5-YEAR REVIEW

Short Form Summary

Species Reviewed: Laysan Duck (*Anas laysanensis*)

Current Classification: Endangered

FR Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2020. Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status Reviews for 129 Species in Oregon, Washington, Idaho, Hawaii, Montana, California, and Nevada. Federal Register 85(48): 14240–14243.

Lead Region/Field Office: Region 1/Pacific Islands Fish and Wildlife Office (PIFWO), Honolulu, Hawai‘i

Name of Reviewer(s):

James Breeden, Fish and Wildlife Biologist, PIFWO
John Vetter, Animal Recovery Coordinator, PIFWO
Megan Laut, Recovery Team Manager, PIFWO

Methodology used to complete this 5-year review: This review was conducted by staff of the PIFWO of the U.S. Fish and Wildlife Service (USFWS), beginning on May 10, 2022. This review is based on an assessment of current, available information since the previous 5-year review, for the Laysan duck (*Anas laysanensis*) (USFWS 2017, entire). The evaluation by James Breeden, Fish and Wildlife Biologist, was reviewed by John Vetter, the Animal Recovery Coordinator, and Megan Laut, the Recovery Team Manager, before review and approval by the Regional Office.

Background:

For information regarding the species' listing history and other facts, please refer to the USFWS Environmental Conservation Online System database for threatened and endangered species at: https://ecos.fws.gov/ecp/.

Review Analysis:

Please refer to the previous 5-year review for the Laysan duck published on August 2, 2007 (available at https://ecos.fws.gov/docs/tess/species_nonpublish/1089.pdf), August 25, 2014 (available at https://ecos.fws.gov/docs/tess/species_nonpublish/2216.pdf), and August 25, 2017 (available at https://ecos.fws.gov/docs/tess/species_nonpublish/2400.pdf) for a complete review of the species' status, threats, and management efforts. At this time, we do not recommend a change in the status of the Laysan duck as endangered.

The Laysan duck is a non-migratory dabbling duck endemic to the Hawaiian archipelago with wild populations currently occurring on Laysan Island (Kamole), Midway Atoll (Kuaihelani), and Kure Atoll (Hōlanikū). The Laysan duck has the most restricted range of any waterfowl species in the world (USFWS 2009, p. 1; Pyle and Pyle 2017, p. 1) and is the rarest duck in the Northern Hemisphere (PMNM 2020, entire). Previous Laysan

duck conservation translocations expanded their range by establishing new populations to reduce extinction risk. Three conservation translocations of wild Laysan ducks have occurred: two from Laysan to establish a population on Midway (2004 and 2005) and one from Midway to establish a population on Kure (2014) (Reynolds et al. 2020, p. 193). Total range of the Laysan duck is approximately 2,817 acres (ac) (1140 hectares [ha]) (USFWS 2009, p. 104).

Avian botulism type C outbreaks continue to occur on Midway and Kure (Reynolds et al. 2020, p. 203). However, avian botulism outbreaks have not been detected on Laysan, where the Laysan duck survival is highest (Reynolds et al. 2020, p. 203). The current status for the Laysan duck is provided in Table 1 below. Threats to the species (Table 2) continue to negatively impact the populations on Laysan, Midway, and Kure, particularly avian botulism and storms.

New status information:

- **Laysan -** Laysan duck counts occurred on September 3, 2017 (n = 67 adults and 49 hatch years); August 29, 2019 (n = 273 adults); June 23, 2021 (n = 172 adults and 10 hatch years); May 13, 2022 (n = 117 adults); May 25, 2022 (n = 109 adults); and June 10, 2022 (n = 124 adults) (Boyd, 2022, pers. comm.). No population analysis has been done on these counts, so the most recent estimated population of Laysan ducks on Laysan is 339 individuals (95% Confidence Interval [CI] = 265–413) (Reynolds et al. 2015, p. 96).
- **Midway -** Laysan duck counts occur year around on Midway. The current estimated population of Laysan ducks on Midway is 987 (920–1,054 95% CI) ducks (Plissner 2022, entire)**.**
- **Kure -** Laysan duck counts occur year around on Kure. The current estimated population of Laysan ducks on Kure is 87 individuals (Vanderlip 2022, entire).

New Threats:

- Climate change destruction or degradation of habitat - According to the Intergovernmental Panel on Climate Change, human activities have caused a 1 degree Celsius (°C) (1.8 degrees Fahrenheit [°F]) increase in temperature above pre-industrial levels, and if the current rate of warming remains constant, an increase of 1.5°C (2.7 °F) by the year 2030 (IPCC 2018, A1, p. 6) may occur. Regional climate change models predict that the wet windward parts of the Hawaiian Islands may become wetter or remain stable in their seasonal rainfall, while the dry leeward sides would become drier (Timm et al. 2015, p. 92). The Hawaiian Islands are expected to experience a greater contrast between wet and dry regions (Timm et al. 2015, p. 92). Changes in climatic conditions may cause a reduction of prey, loss of habitat, and increase localized catastrophes such as severe storms, diseases, climate change, or demographic stochasticity which, because of the Laysan duck's restricted range and low numbers, increases the ducks vulnerability to extinction (Gilpin and Soule 1986, pp. 24–34; Pimm et al. 1988, p. 757; Mangel and Tier 1994, p. 607).

