

Recovery Outline
for the
Rota Bridled
White-eye
(*Zosterops
rotensis*)

October 2004



Common Name
Scientific Name

Rota Bridled White-eye
Zosterops rotensis

Listing Status and Date

Endangered; February 23, 2004 (USFWS 2004)

Lead Agency/Region

U.S. Fish and Wildlife Service, Region 1

Lead Field Office

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Purpose of the Recovery Outline: This document lays out a preliminary course of action for recovery of the Rota bridled white-eye. It is meant to serve as interim guidance to direct recovery efforts and inform consultation and permitting activities until the comprehensive draft recovery plan has been completed. Recovery outlines are intended primarily for internal use by the U.S. Fish and Wildlife Service, and formal public participation will be invited upon the release of the draft recovery plan. However, we will consider any new information or comments that members of the public may wish to offer in response to this outline during the recovery planning process. For more information on Federal recovery efforts for the Rota bridled white-eye, or to provide additional comments, interested parties may contact the lead field office for this species, at the above address or telephone number.

Scope of Recovery and Available Information: The scope of this recovery effort is single species. Relatively little is known about the Rota bridled white-eye. Taxonomic work has been completed (Slikas *et al.* 2000) and some life history information has been collected (Craig and Taisacan 1994; Lusk and Taisacan 1997; Amidon 2000). In addition, preliminary work on habitat relationships (Amidon 2000) and a review of threats to the species has been completed (Fancy and Snetsinger 2001). However, the habitat needs and threats to the species are still not well understood and additional research is needed to help understand what is needed to recover the species. The need for additional research is acknowledged as playing a role in the early stages of recovery of the species. The uncertainties associated with the specific habitat needs of and threats to the Rota bridled white-eye will be resolved to the extent possible through the course of the recovery process and will likely result in modifications to the recovery program over time.

OVERVIEW

Species Description and Life History

The Rota bridled white-eye is a small bird (weight about 10 grams, or 0.4 ounces) in the family Zosteropidae, Order Passeriformes. The species is endemic to the 86-square-kilometer (33-square-mile) island of Rota in the Mariana archipelago (Figure 1). The name white-eye is derived from the ring of white feathers around each eye. The plumage is tinged with yellow, and the bill, legs, and feet are yellow-orange. The sexes are similar in appearance. A closely related white-eye species, the bridled white-eye (*Zosterops conspicillatus*) is found on the neighboring Mariana Islands of Aguijan, Tinian, and Saipan. The endangered Guam subspecies of the bridled white-eye (*Zosterops c. conspicillatus*) was found on Guam and is now presumed extinct (Wiles *et al.* 1995).

Rota bridled white-eyes are primarily found in native forests and introduced *Acacia confusa* (sosugi) forests at upper elevations in Rota's Sabana region (Amidon 2000). They are highly gregarious, and are often observed foraging in small groups of five to seven birds (Craig and Taisacan 1994), occasionally in mixed-species flocks (Amidon 2000). Rota bridled white-eyes forage primarily by gleaning insects from leaves in the upper, outer layers of trees, but also feed on seeds, nectar, flowers, and fruits (Craig and Taisacan 1994; Amidon 2000). Additional details on the known life history of the Rota bridled white-eye are provided in the final rule listing the species as endangered (USFWS 2004).

Historical and Current Population Status

Early descriptions of the Rota bridled white-eye by Baker (1948) described this species as numerous and found at lower elevations (less than 150 meters [492 feet]). However, by 1975, white-eyes were only observed at upper elevations (greater than 150 meters [492 feet]) in the Sabana region, a plateau 450 meters (1,476 feet) in elevation dominating the topography of the western half of Rota (Pratt *et al.* 1979). The current distribution of Rota bridled white-eyes (Figure 2) indicates that the highest densities are found in the high-elevation wet forests on the Sabana (Amidon 2000; Fancy and Snetsinger 2001). In addition, every Rota bridled white-eye nest location that has been

