

# Continued decline in Maui's endemic honeycreepers: 2017 east Maui HFBS

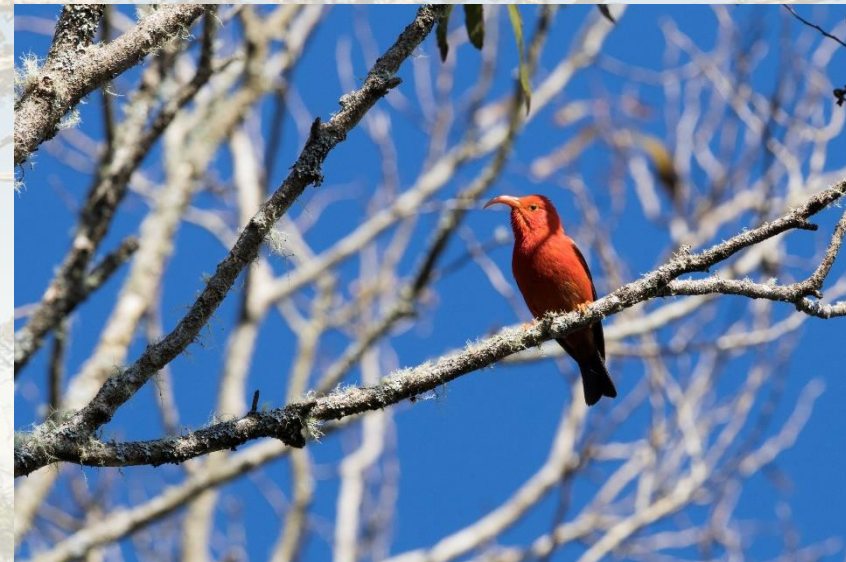


Warren, C.C., S.W. Judge, R.J. Camp, H.L. Mounce, L.K. Berthold,



# Why do we count birds?

- Expensive, time- and labor-intensive, just plain difficult
- Abundance estimates are difficult to interpret, imprecise
  - What does it mean to you that there are 200,000 'Apapane? Is that a lot?
- Very low abundance – alarm
  - Is that a viable population?
- **Trends**
  - Abundance over time
  - Changes in distribution





# Hawai'i Forest Bird Survey

- Began in 1976 to “identify areas requiring protection, research priorities, and management strategies”.
- At the forefront of standardized bird “point count” survey methods.
- Goals, for each bird species, identify:
  1. Distribution
  2. Population Size
  3. Density by vegetation type and elevation
  4. Habitat response
  5. Geographical areas where more study is required
- Repeated on ~5-year cycle



FIGURE 2. Field crew for the Kau forest bird survey of 1976. (Photograph by Miles Nakahara)

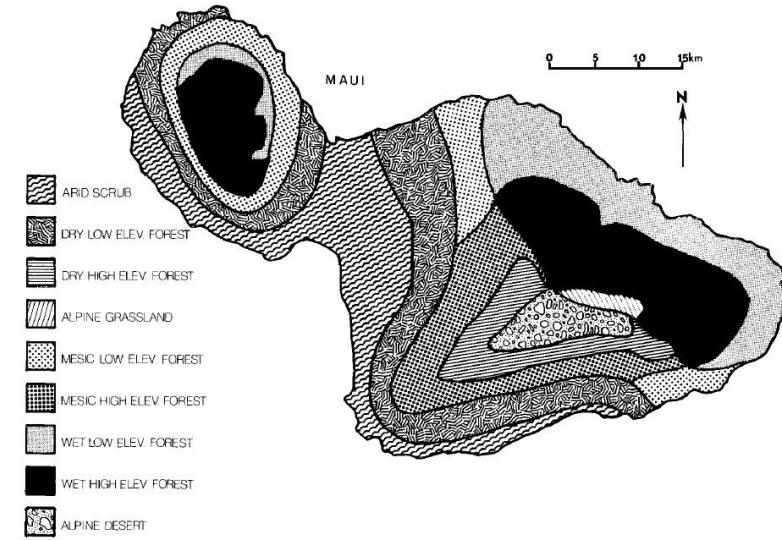


FIGURE 5. Vegetation zones of Maui, after Ripperton and Hosaka (1942).





# Maui's "Lost and Found" Honeycreepers



- Maui was under sampled in 19<sup>th</sup> century – distributions unknown
- 1950 – L. Richards & P. Baldwin, "Rediscovery" of Maui Parrotbill, 'Akohekohe, and Maui 'Akepa
- 1967 – W. Banko, "Rediscovery of Maui Nukupu'u and Maui Parrotbill" – Kīpahulu Valley
- 1976 – Po'ouli Discovered – sensational
- 1980 – HFBS found 9 extant species in East Maui

REDISCOVERY OF MAUI NUKUPUU,  
*HEMIGNATHUS LUCIDUS AFFINIS*,  
AND SIGHTING OF MAUI PARROTBILL,  
*PSEUDONESTOR XANTHOPHRYS*,  
KIPAHULU VALLEY, MAUI, HAWAII

WINSTON E. BANKO

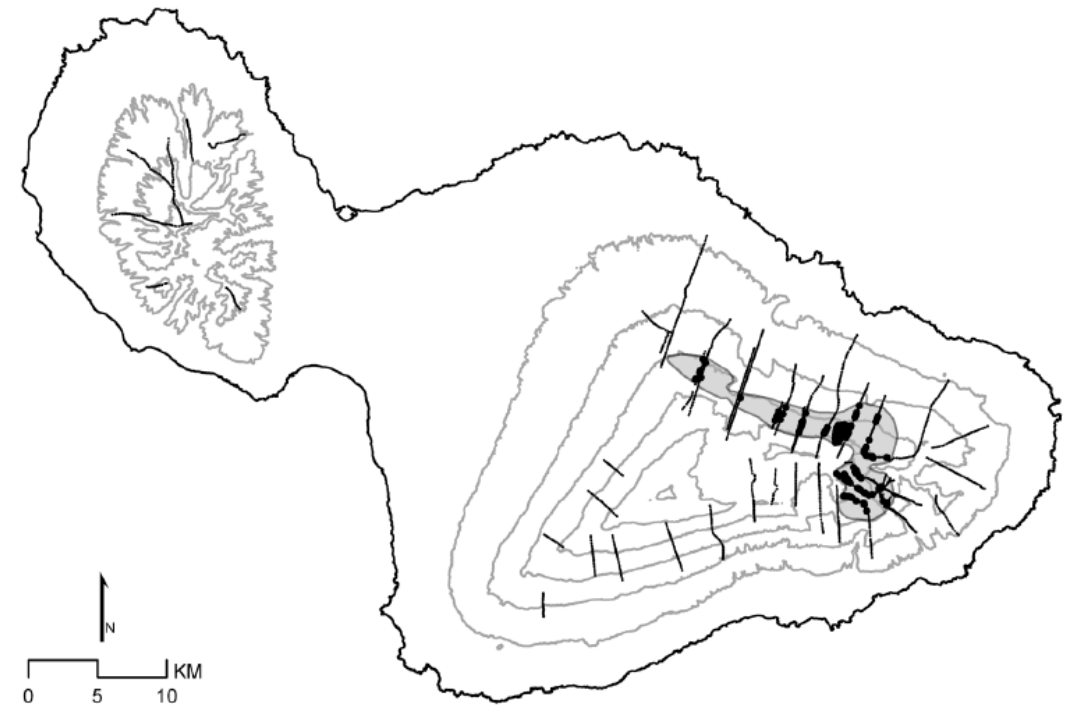
Bureau of Sport Fisheries and Wildlife  
U.S. Department of the Interior  
Hawaii National Park, Hawaii 96718





