

## **5-YEAR REVIEW**

Short Form Summary

**Species Reviewed:** Laysan duck (*Anas laysanensis*)

**Current Classification:** Endangered

### **Federal Register Notice announcing initiation of this review:**

[USFWS] U.S. Fish and Wildlife Service. 2012. Endangered and threatened wildlife and plants; initiation of 5-year status reviews of 46 species in Idaho, Oregon, Washington, Nevada, Montana, Hawaii, Guam, and the Northern Mariana Islands. Federal Register 77(44):13248-13251.

### **Lead Region/Field Office:**

Region 1/Pacific Islands Fish and Wildlife Office (PIFWO), Honolulu, Hawaii

### **Name of Reviewer(s):**

Michelle Reynolds, Biologist (USGS-BRD)

Annie Marshall, Fish and Wildlife Biologist, (PIFWO)

Marie Bruegmann, Acting Recovery Program Leader, (PIFWO)

Kristi Young, Deputy Field Supervisor for Endangered Species, (PIFWO)

### **Methodology used to complete this 5-year review:**

This review was conducted by staff of the Pacific Islands Fish and Wildlife Office of the U.S. Fish and Wildlife Service (USFWS), beginning on March 6, 2012. The review was based on a review of current, available information since the last 5-year review for the Laysan Duck (USFWS 2007). Dr. Michelle Reynolds, USGS-BRD, assisted with portions of the review and recommendations for conservation actions needed prior to the next 5-year review. The evaluation of Annie Marshall, Fish and Wildlife Biologist, was then reviewed by the Acting Recovery Program Leader and the Deputy Assistant Field Supervisor for Endangered Species before submission to the Field Supervisor for approval.

### **Background:**

For information regarding the species listing history and other facts, please refer to the Fish and Wildlife Service's Environmental Conservation On-line System (ECOS) database for threatened and endangered species ([http://ecos.fws.gov/tess\\_public](http://ecos.fws.gov/tess_public)).

### **Review Analysis:**

Please refer to the previous 5-year review for Laysan duck published on August 2, 2007 (available at [http://ecos.fws.gov/docs/five\\_year\\_review/doc1129.pdf](http://ecos.fws.gov/docs/five_year_review/doc1129.pdf)) and the revised recovery plan for the Laysan duck (USFWS 2009) for a complete review of the species' status, threats, and management efforts. No new threats or no new information regarding the species biological status have come to light since listing to warrant a change in the Federal listing status of the Laysan duck as endangered.

The Laysan duck is endangered and was extirpated across the Hawaiian archipelago with an extant population persisting only on the island of Laysan. A second population was

established via translocation of wild birds from Laysan Island to Midway Atoll in 2004 and 2005 (USFWS 2009). The current status for the Laysan duck is provided in Table 1 below. Threats to the species continue, including new threats (see below), and have recently negatively impacted the populations on both Laysan Island and Midway Atoll.

New status information:

In 2012, the population estimate of Laysan ducks on Laysan Island was 339 (95% CI 265-413) (Reynolds *et al.* in prep.; U.S. Geological Survey [USGS]/USFWS unpubl. data 2014). The population estimate for Laysan ducks on Midway in 2010 was 473 (95% CI 439-508) (Reynolds *et al.* 2011, *in litt.* 2014). Preliminary analysis of the Midway population from limited data collected after a tsunami overwash event in 2011 ranged between 231-330 in 2012 (USGS publ. data 2014). There was no data collection for Laysan duck population estimates for either Laysan or Midway after 2012.

New threats:

- Disease – botulism – A new type of epizootic, avian botulism C, has occurred on an annual basis on Midway Atoll since 2008, resulting in high mortality and population declines and is a threat to the species persistence on small islands (M. Reynolds, *in litt.* 2014).
- Climate change degradation of habitat – Climate change is a threat to this species as it currently occurs only on low lying islands vulnerable to sea level rise, storm surge, and tsunamis. New digital elevation models (Reynolds *et al.*, *in litt.* 2010; Reynolds *et al.* 2011) indicate the mean elevation of Midway Atoll is 2.5 meters (8.2 feet) and the mean elevation of Laysan is 4.3 meters (14.8 feet) (Berkowitz *et al.* 2012; Krause *et al.* 2012).

