Kiwikiu (Maui Parrotbill; *Pseudonestor xanthophrys)* Recovery

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Research

POPULATION

Kiwikiu (Maui Parrotbill; *Pseudonestor xanthophrys*) is a **critically endangered** insectivorous Hawaiian honeycreeper endemic to Maui.

Historically distributed island-wide, populations are now restricted to 36 km². Population viability models predict extinction within 25 years. Population estimates reveal **continued decline** even in protected habitats with **<312 individuals** left in the wild.

THREATS

Threats include habitat loss, habitat degradation, depredation by introduced predators, avian disease spread by introduced mosquitos, and climate change.

Remnant habitat survives in gulches in Nakula Natural Area Reserve.

RESEARCH

Intensive demographic and genetic studies were conducted throughout the species' range from 2006 - 2014.

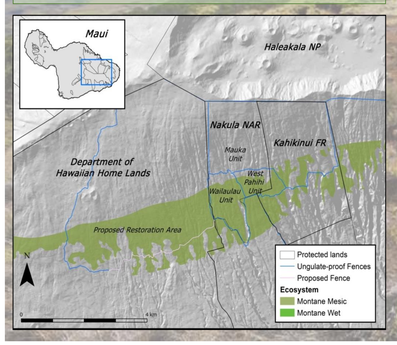
Results show:

- One offspring/year
- Low annual productivity
- High nest failure rate due to poor weather
- High adult survivorship
- Low juvenile survivorship
- Large home ranges
- Genetically separated eastern and western populations

Without practical tools for landscape-level disease, vector, or predator control, REINTRODUCTION to new areas has been identified as the most important recovery action for this species.

Restoration

Nakula Natural Area Reserve (NAR) on leeward east Maui was selected as the most suitable site to establish a new population. This area was degraded from a history of heavy introduced ungulate pressure. Historical forest bird densities in this area are unknown, but Kiwikiu were once found here.



After fencing, **restoration trials were initiated to assess the most efficient and effective methods for forest recovery. Restoration trials indicated that** natural regeneration could be stimulated by removal of non-native grasses but was limited to a few native plant species.

Outplanting was very successful; 82% two-year survivorship.

Nakula is returning to a **primarily forested habitat** through widespread natural regeneration and broad-scale plantings.
> 250,000 seedlings of 16 native tree and shrub species have been planted on leeward slopes with plans for more restoration across the region.

Future challenges will be in **restoring woody plant diversity** to the site, which may be critical to long-term success for Kiwikiu.

The Kiwikiu Reintroduction Plan has been drafted and reviewed by the Maui Forest Bird Working Group made up of the following organizations: American Bird Conservancy, Haleakalā National Park, Leeward Haleakalā Watershed Restoration Partnership, Maui Forest Bird Recovery Project, National Park Service Inventory & Monitoring, Pacific Bird Conservation, Pacific Cooperative Studies Unit, San Diego Zoo Global, State of Hawai'i Department of Land & Natural Resources – Forestry & Wildlife, State of Hawai'i Department of Land & Natural Resources – Native Ecosystems Protection & Management, The Nature Conservancy of Hawai'i, US Fish & Wildlife Service, and US Geological Survey – Biological Resources Division.

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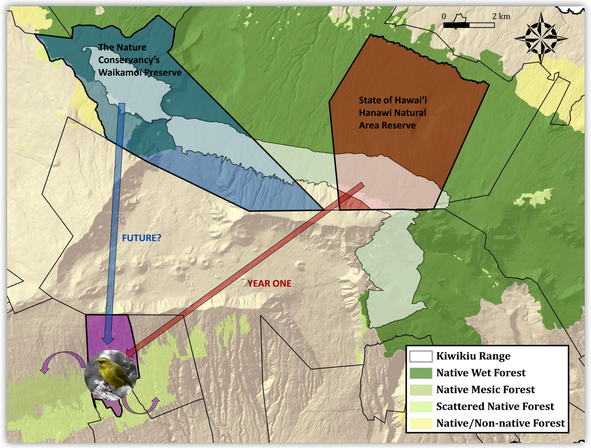
Reintroduction

The short-term goal of this reintroduction is to create a disjunct population of Kiwikiu, separate from the main source population, which survives through multiple years.

The long-term objective is for the newly established population of Kiwikiu to be self-sustaining, successfully breeding, and achieve sufficient size to provide significant protection from extinction in case the source population is threatened or extirpated.

Completed tasks prior to reintroduction include:

- **Reintroduction Plan** finalized by Maui Forest Bird Working Group.
- Full plan can be accessed at **mauiforestbirds.org.**
- Funding secured.
- Disease, mosquito, prey, and predator abundance surveys conducted.
- Nakula forest bird community monitored through repeated annual census.
- **Threat reduction** for cats, mongooses, and rats ongoing. Predator reduction grid with GoodNature™ A24s, DOC250s, and elevated and ground-based body grip traps.
- **Release aviaries** constructed approximately 150m apart to facilitate birds being able to hear one another without territorial conflicts.
- Filming underway for **community outreach** productions and materials.



Cohort for translocation and release will consist of 12 wild and 8 captive individuals.

- Conservation breeding efforts for Kiwikiu began in the late 1990s, but there has been limited and inconsistent success.
- These eight birds constitute the remaining breeding flock.
- Captive birds consist of seven males and one female making a 50:50 sex ratio a heavy take on wild females: a release cohort of more males than females is very likely.

SOFT RELEASE TECHNIQUE

All 20 birds will be held in paired aviaries at 10 sites. Captive birds will be held for ~2-3 weeks. The releases will be conducted incrementally to help anchor birds on the site.

Food supplementation will be provided in the release aviaries and after the birds are released. This will consist of both live food and commercial food supplements.

Post-release monitoring will use radio transmitters and color-band resighting. Telemetry protocols will be trialed on a more common honeycreeper in the area prior to releases.