Nightingale Reed-warbler
(*Acrocephalus luscinia*)

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: Nightingale Reed-warbler (*Acrocephalus luscinia*)

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5-YEAR REVIEW
Nightingale Reed-warbler/*Acrocephalus luscinia*

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, Loyal Mehrhoff, 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 primary sources of information for this five-year review include updates on the status and biology of this species obtained from local agencies and researchers recently or currently working on this species as well as background information from older sources such as the recovery plan for the nightingale reed-warbler (*Acrocephalus luscinia*) (USFWS 1998b). 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 Assistant Field Supervisor for Endangered Species before submission to the Field Supervisor for approval.

1.3 Background:

1.3.1 FR Notice citation announcing initiation of this review:

U.S. Fish and Wildlife Service. 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: U.S. Fish and Wildlife Service. 1970. Conservation of endangered species and other fish and wildlife. Federal Register 25 (233):18319-18322.
Date listed: December 2, 1970
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: None

1.3.4 Review History:
Species status review [FY 2007 Recovery Data Call (September 2007)]: Declining

1.3.5 Species' Recovery Priority Number at start of this 5-year review: 8

1.3.6 Current Recovery Plan or Outline
Name of plan or outline: Recovery plan for the nightingale reed-warbler, *Acrocephalus luscinia*
Date issued: April 10, 1998
Dates of previous revisions, if applicable: N/A
Indicate if plan is being used: Yes, some of the recovery actions outlined in the recovery plan have been initiated. A large number of the recovery actions require ongoing and/or long-term commitments (*e.g.*, predator control, habitat management and restoration, monitoring, and establishing additional populations).

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?
__X__ *Yes*
_____ *No*

2.1.2 Is the species under review listed as a DPS?
____ *Yes*
__X__ *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*
__X__ *No*

2.2 Recovery Criteria

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

__X__ *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?

__X__ *Yes*
____ *No*

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

__X__ *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 (Factors A, C, and E) affecting this species are discussed in Section 8, Reasons for Decline and Current Threats, of the recovery plan (USFWS 1998b). The main two threats to the nightingale reed-warbler continue to be the loss and degradation of habitat, including wetlands (Factor A), and predation by introduced species (Factor C: predation and disease). Mosher (2006) found that 71 percent (15/21) of nest losses were attributable to rat predation (*Rattus* spp.), 24 percent (5/21) to an unknown predator, and five percent (1/21) to a feral cat. The potential predator of greatest concern is the brown treesnake (*Boiga irregularis*). If the brown treesnake becomes established on Saipan, the nightingale reed-warbler would likely become extirpated there as it was on Guam. There are no known impacts of disease at this time, however, the possibility that West Nile Virus or avian influenza may get to the islands and impact the species has recently become a concern (Factor C). Environmental contaminants are considered a threat to birds using wetland habitat, and fires are a threat to upland and wetland habitats in the Mariana Islands (Factor E: other natural or manmade factors). It is uncertain if inadequacy of existing regulatory mechanisms (Factor D) is a threat at this time. However, there is a concern that landowners are clearing occupied habitat without appropriate permits from the CNMI and the USFWS. Overutilization (Factor B) is not known to be a threat to this species (USFWS 1998b).

The recovery plan for the nightingale reed-warbler includes the following criteria for downlisting and delisting:

Downlisting criteria

Downlisting may occur when populations on Saipan and Alamagan are secure from threats and maintained at their current numbers or increasing for at least 5 consecutive years.

Delisting criteria

Criterion 1. The population of nightingale reed-warblers must number at least 8,000 individuals, distributed in secure populations over 5 islands as follows: at least 4,000 on Saipan, 2,000 on Alamagan, and 2,000 on at least 3 additional islands, chosen from the following islands: Rota, Aguiguan, Tinian, Anatahan, Pagan, or Agrihan.

Criterion 2. These populations must be stable or increasing for at least 5 consecutive years.

At this time, the recovery criteria in the recovery plan (USFWS 1998b) have not been met. The nightingale reed-warbler is not secure from threats on either Saipan or Alamagan. The population on Saipan is decreasing (Camp *et al.* 2009), and the status of the population on Alamagan is uncertain because this island is seldom visited by biologists and the nightingale reed-warbler is not surveyed on a regular basis there. Numbers on Alamagan are likely to be lower than needed for delisting, owing to habitat degradation by humans and introduced mammals. Further, no populations have been established on any additional islands.

