

5-YEAR REVIEW

Short Form Summary

Species Reviewed: ‘Alalā or Hawaiian crow (*Corvus hawaiiensis*)

Current Classification: Endangered

FR Notice announcing initiation of this review:

[USFWS] U.S. Fish and Wildlife Service. 2023. Endangered and threatened wildlife and plants; Initiation of 5-year status reviews for 133 species in Oregon, Washington, Idaho, Montana, California, Nevada, Hawaii, Guam, and the Commonwealth of the Northern Mariana Islands. Federal Register 88(56):17611-17614.

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

Name of Reviewer(s):

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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 in March 2025. The review was based on a review of current, available information since the last 5-year review for the ‘alalā or Hawaiian crow (*Corvus hawaiiensis*) (USFWS 2020, entire). The evaluation by Jay Nelson, Fish and Wildlife Biologist, was reviewed by John Vetter, the Animal Recovery Coordinator, and Megan Laut, the Recovery Program Manager.

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 <http://ecos.fws.gov/ecp/species/B004>

Review Analysis:

Please refer to the Revised Recovery Plan for the ‘Alalā (USFWS 2009a, entire) and the previous 5-year reviews for the ‘alalā published on September 18, 2020; August 18, 2015, and July 31, 2009 (available at <http://ecos.fws.gov/ecp/species/B004>) 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 ‘alalā as endangered.

The ‘alalā is a member of the family Corvidae, the family of birds that includes ravens, crows, jays, and magpies, among others. In appearance, the ‘alalā is a typical medium-sized crow, from dark brown to black in color (USFWS 2009a, p. I-3). The ‘alalā is endemic to the island of Hawai‘i. Historically the species was restricted to the dry and mesic forests in the western and southern portions of the island from North Kona District to the vicinity of Kīlauea Crater in the Ka‘ū District. The species is associated with ‘ōhi‘a

(*Metrosideros polymorpha*) and ‘ōhi‘a-koa (*Acacia koa*) forests with an understory of fruit-bearing trees, vines, and shrubs (USFWS 2009a, p. viii).

New status information:

The last observation of ‘alalā in the wild was in 2002 (USFWS 2009a, p. viii). There have been reported sightings of ‘alalā since then but none have been confirmed. The most recent reported sighting was in 2014 in Ka‘ū Forest Reserve (Ka‘ū FR) (Ball 2014, entire). There are 110 ‘alalā currently in captivity in Hawai‘i: 72 at the Keauhou Bird Conservation Center (KBCC) in Volcano, Hawai‘i; 37 at the Maui Bird Conservation Center (MBCC) in Olinda; and 1 at the Pana‘ewa Zoo in Hilo, Hawai‘i. The ratio of females to males for all captive birds is 45 females and 65 males (B. Masuda 2025, in litt., entire). The KBCC and MBCC are managed by the San Diego Zoo Wildlife Alliance (SDZWA). Five ‘alalā were released into the wild on East Maui in 2024 (HDLNR 2024a) with plans to release two additional birds in 2025. The entire world population of ‘alalā is 115 birds between the captive and wild flocks. While the age structure of the captive population at the KBCC and MBCC is stable, the demographic structure of the captive population has shifted over time with increasing numbers of older birds due to the release of younger birds in the reintroduction program. Currently, the captive flock is retaining more younger birds as captive breeders to better balance the age structure of the captive flock. The size and reproductive output of the captive population supports ongoing releases of ‘alalā on East Maui and planned reintroduction of ‘alalā to the island of Hawai‘i.

New threats:

- Please see August 27, 2020, 5-year Status Review for discussion of habitat sustainability and the threat from avian disease (USFWS 2020, pp. 2-3).
- Rapid ‘Ōhi‘a Death (ROD): ROD is a disease caused by the fungal pathogens, *Ceratocystis lukuohia* and *Ceratocystis huliohia*, that rapidly kills individual ‘ōhi‘a trees as well as groups of trees (Barnes et al. 2018, entire). Since its first detection on Hawai‘i Island in the Puna District around 2010 (Keith et al. 2015, entire), ROD has killed an estimated over 1 million ‘ōhi‘a trees on the island of Hawai‘i (USDA 2024). ROD and ROD suspected trees currently overlap virtually all habitat formerly occupied by ‘alalā on Hawai‘i Island (BIISC 2023, p. 2; Fig. 1). ROD therefore poses a substantial continuing and increasing threat to ‘alalā by widespread destruction of ‘ōhi‘a trees the species uses for nesting and foraging.

