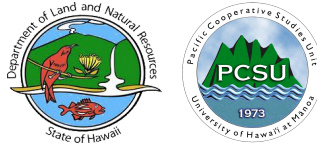


# Composition of Native Forest Birds Captured on East Maui



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# INTRODUCTION

- Mist netting can be used to monitor species composition, local abundance, and demography of bird populations (2). This tool is used to supplement population monitoring methods and known to detect more cryptic birds than aural and visual survey methods (see [2] for more references).
- Capture allows birds to be examined to assess traits that often cannot be seen from afar — such as health, sex, and breeding status. While in the hand, blood and fecal samples can be taken for further analyses, and applying color bands can be used for mark-recapture studies to estimate survival and productivity (2).
- Maui Forest Bird Recovery Project works to recover native Hawaiian forest birds and their habitats. Mist netting is an ecological technique that we use to gain insight into factors affecting these populations (1). We have collected an abundance of data over many years. Here we review our mist net capture data for composition of native species captured in four locations on east Maui, Hawai'i.

# SEX RATIO

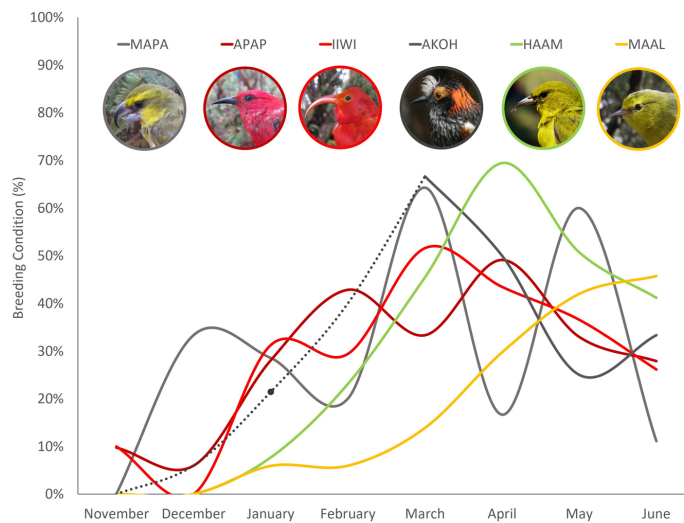


Given an equal sex ratio in the wild, we expected to capture a 50:50 ratio of male to female individuals. General patterns by species indicate:

- 'Ōiwi and 'Alauahio – Yes
- 'Alauahio and Kiwikiu – No
  - Expected given target banding, male aggression
- 'Ākohekohe and 'Amakihi – No
  - Unexpected, **could** suggest a skewed sex ratio in wild

