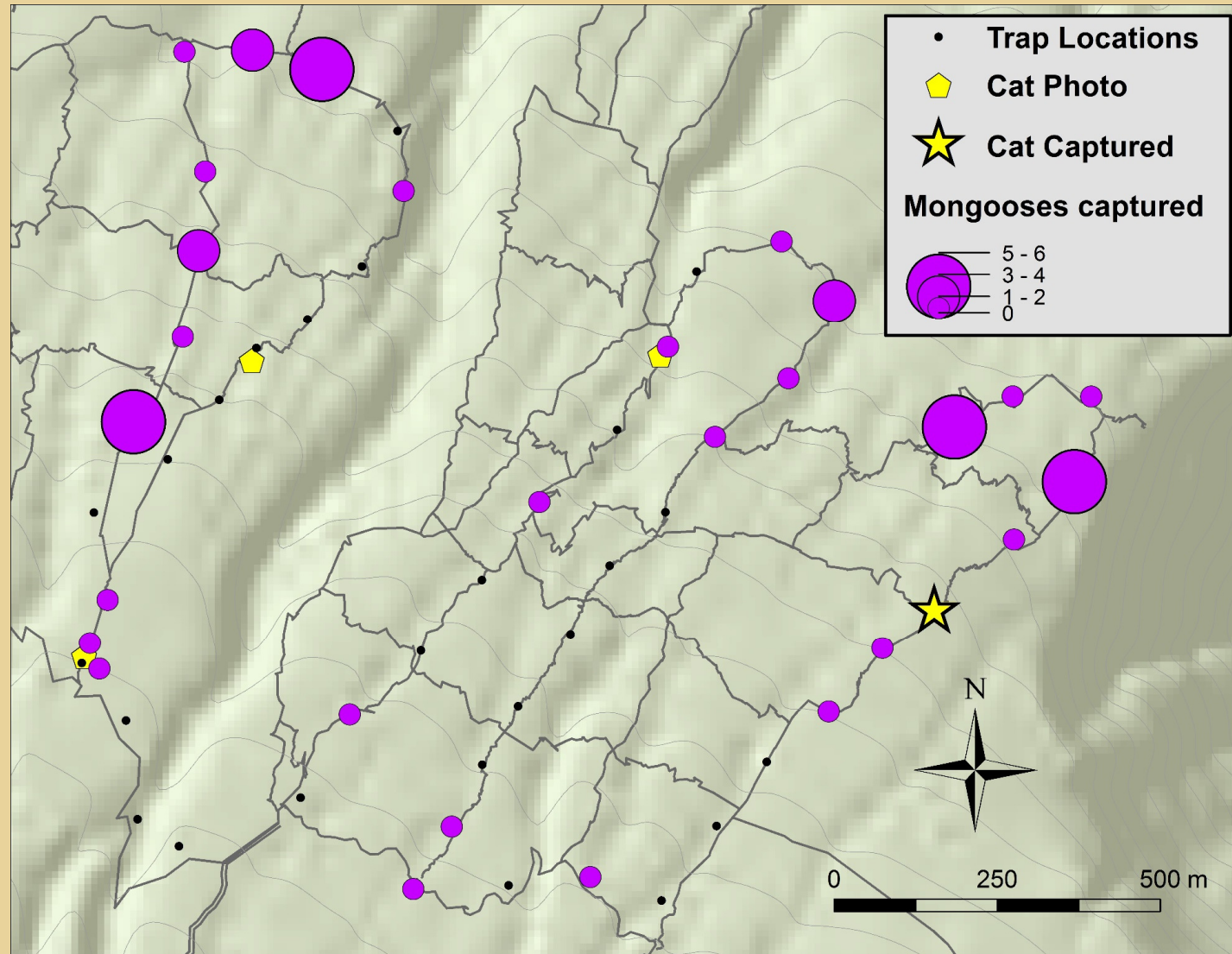
Total Animal Captures in TNC's Waikamoi Preserve