New management actions:

- A Laysan duck working group (including personnel with various expertise from various agencies) was re-established in 2014 to implement translocations recommended by the recovery plan (USFWS 2009). Planning included logistics, permits, transport, NEPA, genetic management, preparing Lisianski Island, and preparing Kure Atoll, etc. Through several discussions, it was decided that the most logical effort at this time, would be to move ducks from Midway to Kure. To maximize genetic diversity of the founding stock, juveniles from different broods from different areas of Midway will be selected for translocation. The working group has also agreed that it will be important to move additional founders from Laysan Island to Kure and Midway Atoll in the near future to maximize their genetic variation. For the current proposed translocation of Laysan ducks, an addendum to the recovery plan is being developed that specifically addresses moving birds from Midway to Kure, otherwise, protocols will be the same applied successfully in 2004 and 2005 (Laysan to Midway). The addendum to the recovery plan is currently focused on describing the guidelines and protocols for planning, preparation, and release stages for a translocation

from Midway to Kure and builds off the recovery plan that was used to successfully translocate Laysan ducks from Laysan to Midway (Reynolds *et al.* 2004; Reynolds in prep.).

### **Synthesis:**

Downlisting, and delisting objectives are provided in the recovery plan for the Laysan duck (USFWS 2009). To be downlisted, the Laysan Island population must be stable or increasing when monitoring data are averaged over a period of 15 consecutive years and should average roughly 500 ducks over this period (believed to be the carrying capacity of the island). In addition, a total of at least 1,800 potentially breeding ducks should exist on a combination of Northwestern Hawaiian Islands (including Laysan and Midway) and at least one predator-controlled site in the higher elevation Main Hawaiian Islands. Each of these populations must be stable or increasing when monitoring data are averaged over a period of at least 10 consecutive years. And finally, island- or site-specific management plans for Laysan ducks must be created and implemented.

The downlisting goals for this species have not been met (Table 1), not all threats are being managed, and some threats may be increasing, including avian botulism as well as storms, tsunamis, and sea level rise due to climate change (Table 2). Therefore, the Laysan duck meets the definition of endangered as it remains in danger of extinction throughout its range.

### **Recommendations for Future Actions:**

- Population viability monitoring and analysis
  - Monitor population status and reproduction on Laysan Island to determine trends, identify limiting factors that can be addressed through management, and monitor numbers and condition of juvenile ducks in years when translocations are planned.
  - Monitor survival and reproduction in Midway population (and any other populations initiated through translocation) to determine vital rates for comparison with Laysan population and identify limiting factors that can be addressed through management.
  - Study survival, reproduction, and other aspects of Laysan duck ecology at Midway (and any future release sites) to compare with data from Laysan Island and assess management requirements. This information will provide a basis for adaptive management of Laysan ducks in new environments as well as add to our baseline knowledge of the species.
- Reintroduction / translocation
  - Conduct an “immigration” translocation of individuals from Laysan to Midway to supplement genetic diversity in the recently established population.
  - Conduct translocation of Laysan ducks to Kure Island. Continue restoration activities for Laysan duck habitat on the island.

- Develop translocation plans for moving Laysan ducks to Lisianski Island from Laysan and establish fresh water guzzlers necessary to support ducks at this site.
- Strategic planning – Draft emergency contingency plans for Laysan ducks to address the potential threat of catastrophes such as hurricanes, tsunamis, and epizootics.
- Disease monitoring and control – Continue to monitor for botulism and if detected, implement actions to minimize the threat to other ducks. Research and develop new tools to prevent botulism related mortality on Laysan, Midway and any future reintroduction sites.
- Alliance and partnership development – Revisit partnerships with the Kahoolawe Island Restoration Committee and other stake holders for faunal restoration at Kahoolawe, including habitat restoration and mammalian predator removals for Laysan duck translocations..