# East Maui Trends prior to 2010's (Camp et al. 2009)

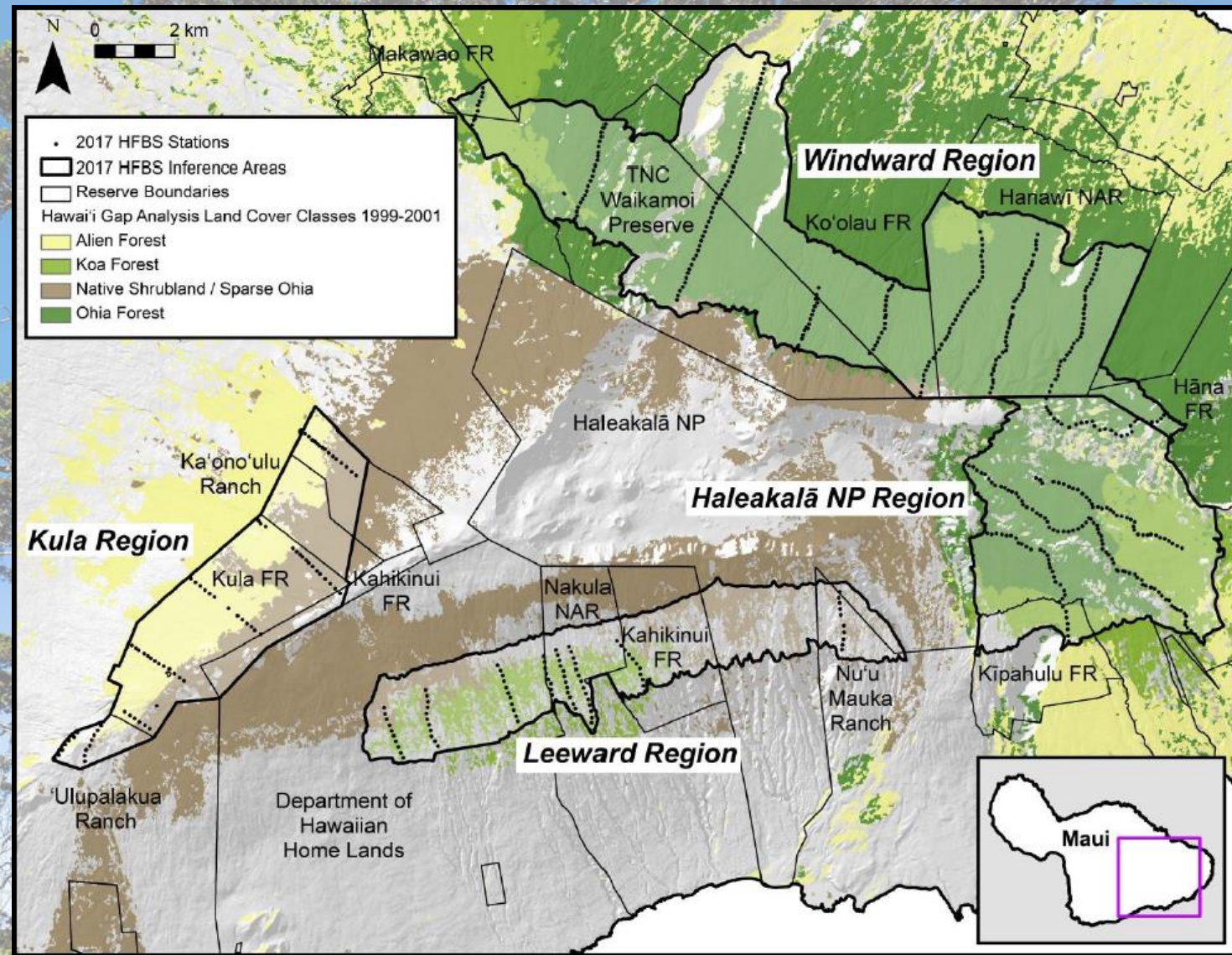
- Long-term trends 1980-2001
  - Kiwikiu (Maui Parrotbill) – **stable**
  - 'Akohekohe - **increasing**
  - Maui 'Alauahio – **increasing**
  - Hawai'i 'Amakihi – **increasing**
  - 'I'iwi – **increasing**
  - 'Apapane - **increasing**





# The 2017 East Maui HFBS

- Largest effort since 1980 survey
- Involved > 10 agencies
- Coordinated by Maui Forest Bird Recovery Project (MFBRP), The National Park Service Inventory and Monitoring Program Pacific Islands Network (PACN), and Hawai'i State Department of Forestry and Wildlife (DOFAW).
- 32 transects within 4 regions



