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:

- 'Iiwi and 'Apapane – 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
- Kiwikiu: 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.
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 Kiwikiu and a high proportion of juvenile nectarivores (~50%). This is likely related to productivity, e.g. Kiwikiu have one chick at a time.

Site variation

Slightly more juveniles in Hanawi than Waikamoi.

- Higher breeding success in Hanawi? Kiwikiu 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

- Locations: Four sites (see slideshow).
- Data collected: weight, age, breeding status, morphometrics.
- Limited analyses to six native species (see slideshow). Compiled data from all sites, focused on sex, age, and breeding status of the birds captured.
- Table below presents total number of birds captured and percent that were native.

<table>
<thead>
<tr>
<th>Location</th>
<th>Total New Birds Captured from 2009-2016</th>
<th># of Native Birds Captured</th>
<th>Percent Native Birds Captured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hanawi Natural Area Reserve</td>
<td>1,247</td>
<td>956</td>
<td>77%</td>
</tr>
<tr>
<td>The Nature Conservancy’s Waikamoi Preserve</td>
<td>2,453</td>
<td>1,827</td>
<td>75%</td>
</tr>
<tr>
<td>Nukula Natural Area Reserve</td>
<td>486</td>
<td>182</td>
<td>37%</td>
</tr>
<tr>
<td>Kula Forest Reserve</td>
<td>208</td>
<td>147</td>
<td>71%</td>
</tr>
<tr>
<td>All Sites TOTAL</td>
<td>4,394</td>
<td>3,112</td>
<td>71%</td>
</tr>
</tbody>
</table>
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 Kiwikiu 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


Acknowledgements

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