New management actions:

- Captive Rearing/Reintroductions –

Hawai‘i Island release

Thirty immature and sub-adult ‘alalā were released from 2016-2019, at Pu‘u Maka‘ala Natural Area Reserve (Pu‘u Maka‘ala NAR), Hawai‘i Island. Threat reduction was implemented before and during the releases including ungulate removal, predator control, weed management, and providing release birds with predator avoidance and wild food recognition training (Greggor et al. 2021, entire; Greggor et al. 2022, entire; Greggor and Masuda et al. 2025, in press, entire). Four ‘alalā pairs formed during the

later years of the second series of Pu‘u Maka‘ala releases, one pair built a nest, and the female appeared to incubate eggs, but they were not confirmed and no young were produced.

The 2016 release had immediate mortality, so additional planning and pre-release training was implemented for later releases. All birds in 2017 survived for at least one year, but later releases in 2018 and 2019 had higher short-term mortality, all birds from the 2019 release dying within six months of their release. Three of the five birds released in 2016 died within one week of their release. Two were killed by native ‘io or Hawaiian hawk (*Buteo solitarius*) and one died as result of early dispersal from the release site during a winter storm likely because the bird that dispersed from its release site was unable to sustain itself on wild foods only. Twenty-two of the release birds died during the second series of Pu‘u Maka‘ala releases (2017 -2019). Deaths where cause can be clearly assigned for the second series of releases were 7 ‘alalā killed by ‘io, 3 died during cold/wet weather from exposure to the elements and loss of body condition, 1 died from conspecific aggression, 1 from disease, 1 from mammal predation, and 1 as result of early dispersal from the release site. Necropsy of the three birds that died in winter during cold/wet weather showed loss of body condition and reduced body fat. These three birds also tested positive for avian malaria post-mortem. The three birds died in a winter storm at a time when supplemental food was being reduced to wean the birds to wild foods. It is difficult therefore among the several stressors the birds experienced to determine which, or combination may have contributed most to their deaths. Six birds were never found and three were found in an advanced state of decay such that conclusions could not be drawn on the cause(s) of their deaths.

As birds matured and began to display territorial behaviors conspecific aggression increased. There was one incident of a territorial pair killing another ‘alalā, and several incidents of intense conspecific aggression, in one instance resulting in significant injury to the bird that was attacked. Unpaired birds co-existed in the small release area with pairs attempting to establish breeding territories resulting in aggressive behaviors by pairs towards unpaired birds and unpaired birds disrupting pairs’ breeding activities. Mortalities from ‘io predation increased as birds transitioned to adult behaviors during the later years of the release possibly because mutual predator defense behaviors of the young release birds waned as the release cohorts matured.

During the Pu‘u Maka‘ala release a number of hurdles were overcome for the successful release of captive-bred ‘alalā to be able to survive in the wild in the near- and middle-term (from six months to 2 years after release). Significant limiting factors to address for future releases are to reduce mortality from ‘io predation, minimize negative effects from conspecific aggression, further evaluate how and when to wean birds from supplemental foods, and develop strategies to assist released birds to become established pairs surviving and breeding in the wild. The pace of mortalities for the Pu‘u Maka‘ala release increased in spring and summer of 2020 and the last 5 surviving birds were returned to captivity in late summer that year.

