

ʻŌʻū
(*Psittirostra psittacea*)

5-Year Review
Summary and Evaluation

U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
Honolulu, Hawaiʻi

5-YEAR REVIEW
Species reviewed: ʻŌʻū (*Psittirostra psittacea*)

TABLE OF CONTENTS

1.0	GENERAL INFORMATION	1
1.1	Reviewers	1
1.2	Methodology used to complete the review	1
1.3	Background	2
2.0	REVIEW ANALYSIS.....	3
2.1	Application of the 1996 Distinct Population Segment (DPS) policy	3
2.2	Recovery Criteria.....	4
2.3	Updated Information and Current Species Status	5
2.4	Synthesis.....	7
3.0	RESULTS	9
3.3	Recommended Classification	9
3.2	New Recovery Priority Number	10
3.3	Listing and Reclassification Priority Number.....	10
4.0	RECOMMENDATIONS FOR FUTURE ACTIONS.....	10
5.0	REFERENCES.....	10
	Signature Page.....	12

5-YEAR REVIEW **ʻŌʻū (*Psittirostra psittacea*)**

1.0 GENERAL INFORMATION

1.1 Reviewers

Lead Regional Office:

Region 1, Endangered Species Program, Division of Recovery, Jesse D'Elia,
(503) 231-2071

Lead Field Office:

Pacific Islands Fish and Wildlife Office, Gina Shultz, Deputy Field Supervisor,
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Cooperating Field Office(s):

N/A

Cooperating Regional Office(s):

N/A

1.2 Methodology used to complete the review:

This review was conducted by staff of the Pacific Islands Fish and Wildlife Office (PIFWO) of the U.S. Fish and Wildlife Service (USFWS) beginning on July 6, 2005. The evaluation of the status of the species was prepared by the lead PIFWO biologist and reviewed by the Hawaiian Birds Recovery Coordinator. The document was then reviewed by the Recovery Program Leader and acting Assistant Field Supervisor for Endangered Species, and Deputy Field Supervisor, before submission to the Field Supervisor for approval.

Information used to conduct this review was obtained from the following sources: the Revised Recovery Plan for Hawaiian Forest Birds (USFWS 2006), Birds of North America species account, No. 335-336 (Snetsinger *et al.* 1998), Hawaiian Forest Bird Survey (Scott *et al.* 1986), Hawai'i Rare Bird Search 1994 to 1996 (Reynolds and Snetsinger 2001), and the most recent Hawaiian forest bird surveys on the island of Hawai'i in 2002 and 2003 and Kaua'i in 2005. Information from these sources was used to determine the species' historical distribution, recovery criteria, threats, most recent documented sightings, and extinction probability. The Birds of North America species account (Snetsinger *et al.* 1998) and the peer-reviewed Revised Recovery Plan for Hawaiian Forest Birds (USFWS 2006) summarized all early scientific information gathered about the species, while the Hawaiian Forest Bird Survey (Scott *et al.* 1986), the Hawai'i Rare Bird Search 1994 to 1996, which was conducted specifically to search for extremely rare and potentially extinct Hawaiian forest birds, and periodic forest bird surveys performed on a five-year rotating cycle on each of the main Hawaiian islands,

provided the most recent information about the continued presence of the species in areas where it was known historically. The above sources constitute the most recent, complete, and scientifically reliable information available for the evaluation of the taxon's current status.