Auwahi Wind





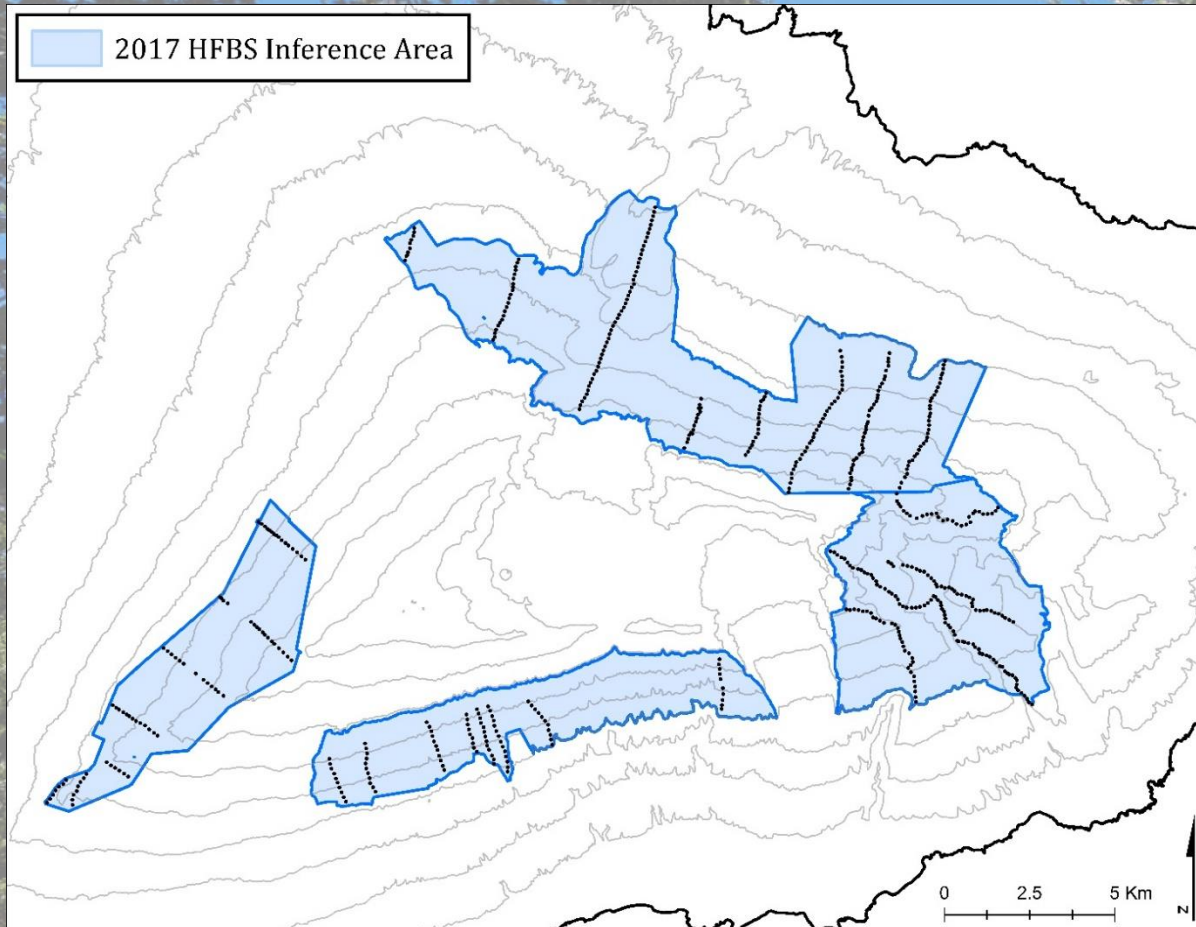
# Conducting the counts

- Clearing and flagging transects
  - “Recently” surveyed transects
  - Historic transects
  - New transects
- Counting
  - Designated stations
  - Record distance to all birds detected, sight and sound





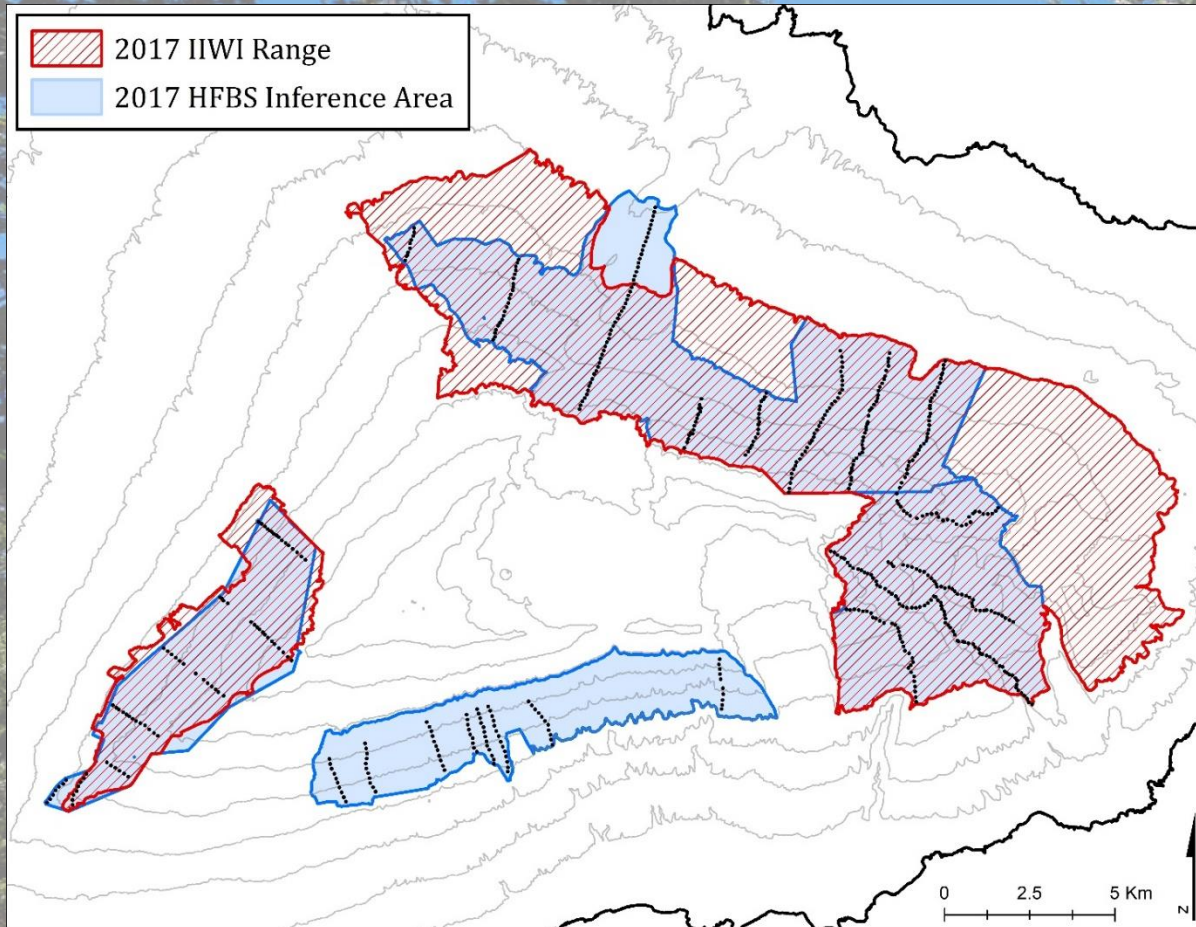
# Inference Area



- Area densities may be applied
- Overall = 14,600 ha
- 4 Species-specific areas
  - 'I'iwi: 11,226 ha
  - Maui 'Alauahio: 9,179 ha
  - Kiwikiu: 2,992 ha
  - 'Ākohekohe: 2,363 ha



