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<u>DRAFT</u> PO`OULI FIVE-YEAR RECOVERY WORK PLAN

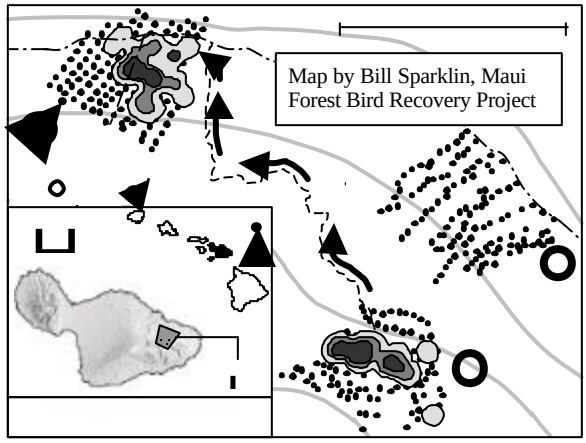
Prepared by Po`ouli Working Group and Hawaiian Forest Bird Recovery Team

Po`ouli. Photo by Paul Baker, Maui Forest Bird Recovery Project.

Purpose. The long-term recovery goals, delisting criteria, recovery strategy, and a comprehensive list of recovery tasks for the Po`ouli are provided in the Hawaiian Forest Bird Recovery Plan (USFWS 2003), which covers 21 species. The purpose of this five-year work plan is to identify interim recovery objectives for the Po`ouli, and to succinctly describe the actions needed in the next five years to reach those interim objectives. Identification of interim recovery objectives will help ensure that initial conservation efforts by different agencies or groups are focused on the same ultimate goals, encourage efficient use of limited recovery resources, and provide milestones to track and evaluate progress toward recovery. Realization of these milestones will measure progress being made toward eventual recovery. Failure in realizing these milestones may indicate that additional resources are needed, or that the current recovery strategy is not effective.

Species Summary. The Po`ouli (*Melamprosops phaeosoma*) is a critically endangered Hawaiian honeycreeper, and is perhaps the rarest bird in the world, with only three known individuals (Baker 2001). It is a stocky, medium-sized (26 g), bird with short wings, a short tail, stout legs, and a short straight bill, and is easily recognized by its gray crown, white cheek patch, and black "lone ranger" mask (Baker 1998). Remarkably, the Po`ouli was apparently unknown to the Hawaiians and was first discovered in 1973 (Casey and Jacobi 1974). Morphological and genetic evidence indicates that the Po`ouli forms a unique lineage within the Hawaiian honeycreepers, and it comprises its own monotypic genus (Fleischer *et al*. 2001). Only two nests of the Po`ouli have ever been found, in March and April 1986, both from the same pair (Kepler et al. 1996). The second, successful nest fledged only one of the two young, which spent 21 days in the nest. The female alone incubated the eggs and brooded the chicks, but both parents fed the chicks. Both nests were an open cup composed of twigs and mosses and lined with thin fern rootlets (Engilis et al. 1996), and were hidden among the foliage 8 meters (26 feet) high in tall `ohi`a trees (Kepler et al. 1996). Po`ouli forage by gleaning, probing, and excavating for small invertebrate prey in moss, lichen, and bark, primarily in the subcanopy and understory. They seem to prefer kanawao (*Broussaisia arguta*), kawa`u (*Ilex anomola*), and `ohi`a as foraging substrates (Mountainspring et al. 1990, Pratt et al. 1997). Prey consist mainly of native snails, adult and larval beetles, and Lepidoptera larvae (Baldwin and Casey 1983, Mountainspring et al. 1990, Kepler et al. 1996). Po`ouli often associate with mixed-species foraging flocks of other insectivorous honeycreepers, especially Maui Parrotbills (*Pseudonestor xanthophrys*) and Maui `Alauahio (*Paroreomyza montana*). Po`ouli are unusually quiet, and their calls closely resemble Parrotbills calls. Female Po`ouli have been seen interacting with and even feeding juvenile Parrotbills (T. Malcolm pers. obs.).

Historically, Po`ouli have been confined to a 1,300 hectare (3,200 acre) area of wet montane forest on the northern and eastern slopes of Haleakala (Mountainspring et al. 1990), but fossil evidence indicates Po`ouli once inhabited drier forests at lower elevation on the leeward slope of Haleakala (James and Olson 1991). The population was estimated at 140 ± 280 (Scott et al. 1986), but estimates of population size and density are imprecise because of the species' low density and cryptic behavior. Numbers and range declined from 1976-1985 (Mountainspring et al. (1990), and surveys in 1994-1995 found six Po`ouli at four locations, while surveys from 1997-2000 located only three birds (Reynolds and Snetsinger 2001). No other Po`ouli have been located since these three birds were color-banded in 1997 and 1998 (Hawai'i DLNR, unpubl. data). The last three birds, thought to consist of one male and two females, occur in separate, non-overlapping home ranges between 1,500 meters (5,000 feet) and 1,950 meters (6,500 feet) elevation in Hanawi Natural Area Reserve (Figure 1). There are no known breeding pairs, and the last documented reproduction occurred



in 1995 (Reynolds and Snetsinger 2001). Conservation efforts for the Po`ouli have included creation of the 3,035 ha (7,500 acre) Hanawi Natural Area Reserve to provide additional protection for lands encompassing the known range; fencing of 800 ha (2000 acres) in the upper portion of Hanawi by 1996 and removal of all ungulates by 1997 (Bill Evanson, Maui DOFAW, pers. comm.); protection of adjacent forest through acquisition and protection of lands by the National Park Service and formation of the East Maui Watershed Partnership (DLNR 1996); and ground-based predator control in the home ranges of the three known birds (Malcolm et al. 2002). Ecological and life-history research was carried out under the direction of the USGS Biological Resources Division during 1994-1996 (Baker 2001).