1.3 Background:

1.3.1 Federal Register (FR) Notice citation announcing initiation of this review:

USFWS. Endangered and threatened wildlife and plants; Initiation of 5-year reviews of the Mariana Fruit Bat (*Pteropus mariannus mariannus*), Mariana Crow (*Corvus hawaiiensis*), Laysan Duck (*Anas laysanensis*), Kauai Akialoa (Honeycreeper) (*Hemignathus procerus*), Large Kauai Thrush (*Myadestes myadestinus*), Kauai Oo (Honeyeater) (*Moho braccatus*), Ou (Honeycreeper) (*Psittirostra psittacea*), Molokai Creeper (*Paroreomyza flammea*), Molokai Thrush (*Myadestes lanaiensis rutha*), Kauai Cave Wolf Spider (*Adelocosa anops*) Kauai Cave Amphipod (*Spelaeorchestia koloana*), *Alsinidendron obovatum* (No Common Name), *Amaranthus brownii* (No Common Name), *Chamaesyce celastroides* var. *kaenana* (Akoko), *Chamaesyce deppeana* (Akoko), *Chamaesyce herbstii* (Akoko), *Chamaesyce skottsbergii* var. *kalaeloana* (Ewa Plains Akoko), *Clermontia pyrularia* (Oha Wai), *Cyanea grimesiana* ssp. *obatae* (No Common Name), *Cyanea pinnatifida* (Haha), *Cyanea st.-johnii* (Haha), *Cyanea superba* (Haha), *Cyanea truncata* (Haha), *Cyrtandra dentata* (Haiwale), *Gouania vitifolia* (No Common Name), *Hedyotis degeneri* (No Common Name), *Hibiscadelphus woodii* (Hau Kuahiwi), *Castilleja levisecta* (Golden paintbrush), Fender's Blue Butterfly (*Icaricia icarioides fenderi*), *Erigeron decumbens* var. *decumbens* (Willamette Daisy), *Lupinus sulphureus* ssp. *kincaidii* (Kincaid's Lupine), *Lomatium bradshawii* (Bradshaw's Desert Parsley), and *Sidalcea nelsoniana* (Nelson's Checker-mallow). Federal Register 70(128):38972-38975.

1.3.2 Listing history

Original Listing

FR notice: USFWS. 1967. Office of the Secretary, Native Fish and Wildlife, Endangered Species. Federal Register 32(48):4001.

Date listed: March 11, 1967

Entity listed: Species

Classification: Endangered

Revised Listing, if applicable

FR notice: N/A

Date listed: N/A

Entity listed: N/A

Classification: N/A

1.3.3 Associated rulemakings:

1.3.4 Review History:

Species status [FY 2008 Recovery Data Call (September 2008)]:
Uncertain

Recovery achieved:

1 (0-25%) (FY 2008 Recovery Data Call)

1.3.5 Species' Recovery Priority Number at start of this 5-year review:

4

1.3.6 Current Recovery Plan or Outline

Name of plan or outline: Revised Recovery Plan for Hawaiian Forest Birds

Date issued: September 22, 2006

Dates of previous revisions, if applicable:

February 1983 (USFWS. 1983. Hawai'i Forest Bird Recovery Plan. Region 1, Portland, OR. 76 pages.) and July 1983 (USFWS. 1983. Kauai Forest Birds Recovery Plan. Region 1, Portland, OR. 69 pages.).

2.0 REVIEW ANALYSIS

2.1 Application of the 1996 Distinct Population Segment (DPS) policy

2.1.1 Is the species under review a vertebrate?

Yes
 No

2.1.2 Is the species under review listed as a DPS?

Yes
 No

2.1.3 Was the DPS listed prior to 1996?

Yes
 No

2.1.3.1 Prior to this 5-year review, was the DPS classification reviewed to ensure it meets the 1996 policy standards?

Yes
 No

2.1.3.2 Does the DPS listing meet the discreteness and significance elements of the 1996 DPS policy?

Yes
 No

2.1.4 Is there relevant new information for this species regarding the application of the DPS policy?

Yes

No

2.2 Recovery Criteria

2.2.1 Does the species have a final, approved recovery plan containing objective, measurable criteria?

Yes

No

2.2.2 Adequacy of recovery criteria.

2.2.2.1 Do the recovery criteria reflect the best available and most up-to date information on the biology of the species and its habitat?

Yes

No

2.2.2.2 Are all of the 5 listing factors that are relevant to the species addressed in the recovery criteria?

Yes

No

2.2.3 List the recovery criteria as they appear in the recovery plan, and discuss how each criterion has or has not been met, citing information:

Downlisting criteria:

Criterion 1. The species occurs in two or more viable populations or a viable metapopulation that represent the ecological, morphological, behavioral, and genetic diversity of the species (Factors A, C, and E).