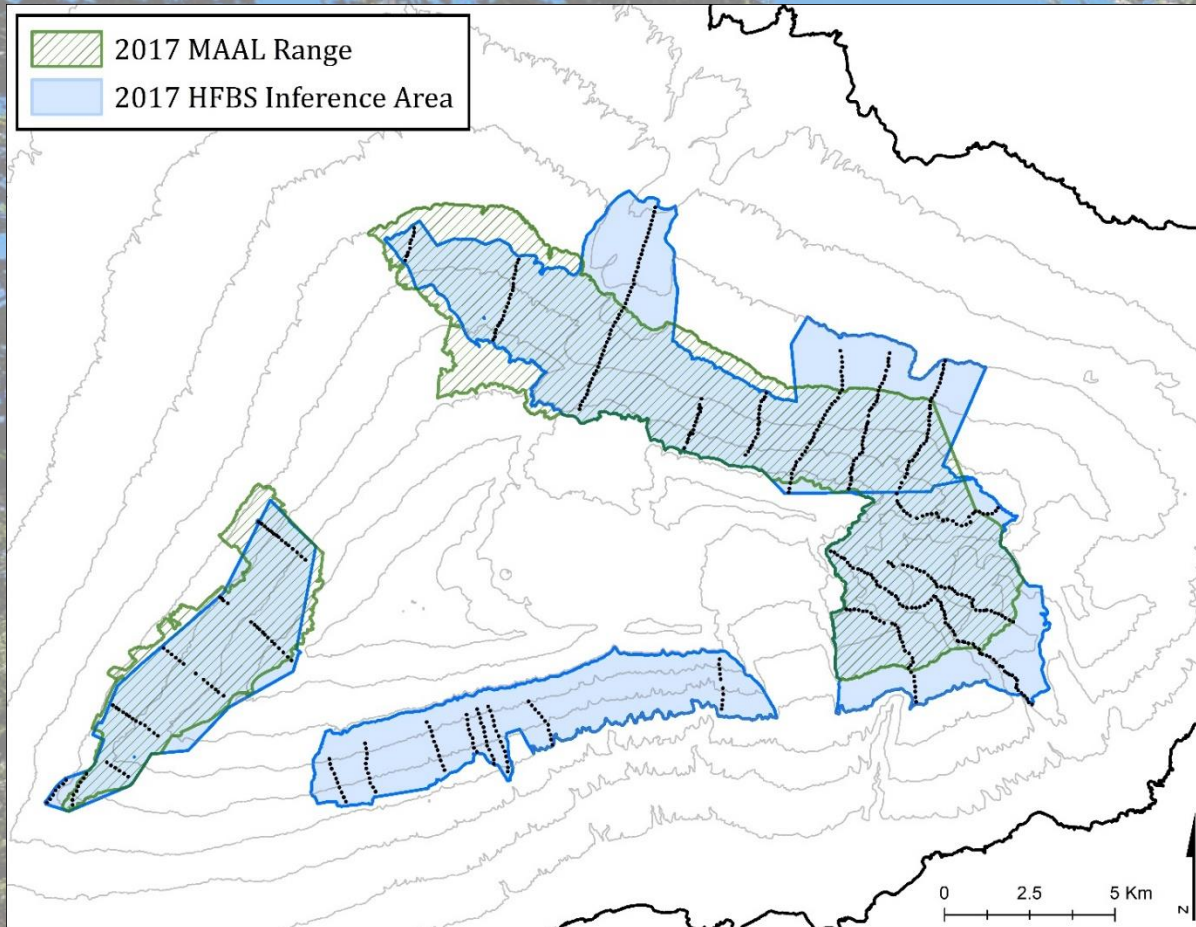
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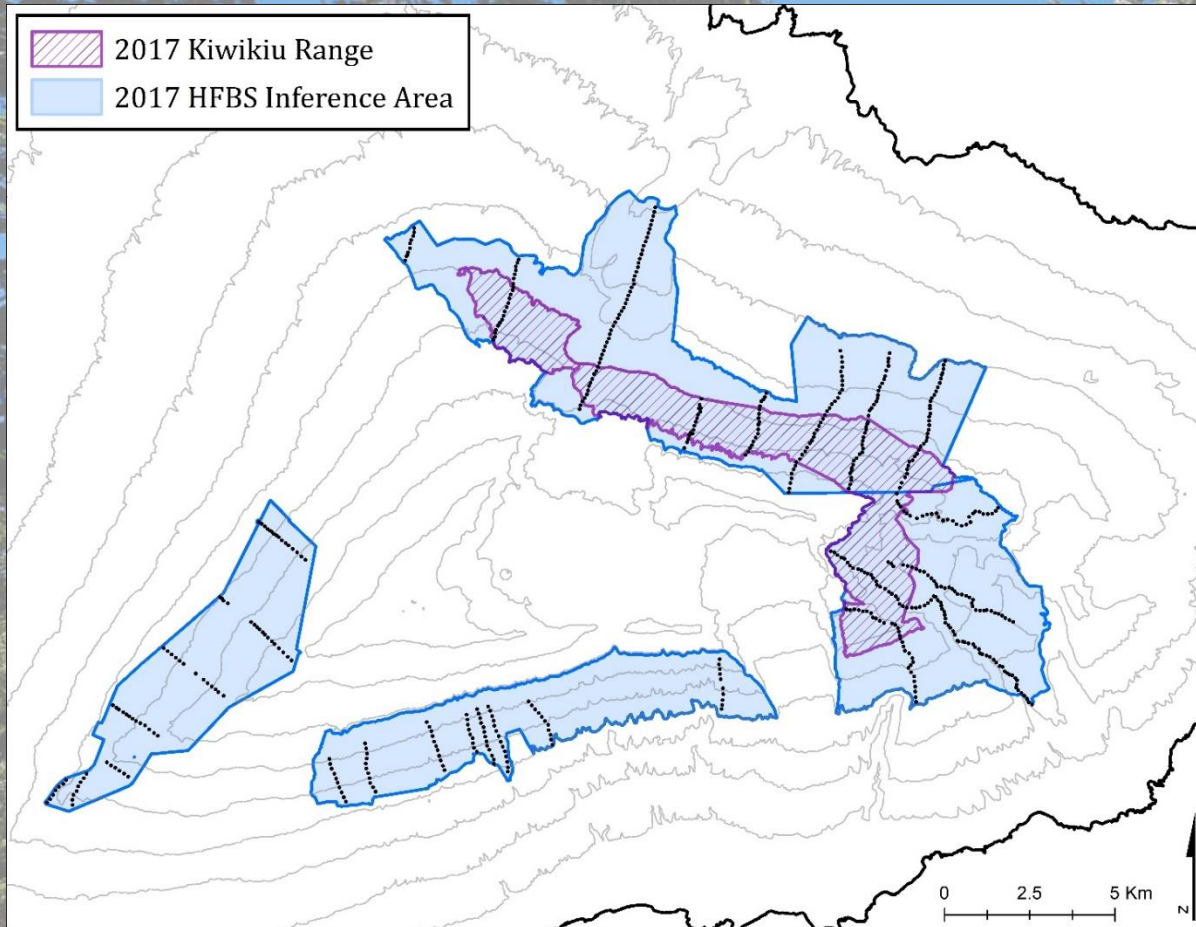
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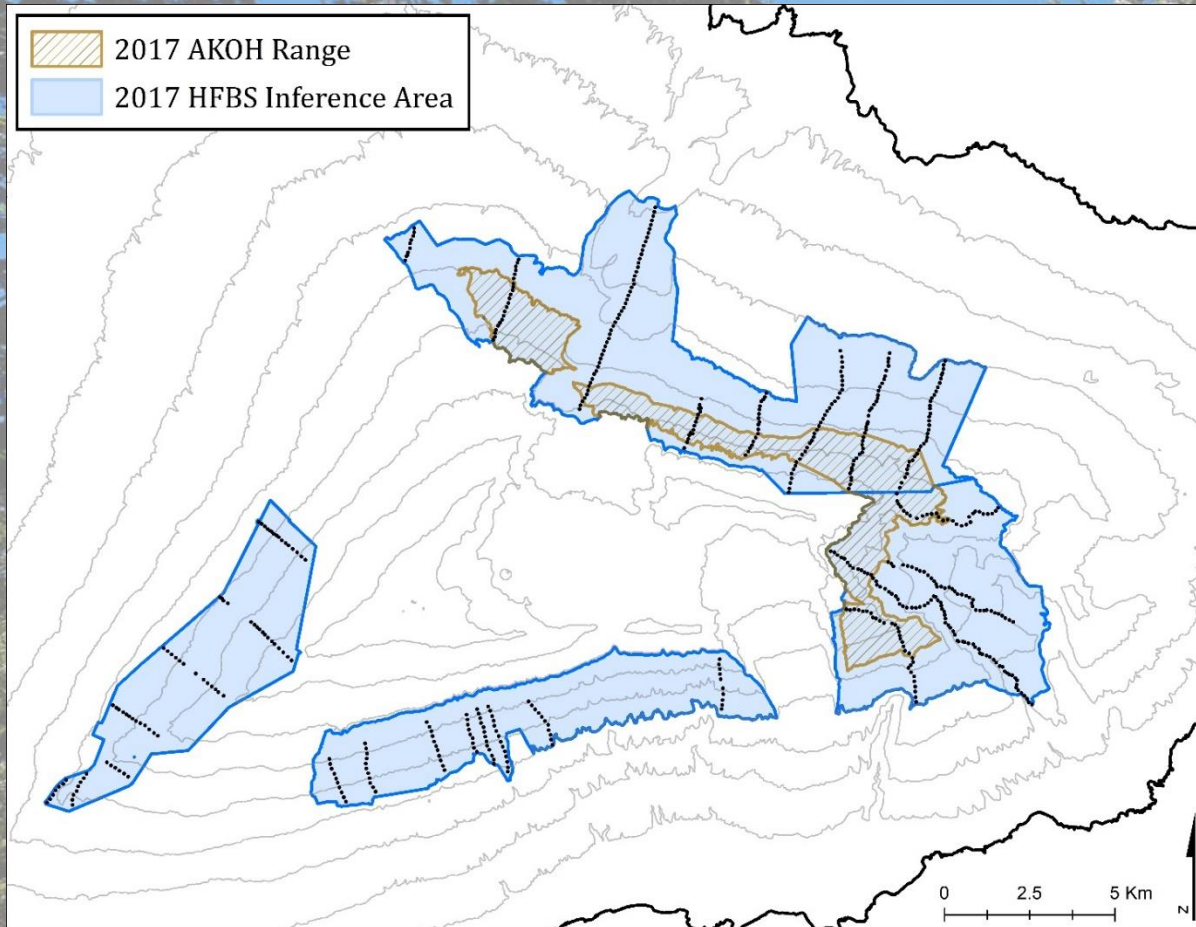
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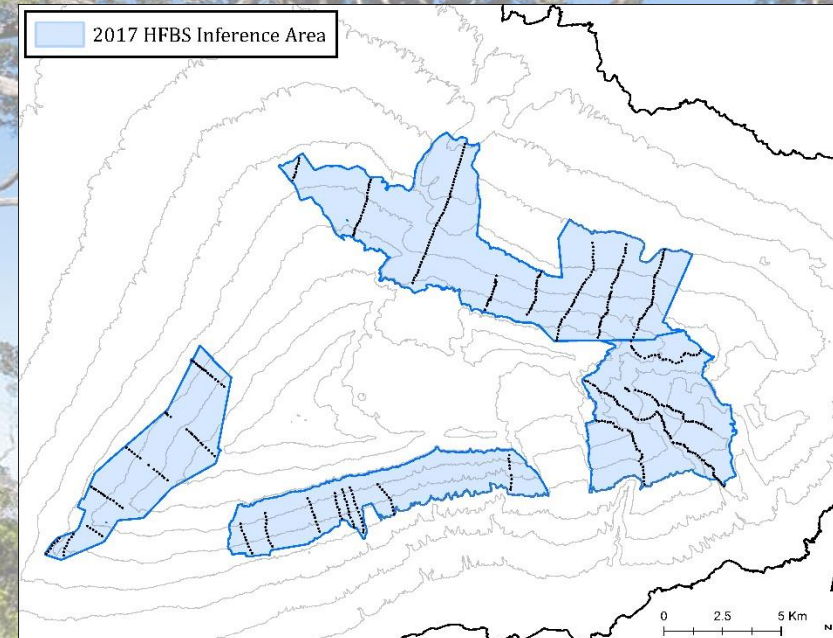