Primary Threats. The range of the Po`ouli coincides with high population densities of other honeycreeper species, a distribution believed to be delimited by suitable habitat and disease-bearing mosquitoes prevalent at elevations below 1,500 meters (5,000 feet; Scott et al. 1986). Po`ouli are associated with low levels of disturbance to soil and vegetation by feral pigs, and habitat damage by feral pigs is thought to be an important cause of the decline in Po`ouli numbers (Mountainspring et al. 1990). Other threats have not been directly linked to the Po`ouli, but both black and Polynesian rats are abundant in Po`ouli habitat (Malcolm et al. 2002), and these animals are known to prey on adults and nests of other Hawaiian forest birds and also on native land snails, which are an important food for the Po`ouli (Baldwin and Casey 1983).

Recovery Strategy. Alternative strategies for recovery of the Po`ouli were outlined previously in an Environmental Assessment (USFWS and Hawai'i DLNR 1999). Based on that EA and subsequent public comments, it was decided that the best strategy was continued habitat management, including predator control, in conjunction with translocation of a female into the home range of the last male, in hopes that they would form a breeding pair and nest. That translocation was successfully carried out in April of 2002, but the translocated female subsequently returned to her own home range after one day (Groombridge et al. 2002). Although no breeding pair was created by the translocation, the female showed signs of potential positive acclimation to captivity, reacting passively to its holding cage and readily consuming food items including a native *Succinea* snail and several waxworms (Groombridge et al. 2002).

With a known population of only three birds, the last documented breeding of Po`ouli in 1995, and no known breeding pairs, the most urgent aspect of the recovery strategy for the Po`ouli must be to facilitate pair formation and reproduction among the three known individuals. The various recovery strategies for achieving this goal were revisited in June of 2002 by the Po`ouli Recovery Working Group, which consists of representatives from the USFWS, Hawaii DOFAW, Hawaii NARS, Hawaiian Forest Bird Recovery Team, the Zoological Society of San Diego, the Maui Forest Bird Recovery Project, and the University of Hawaii. It was not possible to arrive at a strategy that was unanimously supported, but two options had broad support; capture of all three birds and removal to captivity, and capture of all three birds and placement in a field aviary. These strategies may be equally viable and both were considered to have advantages and disadvantages, but in November 2002 the USFWS and Hawaii DOFAW decided that removal to captivity was preferable because that option could be implemented more quickly, which is important due to the advanced ages of the birds and their unknown lifespan. The ZSSD agreed to undertake care and propagation of the Po`ouli at the Maui Bird Conservation Center.

The ultimate goal of recovery efforts is to release descendents of the three known Po`ouli back into the wild and restore a self-sustaining wild population. It is therefore extremely important that the species' habitat continue to be protected and managed to ensure that reintroduction to the wild remains an option. The scale of management should be increased through fencing and ungulate control in additional areas, and aerial broadcast of diphacinone to control rats. Continued habitat protection and management may benefit any wild Po`ouli that have not been located and are not part of captive propagation efforts. Surveys for additional wild Po`ouli should be undertaken in order to provide more options for recovery.

In the event of a death of a Po'ouli, various tissues should be collected for cell culture and possible future cloning, and immediately sent to both the Zoological Society of San Diego, Center for the Reproduction of Endangered Species and the Audubon Nature Institute Center for Research on Endangered Species.

Interim Recovery Objectives. In order to meet the long-range recovery goals for the Po`ouli, the following short-term goals should be accomplished first.

- Facilitate production of at least one young Po`ouli.
- Conduct large-scale rodent control at Hanawi NAR by aerial broadcast of diphacinone.
- Complete fencing of lower Hanawi NAR.
- Locate any additional wild Po`ouli through additional surveys.

If these objectives are met within five years, then new interim recovery objectives will be identified to continue to guide progress toward full recovery. If these objectives are not met within five years, then the causes for failure should be identified and rectified if possible. If it is not possible to correct the causes for failure and the current strategy is deemed ineffective, then a new strategy will be developed and new actions identified.

Five-year Recovery Actions (2003-2007). In order to realize the interim recovery objectives described above, the following actions are necessary:

- Facilitate production of at least one young Po`ouli.
    - Safely capture remaining birds and transport them to MBCC.
    - Acclimate birds to captivity and get them to eat supplemental food.
    - Use captive breeding techniques to facilitate pair formation and breeding.
    - If reproduction does not occur in captivity after 30 months, consider moving birds to an outdoor aviary in a more natural setting. Possible sites include Waikamoi and Hanawi.
- Protect and Manage Existing Habitat.
    - Maintain existing fences in Hanawi NAR, Waikamoi, and Haleakala National Park (currently funded by NPS, USFWS, TNC, and DLNR).
    - Complete fencing of lower Hanawi NAR (in progress by EMWP).
    - Begin public outreach about importance and benefits of controlling rodents and safety of diphacinone.
    - Conduct large-scale rodent control by aerial broadcast of diphacinone in Hanawi and monitor population and individual-level responses of the avian community.
- Conduct surveys to locate additional wild Po`ouli. Areas to survey include Hanawi, Haleakala N.P., and State Forest Reserves.
- Collect indeterminate germ cells from all three birds to establish cell cultures for use in possible future cloning.

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