

by Michelle Reynolds

Rescuing Island Castaways



Laysan ducks are best known for one of their energetic foraging behaviors: a spectacular fly-snapping sprint through the brine fly swarms on Laysan Island's interior mudflats.

Photo by Michelle Reynolds/USGS

*T*he Laysan duck or teal (*Anas layanensis*) has the most restricted range of any duck species and is among the world's most highly threatened birds. Before the arrival of humans to the Hawaiian Islands, this species occurred on most islands in the archipelago, and it apparently was well adapted to harsh environments and variable food resources. Today, however, it is restricted to Laysan Island, a single predator-free coralline island of only 990 acres (400 hectares) northwest of the main islands. Laysan has been protected as part of the Hawaiian Islands National Wildlife Refuge since 1909, and the Laysan duck was among the first species listed in the United States as endangered.

Like many isolated island species from Hawaii and New Zealand, the Laysan duck evolved in the absence of mammalian predators and is ill-suited to life where non-native predators have invaded. For example, when startled, Laysan ducks are more likely to freeze their motion rather than to flush or fly. This strategy is well

suites as a cryptic defense against Hawaii's native flying predators but ineffective against predation by non-native mammals.

Small, isolated populations are extremely vulnerable to extinction from chance events and human related disturbance. The Laysan duck population on nearby Lisianski Island disappeared after successive shipwrecks on the island in the 1840's, probably due to direct human consumption. The species reached the brink of extinction when rabbits were introduced to Laysan Island in the early 1900's, but it recovered from fewer than 10 individuals after the rabbits were removed and the vegetation restored. Although rabbits no longer occur on Laysan, the duck population has gone through several severe bottlenecks. The most recent population crash occurred in 1993 during El Nino drought conditions. The population size (more than 500) was larger than the drought stricken island could support, and a die-off occurred from starvation and parasite infestation. Duck numbers appear to fluctuate with rainfall and population density.

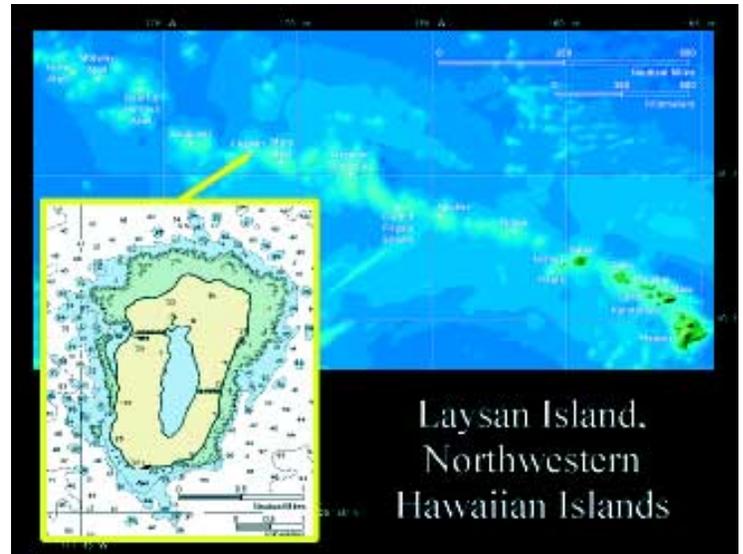
Ecosystem restoration on Laysan Island National Wildlife Refuge and the establishment of additional wild populations on other islands are needed to reduce the risk of extinction. Control of a non-native plant, the sandbur weed (*Cenchrus encinatus*) has been very effective in restoring the duck's nesting habitat, which includes native bunch grass (*Eragrostis variabilis*). Despite the bird's former distribution in forested areas of the main Hawaiian Islands, only remote, predator-free oceanic islands are being considered as sites for establishing new populations. Even the predator-free islands will likely need pest and weed control or reestablishment of freshwater seeps. Many of the Hawaiian Islands are infested with introduced predatory ant species such as the big-headed ant (*Pheidole megacephala*), which could compete with Laysan ducks for invertebrate prey and threaten the endemic arthropods.

The U.S. Fish and Wildlife Service has implemented strict quarantine procedures to prevent additional accidental introductions of harmful non-natives on Hawaii's remote island refuges.

Translocation is a wildlife management tool involving the transfer of animals from one location to another to reestablish extirpated populations or augment depleted populations. The translocated animals can consist of wild and/or captive-propagated individuals.

For the Laysan duck, this tool could reduce the risk of extinction by reintroducing ducks into areas that are free of threats. Research on Laysan is addressing the ecological requirements for any future translocations and the potential effects on the Laysan population from

removing some of its ducks for translocation. Critical features of the ecology and population biology of the Laysan duck in general also are under study. Field research initiated in 1998 has concentrated on foraging ecology and methods to determine population size. The ducks are usually hidden under cover during the day, and become active before sunset and after dark. We have used mark-resight methods to improve population monitoring. Because the duck's behavior varies seasonally, the traditional method of counting unmarked individuals around the lake at sunset consistently underestimated the population for most seasons. Over half of the population was marked during 1998-99, and 1999 population estimates were around 300 adults. The ducks on Laysan had a good breeding year in 1999, and the population for 2000 is estimated at 370 adults.



The important progress being made in understanding the factors limiting the Laysan duck population can translate into practical recovery recommendations. Reestablishing additional populations will reduce the risk of extinction and restore an ecological component now missing from most of the islands. The Service, Ducks Unlimited, National Geographic Society, and U.S. Geological Service (Biological Resources Division) are pooling their resources to ensure that these unique ducks do not become "island castaways." The Laysan duck's "rescue" will arrive in the form of habitat restoration and reintroduction.

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