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:

The most recent work on nightingale reed-warbler biology was conducted on Saipan by Mosher (2006) who studied birds in upland tangantangan and wetland habitats. The mean home range/territory size of male and female nightingale reed-warblers was estimated to be 4.43±2.83 (SD) hectares (10.95±6.99 acres), and the core area was estimated to be 0.85±0.52 (SD) hectares (2.1±1.28 acres). The core area determined by tracking radio-tagged birds (Mosher 2006) was comparable to the territory size estimated by Craig (1992) and Stinson (1994) by mapping the territories of color-banded birds. Mosher (2006) also found that males in *Phragmites karka* wetlands had smaller mean home ranges (1.98±0.59 (SD) hectares (4.89± 1.46 acres) than those in either upland tangantangan forest (*Leucaena leucocephala*) (3.73±1.12 (SD) hectares (9.22± 2.77 acres) or mangrove wetlands (7.86±3.59 (SD) hectares (19.42± 8.87 acres). Males in mangrove wetlands also traveled the greatest distances, followed by those in tangantangan, and those in *Phragmites* wetlands.

Mosher (2006) found two breeding peaks, January through March and July through September. Males and females both incubate eggs, and brood and feed nestlings. Overall nesting success was 44 percent, with predation (primarily by rats, *Rattus* spp.) being the primary cause of nest failure (Mosher 2006). Mosher and Fancy (2002) also describe nests, eggs, and nestlings of the nightingale reed-warbler.

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:

Surveys recently conducted on Saipan indicate that the nightingale reed-warbler population is declining and has declined since surveys were first conducted in 1982 (Camp *et al.* 2009; Engbring *et al.* 1986; USFWS 1998a). Nightingale reed-warbler densities on Saipan decreased by more than half between 1982 and 2007 and it is believed that land cover conversion from forest to anthropogenic-dominated habitats has facilitated the decline (Camp *et al.* 2009).

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:

No new information.

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

The human population on Saipan has increased more than four-fold since surveys were first conducted for the nightingale reed-warbler in 1982 (Camp *et al.* 2009). Habitat has become increasingly fragmented with growing development pressure. The areas that held the highest numbers of nightingale reed-warblers in 1982 were Kagman, Garapan, and Fadang (Engbring *et al.* 1986). In 1997, the number of birds detected in all three areas was lower than in 1982 (USFWS 1998a). The nightingale reed-warbler population decreased from a density of 58 birds per km^2 in 1982, to 40 birds per km^2 in 1997, to 22 birds per km^2 in 2007 (Camp *et al.* 2009). The number of detections increased in Suicide (Marpi) and Tanapag, areas with lower human presence and habitat that has been less disturbed (USFWS 1998a). The numbers of birds also decreased in the Fadang area, which includes the relatively intact (to date) area of Naftan peninsula. However, the Fadang area also includes Koblerville, which has seen recent development, including a school and housing development (A. Marshall, USFWS, pers. obs. 2007).

Even areas that have, to date, remained relative undisturbed (*e.g.*, Marpi, Naftan peninsula) are under threat of development and further fragmentation in the near future. For instance, a road expansion has recently been permitted for the area south of Bird Island, running along a portion of the Saipan Upland Mitigation Bank, a homestead development is potentially planned for Marpi, and golf resorts have been proposed for Naftan and possibly for Bird Island. New quarries are being proposed and quarry expansions are also occurring to accommodate needs for road improvement projects.

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

As discussed above, we believe that the extent of habitat available for nightingale reed-warblers has declined on Saipan, particularly in certain areas where development has occurred (Camp *et al.* 2009). Generally, wetlands in the Mariana Islands are in poor condition due to filling, dredging, altered hydrology, invasive introduced plants, introduced vertebrate predators, ungulate disturbance, fires, erosion, pollution, and

even volcanic activity (Stinson 1993; Wiles and Ritter 1993). Upland habitat used by nightingale reed-warblers is also in poor condition due to grazing, agriculture, invasive plants, and the presence of introduced predators. Habitat loss continues to be a primary threat to this species and has yet to be addressed on a scale sufficient to reduce the threat.

In addition, sightings of the brown treesnake on Saipan suggest it may be in the process of becoming established there (Rodda and Savidge 2007). The brown treesnake was accidentally introduced to Guam around 1949 causing the extirpation or extinction of 13 of Guam's 22 native breeding birds (Rodda and Savidge 2007), including the nightingale reed-warbler (Reichel *et al.* 1992). The spread of the brown treesnake to Saipan would likely cause the nightingale reed-warbler's extirpation there, leaving only a single, small population on Alamagan.