After the last remaining birds from the Pu‘u Maka‘ala release were returned to captivity, the USFWS and Hawai‘i Department of Land and Natural Resources (HDLNR) developed a two-pronged approach to return captive-raised ‘alalā to the wild. One approach is to release ‘alalā in suitable habitat where there are no ‘io; e.g., the current ongoing East Maui release (HDLNR/USFWS 2024, entire); and the second is to release ‘alalā on the island of Hawai‘i, but modifying release strategies to minimize risk from ‘io, making changes to supplemental feeding and weaning strategies, developing release strategies to minimize con-specific conflict, and possible release of pairs and/or family groups (IAIWG 2025, entire).

Planning is ongoing for a Hawai‘i Island-release in native forest in Ka‘ū on the southeast slope of Mauna Loa volcano. Ka‘ū once harbored populations of ‘alalā and is the largest area of managed intact native forest on the island of Hawai‘i that ‘alalā once inhabited.

East Maui release

Five, 1 1/2-year-old ‘alalā were released on east Maui in the Kīpahulu Forest Reserve (Kīpahulu FR) in November 2024. The release is planned as a five-year pilot project. The Kīpahulu FR release site was chosen because native forest habitat at the release site is similar to native forest on the island of Hawai‘i, a native crow species very similar to ‘alalā once lived on east Maui, and there are no ‘io present on Maui (HDLNR/USFWS 2024, entire). The five birds (three males and two females) are being provided supplemental food and their movements tracked. As of spring 2025, all released ‘alalā continue to survive near the release site. During the Environmental Review process (HDLNR/USFWS 2024, entire) there was substantial outreach to the East Maui community and strong public support for the release.

- Threat Management – The ‘Io-‘Alalā Interactions Working Group (IAIWG) was formed after the last five birds from the second series of Pu‘u Maka‘ala releases were returned to captivity. This group evaluated ‘alalā mortalities from ‘io predation for ‘alalā releases on Hawai‘i Island from 1993 to 2020, and developed a set of recommendations for future releases of ‘alalā to Hawai‘i Island with hopes to reduce numbers of ‘alalā killed by ‘io (IAIWG 2025, entire).
 - Among these recommendations are to conduct many small-scale releases over a regional landscape. The benefits of this are to reduce levels of con-specific aggression among ‘alalā as they transition to adult behaviors and minimize the chances that large numbers of ‘alalā are introduced in an area where ‘io are particularly aggressive towards ‘alalā or learn to specialize attacking and killing ‘alalā. It is anticipated that for some sites predation by ‘io may be high, but for others low or no predation, and numbers of ‘alalā will increase because the number of sites where ‘alalā are avoiding ‘io predation and breeding will increase over time.
 - Release ‘alalā in closed forest areas and away from edge habitat. It was found that ‘io concentrate in habitat areas that transition between closed canopy native forest and more open landscapes and prefer more open areas (edge habitat) for hunting where they can perch, observe and ambush prey more easily.

- Use already existing satellite telemetry data for territories and nesting locations of ‘io and conduct additional searches for ‘io when choosing sites to build release aviaries. ‘Io have been observed to behave aggressively towards intruders in their breeding territory and around their nest. To minimize the potential for adverse interactions between ‘io and ‘alalā, release aviaries will be placed as far away as possible from known ‘io nests and the center of ‘io breeding territories.
- Habitat restoration – Ka‘ū FR will likely be the site for the next ‘alalā reintroduction on the island of Hawai‘i. Habitat management has been ongoing in the Ka‘ū FR for more than a decade, and habitat conditions in the areas for potential ‘alalā release has improved considerably.

In 2012, the HDLNR proposed construction of fenced management units for approximately 12,000 acres (4,856 hectares) in the upper elevation (4,000-5,000 ft (1,219-1,524 m)) central portion of the Ka‘ū FR (HDLNR 2012, p. 52). As of 2025, 2,200 acres have been fenced and almost all feral ungulates removed while fencing is almost complete for an additional 1,800 acres and animal removal is soon to begin (I. Cole 2025, in litt., entire). Of the four The Nature Conservancy (TNC) Ka‘ū Preserve units, the largest expanse of intact, high-quality native lowland wet forest occurs in the roughly 2,600-acre Kaiholena Unit. The Kaiholena Unit extends in a broad band of native forest from approximately (2,000-4,000 ft (610-1,219 m)) elevation and abuts the southwestern end of the proposed approximately 12,000 ac fenced area within the Ka‘ū FR. Two-thousand acres of the Kaiholena Unit have been fenced and by 2023 virtually all feral ungulates removed (TNC 2023, pp. 14-15). Removal of invasive introduced plants has been completed within 458 acres of the Kaiholena Unit and there are plans to clear invasive plants from an additional 313 acres of the unit in the coming five years (TNC 2023, p. 18).