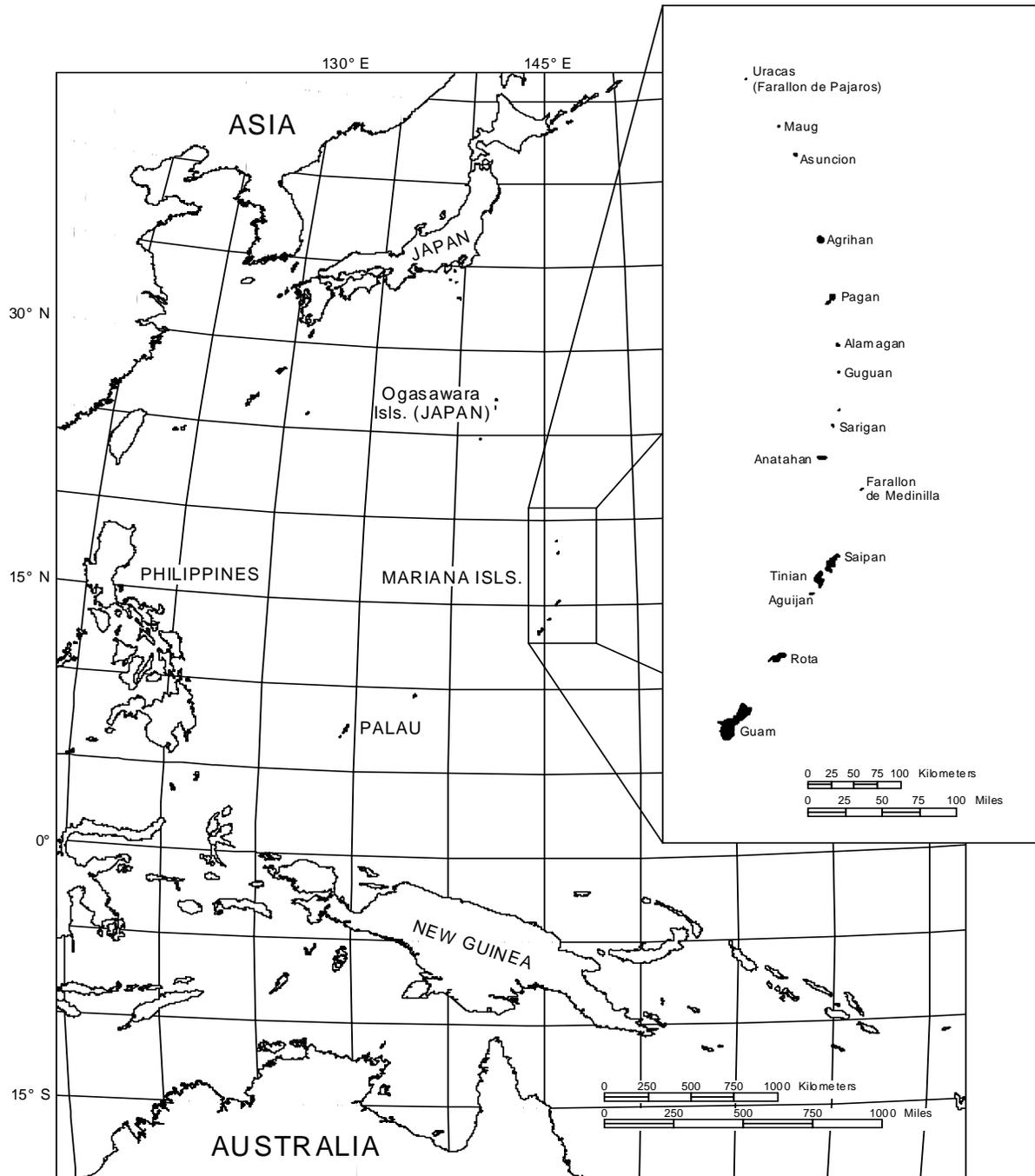


Figure 1. Location and composition of the Mariana archipelago.

