

Ko'ko' or Guam Rail
(Gallirallus owstoni)

5-Year Review
Summary and Evaluation

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

5-YEAR REVIEW

Species reviewed: Ko'ko' or Guam Rail (*Gallirallus owstoni*)

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5-YEAR REVIEW
Ko'ko' or Guam Rail/ *Gallirallus ownstoni*

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,
(808) 792-9400

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 March 8, 2007. The Guam Division of Aquatic and Wildlife Resources annual reports on the Guam rail captive propagation, experimental population, and reintroduction program were the primary source of information for this five-year review. However, updates on the status and biology of the species were also obtained from the Guam Rail Species Survival Plan and other sources. The evaluation of the status of the species was prepared by the lead PIFWO biologist and reviewed by the Vertebrate 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.

1.3 Background:

1.3.1 FR Notice citation announcing initiation of this review:

USFWS. 2007. Endangered and threatened wildlife and plants; initiation of 5-year reviews of 71 species in Oregon, Hawaii, Commonwealth of the Northern Mariana Islands, and Territory of Guam. Federal Register 72(45):10547-10550.

1.3.2 Listing history

Original Listing

FR notice: USFWS. 1984. Endangered and threatened wildlife and plants; determination of endangered status for seven birds and two bats on Guam and the Northern Mariana Islands. Federal Register 49(167):33881-33885.

Date listed: August 27, 1984

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:

USFWS. 1989. Endangered and threatened wildlife and plants; determination of experimental population status for an introduced population of Guam rails on Rota in the Commonwealth of the Northern Mariana Islands; final rule. Federal Register 54:43966-43970.

1.3.4 Review History:

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

Captivity. The Guam rail is currently only found in captivity except for individuals on Rota that are part of a non-essential experimental population.

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

2

1.3.6 Current Recovery Plan or Outline

Name of plan or outline: Native Forest Birds of Guam and Rota of the Commonwealth of the Northern Mariana Islands Recovery Plan

Date issued: September 28, 1990

Dates of previous revisions, if applicable: N/A

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:

The threats affecting this species (Factors C and E) are discussed in detail in section 2.3.2. Factors A, B and D are not considered threats at this time.

The 1990 recovery plan only called for the control and/or eradication of brown treesnakes (*Boiga irregularis*) (Factor C) on Guam, establishing a captive population for translocation and reintroduction (Factor E), and reestablishing a population of 2,000 ko'ko' on Guam (1,000 in northern and 1,000 in southern Guam; Factor E) as interim recovery criteria for the ko'ko'. At this time only one of the recovery criteria from the 1990 recovery plan, establish a captive population, has been met. The ko'ko' is no longer extant in the wild on Guam (P. Wenninger, Guam Division of Aquatic and Wildlife Resources, pers. comm., 2008). Second, brown treesnakes, the primary factor in the extirpation and one of the largest obstacles to achieving their recovery, are still considered abundant and widespread on Guam (G. Rodda, U.S. Geological Survey, pers. comm., 2007).

2.3 Updated Information and Current Species Status

2.3.1 Biology and Habitat

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

Observations of radio-tagged individuals indicated that the species prefers edge habitats, especially grassy or secondary vegetation areas which provide good cover (P. Wenninger, Guam Division of Aquatic and Wildlife Resources, pers. comm. 2008). All observations of breeding by wild individuals over the last decade have also been associated with edge habitats and/or secondary vegetation on Rota and Guam (Beauprez and Brock 1999a,b; P. Wenninger, pers. comm. 2008). Ko'ko' territory sizes were between one and three hectares on Rota after initial release (P. Wenninger, pers. comm. 2008).

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:

The ko'ko' was believed to have been extirpated in the wild on Guam by 1985 (Wiles *et al.* 1995) and is now found only in captivity and in an experimental population on Rota, Commonwealth of the Northern Mariana Islands (P. Wenninger, pers. comm. 2008). In 1983, 22 ko'ko' were captured and moved to captive propagation facilities on Guam and several zoological institutions in the mainland United States to begin a captive propagation program (Haig and Ballou 1995). As of June 2008, there were approximately 158 ko'ko' in captivity on Guam and in mainland zoological institutions (S. Medina, Guam Division of Aquatic and Wildlife Resources, pers. comm. 2008).