Rats	Mongoosees	Cats
211	57	1

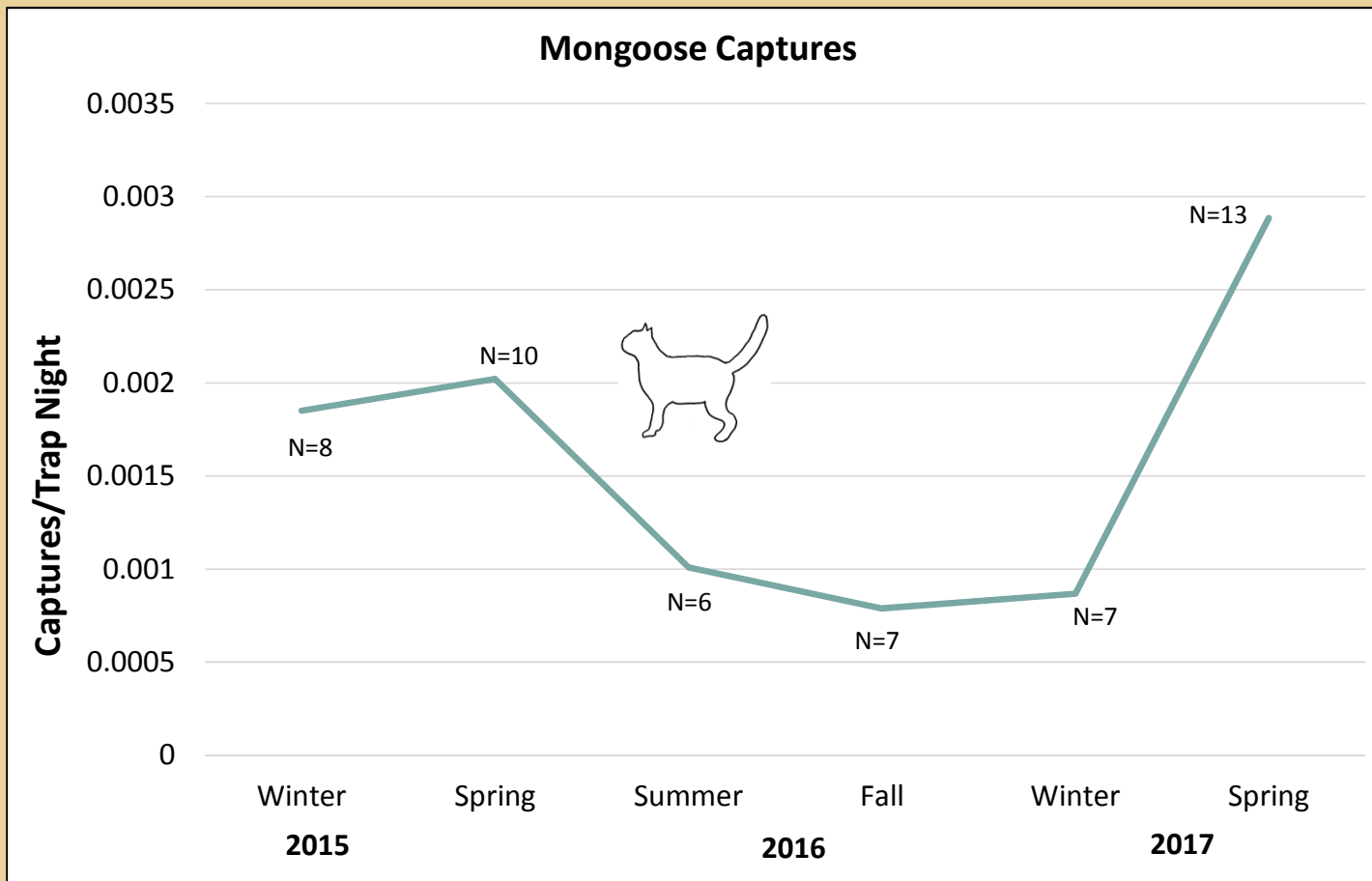
- $\text{Trap Nights} = (\text{Nights} * (\# \text{traps-INOP})) = 39262$

