



Photo: Robby Kohley

Forest Birds

Kiwikiu or Maui parrotbill

Pseudonestor xanthophrys

SPECIES STATUS:

Federally Listed as Endangered

State Listed as Endangered

State Recognized as Endemic

NatureServe Heritage Rank G1 – Critically Imperiled

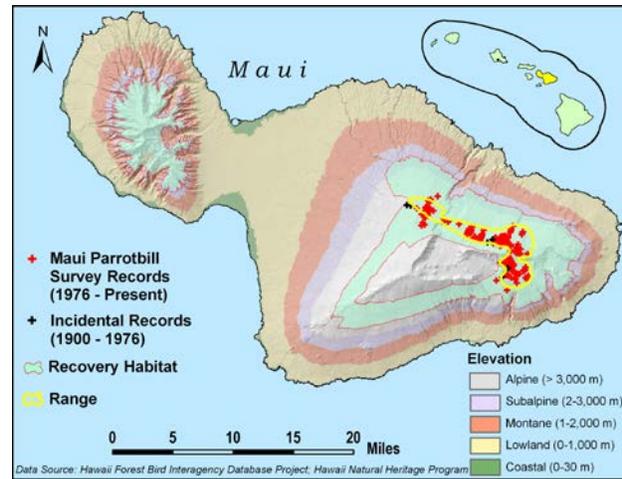
IUCN Red List Ranking – Critically Endangered

Revised Recovery Plan for Hawaiian Forest Birds – USFWS 2006

SPECIES INFORMATION: The kiwikiu or Maui parrotbill is stocky, bull-headed Hawaiian honeycreeper endemic to Maui, with a short tail and a relatively large, parrot-like bill. Adults are mostly olive-green above with a yellow breast, belly and cheeks, and a bright yellow line above their eyes (i.e., supercilium). Males are typically brighter than females, although individuals are variable. Males are larger than females with a larger bill. They feed on a variety of shrubs and small trees, especially ‘akala (*Rubus hawaiiensis*), kanawao (*Broussaisia arguta*), ‘ōhi‘a (*Metrosideros polymorpha*), and koa (*Acacia koa*) where it gleans prey from moss-covered branches or uses its bill to chisel, crack, crush, dig, and tear bark and softer wood in search of beetle and Lepidoptera larvae and pupae. Also opens fruit in search of insects. Pairs defend relatively large (6-8 hectare), year-round home ranges. Females build nests, incubate eggs, and brood young. Clutch size is usually one, and females feed nestlings with food delivered by males. Males feed fledglings. They will renest after a nest failure, but are not known to attempt another nest if the first is successful. Development of bill and acquisition of foraging techniques is prolonged and young remain with parents for 5 to 18 months. Because of this long period of dependency, kiwikiu are often seen in small groups and males can be seen provisioning juveniles from current and previous years.

DISTRIBUTION: Restricted to a ~50 square kilometer (19 square mile) on the northeastern slopes of Haleakalā between 1,230 and 2,370 meters (4,000 – 7,700 feet). Subfossils indicate they once occurred island-wide including at low elevations and leeward (southeastern) forests and on the island of Molokaʻi.

ABUNDANCE: The Hawaiian Forest Bird Survey (1980) estimated the population at 502 ± 116 (95% confidence interval) birds. More recent surveys reported densities similar to those from the 1980 survey.



LOCATION AND CONDITION OF KEY HABITAT: Mid-to-upper-elevation montane wet forests dominated by ‘ōhi‘a, and in a few mesic areas dominated by ‘ōhi‘a and koa (*Acacia koa*), with a dense, diverse native understory and subcanopy of ferns, sedges, epiphytes, shrubs, and small to medium trees. Most of the range is managed by the National Park Service, State of Hawai‘i, The Nature Conservancy (TNC), and the East Maui Watershed Partnership.

THREATS:

- **Low reproduction.** Unlike many Hawaiian honeycreepers, kiwīkiu have low annual fledgling production. This results from a low reproductive potential (one fledgling per year) coupled with low reproductive success due to habitat limitations and weather. This life history characteristic may be related to their very specialized foraging strategy. Regardless, the species is susceptible to factors that reduce population size.
- **Disease.** Despite the availability of seemingly suitable habitat below 1,350 meters (4,500 feet), kiwīkiu are not found in these areas, suggesting that disease may be restricting populations to higher elevations.
- **Predation.** Predation on adults and nests by rats (*Rattus* spp.), cats (*Felis silvestris*), the small Indian mongoose (*Herpestes auro punctatus*), and owls (*Asio flammeus sandwichensis*, *Tyto alba*) may limit the species. High rat densities have been reported in the Hanawā area, which also supports a large proportion of the kiwīkiu. The rare Maui Parrotbill— Photo by Eric Nishibayashi
- **Habitat loss.** Historical accounts suggest that kiwīkiu and ranching has resulted in the loss of large areas of mesic koa forest, and their current range is restricted to wet forests where koa density is relatively low. Thus like many endangered Hawaiian forest birds, kiwīkiu may be restricted to suboptimal habitat.
- **Habitat degradation.** Damage to understory vegetation by feral pigs (*Sus scrofa*) likely reduces habitat suitability and may contribute to reduced food availability and low reproductive success. Habitat degradation also may increase exposure of nests to inclement weather.
- **Population size.** Small populations are plagued by a variety of potentially irreversible problems that fall into three categories: demographic, stochastic, and genetic; the former are usually most problematic. Demographic factors include skewed sex ratios and stochastic factors include natural disasters. Habitat fragmentation exacerbates demographic and genetic problems.