This criterion has not been met. It is not known whether the species still exists.

Criterion 2. Either (a) quantitative surveys show that the number of individuals in each isolated population or in the metapopulation has been stable or increasing for 15 consecutive years, or (b) demographic monitoring shows that each population or the metapopulation exhibits an average intrinsic growth rate (λ) not less than 1.0 over a period of at least 15 consecutive years; and total population size is not expected to decline by more than 20 percent within the next 15 consecutive years for any reason (Factors A, C, and E).

This criterion has not been met. Survey efforts have not been adequate to determine with confidence whether the species still exists.

Criterion 3. Sufficient recovery habitat is protected and managed to achieve Criteria 1 and 2 (Factor A).

This criterion has not been fully met. Portions of suitable habitat within the species range are protected and managed. However, most habitat (>75 percent) on the Islands of Hawai'i and Kaua'i where the species might occur is unfenced and vulnerable to damage by feral ungulates.

Criterion 4. The mix of threats that were responsible for the decline of the species have been identified and controlled (Factors A, C, and E).

This criterion has not been fully met. Most threats have been identified including disease, predation, and habitat damage by feral ungulates. However, each of these threats is only partly controlled. The threat from disease has been partly controlled by protecting forest habitat in some areas from feral pigs that create mosquito breeding sites, but mosquitoes are known to fly several kilometers in forested habitats and thus may still threaten forest birds even in pristine forest. Predator control and ungulate removal has been implemented in some areas where the species may still occur, but not in the entire suitable habitat area for the species.

The taxon may be delisted when the downlisting criteria described above have been satisfied for at least 30 consecutive years.

2.3 Updated Information and Current Species Status

Information on the species' status and threats is also included in the revised recovery plan (USFWS 2006) and in section 2.4 ("Synthesis") below.

2.3.1 Biology and Habitat

2.3.1.1 New information on the species' biology and life history:

No new information.

2.3.1.2 Abundance, population trends (e.g. increasing, decreasing, stable), demographic features (e.g., age structure, sex ratio, family size, birth rate, age at mortality, mortality rate, etc.), or demographic trends:

There is no new information regarding abundance, population trends, demographic features, or demographic trends as the species has not been seen since 1989 on Kaua'i and 1987 on Hawai'i.

2.3.1.3 Genetics, genetic variation, or trends in genetic variation (e.g., loss of genetic variation, genetic drift, inbreeding, etc.):

No new information.

2.3.1.4 Taxonomic classification or changes in nomenclature:

There has been no change in taxonomy or nomenclature.

2.3.1.5 Spatial distribution, trends in spatial distribution (e.g. increasingly fragmented, increased numbers of corridors, etc.), or historic range (e.g. corrections to the historical range, change in distribution of the species' within its historic range, etc.):

No new information.

2.3.1.6 Habitat or ecosystem conditions (e.g., amount, distribution, and suitability of the habitat or ecosystem):

Recent natural disasters may have affected some of the last remaining `ō`ū populations. On the Island of Hawai`i, a large portion of the Upper Waiākea Forest Reserve, location of some of the last observations of `ō`ū and considered prime habitat for the species, was inundated by the 1984 Mauna Loa lava flow, destroying thousands of acres of forest and creating a treeless corridor over a kilometer (0.62 mile) wide. On Kaua`i, two strong hurricanes, Iwa in 1982 and Iniki in 1992, had devastating effects on native forest habitat and native bird species. Habitat degradation resulting from the invasion of pernicious nonnative weeds has drastically changed the forest structure and integrity since the two hurricanes in 1982 and 1992, with the invasion and expansion of noxious weeds such as *Hedychium flavescens* (yellow ginger), *Erigeron karvinskianus* (daisy fleabane), *Tibouchina urvilleana* (glorybush), *Lonicera japonica* (Japanese honeysuckle), and others (USFWS 2006).