**Table 1. Status and trends of Laysan Ducks from listing through current 5-year review.**

<b>Date</b>	<b>No. adult wild individuals (Laysan/Midway)</b>	<b>Downlisting Criteria identified in Recovery Plan</b>	<b>Downlisting Criteria Completed?</b>
1967 (listing)	239-300 (USFWS 1982)/0	1. Laysan Island population is stable or increasing when monitoring data are averaged over a period of 15 consecutive years (average roughly 500 ducks over this period).	No
		2. Total of at least 1,800 potentially breeding ducks on a combination of Northwestern Hawaiian Islands (including Laysan and Midway) and at least one predator-controlled site in the Main Hawaiian Islands.	No
		3. Island- or site-specific management plans for Laysan Ducks are created and implemented.	No
2004 (recovery plan)	581/20 translocated in 2004 and 22 in 2005	1. Laysan Island population is stable or increasing when monitoring data are averaged over a period of 15 consecutive years (average roughly 500 ducks	No

		over this period).	
		2. Total of at least 1,800 potentially breeding ducks on a combination of Northwestern Hawaiian Islands (including Laysan and Midway) and at least one predator-controlled site in the Main Hawaiian Islands.	No
		3. Island- or site-specific management plans for Laysan Ducks are created and implemented.	No
2007 (5-year review)	576 (in 2005; USFWS 2007)/192	1. Laysan Island population is stable or increasing when monitoring data are averaged over a period of 15 consecutive years (average roughly 500 ducks over this period).	No
		2. Total of at least 1,800 potentially breeding ducks on a combination of Northwestern Hawaiian Islands (including Laysan and Midway) and at least one predator-controlled site in the Main Hawaiian Islands.	No
		3. Island- or site-specific management plans for Laysan Ducks are created and implemented.	No
2009 (revised recovery plan)	533-626 (95% CI)/189-236 (95% CI)*	1. Laysan Island population is stable or increasing when monitoring data are averaged over a period of 15 consecutive years (average roughly 500 ducks over this period).	No
		2. Total of at least 1,800 potentially breeding ducks on a combination of Northwestern Hawaiian	No

		Islands (including Laysan and Midway) and at least one predator-controlled site in the Main Hawaiian Islands.	
		3. Island- or site-specific management plans for Laysan Ducks are created and implemented.	No
2014 (5-yr review)	339 (265-413 95 % CI)(in 2012)/231-330 estimated in 2012*	1. Laysan Island population is stable or increasing when monitoring data are averaged over a period of 15 consecutive years (average roughly 500 ducks over this period).	No
		2. Total of at least 1,800 potentially breeding ducks on a combination of Northwestern Hawaiian Islands (including Laysan and Midway) and at least one predator-controlled site in the Main Hawaiian Islands.	No
		3. Island- or site-specific management plans for Laysan Ducks are created and implemented.	No

\*M. Reynolds, *in litt.* 2014

**Table 2. Threats to the Laysan duck and ongoing conservation efforts.**

<b>Threat</b>	<b>Listing factor</b>	<b>Current Status</b>	<b>Conservation/ Management Efforts</b>
Alien Species	A	Ongoing	Partially: Quarantine and restoration efforts in place
Filling of lake and seeps	A	Ongoing	No
Alien predators	C	Ongoing	Partially: Quarantine measures in place
Disease	C	Ongoing	Partially: Monitoring of wetland areas and removal of carcasses for botulism outbreaks

Alien Competitors	E	Ongoing	No/Ant eradication being attempted at Kure 2014
Contaminants	E	Ongoing	No
Human Disturbance	E	Ongoing	Partially: Education of personnel on islands
Environmental Catastrophes	E	Ongoing/Increasing?	No
Climate change and sea level rise	A, E	Increasing	No

**References:**

**See previous 5-year review for a full list of references (USFWS 2007). Only references not listed in that document are provided below.**

Berkowitz, P., C.D. Storlazzi, K.N. Courtot, C.M. Krause, and M.H. Reynolds. 2012. Sea-level rise and wave-driven inundation models for Laysan Island. Chapter 2, pages 72-126 in Reynolds, M.H., Berkowitz, P., Courtot, K.N., and Krause, C.M. (editors), Predicting sea-level rise vulnerability of terrestrial habitat and wildlife of the Northwestern Hawaiian Islands. U.S. Geological Survey Open-File Report 2012-1182. Honolulu, Hawaii.