Mongoose & Cat Captures

- Mongoose captures
 - Perimeter of site
 - High-capture stations
- Cats throughout site
 - Based on game cameras, scat, and 1 capture

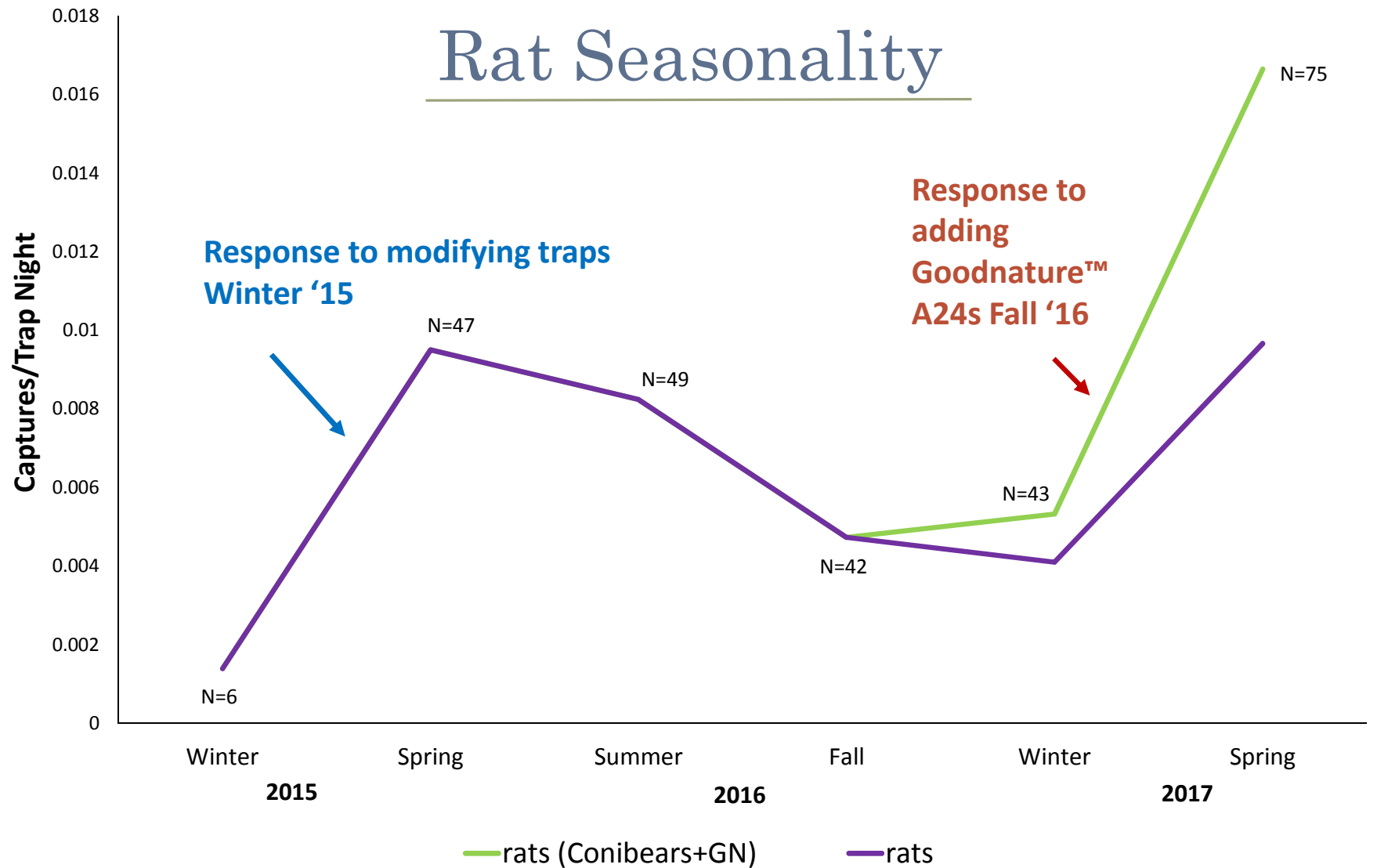


