

Northwestern Hawaiian Islands Passerines



Photo: Kate Willis, USFWS

Laysan Finch

Telespiza cantans

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

NWHI Passerines Recovery Plan – USFWS 1984

SPECIES INFORMATION: The Laysan finch is an omnivorous, ground-nesting Hawaiian honeycreeper (Family: Fringillidae) endemic to Laysan Island in the Northwestern Hawaiian Islands. Laysan finches have black legs, large feet, and relatively large bills suitable for eating seeds. They are vocally inventive and have a varied song repertoire. Male and female finches have different plumage, with adult males being a brighter yellow over a larger proportion of their head and body than females. Males are also about six percent larger by weight than females. Laysan finches are known to feed on seeds, fruits, leaves, flowers, stems, seedlings, roots, carrion, invertebrates, and eggs. Typically found in pairs during the breeding season, Laysan finches are non-territorial and forage in small groups (four to twelve individuals) during the non-breeding season. The breeding biology of the species has been well-documented, in addition to studies of geographic variation in genetics, morphology, and nest substrate choice. During breeding season, males defend their mates and nest sites, while females construct nests and incubate eggs. Females rely upon males for nuptial feedings during the incubation period. In good years, Laysan finches are quite fecund, and double and even triple clutches have been documented. Given the remoteness of their habitat, Laysan finches are among the most-studied endangered birds.

DISTRIBUTION: Laysan finches are restricted to the approximately 200 hectare (450 acre) vegetated area of Laysan Island. Since 1967, translocated finches have occupied the 12 hectare (25 acre) and two hectare (four acre) vegetated areas of Southeast Island and Grass Island (respectively) at Pearl and Hermes Reef. Between 1973 and 1998, populations also existed at North Island and Seal-Kittery Island at Pearl and Hermes Reef; those populations were extinct by 1998.

ABUNDANCE: The U.S. Fish and Wildlife Service has conducted transect surveys at Laysan Island during all but four years since 1966. Based on these surveys, the average population size has been estimated as $11,217 \pm 3,784$ (SD). The 1998 population size estimates for the Laysan, Southeast, and Grass populations are 9,911, 350, and 30, respectively, which are within the typical range of variation observed since the 1960s. Density estimates have averaged 56 birds per hectare (25 birds per acre) at Laysan. Densities have been lower, on average, at Southeast and Grass Islands, by 42 percent and 78 percent, respectively.

LOCATION AND CONDITION OF KEY HABITAT: Laysan finches reside year-round on the flat, low-elevation islands of Laysan and Pearl and Hermes Reef. Climate is similar to that of nearby Midway Atoll. Finches inhabit all vegetated areas of the islands, foraging among several vegetation associations of grasses, herbs, and prostrate vines. On Laysan, however, the finches nest primarily in tussocks of the bunchgrass *Eragrostis variabilis*, whose seeds are also a major food source. *Eragrostis* is markedly less abundant at Pearl and Hermes, particularly at Southeast Island, and finches there frequently nest in marine debris (plastic crates, etc.) that have washed up onto the island. Several freshwater seeps drain into Laysan Island's hypersaline lake; Pearl and Hermes islands have no sources of fresh water, so finches get water from rainfall and from dew accumulations on plants. Plant communities at both Laysan and Pearl and Hermes Reef have been altered by human activity, most notably by both intentional and accidental introductions of alien plants. The entire range of this species occurs within the Hawaiian Islands National Wildlife Refuge.

THREATS: Laysan finches have not generally been as strongly impacted by the factors that threaten other native Hawaiian birds, such as habitat loss, predation by introduced mammals, and disease. Habitat loss, for example, has been prevented by the island's status as a refuge, and disease establishment has been impeded by the lack of standing fresh water necessary for mosquito breeding. However, the finches' remoteness carries with it a different, but related, set of threats:

- Invasive alien plants. Habitat quality has been degraded by weed invasions. Finches have integrated some invasive plants into their diet, but changes to the quality of nesting habitat have been more problematic: *Setaria verticillata* appears to have displaced *Eragrostis variabilis* at Southeast Island (Pearl and Hermes Reef), leading to lower nest density and lower reproductive success among nests in *Setaria*. Conversely, the more recent invasion at Southeast by *Verbesina encelioides* appears to have caused the population to quadruple within two years, only to subsequently crash.
- 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.
- Introduced mammals. The risk of rat (*Rattus* spp.) introduction via transport (i.e., ships, planes) is of concern as rats are known to have decimated passerine populations in the NWHI in the past as a result of shipwrecks.
- Sea level rise. Both the Intergovernmental Panel on Climate Change and the U.S. Environmental Protection Agency project sea level to increase 34-42 centimeters (13-16 inches) by 2100. The mean elevation at Southeast Island is just over one meter (3 feet), so that during spring tides, most of the island would be inundated. Grass Island would lose less area, but is already too small to provide significant reduction of extinction risk for the species. Therefore, if sea level does rise as projected, both of the Pearl and Hermes Reef populations would be seriously jeopardized.

CONSERVATION ACTIONS: Laysan finch persistence requires that the integrity of the island's small, remote ecosystems be maintained. This requires excluding and removing any introduced non-native insects, plants, passerine birds, avian disease, and mammalian and reptilian land animals. Quarantine measures in place for researchers appear to be reducing the rate of new introductions, but many species already established (e.g., *Verbesina encelioides*) are

extremely difficult to eradicate. Thus, rigorous statewide reduction or elimination of non-native invertebrate and plant introduction through stricter quarantine and reduced ship groundings are needed. In addition to these efforts, future management specific to the recovery of Laysan finches may include the following:

- Aggressive weed control and native plant restoration to stabilize habitat quality.
- Prevent the introduction of rats and other possible predators.
- Stabilize islands to minimize erosional and submersion-based losses of land area.

MONITORING: Continue current program of transect counts and habitat monitoring. This information is needed to assess population trends and the efficacy of habitat management.

RESEARCH PRIORITIES: More research is needed on best quarantine techniques, best methods for early detection of alien species, and best eradication methods. Research priorities specific to Laysan finches include the following:

- Additional demographic studies to further refine estimates of population structure, dispersal, survivorship, nesting phenology and success, and other life history and behavioral characteristics.
- Assess which management options (e.g., additional translocations, or supplementation of small populations with birds from Laysan, or both) would be most beneficial in terms of extinction risk reduction.

References:

Morin M., Conant S. 2002. Laysan finch (*Telespiza cantans*) and Nihoa finch (*Telespiza ultima*). In *The Birds of North America*, No. 639 (Poole A, Gill F, editors.). Philadelphia, (PA): The Academy of Natural Sciences; and Washington DC: The American Ornithologists' Union.

U.S. Fish and Wildlife Service. 1984. Recovery plan for the Northwestern Hawaiian Islands passerines. Portland, (OR): U.S. Fish and Wildlife Service. 66 pp.