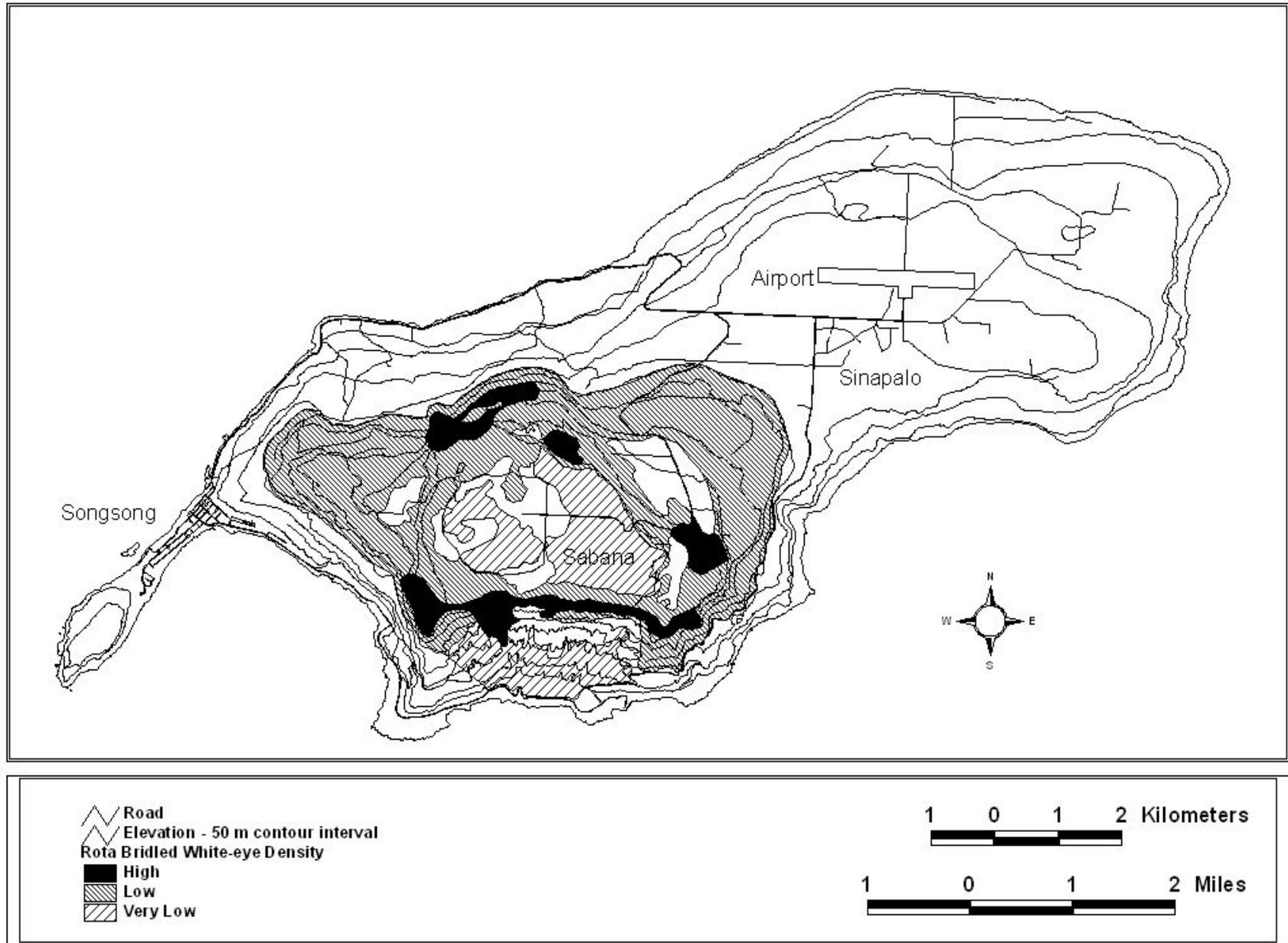


Figure 2. High, low, and very low density Rota bridled white-eye areas on Rota in 1996. See Fancy and Snetsinger (2001) for additional information.

reported was found in high-elevation wet forest (Pratt 1985; Lusk and Taisacan 1997; Amidon 2000). Whether this distribution is the result of habitat preference or is simply an artifact of population decline is unknown; however, the species appears to have been mostly limited to this distribution since at least the 1960's (Fancy and Snetsinger 2001).

The first island-wide survey of forest birds on Rota was conducted in 1982. During this survey, Rota bridled white-eyes were recorded primarily in forested areas above 300 meters (984 feet) and the population was estimated to be 10,763 birds (Engbring *et al.* 1986). In the fall of 1996, a survey by Fancy and Snetsinger (2001) estimated the population of Rota bridled white-eyes to be 1,167 birds. This estimate indicated an 89 percent decline from the 1982 estimate. In addition, this survey determined that 94 percent of the population was restricted primarily to four patches of mature wet forest (cloud forest) covering a total area of about 254 hectares (628 acres) above 200 meters (656 feet) elevation in the Sabana region (Figure 2). In 1999, survey work by Amidon (2000) estimated the Rota bridled white-eye population to be 1,092 individuals.

