Non-breeding Season Movements of ‘Akikiki and Other Endangered Endemic Forest Birds on Kaua‘i

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Introduction

- Three of six endemic forest birds of Kaua‘i are critically endangered: ‘Akikiki (*Oreomystis bairdi*), ‘Akeke‘e (*Loxops caeruleirostris*), and Puaiohi (*Myadestes palmeri*)
- Native forest birds are restricted to the high-elevation Alaka‘i Plateau, where the threat of contracting avian malaria is reduced
- Our study used radiotelemetry to examine non-breeding season movements of younger birds, to see if they were dispersing to lower elevation habitats where they are more likely to come in contact with malaria
- This preliminary study is the first to examine movements outside of the breeding season

Methods

- We captured and attached transmitters to two ‘Akikiki, one ‘Akeke‘e, and three Puaiohi in the fall of 2014
- We attempted to relocate birds at least bi-weekly, using radiotelemetry from helicopter and on foot
- 2 antennas were used for helicopter telemetry flights, and bird locations were determined as the point where a transmitter signal was of equal strength from both antennas
- Bird locations detected on the ground were estimated with single-bearing or multi-bearing projections
- Max territory axis is the longest distance that can be drawn between 2 detection points of a single bird’s area of activity
- ‘Akikiki and ‘Akeke‘e transmitters were expected to be active for up to 3 weeks; Puaiohi transmitters up to 3 months, though Puaiohi were able to remove their transmitters much sooner. We did not attempt to track birds every day of these active periods.

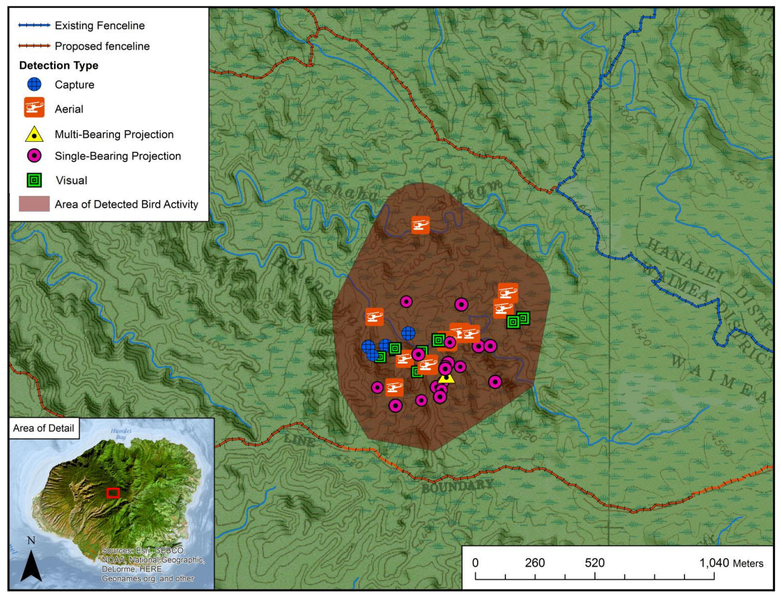
Above Left: trimming the feathers of an ‘Akikiki to prepare for transmitter attachment. Above Right: Juvenile Puaiohi with transmitter successfully attached.

Results

- ‘Akikiki moved up to 524 meters between successive detections, and had a max territory axis of 985 meters
- The ‘Akeke‘e moved up to 335 meters between successive detections, and had a max territory axis of 781 meters
- Puaiohi moved up to 651 meters between successive detections, and had a max territory axis of 836 meters
- Birds moved a lot and were much harder to detect than expected, and many times birds were not detected at all

Table 1. Summary of radiotelemetry data from six radiotagged birds.

Species	Total days transmitter active	Total telemetry points obtained	Max distance from capture site (m)	Max distance from previous detection (m)	Max territory axis (m)
‘Akikiki	18	4	551.7	524.13	985.1
‘Akikiki	19	10	368.8	320.1	760.6
‘Akeke‘e	17	7	343.5	335.9	781.1
Puaiohi	10	10	657.5	425.4	610.5
Puaiohi	11	5	371.5	248.1	796.6
Puaiohi	17	3	651.5	651.5	836.7



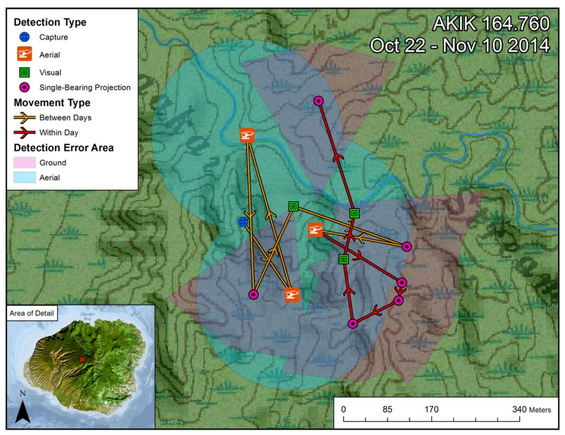


Figure 1 (above). Detections of all radiotagged birds, and area that they likely used.

Figure 2 (left). Example of a single bird’s movements throughout the study period. Error areas were determined based on transmitter detection errors calculated from known location trials.

Discussion

- ‘Akikiki made larger, more frequent movements than have been observed in previous telemetry studies during the breeding season
- Very little continues to be known about ‘Akeke‘e; the individual in this project was the first of its species to receive a radiotransmitter
- All Puaiohi made movements upstream towards a similar location
- In previous efforts during the breeding season observers were able to locate birds and visually confirm all locations for each attempt, whereas we had much more difficulty re-sighting the birds in the fall
- We expected these younger birds to have different movements than older birds during the breeding season, but did not anticipate the increased difficulty of detection
- Young birds possibly dispersed to areas outside of our study area. A short flight (2-3 km) would take them to a much lower elevation area off of the Plateau
- Birds also may have used different microhabitats within the study area than in the breeding season, spending more time in areas that made it harder for us to detect them, i.e. within drainages or valleys, and less time on ridges or canopies
- Future telemetry efforts should test the effectiveness of these transmitters on different areas of the landscape, to determine if they are detectable in complex geographical features

Conservation Implications

- The Halepa‘akai stream area is an important and relatively intact habitat for these birds
- Identifying high activity centers for birds can help us better determine areas in need of conservation action
- Mosquito control, predator fencing, invasive plant removal should be conducted within core areas
- If birds are leaving the Plateau, they are at higher risk for contracting malaria. Mosquito control should be considered even beyond the Plateau
- As malaria is one of the biggest conservation issues facing these birds, further exploration of bird – and even mosquito – distribution and movement will be helpful

Acknowledgements

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