2.3.1.7 Other:

The possibility of avian influenza or West Nile Virus reaching the Mariana Islands from Asia or the U.S. mainland is a recent concern. The impact these two diseases may have on the nightingale reed-warbler is not known at this time, but both diseases have had deleterious impacts to many bird species elsewhere, and could negatively affect the nightingale reed-warbler if they reach the Mariana Islands.

The Saipan Upland Mitigation Bank was reestablished in 2009 through an addendum (Addendum 2009). The purpose of the SUMB is to maintain a baseline population of nightingale reed-warbler territories to be used as mitigation for projects that will impact the nightingale reed-warbler on Saipan (SUMBA 2002).

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: Habitat loss and degradation is one of the primary threats to this species. Wetlands are in poor condition due to filling, dredging, altered hydrology, invasive introduced plants, ungulate disturbance, fires, erosion, pollution, and even volcanic activity (Stinson 1993, Wiles and Ritter 1993). Upland habitats are also being lost due to human population growth on Saipan, which increased 429 percent between 1980 and 2000 (Camp *et al.* 2009). Habitat loss, fragmentation, and degradation have not been addressed to date on a meaningful scale sufficient to reduce this threat. The development of an island-wide conservation plan for Saipan would help address this issue.

2.3.2.2 Overutilization for commercial, recreational, scientific, or

educational purposes: There is no evidence at this time that overutilization is a threat to this species.

2.3.2.3 Disease or predation:
At this time, there are no known impacts from disease. However, the negative impacts of West Nile Virus and avian influenza on species elsewhere has raised the concern that these diseases may reach the Mariana Islands and impact species such as the nightingale reed-warbler.

Predation by introduced species is considered to be a primary threat to the nightingale reed-warbler. Seventy five percent of nightingale reed-warbler nests failed due to predation by cats, rats, and unknown predators in a study on Saipan (Mosher 2006). The most serious threat, however, is the potential for the establishment of a brown treesnake population on Saipan (USFWS 1998b). It is believed that while several factors were likely involved in the extirpation of the nightingale reed-warbler on Guam, their final disappearance was likely attributable to the brown treesnake (Reichel *et al.* 1992, Wiles *et al.* 2003). The establishment of a brown treesnake population on Saipan is likely to have consequences similar to those of Guam (Brown Treesnake Working Group 2005).

2.3.2.4 Inadequacy of existing regulatory mechanisms:
The inadequacy of existing regulatory mechanisms may be a threat at this time. Clearing of occupied habitat without appropriate permits from the CNMI and the USFWS may be occurring and should be investigated.

2.3.2.5 Other natural or manmade factors affecting its continued existence:
Environmental contaminants are considered a threat to birds using wetland habitat. Fires are also a threat to upland and wetland habitats in the Mariana Islands. The extent of this threat to the continued existence of the nightingale reed-warbler has not been studied to date.

2.4 Synthesis

The nightingale reed-warbler is known to have once occurred on at least six islands in the Mariana archipelago; Guam, Aguiguan, Tinian, Saipan, Alamagan, and Pagan. Three subspecies of the nightingale reed-warbler are currently recognized: (1) *A. l. luscinia* on Guam, Saipan and Alamagan; (2) *A. l. nijoi* on Aguiguan; and (3) *A. l. yamashinae* on Pagan (Pratt *et al.* 1987, Watson *et al.* 1986). Mitochondrial DNA analysis provides some evidence that nightingale reed-warblers from Guam and Saipan do not fall out as sister taxa and that the Guam birds fall outside the clade of other Pacific Island *Acrocephalus* and may be descended from a different continental ancestor (Beth Slikas, Smithsonian Institution, *in litt.* 2000). At this time, only one subspecies is known to be extant: *A. l. luscinia* on Saipan and Alamagan.

The nightingale reed-warbler was extirpated on Guam in the late 1960s (Engbring *et al.* 1986, Reichel *et al.* 1992, Tenorio and Associates 1979), a result of wetland loss and the introduction of the brown treesnake. No nightingale reed-warblers have been observed on Aguiguan since 1995 (USFWS 1998b). There is only prehistorical evidence of the species' existence on Tinian (Steadman 1999), and the Pagan subspecies was extirpated as a result of volcanic activity between the 1960s and 1981 (Glass 1987).