In general, the current known population status of the species appears to be conducive to strategies that could lead to its long-term persistence in the wild. There do not appear to be any major limiting factors in terms of demographics or genetics that would preclude a positive response to protection or management. However, the highly restricted range and reduced population make it highly susceptible to extinction from random catastrophic events. Therefore, stabilizing and protecting the existing population requires immediate attention.

Rota Description and Landownership

Rota is the fourth largest island in the Mariana archipelago, located 49 kilometers (30 miles) north of Guam in the U.S. Commonwealth of the Northern Mariana Islands (Figure 1). The Sabana region is an uplifted plateau 450 meters (1,476 feet) in elevation covering 12 square kilometers (5 square miles) on the western half of the island (Figure 2). Cliffs border the Sabana on all but the northeast side, where the plateau slopes down to the eastern part of the island, which has been covered in secondary growth forest intermingled with residential and agricultural lands since the 1930's. Undeveloped land on Rota is held for agriculture, grazing, and potential ecotourism activities. The cliff lines surrounding the Sabana region remain primary forest due to their steepness. Although approximately half of the island is now forested, much of the forest is of medium stature and is degraded by development activities, introduced plants and animals, logging, and the effects of warfare from World War II (see Habitat Loss and Degradation, below). There are two villages on the island of Rota, Sinapalo and Songsong; the population as of 2000 was 3,283 people (U.S. Census Bureau 2000).

Currently, 85 percent of the Rota bridled white-eye population occurs on public lands and 15 percent occurs on private lands. There is no U.S. Government-owned land in the Commonwealth of the Northern Mariana Islands; all public lands are administered by the Mariana Public Land Authority for people of Mariana Island descent. Approximately 60 percent of the land on Rota is administered by the Mariana Public Land Authority, although much of it has been leased to private individuals.

Listing Factors/Primary Threats to the Species

As identified in the final rule (USFWS 2004), the primary threats to the Rota bridled white-eye are habitat loss and degradation, and predation by introduced rats (*Rattus* spp.) and birds (black drongos [*Dicrurus macrocercus*]). The small population size and limited distribution also make this species vulnerable to extinction from random environmental events. A description of each of these threats is presented below; each is classified according to the five listing/delisting factors identified in section 4 of the Endangered Species Act (“Act”; 16 USC 1531 *et seq.*).

Habitat Loss and Degradation (Factor A)

Much of the level land on Rota was cleared for sugar cane cultivation, including areas on the Sabana, and areas were cleared on the Sabana for phosphate mining during the Japanese Administration (1914 to 1944) of the Mariana Islands (Fosberg 1960; Engbring *et al.* 1986). In addition, Rota was heavily bombed but not invaded during World War II (Engbring *et al.* 1986). By 1946, only one-fourth of the total area of Rota was covered in native forest which was broken into small parcels or located along the base of cliffs (Fosberg 1960). After 1946, many of the cleared areas reverted to native forest through natural regeneration. By the mid-1980’s, Falanruw *et al.* (1989) reported that 60 percent of Rota was composed of native forest, although a significant portion of this was in an altered condition. The majority of the mature native forest was found along the cliffs of the upper plateau, with the forest on level portions of the island being mostly secondary growth. Currently, the amount of native forest remaining on Rota is believed to be less than 60 percent of the island due to homestead and resort development (F. Amidon, U.S. Fish and Wildlife Service [USFWS], pers. comm. 2004).

Although limestone forest has been lost due to development, the majority of the high-elevation forests in the Rota bridled white-eye’s current range have not been subjected to development and large-scale clearing in the past because of their rugged topography. These forests have, however, received extensive typhoon damage in recent years (Fancy and Snetsinger 2001; J. Morton, USFWS, pers. comm. 2003) that has increased fragmentation and reduced the availability of breeding and foraging habitat. This typhoon-related damaged may have been exacerbated by the previous clearing for farming and phosphate mining on the Sabana that increased the exposure of the remaining forests to the impacts of high winds. The resulting loss of breeding and foraging habitat for the Rota bridled white-eye may be the primary factor in the range restriction and population decline of the species over the last two decades (Amidon 2000; Fancy and Snetsinger 2001).