2.3.1.7 Other:

Not applicable.

2.3.2 Five-Factor Analysis (threats, conservation measures, and regulatory mechanisms)

2.3.2.1 Present or threatened destruction, modification or curtailment of its habitat or range:

One of the primary threats to this species and to other Hawaiian forest birds is habitat loss and degradation by agriculture, urbanization, cattle (*Bos taurus*) grazing, browsing by feral ungulate species, timber harvesting, and invasion of nonnative plant species into native-dominated plant communities (USFWS 2006). Feral pigs (*Sus scrofa*), and goats (*Capra hircus*) to a lesser degree, have had a long-term damaging effect upon native forests in the remaining `ō`ū range by consuming and damaging understory vegetation, creating openings on the forest floor for weeds, transporting weed seeds into the forest, and causing soil erosion and disruption of seedling regeneration of native plants.

2.3.2.2 Overutilization for commercial, recreational, scientific, or educational purposes:

Overutilization is not known to be a threat.

2.3.2.3 Disease or predation:

Predation by nonnative mammals such as black rats (*Rattus rattus*) and Polynesian rats (*Rattus exulans*) and diseases such as avian malaria (*Plasmodium relictum*) and avian pox (*Poxvirus avium*) carried by nonnative mosquitoes have also been primary threats to this species (USFWS 2006).

2.3.2.4 Inadequacy of existing regulatory mechanisms:

No new information.

2.3.2.5 Other natural or manmade factors affecting its continued existence:

This species now occurs in such low numbers and in such restricted ranges, if it exists at all, that it is threatened by natural processes, such as inbreeding depression and demographic stochasticity, and by natural and man-made factors such as hurricanes, wildfires, and periodic vegetation die-back (USFWS 2006). Impacts of nonnative birds are not well understood, but include aggressive behavior towards native bird species, possible competition for food, nest sites, and roosting sites, and possibly supporting elevated predator population levels.

2.4 Synthesis

Reevaluation of conclusions regarding extinction probability based on the 1994 to 1996 Hawai`i Rare Bird Search (Reynolds and Snetsinger 2001) and reexamination of data from the Hawaiian Forest Bird Survey (Scott *et al.* 1986) and surveys by John Sincock from 1968 to 1973 (USFWS 1983) indicates that the species' status is best described as uncertain.

The species was last sighted on Kaua`i in 1989 and Hawai`i in 1987 (Pyle 1989). However, limited search efforts and difficulty collecting data render the status of the species inconclusive. For instance, important habitat areas for the species, Ka`ū, Upper Waiākea, and Pu`u Maka`ala Districts on Hawai`i, comprising over 30,000 hectares (74,131 acres), were not searched adequately or under acceptable weather conditions during The Hawai`i Rare Bird Search (Reynolds and Snetsinger 2001). As stated by Reynolds and Snetsinger (2001), “insufficient visits to promising habitat and poor weather conditions during Upper Waiākea searches make additional effort necessary to determine the status of `Ō`ū on Hawai`i.” Although the authors

determined it was likely the species was extirpated ($P \geq 0.95$) from the Kona District on Hawai'i, they were not confident that the species did not exist in the three Hawai'i districts mentioned above.

In addition, based on data for the Kona and Ka'u Districts on Hawai'i, Scott *et al.* (1986, pages 69 to 71) determined the probability of detecting at least one bird of a species unrecorded during the Hawai'i Forest Bird Search to be 0.811 and 0.848, respectively, for a hypothesized population of 50 'ō'ū, and 0.284 and 0.314 for a population of 10 'ō'ū. That is, for a population of 10 'ō'ū within each of these two Hawai'i districts, Scott *et al.* (1986) determined there was only approximately a 30 percent chance the surveys would have detected at least one of these individuals. This low probability of detection points out the limited time spent and area covered and the much greater effort needed to effectively survey for extremely rare species such as 'ō'ū using the variable circular-plot point count methodology (Scott *et al.* 1986).