Mongoose & Cat Seasonality



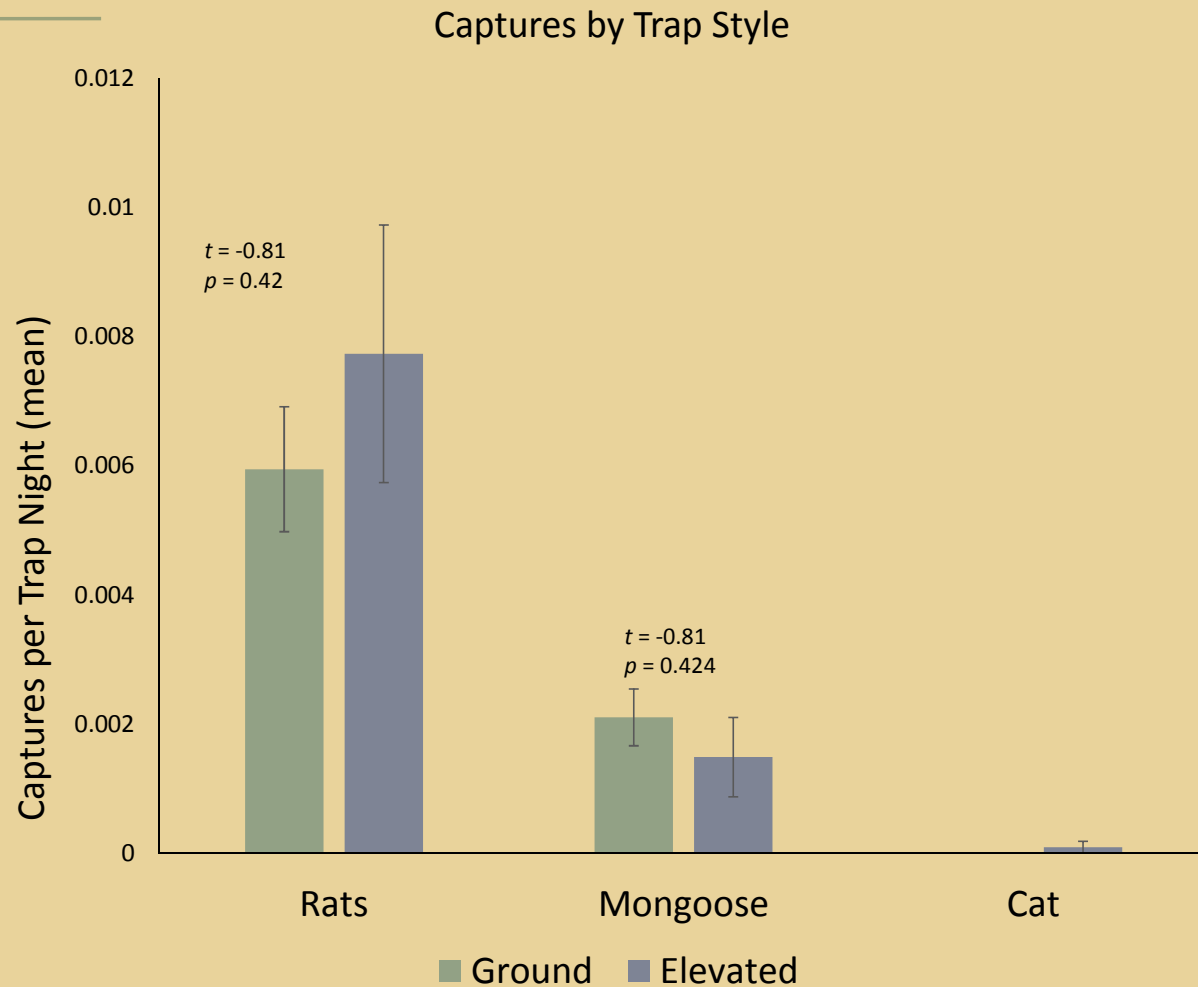
- Mongooses:
 - Fluctuation possibly due to their breeding (Mar-May, Oct-Dec)
- Cats:
 - Summer capture
 - Game cameras: Jan, Mar, Nov