The continued loss and degradation of native forest on the Sabana has very important implications for long-term Rota bridled white-eye conservation. Without adequate native forest available, the continued persistence of the Rota bridled white-eye is uncertain. Therefore, one of the highest recovery priorities is to protect the remaining forest from further loss and degradation and to restore native forests to these regions.

Introduced Predators (Factor C)

Rat Predation — Introduced rats have been found to be major predators of native birds in Hawai`i, New Zealand, and other Pacific Islands (Atkinson 1977, 1985; Robertson *et al.* 1994). Currently, two species of introduced rat, the Asian house rat (*Rattus tanezumi*) and Polynesian rat (*R. exulans*), have been recorded on Rota (Johnson 1962; Flannery 1995). Recent work by our personnel on Rota and opportunistic rodent trapping and observations for the Guam rail (*Gallirallus owstoni*) release program indicate that high densities of rats exist on Rota (Fancy and Snetsinger 2001). Therefore, rat predation may be limiting the recovery of the species and may, in combination with other factors, be playing a role in the population decline.

In addition, recent analysis of forest bird survey data since 1982 indicates that many of the forest birds on Rota have declined significantly, especially since the mid-1990's (Amar *et al.*, in review). The species showing the largest declines are all open-cup nesters, like the Rota bridled white-eye. Cavity nesters such as the Micronesian starling (*Aplonis opaca*) and collared kingfisher (*Halcyon chloris*) are showing no population decline or only small declines. This may be an indication that rat predation may be playing a prominent role in the decline of bird populations on Rota.

Black Drongo Predation — Black drongos, an Old World bird species, were thought to have been introduced to Rota from Taiwan by the Japanese South Seas Development Company in 1935 to control destructive insects (Baker 1948). Black drongos are noted for their aggression toward and occasional predation on small passerines such as white-eyes (Ali and Ripley 1972; Maben 1982), and a black drongo has been observed eating an adult Rota bridled white-eye (Amidon 2000). Black drongo predation is thought to be a factor in the decline and range restriction of the Rota bridled white-eye (Craig and Taisacan 1994). However, not all researchers agree that the black drongo has played a significant role in the decline and range restriction of the Rota bridled white-eye.

Maben (1982) found that, although black drongos would harass other birds on Guam, they did not regularly attempt to prey on them. Birds have also been reported to forage within black drongo territories and nest near active black drongo nests without harassment (Ali and Ripley 1972; Maben 1982). Michael Lusk (USFWS, *in litt.* 1996) observed no interactions between black drongos and Rota bridled white-eyes during a 1993 to 1994 study of their interactions on Rota (cited in Fancy and Snetsinger 1996). In addition, Amidon (2000) observed only one black drongo predation on a Rota bridled white-eye over 11 months, despite efforts to record this specific behavior. However, it is possible that black drongo predation or harassment, in combination with other factors, such as habitat loss, may be limiting the Rota bridled white-eye population (Amidon 2000; Fancy and Snetsinger 2001).

Predation by introduced rats and black drongos likely played a role in the decline and range restriction of the Rota bridled white-eye. The importance of their role is still

uncertain but it is expected that they both are limiting the recovery of the species. Therefore, introduced rat and black drongo control research and implementation will be needed.

Small Population Size and Limited Distribution (Factor E)

The small population size and limited distribution of the Rota bridled white-eye places this species at risk from naturally occurring events and environmental factors. In particular, typhoons pose a serious threat, both directly and indirectly, to the white-eye and other avian populations (Wiley and Wunderle 1993). This threat can also be exacerbated by human land-use practices, which can affect the extent of damage caused by these storms.

Direct effects from typhoons include mortality from winds and rains. Indirect effects include the short-term and potential long-term loss of food supplies, foraging habitat, nests, nest and roost sites, and microclimate changes. For example, in December 1997, Supertyphoon Paka defoliated trees and removed large amounts of epiphytic growth and associated organic matter from the forests of Rota (J. Morton, *in litt.* 1998). This may have resulted in lower-quality foraging and breeding habitat and decreased availability of nesting material for the Rota bridled white-eye until the forests recovered from the typhoon. Typhoon damage can also lead to long-term forest composition changes (Lugo and Scatena 1996) that can affect bird community composition. For example, Amidon (2000) found that Rota bridled white-eye abundance decreased on the Sabana between 1982 and 1994, while black drongo, collared kingfisher, and Micronesian starling abundance increased. These changes in bird abundance may be related to changes in habitat (*e.g.*, increase in the number of dead trees for perching or nest sites for cavity nesters) caused by typhoon Roy in 1988.