On Kaua'i, search data in likely 'ō'ū habitat was also limited in scope. From 1968 to 1973, John Sincock conducted 466, 30-minute counts along stream and ridge transects within three areas of the Alaka'i Swamp: the "North Alaka'i," "South East Alaka'i," and "South West Alaka'i" which contained almost all habitat area (approx. 7,800 hectares [19,274 acres]) considered essential for endangered forest birds on Kaua'i, and where rare species most likely would continue to be found (USFWS 1983). Based on the effective detection distance for the species from transects surveyed, Sincock determined that he surveyed 497.6 hectares (1,229 acres), or less than one-fifteenth of the total essential habitat area. During these surveys, Sincock estimated populations of 'ō'ū to be 12 with a standard error (S.E.) of 12 for the North Alaka'i and 50 with a S.E. of 39 for the Southeast Alaka'i study areas. Although extensive for its coverage of the species' likely potential range, the 1968 to 1973 survey cannot be considered comprehensive in its coverage of the actual land area where the species at the time might still have existed.

The study area for the Hawaiian Forest Bird Survey on Kaua'i in 1981 was located within the larger essential habitat area surveyed by Sincock, but consisted of six transects only and less than one-fourth (approx. 1,700 hectares (4,200 acres)) of the essential habitat area that was surveyed by Sincock (USFWS 1983; Scott *et al.* 1986, pages 15 to 17 and 39). Scott *et al.* (1986, pages 107 to 111) estimated 3 ± 6 'ō'ū for the area they surveyed.

Finally, study areas for the Hawai'i Rare Bird Search in 1994 to 1996 on Kaua'i consisted of four major drainages within the Alaka'i Swamp: the Koai'e, Mōhihi-Waiakōali-Koali, Halehaha-Halepa'akia, and North Kawaikōi, all found within the essential habitat area boundary defined by Sincock (USFWS 1983). However, Reynolds and Snetsinger's (2001) survey did not include some areas of suitable habitat along the perimeter and inside the essential habitat boundary described by Sincock and approximately 800 hectares (1,976 acres) of private lands (approx. 14 percent of the essential habitat area) along the southern boundary of the Alaka'i

Swamp. Therefore, approximately 25 percent of the essential habitat area as defined by Sincock for `ō`ū on Kaua`i has not been surveyed since 1968 to 1973 (USFWS 1983). The species was not detected during the Hawai`i Rare Bird Search on Kaua`i, and extinction probability was calculated to be ≥ 0.95 (Reynolds and Snetsinger 2001). However, Reynolds and Snetsinger (2001) stated that although they searched habitat with historical records and/or high native-species diversity to increase their chances for rare bird detections, similar habitat with rare bird detections existed outside their search areas. Probabilities of detecting at least one bird of this species were not determined for Kaua`i (Scott *et al.* 1986).

Therefore, determination of extinction probability by Reynolds and Snetsinger (2001) for `ō`ū on Kaua`i should be considered valid only for the areas on Kaua`i surveyed (or approximately 75 percent of the habitat area where the species, if it still exists, is most likely to occur). Reynolds and Snetsinger (2001) concluded that based on Hawai`i Rare Bird Search survey data for Hawai`i the `ō`ū was likely extirpated ($P \geq 0.95$) from the Kona District. However, that survey data for three districts on Hawai`i was insufficient to state with confidence the species no longer exists within these areas.

As Reynolds and Snetsinger (2001) describe, there are instances where rare Hawaiian birds have been rediscovered after they were presumed extinct or have been found in larger populations than expected. Given the only partial coverage by the Hawaiian Forest Bird Survey and Hawai`i Rare Bird Search of suitable habitats where the species may still exist on Kaua`i and insufficient visits to promising habitat and poor weather conditions during surveys of large areas on Hawai`i, additional search effort is needed to determine species status for both Kaua`i and Hawai`i. The large area on Hawai`i with suitable habitat, and many sites that are remote and only rarely visited by qualified observers, increase the potential that a small population of `ō`ū still exist on Hawai`i. In addition, the extremely difficult terrain of the Alaka`i Wilderness on Kaua`i and the wet weather make surveys difficult, and numerous steep valleys on Kaua`i create small pockets of habitat where the species could potentially persist.