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# Short-term trends 'Apapane

- Most abundant
  - 228,480  $\pm$  19,855 individuals
  - Exist outside the inference area
- Inconclusive (2011/2012 v. 2017)
  - HALE – inconclusive
  - Windward - inconclusive
- Present on all transects in all regions

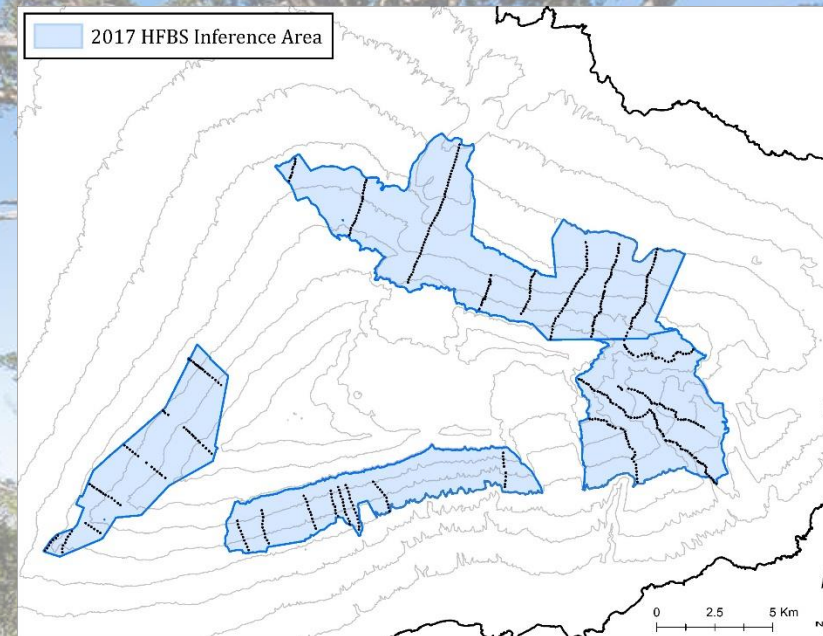




# Short-term trends Hawai'i 'Amakihi



- Second most abundant
  - $77,776 \pm 3,694$  individuals
  - Exist outside the inference area
- **Decreasing** (2011/2012 v. 2017)
  - HALE – **decreasing**
  - Windward - **decreasing**
- Present on all transects in all regions

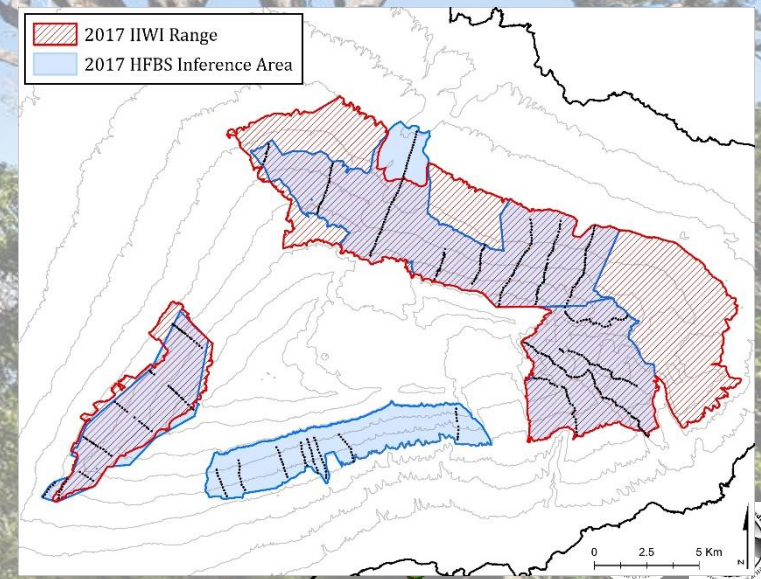




# Short-term trends 'I'iwi



- Abundant
  - $50,252 \pm 3,437$  individuals
    - Exist outside the inference area
- Increasing (2011/2012 v. 2017)
  - HALE – inconclusive
  - Windward - increasing
  - Rangewide – increasing
- Absent from Leeward Region



