

Photo

## Forest Birds

# Palila

*Loxiodes bailleui*

### **SPECIES STATUS:**

Federally Listed as Endangered

State Listed as Endangered

State recognized as endemic

Hawaii Natural Heritage Ranking G1—Critically imperiled

**SPECIES INFORMATION:** The palila is a finch-billed Hawaiian honeycreeper which specializes on seeds in green mamane pods (*Sophora chrysophylla*). Birds move up- and down-slope in response to availability of mamane seeds. Palila will also eat mamane flowers, buds, leaves and small pods, as well as berries from the naio (*Myoporum sandwicense*) trees which dominate this forest type. Caterpillars and insects are important during breeding and nesting season. Pairs are monogamous. Females build nests of grass, twigs and lichens; males defend a small territory around the nest tree. Clutch size is two (1-3). A second adult male often helps the pair by feeding the female and chicks; whether this male sires some of the chicks is unknown.

**DISTRIBUTION:** Palila inhabit mamane/naio forest on the southern slope of Mauna Kea between 2000 and 2850 meters (6500 – 9350'). The population is centered near Pu'u La'au on the western edge of this area. Palila were once common in all mamane forests across northwestern Mauna Loa, Hualalai and Mauna

Map distribution

**ABUNDANCE:** Annual population surveys from 1980 to 1995 yielded a mean population estimate of  $3390 \pm 333$  (s.e.) birds. Palila population estimates are highly variable among years, which may be a reflection of census technique and timing.

**LOCATION AND CONDITION OF KEY HABITAT:** Palila are found solely in mamane and mamane/naio forests. Areas with greater crown cover and taller trees attract higher densities of birds. Seasonal availability of mamane pods affects both seasonal and annual density of the palila; birds follow the bloom and fruiting of the trees across elevations. Thus, 96% of the population, and the area with the highest breeding success, occur near Pu'u La'au, where both the elevation range and the quality of the mamane forest is greatest. Mamane forest habitat was severely degraded by grazing sheep and goats: these have been largely, though not entirely, eliminated in response to a court order to maintain palila habitat. The establishment of fine fuels in the form of alien grasses that might carry destructive fires is of concern. The current range of palila lies entirely within Mauna Kea Forest Reserve, thus management is stable.

**THREATS:** Palila are subject to the same threats as other Hawaiian forest birds—habitat loss and modification, avian disease and predation by introduced mammals. Specifically, the following are of immediate concern:

- Fire is a consistent threat to palila habitat. A single large fire could severely limit food resources for the entire population for a period of several years.
- Alien weeds, especially fire-adapted grasses, increase the fine fuel accumulation and thus the fire threat, as well as decrease native plant recruitment in the mamane forest.
- Feral ungulates, even at low densities, limit native plant regeneration and cause soil erosion, thus promoting alien weeds.
- Nest predation by black rats and feral cats limits the palila population, and may cause as much as 35% of nestling mortality.
- Disease is not a factor in their current range, but it almost certainly played a role in the species decline. Expansion of the population to former ranges, including the Pohakuloa Flats, may be limited by the presence of disease at lower elevations.
- Severe weather probably affects mortality in some years.

**CONSERVATION ACTIONS:** The species' vulnerability to extinction was recognized by the middle of the 1900's. Since then, specific (and sometimes schizophrenic) actions have been taken. These include:

- Removal of 46,000 sheep and other feral ungulates in the first half of the 20<sup>th</sup> century. This slowed destruction of the mamane forest habitat. Subsequently, mouflon sheep were introduced for sport hunting, and forest degradation accelerated.
- Court rulings in 1978 and 1987 ordered the eradication of mouflon sheep from palila critical habitat. While eradication is not complete, sheep numbers have been substantially reduced and habitat is recovering.
- Research on population size and distribution, home range and movements, breeding biology, limiting factors and demography, conservation and habitat characteristics has been completed.
- Research into ecology and limiting factors, including food availability and its limits, small population genetics and demography and habitat quality is ongoing. Development and implementation of restoration techniques for palila are included in this long-term study.
- Experimental translocations of birds have been undertaken to attempt to recolonize former habitat.
- Captive propagation of palila is ongoing at Keauhou Bird Conservation Center. It is hoped that captive-bred birds might maintain some site fidelity to release sites.
- Active restoration of habitat at translocation sites. This must include regeneration of mamane forest as well as control of mammalian predators and parasitoid wasps that threaten the food source.
- Increase public education efforts to include ongoing research, threats, Saddle Road realignment mitigation, grazing effects, fire, etc.

**MONITORING:**

- Continue regular population surveys.
- Monitor small mammal populations to assess effectiveness of control efforts.

**RESEARCH PRIORITIES:**

- Fire ecology

**DRAFT:** palila, February 24, 2005

- Development of techniques for successful translocation.
- Bird/habitat relationships, which are expected to be dynamic as mamane forests recover.

**References:**

U.S. Fish and Wildlife Service. 2003. Draft Revised Recovery Plan for Hawaiian Forest Birds. Region 1, Portland, OR. 428pp.