The HDLNR plans to build a road across the 1950 lava flow in upslope Ka‘ū FR to gain access to the upper elevation central portion of the FR for maintenance of hooved-animal-proof fencing, thus saving time for conducting other natural resource management such as invasive species control and tree planting and reduce the amount of time needed to respond to emergencies like wildfires in this area (HDLNR 2024b, pp. 2-3). The road will also likely serve as an access route to ‘alalā release sites in upper central Ka‘ū FR.

Table 1. Status and trends of ‘alalā from listing through current 5-year review.

Date	No. Adult Wild Individuals	Downlisting Criteria Identified in Recovery Plan	Downlisting Criteria Completed?
1967 (listing)	Rare	No recovery plan developed yet.	N/A
1978 Hawaii Forest Bird Survey (first population)	76 ± 18 (95% CI)	No recovery plan developed yet.	N/A

estimate, Scott et al. 1986)			
1982 (first recovery plan)	Approximately 75 birds	Determine biological and ecological requirements; Improve habitat conditions; Secure wild population; Monitor habitat and populations; Implement public information and education programs.	Determine biological and ecological requirements – Yes; Improve habitat conditions – Yes; Secure wild population – No; Monitor habitat and populations – Yes; Implement public information and education programs – Yes
2009 (Revised Recovery Plan and 5-year review)	0 in wild; 68 in captivity	The genetic diversity present in the ‘alalā population in 2003 has been preserved to the maximum extent possible.	Yes
		The population as a whole is demographically stable.	Yes
		Two or more subpopulations exist in the wild.	No
		Persistence of wild subpopulations does not require supplementation from a captive flock.	No
		Peer-reviewed population models yield a probability of extinction of less than five percent within 100 years.	No
		Sites with potential suitable habitat have been identified and threats in suitable habitat have been managed so that ‘alalā subpopulations in the wild are growing or stable in landscapes that include areas managed for native biodiversity and lands	Partial; ungulate fencing on Hualālai, south Kona, and east Mauna Loa

		managed for other compatible uses.	
2015 (5-yr review)	0 in wild; 115 in captivity	The genetic diversity present in the ‘alaalā population in 2003 has been preserved to the maximum extent possible.	Yes
		The population as a whole is demographically stable.	Yes
		Two or more subpopulations exist in the wild.	No
		Persistence of wild subpopulations does not require supplementation from a captive flock.	No
		Peer-reviewed population models yield a probability of extinction of less than five percent within 100 years.	No
		Sites with potential suitable habitat have been identified and threats in suitable habitat have been managed so that ‘alaalā subpopulations in the wild are growing or stable in landscapes that include areas managed for native biodiversity and lands managed for other compatible uses.	Partial; ungulate fencing on Hualālai, south Kona, Ka‘ū, and east Mauna Loa
2020 (5-yr review)	5 in wild on Hawai‘i; 112 in captivity	The genetic diversity present in the ‘alaalā population in 2003 has been preserved to the maximum extent possible.	Yes
		The population as a whole is demographically stable.	Yes
		Two or more subpopulations exist in the wild.	No
		Persistence of wild subpopulations does not require supplementation from a captive flock.	No
		Peer-reviewed population models yield a probability of extinction of less than five percent within 100 years.	No
		Sites with potential suitable habitat have been identified and	Partial; ungulate fencing on

