Maui’s Native Forest Birds

Understanding the Past, Present and Future
Hawaii’s Isolation
Wind, Water, or Wings

Hawaiian Monk Seal
*Monachus schauinslandi*
`Ilioholoikauaua`

Hawaiian Hoary Bat
*Lasiurus cinereus semotus*
Opeapea

Green Sea Turtle
*Chelonia mydas*
Adaptive Radiation

Darwin’s Finches

Hawaiian Forest Birds
Native Hawaiian Birds

Total Number of Original Species: 127
Now Extinct: 60
Extant: 67
Federally Listed as Threatened or Endangered: 33
Hawaiian Honeycreepers

Original Number of Species: 54
Now Extinct: 28
Extant: 26
Federally Listed as Threatened or Endangered: 17
Summary of Current Threats

- Habitat Degradation
- Introductions:
  - Invasive Plants and Animals
  - Ungulates
  - Disease
Habitat Loss and Degradation

Native Habitat Before Human Habitation

Ecosystem Types
- Subalpine Forest, Shrubland & Alpine Desert
- Wet Forest, Shrubland, & Bog
- Mesic Forest & Shrubland
- Dry Forest, Shrubland & Grassland
Habitat Loss and Degradation
Current Limits of Native Ecosystems

Ecosystem Types
- Subalpine Forest, Shrubland & Alpine Desert
- Wet Forest, Shrubland, & Bog
- Mesic Forest & Shrubland
- Dry Forest, Shrubland & Grassland
Habitat Loss and Degradation

Invasive Plants

Miconia (*Miconia calvescens*)

Strawberry Guava (*Psidium cattleianum*)

Photos by Forest & Kim Starr and Rob Tucker
Maui Invasive Species Committee

"Defending the 'āina"

Maui Invasive Species Committee

573.MISC (6472)

www.mauiisc.org
Habitat Loss and Degradation

Feral Ungulates

Feral pig feeding on native tree fern

Cattle destruction in koa forest

Photos by J. Jeffrey
PROTECTING THE WATERSHED

• Watershed Partnerships
• The Nature Conservancy
• The National Park
• State of Hawaii
• Hawaiian Islands Land Trust
Predation

Photos by J. Jeffrey and Chris Jones
Competition with Non-Natives

Photos by J. Jeffrey, Oahu Nature Tours and Janruess
Introduced Diseases: 
Avian Malaria and Avian Pox
What are Maui’s Native Forest Birds?
`Apapane
(Himatione sanguinea)

- Common and widespread
- Most abundant honeycreeper
- Nectarivorous
- Recent detections at low elevations may indicate some resistance to avian malaria

Photos by Mike Neal
Hawai`i `Amakihi

(Hemignathus virens)

- Found on:
  - Hawai`i, Maui, and Moloka`i
- Dietary generalists
- Evolution of avian malaria resistance suggested by observational and genetic data

Photos by Mike Neal and Robby Kohley
I'iwi
(Vestiaria coccinea)

- Occurs on:
  - Hawai`i, Maui, and Kaua`i
  - Moloka`i and Oahu (facing extirpation)
- Population showing downward trend in most areas
- Nectarivorous
- Highly susceptible to avian malaria

Photos by Mike Neal and Robby Kohley
Maui `Alauahio, Maui Creeper

(Paroreomyza montana)

- Historically on Maui and Lana`i. Now restricted to East Maui
- Population: 35,000
- Occupies both native and alien forests
- Generalist insectivore

Photos by Mike Neal and Robby Kohley
`Akohekohe, Crested Honeycreeper
(Palmeria dolei)

- Maui Endemic. Used to be found on Molokai’i.
- Currently occupies only 5% of historic range
- Critically Endangered Population: 3,800
- Mostly nectarivorous, also eats arthropods

Photos by Mike Neal
Kiwikiu, Maui Parrotbill
(Pseudonestor xanthophrys)

- Range currently limited to windward Haleakalā
- Critically Endangered
- Population: 502 ± 116 (HFBS); density estimates statistically stable.
- Excavates bark and wood in search of insect and larval prey

Photos by Mike Neal
What is being done?

Current Research
Established in 1997 to investigate declines in Maui’s forest bird populations, including the Po’ouli.

Mission: To develop and implement techniques for the recovery of Maui’s endangered bird species.
Most current research is focused on the Maui Parrotbill
Kiwikiu Life History

- Insectivorous
- Monogamous
- Long-lived (14+ years)
- High adult survival rates
- Nest in ohia with 1 egg clutch
- Long juvenile dependency
- Fledge one chick per season
- Productivity studies
Kiwikiu & MFBRP

• ~ 500 individuals restricted to ~ 50 km²
• 2006: Began research in Hanawi Natural Area Reserve, core
• 2012: Switched studies to TNC Waikamoi Preserve, edge
Productivity Questions

- Population estimates
- Age at first successful breeding
- Proportion of population which is breeding
- Breeding lifespan
- Recruitment rate
- Egg fertility or genetic constraints
- Annual Variation
Survival Data
(Mark, Recapture, Resight)

Photo by Robby Kohley
Productivity
Nest success & Hatchlings/Pair
Additional Threats

• Population Size
• Disastrous Introductions
  • Brown Tree Snake
• Climate Change
• Avian Disease and Habitat Loss
• Potential 75% loss in habitat
Establishing a Second Population

Proposed fencing and restoration on leeward Haleakala

- Haleakala NP
- Kahikinui FR
- LHWRP
- DHHL
- Proposed Fence Seg 1
- Proposed Fence Seg 2
- Proposed Fence Seg 3
- Completed Fence
- DHHL Fence Seg 1
- DHHL Fence Seg 2
- Koa Forest
- Ohia Forest

Scale: 0.9 0.45 0 0.9 Km
Nakula Natural Area Reserve

614 ha Nakula NAR

150 ha experimental exclosure
Research for Reintroduction

- Genetics and the selection of birds
- Maui Bird Conservation Center/San Diego Zoological Society captive flock
- Food availability in existing forests
- Supplemental feeding
- How to restore habitat
Nakula Exclosure Restoration

- Restoration trials currently being set up
- Planting to begin Fall 2013
Longer term Goal

Extend restoration to more of Haleakala to gain potential habitat loss back
What Can you Do?
Be a Good Steward of the Environment

- Reduce your ecological footprint
  - www.myfootprint.org/
- Clean your camping gear and shoes from weeds
- Plant Native Plants
- Spay and neuter your pets and prevent loose animals from killing wildlife
- Prevent invasive plants and animals from getting here
WE NEED TO DO SOMETHING NOW!

• Write politicians

• Legislation is needed
  • More money for conservation, protection of our water. Invasive species control.

• Enforcement of laws
  • Prevention of what comes in and out of the islands

• Education of our youth for the future
Cost of management

Conservation work in Hawaii is expensive!

- Exotic plant removal (Miconia): $6.27 million
  Maintenance: $449,245 per year
- Helicopter time: $750 per hour
- Predator-proof fencing: $150,000 per km
- Rat control: $325 /ha/year
- Ungulate fencing: $50,000 per km

$2.5 billion needed to recover 21 forest birds
Learn and Share Ecological Knowledge

• Volunteer or donate to local environmental organizations
  
  • See our website for a list or visit www.hear.org

• Experience native Maui

• Join East Maui Watershed, Leeward Haleakala, or West Maui Watershed for one of their interpretive hikes

• Join Haleakala National Park for a hike in The Nature Conservancy’s Waikamoi Preserve