Beginning in 1989, ko'ko' were released on the island of Rota as part of a non-essential experimental population (Wittelman and Beck 1990). As of June 2008, a total of 918 ko'ko' were released on Rota as part of an effort to establish an experimental population on that island (Wittelman and Beck 1990; Beck 1991; Brock and Beck 1995; Beauprez and Brock 1996, 1997, 1998, 1999a; Medina and Aguon 2000; P. Wenninger, pers. comm. 2008). Breeding has been documented and ko'ko' have been observed several years post-release in some regions of the island (P. Wenninger, pers. comm. 2008). In 2007, approximately 60-80 ko'ko' were believed to be persisting in the Duge and Apanon areas of Rota (P. Wenninger, pers. comm. 2007). However, additional releases and intensive cat control are needed, as cat predation is believed to be the primary factor preventing the establishment of a self-sustaining population on Rota.

In addition to releases on Rota, there have been two releases of ko'ko' on Guam since the species was listed. In 1998, 16 ko'ko' were released in "Area 50" in northern Guam (Beauprez and Brock 1999b). A temporary brown treesnake barrier was constructed around Area 50 and snake populations in the barrier were reduced through snake control. Breeding was documented, although the small population was believed to have been extirpated by feral cats and other predators (Beauprez and Brock 1999b). In 2003, a total of 44 ko'ko' were released in a snake-reduced area of the Munitions Storage Area on Andersen Air Force Base (P. Wenninger, pers. comm. 2008). Of the released ko'ko' with radio transmitters (n = 26), over 80 percent were predated by feral cats (P. Wenninger, pers. comm. 2008). Efforts to reduce cat predation were limited due to difficulty obtaining approval to control cats in the area. No ko'ko' are believed to be persisting on Guam at this time (P. Wenninger, pers. comm. 2008).

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

The current captive population originated from only 13 of the 22 founders brought into captivity (Haig and Ballou 1995). Estimated gene diversity of the captive population is 86 percent but with management could be as high as 92 percent (Ross *et al.* 2006).

2.3.1.4 Taxonomic classification or changes in nomenclature:

The genus of ko'ko' has been changed from *Rallus* spp. to *Gallirallus* spp.; therefore, ko'ko' are now referred to as *Gallirallus owstoni* (Wiles 2005).

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.):

This species has been extirpated in the wild since 1985 (Wiles *et al.* 1995). Efforts to establish a non-essential experimental population on the island of Rota are currently underway. In addition, experimental releases of ko'ko' on Guam were undertaken in 1998 and 2003; however, no wild ko'ko' are believed to be present on Guam at this time (P. Wenninger, pers. comm. 2008).

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

The ko'ko' is believed to be favor edge habitat or secondary vegetation species (Jenkins 1979; P. Wenninger, pers. comm. 2008). Therefore, the quantity and quality of potential ko'ko' habitat on Guam is believed to be stable or increasing due to development on the island. However, the extent of these changes is unknown at this time as vegetation changes on the island are not closely monitored.

2.3.1.7 Other:

N/A

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:

No new information.

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

No new information.

2.3.2.3 Disease or predation:

By 1988, the brown treesnake had eliminated most of the native birds on the island (Wiles *et al.* 2003), as well as many other native and exotic animal species (Fritts and Rodda 1998). All but two of Guam's native bird species (the yellow bittern [*Ixobrychus sinensis*] and Mariana swiftlet [*Aerodramus bartschi*]) have shown patterns of decline coinciding with the expansion of the snake's range across the island. These patterns of decline indicated an inverse relationship between populations of snakes

and birds (Savidge 1987), presumably due to nest predation by brown treesnakes. Conry (1988) recorded daily egg and nestling mortality by brown treesnakes as high as 21.5 percent in Philippine turtle-doves (*Streptopelia bitorquata*) on Guam. The ko'ko' decline followed the same pattern as other birds on Guam, rails having been first extirpated in the southern and central portions of the island, where the snake first colonized. The last wild ko'ko' was observed in 1987 on Andersen Air Force Base in northern Guam (Wiles *et al.* 1995).