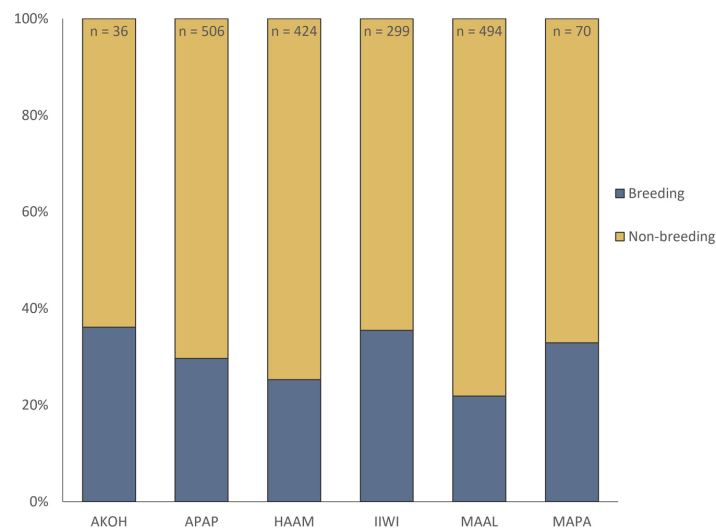
# BREEDING

## Seasonality



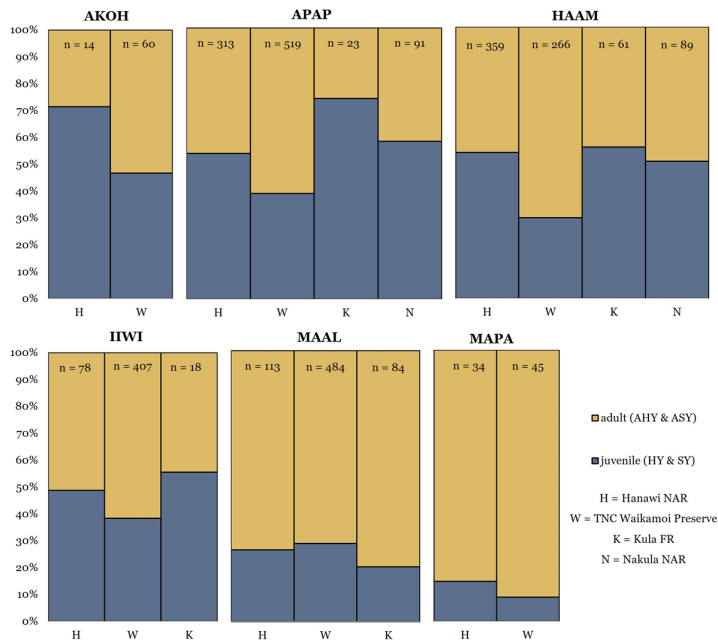
- In most species, breeding peaks March-April
- Kiwīkiu: little pattern; known to breed year-round.
- 'Alauahio: late breeding season
- 'Ākohekohe: possibly March-April like other nectarivores; low *N* for some months

## Breeding:Non-breeding Ratio



- We captured a similar proportion of breeding (20-30%) to non-breeding in all species. These are based on birds with a cloacal protuberance (CP) or brood patch (BP) scores >1.

# AGE STRUCTURE



As expected, we caught more adults at all sites than juveniles.

Observations below are based on raw banding data.

## Species variation

Proportion of juveniles to adults varied by species. We caught few juvenile Kiwiku and a high proportion of juvenile nectarivores (~50%). This is likely related to productivity, e.g. Kiwiku have one chick at a time.

## Site variation

Slightly more juveniles in Hanawi than Waikamoi.

- Higher breeding success in Hanawi? Kiwiku densities are known to be higher.

Slightly higher proportion of juvenile 'Apapane in leeward sites. This is not the case in 'Amakihi.

- Lower adult survival?
- Higher breeding success?
- Time of year bias?

# METHODS

- o Locations: Four sites (see slideshow).
- o Setup: 1-30 nets, sunrise-sunset, weather permitting. Nets: 6-18m long, 36mm mesh, supported by 5-6m collapsible poles. Strategy: Passive and target netting (using playback).
- o Data collected: weight, age, breeding status, morphometrics.
- o Bands: US Fish and Wildlife Service metal numbered band and colored bands for certain species.
- o Limited analyses to six native species (see slideshow). Compiled data from all sites, focused on sex, age, and breeding status of the birds captured.
- o Table below presents total number of birds captured and percent that were native.

Location	Total New Birds Captured from 2009-2016	# of Native Birds Captured	Percent Native Birds Captured
Hanawi Natural Area Reserve	1,247	956	77%
The Nature Conservancy's Waikamoi Preserve	2,453	1,827	75%
Nakula Natural Area Reserve	486	182	37%
Kula Forest Reserve	208	147	71%
All Sites TOTAL	4,394	3,112	71%

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# SUMMARY

- Using mist nets as a tool for research requires immense effort. It is time- and training-intensive. However, we are working with species that can be difficult to detect necessitating the use of multiple methods.
- Our banding has focused largely on Kiwiku productivity. As a result, our banding effort is not standardized. This introduces potential biases. These include unaccounted for variation in net placement within sites (non-random), net height (low, targeting understory), and net hours per season and site.
- Our results raise a number of research questions especially regarding variation in population structure and breeding behavior among species and as a function of site or habitat type.

## Literature Cited

- 1.) Albert SA, DeSante DF, Kaschube R, Saracco JF. 2016. MAPS (Monitoring Avian Productivity and Survivorship) data provide inferences on demographic drivers of population trends for 158 species of North American land birds. *North American Bird Bander* 40.4 and 40.1: 133-140. The Institute for Bird Populations, Point Reyes Station, CA.
- 2.) Dunn EH and Ralph CJ. 2004. Use of mist nets as a tool for bird population monitoring. *Studies in Avian Biology* 29: 1-6.

## Acknowledgements

Maui Forest Bird Recovery Project is a part of the University of Hawai'i Pacific Cooperative Studies Unit-RCUH. Funds were provided by US Fish and Wildlife Service, Hawai'i Department of Land and Natural Resources-Division of Forestry and Wildlife, American Bird Conservancy, and private donors. This work was all done through partnerships and land access provided by The Nature Conservancy of Hawai'i and the State of Hawai'i Department of Land and Natural Resources. Special thanks to all of our banding volunteers and research assistants over the many years of this project.