Recent surveys of land birds on Saipan indicate nightingale reed-warblers decreased from a high density of 58 birds per km^2 in 1982 to 22 birds per km^2 in 2007, with significant declines in urban habitat (Camp *et al.* 2009). Surveys on Alamagan in 1988 estimated 350 to 1,000 nightingale reed-warbler pairs (Reichel *et al.* 1992), and in 1992, 2,000+ individuals were estimated (Stinson 1993). The DFW (2000) conducted surveys on Alamagan and estimated there were 173 pairs (120-227 95% confidence interval) of nightingale reed-warblers on the island. The variation in these estimates may reflect differences in survey methodology, but further studies are needed there. Therefore, the nightingale reed-warbler has been extirpated from three islands, appears to be declining on Saipan, and has an uncertain status on Alamagan. The extirpation of the nightingale reed-warbler from Guam, Pagan, and Aguiguan represents the loss of two of the three currently recognized subspecies; thus one subspecies remains.

Habitat loss and degradation and predation by introduced species are the main limiting factors for this species. Without an island-wide plan to conserve habitat on Saipan, development will continue to fragment and reduce habitat quality for this species. The establishment of the brown treesnake on the island will certainly result in the extirpation of the nightingale reed-warbler on Saipan. The species may not be faring well on Alamagan either, where humans, feral cattle, goats, and pigs have extensively altered the vegetation (DFW 2000). Rats (*Rattus exulans*) also occur on Alamagan (DFW 2000), and likely depress the breeding success of nightingale reed-warblers there as rats do on Saipan (Mosher 2006).

In summary, nightingale reed-warblers remain on only two of the six islands in the Mariana Archipelago where they once occurred. Little management occurs within the species' habitat, numbers appear to have declined on Saipan, and the major threats to the species have not been addressed. Only one subspecies out of three recognized subspecies is extant. The recovery plan (USFWS 1998b) proposal to translocation nightingale reed-warbler to at least three additional islands has not occurred nor have there been studies to determine the appropriateness of the islands suggested for translocation: Rota, Aguiguan, Tinian, Anatahan, Pagan, or Agrihan (USFWS 1998b). The stabilization and recovery goals for this species have not been met and therefore the nightingale reed-warbler continues to meet the definition of endangered as it remains in danger of extinction throughout its range.

3.0 RESULTS

3.1 Recommended Classification:

____ Downlist to Threatened

____ **Uplist to Endangered**
____ **Delist**
____ *Extinction*
____ *Recovery*
____ *Original data for classification in error*
__X__ **No change is needed**

3.2 New Recovery Priority Number: N/A

Brief Rationale:

3.3 Listing and Reclassification Priority Number:

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

- Develop an island-wide nightingale reed-warbler conservation plan for Saipan.
- Develop and implement plans to protect and manage upland habitat on Saipan and Alamagan.
- Develop plans to protect and restore important wetland habitat on Saipan. Prioritize wetland protection and restoration for nightingale reed-warblers on Saipan.
- Develop methodology to monitor nightingale reed-warblers consistently on Alamagan.
- Conduct regular monitoring of the nightingale reed-warbler populations on Saipan and Alamagan.
- Develop a plan to maintain the Alamagan nightingale reed-warbler population.
- Develop plans for predator control in key areas, keep abreast of research on improvements in predator control, and implement improved methodology.
- Continue work in the Saipan Upland Mitigation Bank (SUMBA 2002).
- Research the environmental factors and management actions that directly affect demographic parameters.
- Continue brown treesnake interdiction to protect Saipan.
- Develop and implement a plan for the establishment of nightingale reed-warbler populations on at least three additional islands.
- Develop public support for the protection of this endemic species.

5.0 REFERENCES

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Signature Page
U.S. FISH AND WILDLIFE SERVICE
5-YEAR REVIEW of Nightingale reed-warbler (*Acrocephalus luscinia*)

Current Classification: ___E_____

Recommendation resulting from the 5-Year Review:

____ Downlist to Threatened
____ Uplist to Endangered
____ Delist
_X__ No change needed

Appropriate Listing/Reclassification Priority Number, if applicable:_____

Review Conducted By:
Ann Marshall, Fish and Wildlife Biologist
Holly Freifeld, Vertebrate Recovery Coordinator
Marilet A. Zablan, Assistant Field Supervisor for Endangered Species

Approved _____ Date JUL - 8 2010
Loyal Mehrhoff, Field Supervisor, Pacific Islands Fish and Wildlife Office