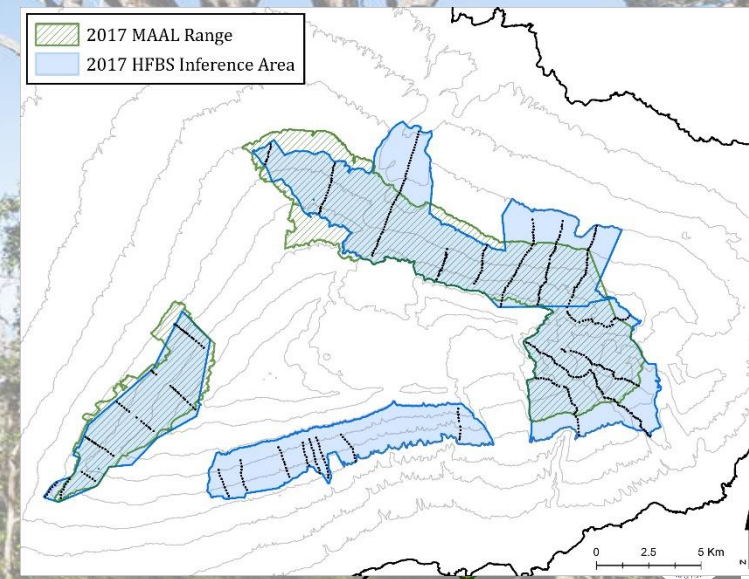


# Short-term trends

## Maui 'Alauahio



- Locally common
  - $99,060 \pm 9,510$  individuals
- Inconclusive (2011/2012 v. 2017)
  - HALE – inconclusive
  - Windward - inconclusive
  - Rangewide - inconclusive
- Absent from Leeward Region

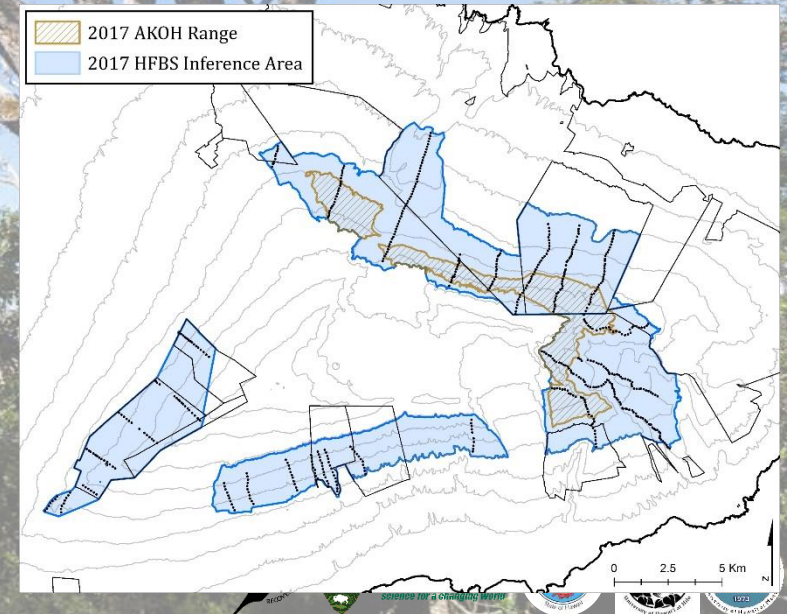




# Short-term trends 'Ākohekohe



- Smallest (fragmented?) range
  - $1,768 \pm 315$  individuals
- Inconclusive (2011/2012 v. 2017)
  - HALE – inconclusive
  - Windward - inconclusive
- Only exist in Windward and HALE regions