Rat Seasonality



Ground vs. Elevated

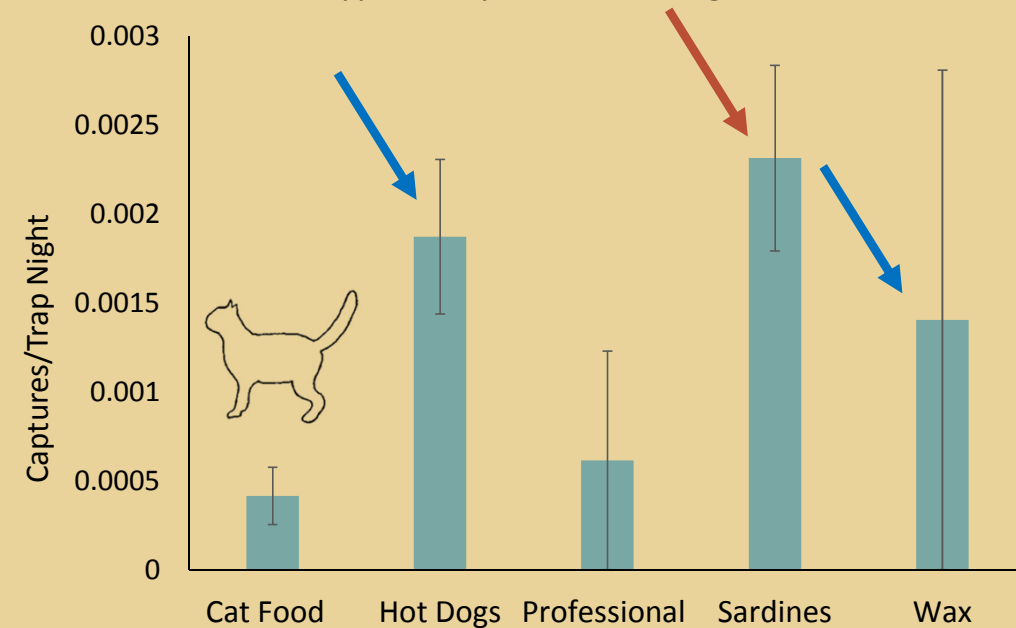
- No significant capture difference between two styles of stations
- Why use both?
 - Elevated: caught cat
 - Ground: 2 traps= same effort



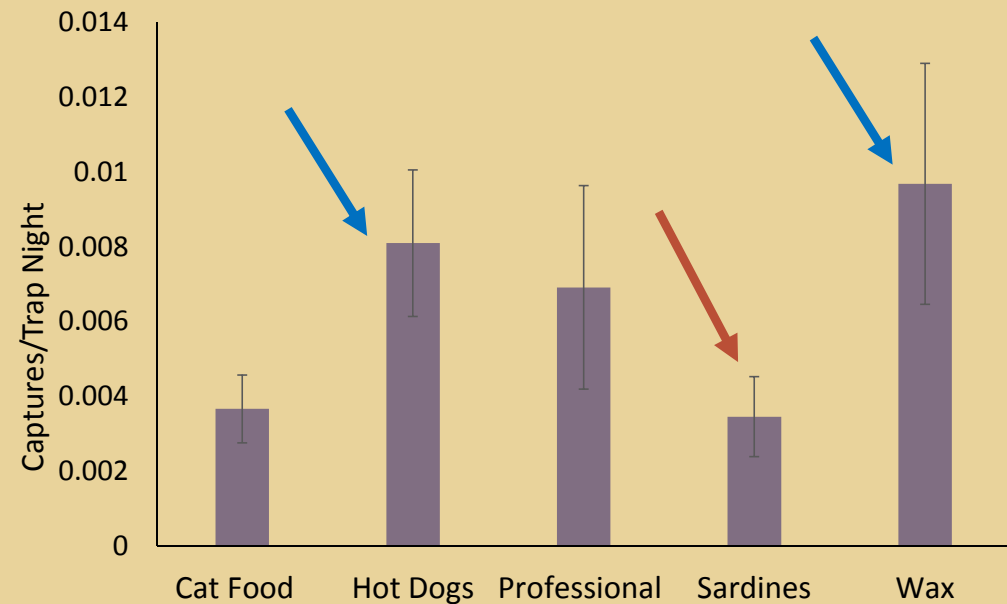
Bait Preference

- Want something that will last long, be attractive for cats/mongoose AND rats won't steal
 - Canned Sardines
- Baits tied onto whiskers tend to capture rats more often
 - Hot dogs and wax