New Management Actions:

- Reintroduction/Translocation - A second conservation translocation is being developed to transfer Laysan ducks from Midway to Kure to increase population size and enhance genetic representation (Vanderlip 2022, entire).
- Habitat and natural process management and restoration - Planning efforts underway to eradicate the house mouse (*Mus musculus*) from Midway.
- Habitat and natural process management and restoration - Additional guzzlers have been installed on Midway.
- A seasonal field camp is monitoring the Laysan duck population on Laysan during the summer of 2022. The monitoring is expected to provide an updated population estimate.

Recommendations for Future Actions:

- Habitat and natural process management and restoration - Continue restoration activities for Laysan duck habitat on Laysan, Midway, and Kure.
- Threats - Recently, quarantine measures have not been entirely successful. Review quarantine measures for the Northwestern Hawaiian Islands, revise and implement as needed.
- Threats - Improve monitoring for new introductions of alien species throughout the Northwestern Hawaiian Islands.
- Population viability monitoring and analysis -
    - Monitor population status and reproduction on Laysan 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 and Kure populations (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 Kure (and any future release sites) to compare with data from Laysan 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 and to Kure to supplement genetic diversity in the recently established populations.
    - Develop translocation plans for moving the Laysan duck to another appropriate island from Laysan and restore habitat as needed, including the establishment of freshwater 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, Kure and any future reintroduction sites. Vaccination trials for botulism are a high priority.

- Alliance and partnership development - Revisit partnerships with the Kaho‘olawe Island Restoration Committee and other stake holders for faunal restoration at Kaho‘olawe, including habitat restoration and mammalian predator removals for potential future Laysan duck translocations.
- Update the recovery plan (USFWS 2009, entire). Use recent survey and biological data to reevaluate down- and delisting criteria as appropriate.

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

Date	**No. adult wild individuals (Laysan/Midway/Kure)**	**Downlisting Criteria Identified in Recovery Plan**	**Downlisting Criteria Completed?**
1967 (listing)	239–300 (USFWS 1982, p. 14)/0/0	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 2005/0	1. Laysan Island population is stable or increasing when monitoring data are averaged over a period of 15 consecutive years	No

		(average roughly 500 ducks 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 (USGS 2005, entire)/192/0	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
2009 (revised recovery plan)	611 (538–714 95% CI) (USFWS 2009, p. 1)/189–236 (95% CI)/0	1. Laysan Island population is stable or increasing when	No

		monitoring data are averaged over a period of 15 consecutive years (average roughly 500 ducks 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
2014 (5-yr review)	339 (265–413 95 % CI) (Reynolds et al. 2015, p. 96)/231–330 (Reynolds 2014, entire)/28 (USGS 2014, entire)	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

2017 (5-yr review)	339 (265–413 95 % CI) (Reynolds et al. 2015, p. 96)/ 314–435 95 % CI (Reynolds et al. 2017, p. 66)/ 30–35 (Vanderlip 2017, entire)	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
2022 (5-yr review)	339 (265–413 95 % CI) (Reynolds et al. 2015, p. 96)/ 987 (920–1,054 95% CI) (Plissner 2022, entire)/ 87 (Vanderlip 2022, entire)	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	No

		are created and implemented.	

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

Threat	Listing Factor	Current Status	Conservation/Management Efforts
Alien species	A	Ongoing	Partial: Quarantine and restoration efforts in place, but are not completely successful. House mouse eradication on Midway is planned for 2023.
Filling of lake and seeps (on Laysan)	A	Ongoing	No
Alien predators	C	Ongoing	Partial: Quarantine measures are in place.
Disease	C	Ongoing	Partial: Monitoring of wetland areas and removal of carcasses for botulism outbreaks are ongoing.
Alien competitors	E	Ongoing	No, an introduced vertebrate, the snake-eyed skink (*Cryptoblepharus* spp.), may adversely affect native invertebrates and may be a food competitor (Morin and Conant 1998, p. 70).
Contaminants	E	Ongoing	No
Human disturbance	E	Ongoing	Partial: Education of personnel takes place on islands where the Laysan duck occurs.
Environmental catastrophes	E	Ongoing/Increasing?	No
Climate change and sea level rise	A, E	Increasing	No

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***In litt*:**

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***Personal Communication*:**

Boyd, A. 2022. Phone conversation between Amanda Boyd, U.S. Fish and Wildlife Service, Deputy Superintendent, Papahānaumokuākea Marine National Monument and James Breeden U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office, Wildlife Biologist, regarding Laysan duck surveys on Laysan Island. June 16, 2022.

U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 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
X No Change in listing status

Name of Reviewer(s):
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for MEGAN LAUT Digitally signed by MEGAN LAUT Date: 2022.07.18 11:26:19 -10'00' Date _____