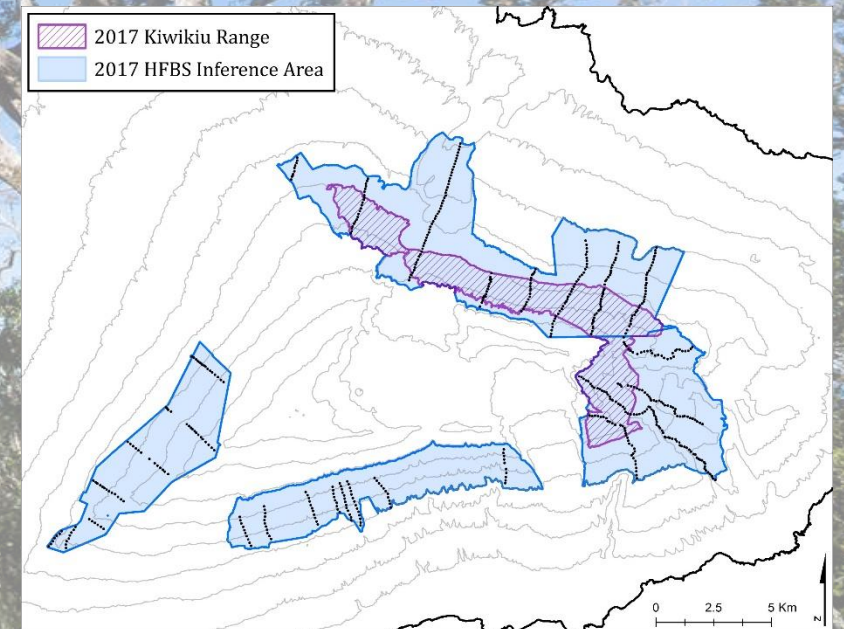




# Short-term trends Kiwikiu (Maui Parrotbill)

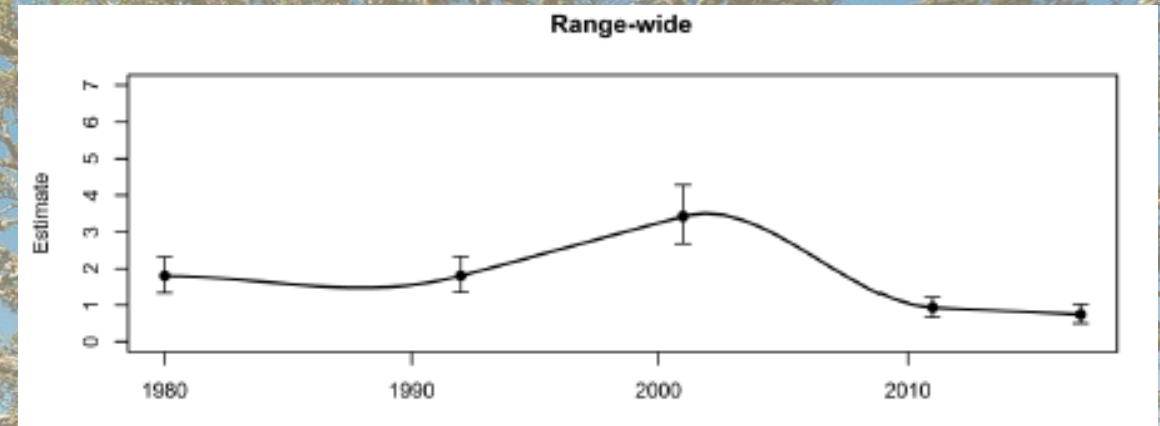
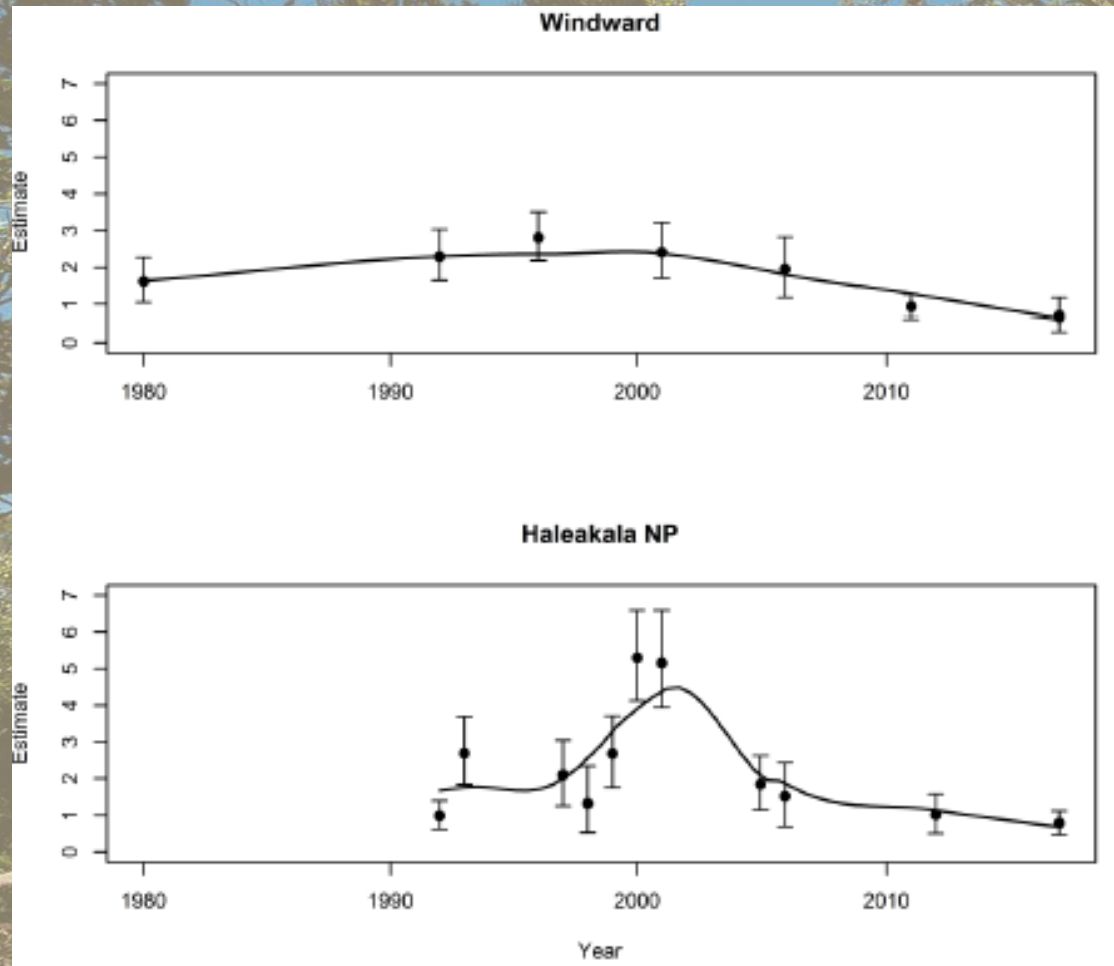


- Exceedingly rare
  - $157 \pm 67$  individuals !!!
- Inconclusive
  - HALE – **decreasing**
  - Windward - **stable**
  - Rangewide - inconclusive





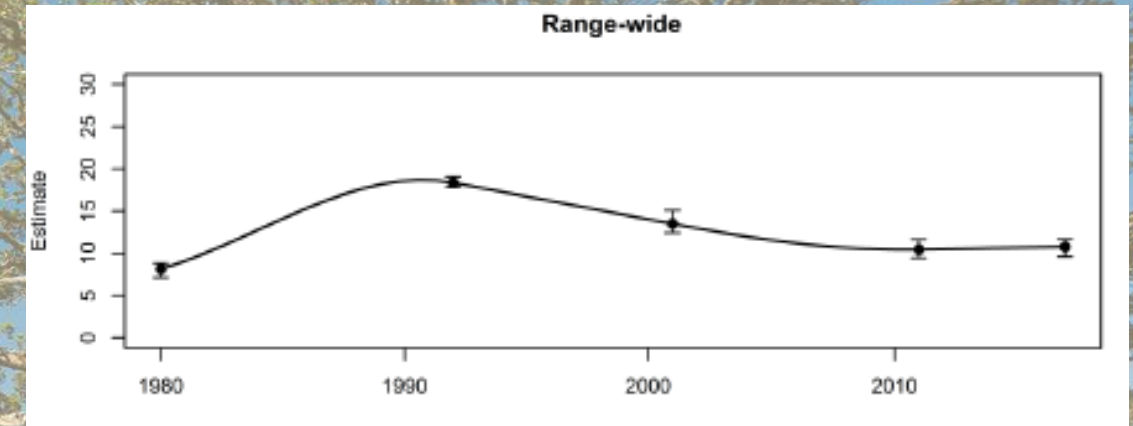
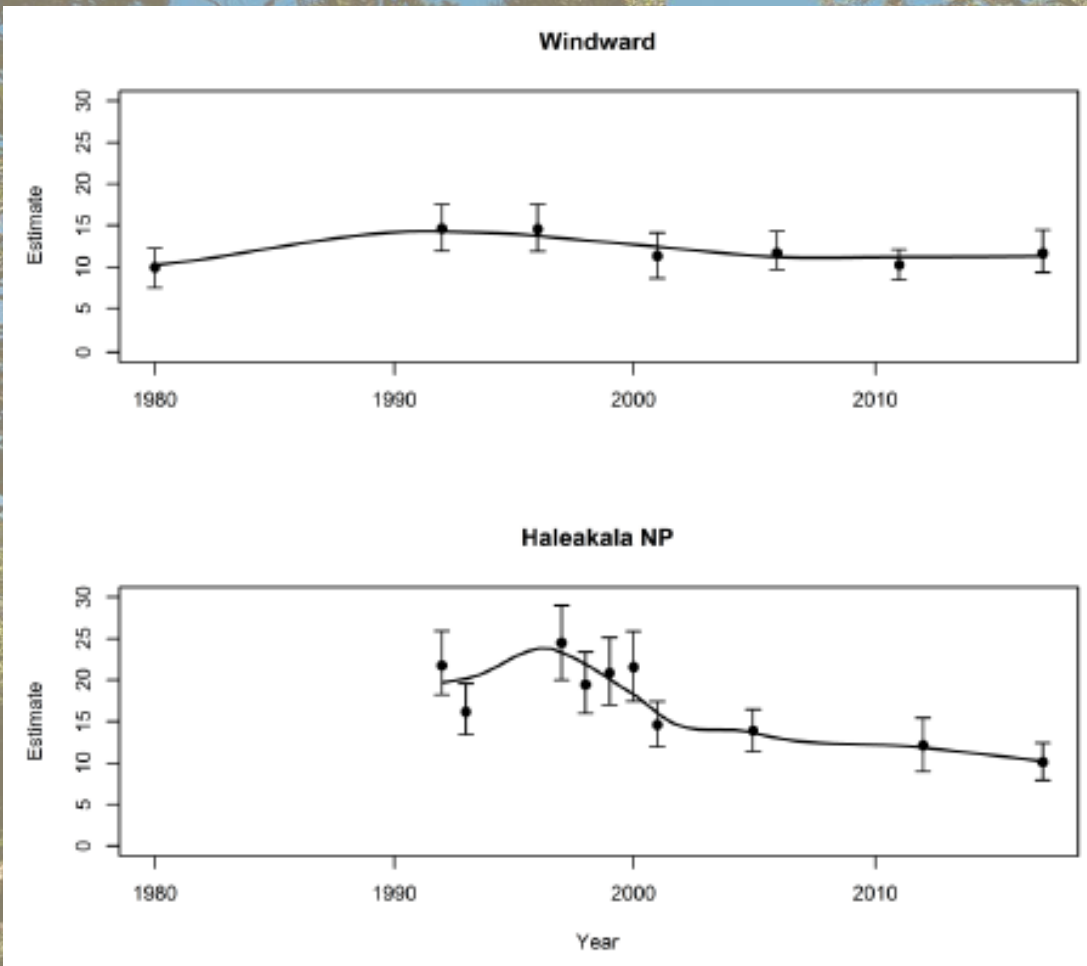
# Long-term trends - 'Ākohekohe