Brown treesnake densities peaked in the mid-1980s and have since declined, but remain at levels that threaten efforts to reestablish wild populations of ko'ko' on Guam (Rodda *et al.* 1992, 1999a; Fritts and Rodda 1998; G. Rodda, pers. comm. 2007). Current evidence suggests that snake populations in tangantangan (*Leucaena leucocephala*) on Guam range from 20 to 60 snakes per hectare (9 to 26 snakes per acre), counting only larger snakes over 800 millimeters (31 inches) snout-to-vent length, while snakes in this size class occur at lower densities (10 to 20 snakes per hectare (4 to 9 snakes per acre) in grassland, ravine forest, or native forest vegetation types (Rodda *et al.* 1999b).

In addition to the brown treesnake, feral cats are limiting efforts to reestablish ko'ko' on Guam and to establish a non-essential experimental population on Rota. Of 315 ko'ko' released on Rota with transmitters, 16% are believed to have been predated by feral cats (P. Wenninger, unpublished data). On Guam, 50% of the 42 ko'ko' released with transmitters were believed predated by feral cats (P. Wenninger, unpublished data). Therefore, extensive control of feral cats is needed to help recover the species.

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:

No new information

2.4 Synthesis

The ko'ko' or Guam rail is endemic to the island of Guam and was extirpated from the wild by 1985. Currently, a captive population of 158 (104 on Guam) individuals in 16 (including Guam) captive propagation facilities and an experimental population of approximately 60 to 80 individuals are all that remain of the species. The species reproduces well in captivity and approximately 980 individuals have been released in the experimental population on Rota and in two experimental releases on Guam. Cat

predation on Guam and Rota, and brown treesnake predation on Guam, are prominent barriers to reestablishing a viable population on Guam and establishing a viable experimental population on Rota. Therefore, extensive cat and snake control are believed to be needed to recover the species.

Because a wild population of ko'ko' has not been established on Guam and the large-scale control of brown treesnakes and feral cats has not been undertaken, the recovery goals for this species have not been met. Therefore, the ko'ko' meets the definition of endangered as it remains in danger of extinction throughout all of its range.

3.0 RESULTS

3.1 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

- Continue efforts to maintain an active captive propagation and reintroduction program.
- Continue efforts to develop and refine brown treesnake control techniques to support large-scale control and/or eradication efforts.
- Implement large-scale brown treesnake control and/or eradication.
- Implement large-scale feral cat control and/or eradication.
- Complete establishment of the experimental population on Rota.

- Consider alternate sites for establishing experimental populations (e.g., Wake Island).
- Develop reintroduction plan for and reintroduce ko'ko' to Guam.
- Revise recovery plan.

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Personal Communications:

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Signature Page
U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of Koko or Guam Rail (*Gallirallus owstoni*)

Current Classification: E

Recommendation resulting from the 5-Year Review:

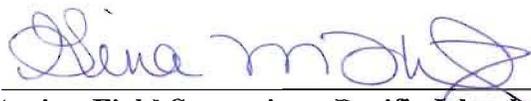
- Downlist to Threatened
- Uplist to Endangered
- Delist
- No change needed

Appropriate Listing/Reclassification Priority Number, if applicable: _____

Review Conducted By:

Fred Amidon, Fish and Wildlife Biologist
Holly Freifeld, Vertebrate Recovery Coordinator
Marilet A. Zablan, Recovery Program Leader and acting Assistant Field Supervisor for
Endangered Species
Gina Shultz, Deputy Field Supervisor

Approved: _____



Date

29 July 2009

Acting Field Supervisor, Pacific Islands Fish and Wildlife Office