

I agree with the IUCN that the Laysan teal (*Anas laysanensis*) is less threatened than it was prior to the translocation to Midway Atoll. Its range and abundance has almost doubled. However, its range and population size were so tiny, that despite the reintroduction, it still meets IUCN criteria for critically endangered or endangered. It is still a species at high risk of extinction with two new risks that are increasing in frequency. Based on its limited distribution and susceptibility to population crashes, the species is still a strong candidate for IUCN Critically Endangered status or endangered and should not be down-listed to vulnerable. I list the relevant criteria below:

“A taxon is Critically Endangered when the best available evidence indicates that it meets any of the following criteria (A to E), and it is therefore considered to be facing an extremely high risk of extinction in the wild.” (IUCN Red List Categories and Criteria Version 3.1)

Criterion B. Geographic range in the form of either B1 (extent of occurrence) OR B2 (area of occupancy) OR both.

B2: Area of occupancy estimated to be less than 10km², and estimates indicating at least two of a-c:

- a. Severely fragmented or known to exist at only a single location
- c. Extreme fluctuations in any of the following:
 - (iv) number of mature individuals

All of the stochastic threats to small island populations still exist. However there are now two new threats – increased disease risk and sea level rise from global climate change. Previously widespread throughout the Hawaiian Islands, the Laysan teal has the most restricted range of any duck in the world: the entire species range is limited to 9 km sq on two isolated Northwest Hawaiian atolls: Laysan Island and Midway Atoll. Laysan is only 10.6 m at its maximum elevation and the island’s mean elevation is only 3.45 m, and the ducks habitat on Laysan is merely 2.45 km² (245 ha.) after removing beach and desert areas. Likewise the Midway Atoll mean and max elevation is lower than those of Laysan. The islands, and therefore both Laysan teal populations, are at risk from severe storms, tsunamis, and sea level rise due to global climate change. All of the Hawaiian Atolls are vulnerable to storm surges and wave run-up from hurricanes in the Central Pacific currently with overwash with elevations of 4 – 9 m. A severe storm hit Laysan on Feb 11, 2011 flooding 35,000 albatross nests and a severe storm on Midway Atoll on January 12, 2011 with wave wash and that flooded Sand and Eastern Islands.

Other threats faced by the teal are accelerated filling of the interior lake and freshwater seeps due to alien wetland plant species, and erosion of dunes from storm impacts. And as previously, the populations are vulnerable to drought-related food reductions, and new and known catastrophic diseases such as Echinuria (which wiped out 75% of the population in 1993). Nothing has changed on Laysan to prevent catastrophic disease.

More recently Botulism C has emerged as a new and an annual epizootic at Midway Atoll since 2008. In 2008, 181 dead Laysan teal were collected, in 2009 over 90 dead Laysan teal were collected, and in 2010 over 70 botulism sickened and dead birds were recovered. The outbreaks are managed by intensive searches conducted by the US Fish and Wildlife Service, and the removal of wetland vegetation to better detect dead ducks at the wetlands, and rehabilitation of sick ducks with anti-toxin, and nutritional support. Without this effort, the outbreak could be devastating and as the population approaches the island’s carrying capacity, reproduction may slow (deaths could exceed births). The most recent (2010) preliminary population estimate for Laysan teal at Midway Atoll is between 268 – 473 depending on of assumptions about the survival of the juvenile birds marked. The best estimates indicate the post-fledgling (adult and juvenile) population in 2009 exceeded 400 birds.

The carrying capacity (K) of Laysan today is approximately 500 Laysan teal, but the number of birds that can be supported on the island varies in relation to environmental variation and habitat condition. The post fledgling population size (adult and juvenile) of Laysan teal from is 521 (CI 492-549) in 2010 using a Chapman (Lincoln Petersen) type estimator (unpublished data in table below). The number of breeders has not been determined.

There are plans by the USFWS to introduce another endangered insectivore (the Nihoa Miller Bird) to Laysan Island in 2011. Although a similar Millerbird once occurred on Laysan, the loss of terrestrial invertebrates due to non-native ants and other changes since 1915 may lead to competition for terrestrial prey, if the Nihoa Millerbirds become very successful. We do not see this as a direct threat to the species, however, the carrying capacity (K) of Laysan to support two endangered insectivores may be less than it is at present. The most recent unpublished estimates of Laysan teal abundance (adults and post fledgling juveniles) from Laysan Island are listed below:

Year	Total pop Laysan Island estimate	CI Lower	CI Upper
	2010	521	492
2009	496	455	538
2008	456	416	497

I believe the species will remain endangered until it can be restored to a higher elevation and larger island that is free of the introduced mammalian predators. Introduced predators were likely to have caused its range contraction to the NW Hawaiian Islands. The unoccupied predator free islands are very small (see table below for area and estimated carrying capacities).

Estimate of post-fledgling abundance

Island	Total Area (ha)	Laysan Teal Habitat	Estimated K range	K- LADU	Density (K/ha)
Laysan	521 (CI 492-549)	415.7	245.63	316-636	1.85
Midway Atoll	473 (439 -508)*	586.2	405.50	473-749	1.48
Lisianski	Unoccupied	148.5	123.60	207	
Green (Kure)	Unoccupied	93.0	65.40	109	
Tern Island (French Frigate Shoals)	Unoccupied	12.1	5.92	10	
Southeast Island (Pearl &Hermes)	Unoccupied	15.10	12.59	21	
North Island (P&H)	Unoccupied	9.3	4.36	7	
East Island (FFS)	Unoccupied	4.2	1.57	3	
Grass Island (P&H)	Unoccupied	2.9	1.21	2	
Seal-Kittery Island (P&H)	Unoccupied	12.6	0.98	2	
Nihoa Island	Unoccupied	76.4	53.4	89	

*This estimate assumes survival of most recently marked juvenile birds –so may be an over estimate of post-fledgling population size. Let me know if you have any questions. Sorry for my tardy response.

Sincerely,

Michelle Reynolds
Wildlife Biologist, PhD

** These are my opinions and do not reflect the US Government. All unpublished estimates are preliminary for informational purposes only.