CONSERVATION ACTIONS: In 1997, a captive breeding program was initiated. As of 2015, 14 kiwikiu are in captivity at the Maui Bird Conservation Center. The kiwikiu also benefits from management efforts to conserve other endangered forest birds on northeastern Haleakalā, such as the establishment of the 3,000 hectare (7,500 acre) Hanawī Natural Area Reserve in 1986, the formation of East Maui Watershed Partnership and Maui Forest Bird Recovery Project, fencing, ungulate and small mammal control, forest restoration, habitat monitoring, and studies of disease and disease vectors. Future actions specific to the recovery of the kiwikiu may include the following:

- Protect and restore habitat in high-elevation disease-free areas.
- Implement fencing and ungulate control in low-elevation habitat from the Hanawī Natural Area Reserve to TNC’s Waikamoi Preserve, to facilitate the recovery of the understory and subcanopy vegetation and eventually result in high-quality kiwikiu habitat.
- Establish a continuous corridor of suitable habitat around Haleakalā by connecting conservation lands on the southern and western parts of the mountain. Restoration of koa forests to this area would be a key element to this effort.
- Restore, fence, and eradicate ungulates from the remnant mesic koa forests on the State Forest Reserve and Department of Hawaiian Home Lands in the Kahikinui region of southern Haleakalā. Restoration of this area would be a cost-effective starting point to providing the kiwikiu with high-quality habitat.
- Conduct public outreach and education about the importance of invasive species control and forest restoration.
- Continue protection and management of wildlife sanctuaries and refuges.

MONITORING: Continue forest bird surveys and habitat monitoring.

RESEARCH PRIORITIES: Research priorities for most Hawaiian forest birds include improving methods for controlling rats, mongooses, and feral cats in native forests, determining ecological requirements of *Culex* mosquitoes at mid- and high-elevation forests, and developing methods to control mosquitoes. Research priorities specific to the kiwikiu include the following:

- Evaluate the effect of predator control on reproduction and survival of kiwikiu.
- Further refine captive breeding techniques and evaluate experimental reintroduction sites. Evaluation should include mosquito surveys and determination of disease prevalence in lower elevation sites.
- Investigate habitat use in forests that kiwikiu do not currently inhabit to design and implement large-scale restoration.

References:

Brinck KW, Camp RJ, Gorresen PM, Leonard DL, Mounce HL, Iknayan KJ, Paxton EH. 2012. 2011 Kiwikiu (Maui Parrotbill) and Maui Alauahio abundance estimates and the effect of sampling effort on power to detect a trend. Hawaii Cooperative Studies Unit, University of Hawaii at Hilo. Technical Report HCSU-035.

IUCN Red List of Threatened Species. 2015. Version 2014.3. Available at: www.iucnredlist.org. (Accessed May 2015).

Mounce HL, Leonard DL, Swinnerton KJ, Becker CD, Berthold LK, Iknayan KJ, Groombridge JJ.

2013. Determining productivity of Maui Parrotbills, an endangered Hawaiian honeycreeper. *Journal of Field Ornithology* 84(1):32-39.
- Mounce, HL, Iknayan, KJ, Leonard, DL, Swinnerton, KJ, and Groombridge, JJ. 2014. Management implications derived from long term re-sight data: annual survival of the Maui Parrotbill *Pseudonestor xanthophrys*. *Bird Conservation International* 24:316-326
- Mounce HL, Raisin C, Leonard DL, Wickenden H, Swinnerton KJ, Groombridge JJ. 2015. Spatial genetic architecture of the critically-endangered Maui Parrotbill (*Pseudonestor xanthophrys*): management considerations for reintroduction strategies. *Conservation Genetics* Volume 16, Issue 1: Page 71-84.
- Scott JM, Mountainspring S, Ramsey FL, Kepler CB. 1986. Forest bird communities of the Hawaiian islands: their dynamics, ecology and conservation. Lawrence, (KS): Cooper Ornithological Society.
- Simon JC, Baker PE, Baker H. 1997. Maui parrotbill (*Pseudonestor xanthophrys*). In *The Birds of North America*, No. 311 (Poole A, Gill F, editors.). Philadelphia, (PA): The Academy of Natural Sciences; and Washington DC: The American Ornithologists' Union.
- Warren CW, Mounce HL. 2014. Home-range patterns of two Hawaiian honeycreepers, Kiwikiu (*Pseudonestor xanthophrys*) and Maui Alauahio (*Paroemyza montana*). Presentation. Island Biology Conference, Honolulu, HI.
- U.S. Fish and Wildlife Service. 2006. Revised Recovery plan for Hawaiian forest birds. Portland, (OR): U.S. Fish and Wildlife Service.