		threats in suitable habitat have been managed so that ‘alalā subpopulations in the wild are growing or stable in landscapes that include areas managed for native biodiversity and lands managed for other compatible uses.	Hualālai, south Kona, Ka‘ū, and east Mauna Loa
2025 (5-yr review)	5 in wild on Maui; 110 in captivity	The genetic diversity present in the ‘alalā population in 2003 has been preserved to the maximum extent possible.	Yes
		The population as a whole is demographically stable.	Yes
		Two or more subpopulations exist in the wild.	Partial; one subpopulation on east Maui
		Persistence of wild subpopulations does not require supplementation from a captive flock.	No
		Peer-reviewed population models yield a probability of extinction of less than five percent within 100 years.	No
		Sites with potential suitable habitat have been identified and threats in suitable habitat have been managed so that ‘alalā subpopulations in the wild are growing or stable in landscapes that include areas managed for native biodiversity and lands managed for other compatible uses.	Partial; ungulate fencing on Hualālai, south Kona, Ka‘ū, and east Mauna Loa; release on east Maui where there are no ‘io

Table 2. Threats to the ‘alalā and ongoing conservation efforts.

Threat	Listing Factor	Current Status	Conservation/Management Efforts
Ungulates – degradation of habitat and herbivory	A, C, E	Ongoing	Partial. Some habitat areas are fenced and ungulates removed.
Invasive introduced plants	A, E	Ongoing	Partial. Some habitat areas are managed to removed introduced plants.

Rapid ‘Ōhi‘a Death	A	Increasing	Partial: Research has shown the importance to exclude feral ungulates from areas not yet infected or only lightly infected by ROD in slowing ROD spread.
Low numbers	E	Ongoing	Partial. Captive propagation and reintroductions ongoing. Inbreeding is addressed through managed pairing in captivity.
Avian Disease	C	Increasing	Partial: Control of cats that spread <i>Toxoplasmosis</i> is ongoing in some areas. Ungulate removal reduces the number of breeding sites for mosquitoes. Broadscale application of Incompatible Insect Technique (IIT) <i>Wolbachia</i> infected mosquitoes and <i>Bacillus thuringensis israelensis</i> (Bti), a bacterial larvicide, on other islands may serve as a model for broadscale application of IIT and Bti on the island of Hawai‘i.
Predation	C	Ongoing	Partial: Forest restoration in some areas to provide improved cover for protection from ‘io or Hawaiian hawk; rodent, mongoose, and cat control in some areas. Release on east Maui where there are no ‘io.
Habitat degradation	A, E	Increasing	Incidence of ROD has increased dramatically throughout the species range and tens of thousands of ‘ōhi‘a trees killed.

Syntheses:

The ‘alalā is historically known from the island of Hawai‘i and became extinct in the wild in 2002. The captive population of 110 individuals, and wild population of 5 individuals constitute the entire species (see Table 1). General recovery goals for this species have not been met because the large majority of ‘alalā are in captivity and large areas of suitable habitat for ‘alalā is threatened by ungulates and ROD (see Table 2). The species is vulnerable to extreme reduction in numbers should a catastrophic event such as a hurricane or fire strike either of the two conservation breeding centers and there is only one small population of ‘alalā in the wild that currently is dependent on human care for its continued existence.

Delisting objectives are provided in the Revised Recovery Plan for the ‘Alalā (*Corvus hawaiiensis*) (USFWS 2009, pp. ix-x). Downlisting criteria are not presented. To be

delisted the following criteria will need to be met: 1. The genetic diversity present in the ‘alalā population in 2003 has been preserved to the maximum extent possible; 2. The population as a whole is demographically stable; 3. Two or more subpopulations exist in the wild; 4. Persistence of wild subpopulations does not require supplementation from a captive flock; 5. Peer-reviewed population models yield a probability of extinction of less than five percent within 100 years; and 6. Threats in suitable habitat have been managed so that ‘alalā subpopulations in the wild are growing or stable in landscapes that include areas managed for native biodiversity. Given the current total population of 115 birds, and of these 110 birds in captivity that are vulnerable to drastic reduction in numbers from a single catastrophic event, only five birds in the wild that are still largely dependent upon human care, and large areas of habitat needed for species survival in the wild currently being degraded by feral ungulates and invasive plants, ‘alalā continues to meet the definition of endangered as it remains in danger of extinction throughout its range.