Krause, C.M., K.N. Courtot, P. Berkowitz, J. Carter, and M.H. Reynolds. 2012. Climate change vulnerability assessment of the low-lying northwestern Hawaiian Islands. Chapter 1, pages 3-71 in Reynolds, M.H., Berkowitz, P., Courtot, K.N., and Krause, C.M., (editors), Predicting sea-level rise vulnerability of terrestrial habitat and wildlife of the Northwestern Hawaiian Islands. U.S. Geological Survey Open-File Report 2012-1182. Honolulu, Hawaii.

Reynolds, M.H. In prep. Revised draft Laysan teal re-introduction plan. Part 2: Midway Atoll to Kure Atoll.

Reynolds, M. H., K. W. Brinck, and L. Laniawe. 2011. Population estimates and monitoring guidelines for endangered Laysan teal, *Anas laysanensis*, at Midway Atoll: pilot study results 2008-2010. Hawaii Cooperative Studies Unit Technical Report HCSU-021. University of Hawaii at Hilo, Hilo, Hawaii. Available online at [http://hilo.hawaii.edu/hcsu/documents/HCSU-021\\_Reynolds\\_LADU\\_Midway.pdf](http://hilo.hawaii.edu/hcsu/documents/HCSU-021_Reynolds_LADU_Midway.pdf). Accessed on August 21, 2014.

Reynolds, M.H., M. Vekasy, and J. Klavitter. 2004. Draft Laysan teal re-introduction plan: translocation to Midway Atoll. Part 1: preparation, transport, and release. 47 pages. Unpublished.

[USFWS] U.S. Fish and Wildlife Service. 1982. Laysan duck recovery plan. U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Portland, Oregon. 38 pages.

[USFWS] U.S. Fish and Wildlife Service. 2007. Laysan duck (*Anas laysanensis*): 5-year review summary and evaluation. U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Honolulu, Hawaii. 8 pages.

[USFWS] U.S. Fish and Wildlife Service. 2009. Revised recovery plan for the Laysan duck (*Anas laysanensis*). U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Portland, Oregon. ix + 114 pages.

**In litt.:**

Reynolds, Michelle. 2014. U.S. Geological Survey-Biological Resources Division, Pacific Island Ecosystems Research Center, Hawaii National Park, Hawaii. E-mails to Annie Marshall, U.S. Fish and Wildlife Service, dated March 11, 2014, and August 20, 2014. Subject: Laysan duck question and 5-year & status of permit respectively.

Reynolds, M.H., C. McGowan, S.J. Converse, B. Mattsson, J.S. Hatfield, A. McClung, L. Mehrhoff, J.R. Walters, and K. Uyehara. 2010. Trading off short-term and long-term risk: minimizing the threat of Laysan duck extinction from catastrophes and sea-level rise. A case study from a structured decision making workshop. U.S. Fish and Wildlife Service, National Conservation Training Center, Shepards town, West Virginia. Available online at [http://nctc.fws.gov/courses/ALC/ALC3159/reports/final-reports/2010FR/laysan\\_duck\\_final\\_report.pdf](http://nctc.fws.gov/courses/ALC/ALC3159/reports/final-reports/2010FR/laysan_duck_final_report.pdf).

**Unpublished data:**

[USGS] U.S. Geological Survey. 2014. U.S. Geological Survey-Biological Resources Division, Pacific Island Ecosystems Research Center, Hawaii National Park, Hawaii.. Unpublished data.

[USGS/USFWS] U.S. Geological Survey/U.S. Fish and Wildlife Service. 2014. U.S. Geological Survey-Biological Resources Division, Pacific Island Ecosystems Research Center, Hawaii National Park, Hawaii and U.S. Fish and Wildlife Service. Unpublished data.

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**U.S. FISH AND WILDLIFE SERVICE**  
**5-YEAR REVIEW of Laysan duck (*Anas laysanensis*)**

**Pre-1996 DPS listing still considered a listable entity?** N/A

**Recommendation resulting from the 5-year review:**

- Delisting
- Reclassify from Endangered to Threatened status
- Reclassify from Threatened to Endangered status
- No Change in listing status

**Appropriate Listing/Reclassification Priority Number, if applicable:** \_\_\_\_\_

**Review Conducted By:**

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Date *2014-08-25*