- “Noisy” data, especially in HALE region
- Increasing trend to 2000s
- Sharp decline to present
- 2017 was the lowest abundance est.



# Long-term trends –Maui ‘Alauahio

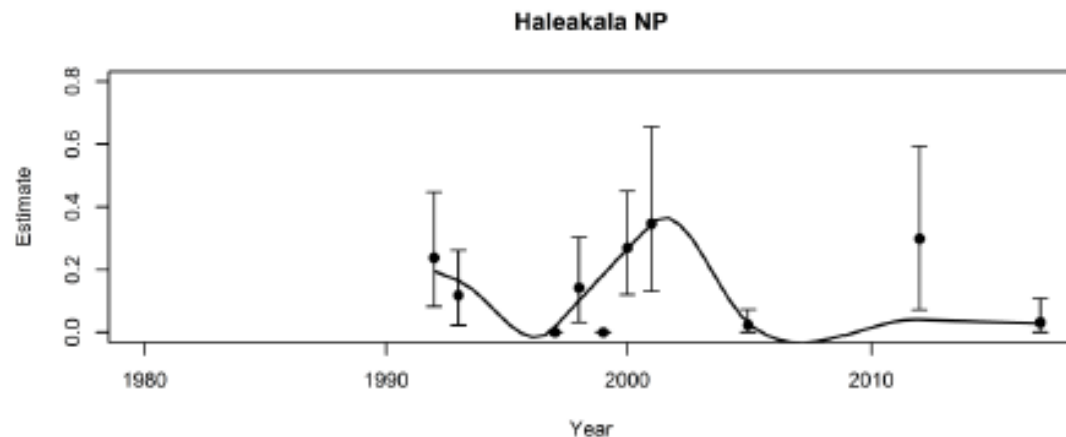
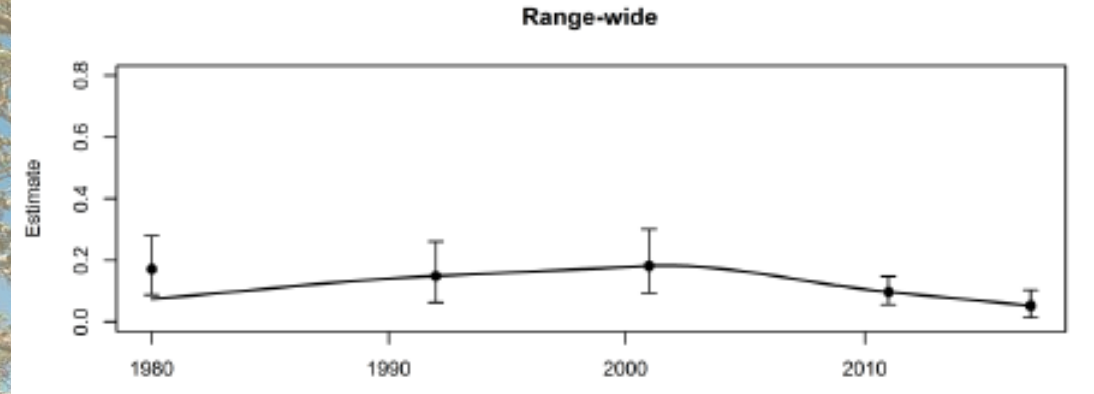
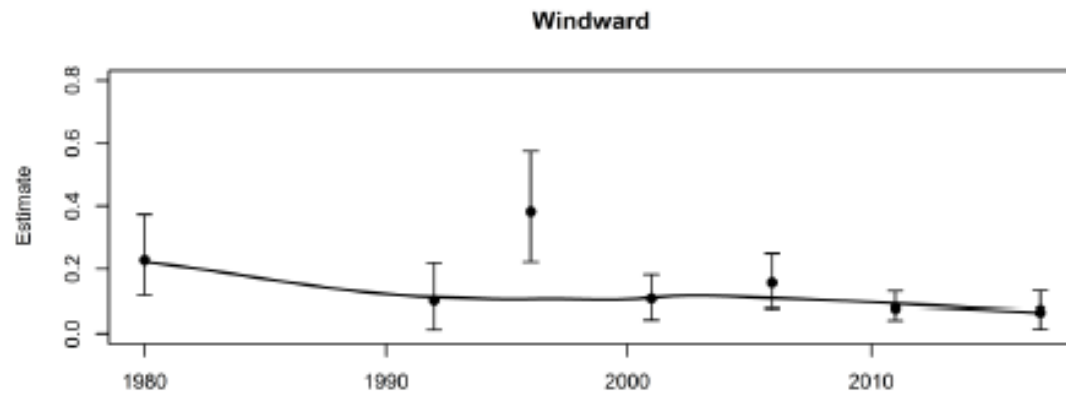


- Still fairly abundant
- General decline from ~200,000 individuals to ~100,000 individuals





# Long-term trends –Kiwikiu



- Large error, imprecise density estimates
- “Stable” until recent years
- 2017 was the lowest abundance est.
- Perilously low abundance; < 312