Recommendations for Future Actions:

The recovery strategy for ‘alalā centers on protection, restoration, and management of native forests on the island of Hawai‘i where ‘alalā inhabited historically and on east Maui where there is a small wild population of ‘alalā. Continued releases of ‘alalā to the wild and establishment of sustainable wild populations is fundamental to recovery of the species.

- Surveys/inventories —
 - Continued monitoring of ‘alalā released on east Maui is important to determine the species’ response to management actions and adaptation to their release environment including use of wild foods, territory establishment, and breeding activity.
 - Continued monitoring of site-specific changes in presence of mosquitoes and prevalence of avian disease is important to document fine scale temporal and spatial changes of avian disease and effects on ‘alalā.
 - Continue efforts to map changes in the distribution of ROD across Hawai‘i Island and changes in ROD presence in ‘alalā habitat.
- Habitat and natural process management and restoration —
 - We recommend continued habitat management on the island of Hawai‘i in areas where the species once existed (USFWS 2009a, entire) and areas on east Maui where ‘alalā have been recently released. Invasive plants such as Himalayan ginger (*Hedychium gardnerianum*) and strawberry guava (*Psidium cattleianum*) are degrading ‘alalā habitat. Continue control of introduced invasive plants and exclusion/removal of ungulates that spread seeds of invasive plants.
 - Ungulate monitoring and control – Continue ungulate control. There are large areas of ‘alalā habitat in the Ka‘ū and Kona Districts of Hawai‘i that are not fenced and continue to be degraded by feral ungulates. Ungulate removal is ongoing and new fence construction and repairs to existing fencing are planned throughout Hawai‘i Volcanoes National Park; Hakalau Forest National Wildlife Refuge Complex/Kona Forest Unit; The Nature Conservancy Preserves in Kona and Ka‘ū; Pu‘u Wa‘awa‘a Forest Bird Sanctuary on Hualālai Volcano in North Kona; State of Hawai‘i Natural Area Reserves; and some State Forest lands including areas of Ka‘ū FR. It is important that fencing and ungulate control be conducted in all areas

- ‘alalā may be reintroduced to minimize damage caused by feral ungulates to forest and forest understory plants that provide food for ‘alalā.
- Rapid ‘Ōhi‘a Death: It has been shown that feral ungulates are an effective vector in transferring ROD from infected trees to uninfected or only lightly ROD-infested forest areas (Hughes et al. 2023, entire). An experiment conducted from 2019-2022, comparing two equally sized areas across the fenced boundary of Hawai‘i Volcanoes National Park, found virtually no incidence of ROD in the area without feral ungulates but widespread presence of ROD in the area with feral ungulates (UH News 2023, entire). This evidence suggests there is substantial benefit of fencing and removal of feral ungulates in preventing the spread of ROD.
 - Disease monitoring and control — ‘Alalā appear less susceptible than Hawaiian honeycreepers to avian disease, however, ill effects of suspected malaria and pox infection have been observed in released ‘alalā and infection with avian malaria may have been a contributing factor to the deaths of three birds during the Pu‘u Maka‘ala release in winter 2019-2020 during cold wet weather and when the birds were being weaned from human provided foods.
 - Control of mosquitoes and their breeding sites is needed using traditional methods including application of *Bacillus thuringiensis israelensis* (Bti), a bacterial larvicide, whenever feasible. See <https://dlnr.hawaii.gov/dofaw/fw-announcements/kauai/mosquito-updates/> for example of broad-scale application of Bti to protect Kaua‘i forest birds. Ungulate exclusion and ungulate removal are essential to reduce mosquito breeding sites. Grade dirt roadways where puddles form causing mosquito breeding sites as applicable.
 - Landscape-scale mosquito control — Over the last 5-years there has been substantial movement toward development and implementation of landscape-scale control of the introduced southern house mosquito (*Culex quinquefasciatus*) that transmits avian disease to Hawaiian forest birds. In 2022 an Environmental Assessment (EA) was published for broad-scale mosquito control in conservation areas on east Maui using the Incompatible Insect Technique (IIT) (HALE 2022, entire), and first use of IIT on east Maui using male *C. quinquefasciatus* mosquitoes treated with *Wolbachia* is ongoing. Please see August 27, 2020, 5-year Status Review (USFWS 2000, p. 3) for a more detailed description of the IIT technique. A similar EA was finalized for Kaua‘i in 2023 (HDLNR/USFWS/SWCA 2023) and IIT applications began on that island in 2025 (see <https://dlnr.hawaii.gov/blog/2025/02/14/nr25-23/>). Depending upon results of the IIT application on other islands, landscape-scale mosquito control using IIT may be an important tool to protect ‘alalā from avian disease, particularly with continued habitat degradation as mosquitoes move upslope into highest elevation areas on the island of Hawai‘i (USFWS 2020, p. 2).
 - Corvids are known to be highly vulnerable to West Nile virus, which has not been introduced to Hawai‘i but has the potential to become established in the Hawaiian Islands (LaPointe et al. 2009, entire). The U.S. Geological Survey, National Wildlife Health Center, Honolulu Field Station collaborates with the USFWS and State of Hawai‘i in surveillance and interdiction efforts to detect and prevent the establishment of new avian diseases into the state, including surveillance for West Nile virus (USGS 2025). Continued support for this program is critical to prevent West Nile virus and other avian diseases from entering the State of Hawai‘i.