Bait Type Comparison - Mongoose



Bait Type Comparison - Rats



Observations & Future

- Mongooses: captures suggest well-established population
- Cats: 1 captured plus 1-2 others on camera
 - 1 cat can do a lot of damage
 - May be seasonal. Travel over long distances and have large territories
- DOC250s
- Rats: Bycatch, Bait thieves, Obstruct traps
 - Goodnature™ A24s around Conibear stations

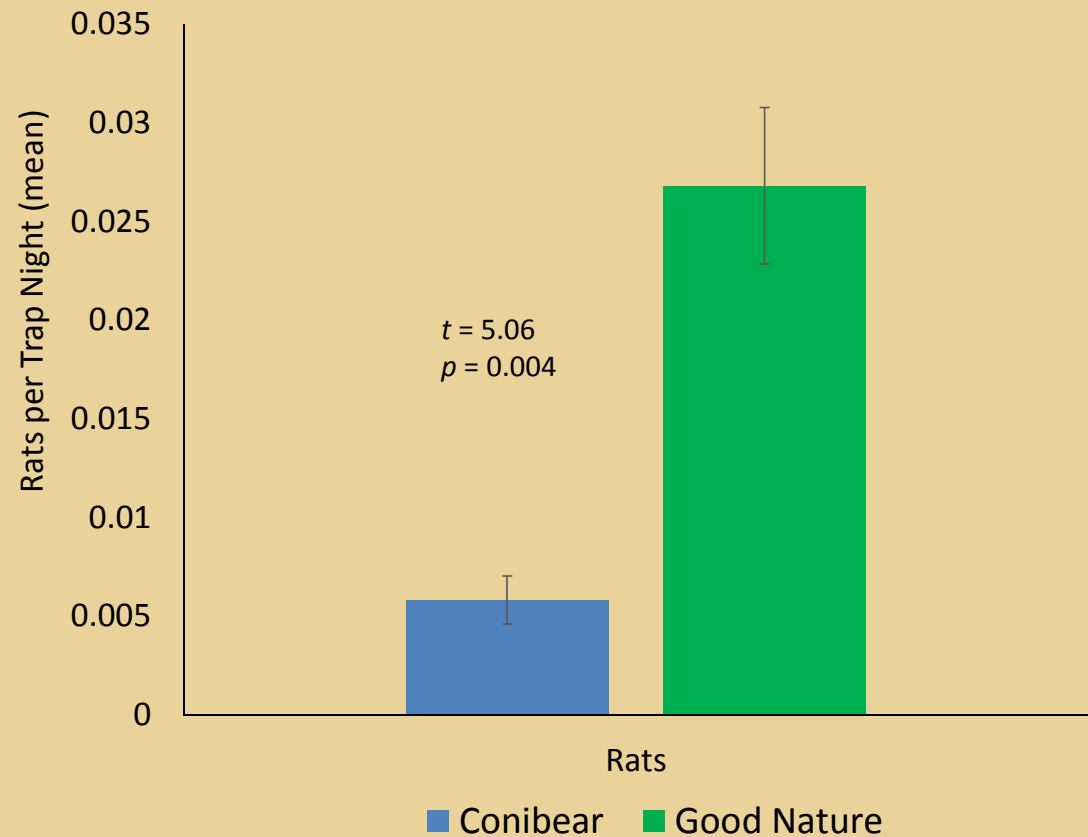


Goodnature™ A24s

- Prevent bait theft and Conibear obstruction
- More efficient trap
- Plans to expand



Rat Captures by Trap Type





Acknowledgements