3.0 RESULTS

3.3 Recommended Classification:

Downlist to Threatened

Uplist to Endangered

Delist

Extinction

Recovery

Original data for classification in error

No change is needed

3.2 New Recovery Priority Number: N/A

Brief Rationale:

3.3 Listing and Reclassification Priority Number: N/A

Reclassification (from Threatened to Endangered) Priority Number: _____

Reclassification (from Endangered to Threatened) Priority Number: _____

Delisting (regardless of current classification) Priority Number: _____

Brief Rationale:

4.0 RECOMMENDATIONS FOR FUTURE ACTIONS

Given the low survey effort for this species and the difficulty of detecting forest birds in remote mountainous habitats in Hawai'i, this species' biological status is unknown. This determination is based on reexamination of data from the 1994 to 1996 Hawai'i Rare Bird Search (Reynolds and Snetsinger 2001) and the Hawaiian Forest Bird Survey (Scott *et al.* 1986). Although results of the 1994 to 1996 Hawai'i Rare Bird Search and the most recent forest bird surveys on Hawai'i in 2002 and 2003 and Kaua'i in 2005 suggest the 'ō'ū may be extinct, additional targeted searches for this species are needed to confirm this assessment, especially in areas where the species was last known to have occurred and that have been searched infrequently, and for areas not searched adequately during the 1994 to 1996 Hawai'i Rare Bird Search. Therefore, PIFWO recommends the following actions:

- Conduct intensive searches for 'ō'ū on Hawai'i, particularly in Ka'ū, Upper Waiākea, and Pu'u Maka'ala Districts, and on Kaua'i using similar methodologies as those employed during the 1994 to 1996 Hawai'i Rare Bird Search (Reynolds and Snetsinger 2001). Focus in areas not surveyed or not surveyed adequately during the 1994 to 1996 Hawai'i Rare Bird Search.
- Deploy autonomous recording units, or ARUs (Fitzpatrick 2002), in suitable habitats for this species. These field recording units record vocalizations of forest birds. The recordings are then analyzed using computer programs to determine if the target species is present in the area. Use of this technology would greatly increase the amount of search time for this species.

5.0 REFERENCES

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[USFWS] U.S. Fish and Wildlife Service. 1983. Hawai'i Forest Bird Recovery Plan. Region 1, Portland, OR. 76 pages.

[USFWS] U.S. Fish and Wildlife Service. 1983. Kauai Forest Birds Recovery Plan. Region 1, Portland, OR. 69 pages.

[USFWS] U.S. Fish and Wildlife Service. 2006. Revised Recovery Plan for Hawaiian Forest Birds. Region 1, Portland, OR. 622 pages.

Signature Page
U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of `Ō`ū (*Psittirostra psittacea*)

Current Classification: E

Recommendation resulting from the 5-Year Review:

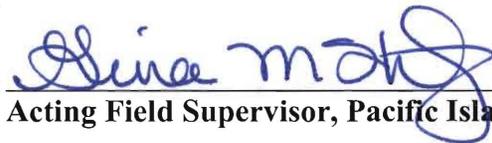
- Downlist to Threatened
- Uplist to Endangered
- Delist
- No change needed

Appropriate Listing/Reclassification Priority Number, if applicable: _____

Review Conducted By:

Jay Nelson, Fish and Wildlife Biologist
Eric VanderWerf, (former) Hawaiian Birds Recovery Coordinator
Marilet A. Zablan, Recovery Program Leader and acting Assistant Field
Supervisor for Endangered Species
Gina Shultz, Deputy Field Supervisor

Approved


Acting Field Supervisor, Pacific Islands Fish and Wildlife Office

Date

31 July 2009