- Predator monitoring and control —
 - Implement mammalian predator control efforts in native forest areas suitable for ‘alalā reintroduction to minimize predation and reduce risk of diseases spread by small mammals, like toxoplasmosis (*Toxoplasma gondii*), which is known to kill captive-released ‘alalā (Work et al. 2000).
 - Research to determine impacts of rats (*Rattus* spp.) on ‘alalā is needed and control of rats if necessary. Threat from rats is likely greatest when ‘alalā are nesting.
- Biosecurity — Implement a statewide interagency biosecurity plan to prevent spread of Rapid ‘Ōhi‘a Death (ROD) on the island of Hawai‘i and to other Hawaiian Islands, and introduction of other threats that may affect ‘alalā and its forest habitat. An effective biosecurity plan requires a comprehensive approach that includes:
 - Pre-border policies and processes to prevent invasive species from making their way to the state of Hawai‘i.
 - Border policies and processes that support inspecting incoming items to ensure minimal risk of pest entry into the state.
 - Post-border policies and processes that support detecting and responding to new incursions of invasive species and controlling established invasive species wherever possible.
- Continue captive propagation – manage the flock to optimize population demographics and growth/stability while also supporting reintroduction and genetic storage. Population management should be prioritized to ensure the long term viability of the captive flock.
 - Initiate ‘alalā reintroduction in Ka‘ū FR. Continue monitoring ‘alalā released on east Maui. Provide support (predator control/supplemental feeding/ungulate removal) as needed at ‘alalā release sites to promote ‘alalā survival and reproduction in the wild.
 - Complete EA or Environmental Impact Statement (EIS) to evaluate effects of ‘alalā to east Maui ecosystems (beneficial and harmful) and determine if ‘alalā should remain on east Maui long-term, returned to captivity, or captured and re-released on Hawai‘i Island.

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See previous 5-year reviews for additional references.

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U.S. FISH AND WILDLIFE SERVICE
SIGNATURE PAGE for 5-YEAR REVIEW on
'Alalā or Hawaiian crow (*Corvus hawaiiensis*)

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

Recommendation resulting from the 5-year review:

<u> </u>	Delisting
<u> </u>	Reclassify from Endangered to Threatened status
<u> </u>	Reclassify from Threatened to Endangered status
<u> X </u>	No Change in listing status

Review Conducted By: Jay Nelson, Fish and Wildlife Biologist, PIFWO
John Vetter, Animal Recovery Coordinator, PIFWO
Megan Laut, Recovery Team Manager, PIFWO

for **Field Supervisor, Pacific Islands Fish and Wildlife Office**