Since typhoons are a common occurrence in the Mariana Islands it is very likely that the currently reduced Rota bridled white-eye population could be severely impacted by a single typhoon event. Therefore, it is extremely important that efforts to protect the species from these sorts of events be instituted early on in the recovery process. This might include establishing a second population in captivity while long-term habitat protection and improvement efforts are undertaken.

Pesticides (Factor E)

Currently, pesticides are not believed to be a threat to the Rota bridled white-eye. However, pesticide use may have played some role in the extirpation of the endangered Mariana swiftlet (*Aerodramus bartschi*) and the sheath-tailed bat (*Emballonura semicaudata rotensis*) from Rota. It is also possible that pesticide use may have played some role in the decline and range restriction of the Rota bridled white-eye. For example, the insecticide malathion was sprayed on Rota in 1989 to control the melon fly. Bird survey data at the time did not indicate that the spraying of this insecticide had any impact on bird populations (Engbring 1989). However, the timing of the insecticide application coincides with the decline and range restriction of the Rota bridled white-eye between 1982 and 1994 and may have played some

role. Therefore, large-scale application of pesticides should be analyzed in the recovery effort.

Conservation Efforts

In 1991, the Commonwealth of the Northern Mariana Islands (CNMI) government listed the Rota bridled white-eye as threatened or endangered (the CNMI makes no distinction between the threatened and endangered categories) (Public Law 2-51). However, CNMI regulations do not prohibit the taking of CNMI-listed threatened and endangered species (Kevin Garlick, USFWS, *in litt.* 1997). The CNMI also designated a “protected area” on the Sabana in 1994 through Rota Local Law No. 9-1 (Sabana Protected Area Management Committee 1996). A plan was developed to manage this protected area as part of an effort by the CNMI government to limit development in this upper elevation area (Sabana Protected Area Management Committee 1996); however, it has not been implemented.

The CNMI Division of Fish and Wildlife has also conducted quarterly roadside surveys for the Rota bridled white-eye since 2000. These surveys consist of 50 point-count stations established within the Rota bridled white-eye’s current range. The CNMI Division of Fish and Wildlife has also funded a small study on Rota bridled white-eye nest predators using video cameras. To date, only five nests have been monitored. Finally, preliminary research on the factors in the decline of the Rota bridled white-eye has been conducted (Amidon 2000; Fancy and Snetsinger 2001) and some life history data has been collected (Craig and Taisacan 1994; Lusk and Taisacan 1997; Amidon 2000).

Summary Assessment

Overall, the population status of the Rota bridled white-eye is declining. Since 1982 the population has declined approximately 90 percent and the population distribution has been severely limited. However, the recovery prognosis is thought to be good because the Rota bridled white-eye population is still of sufficient size to allow for successful management and many of the threats to the species may be addressed by relatively straightforward means such as reforestation and predator control. In addition, because the Rota bridled white-eye’s range is limited to the Sabana region, which is the primary watershed for the island, reforestation and habitat protection efforts are expected to receive some local support.

In summary, the Rota bridled white-eye population is declining and their range is highly restricted. However, with early intervention the population trend can be reversed and recovery can be achieved. The key challenges will be identifying the habitat requirements of the Rota bridled white-eye and assessing the impact of black drongos and rats on white-eye populations. In addition, coordinating an effective recovery effort and obtaining sufficient funding to implement required actions will be important for recovery.

Preliminary Recovery Strategy

Recovery Priority Number

The Rota bridled white-eye is assigned a recovery priority number of 2 on a scale of 1C (highest) to 18 (lowest; the “C” indicates the potential for conflict with human economic activities), based on the high degree of threat, a high potential for recovery as stated above, and its taxonomic status as a full species (USFWS 1983a,b). The high degree of threat is linked to the rapidly declining population and continued loss of habitat and predation by introduced predators. It is also related to susceptibility of the population to random catastrophic events. The high potential for recovery is based on the likelihood that the threats can be controlled through known habitat protection and management techniques and predator control. In addition, recovery efforts, such as reforestation are expected to receive local support. An additional “C” ranking is not warranted because the conservation efforts needed to recover the species are not expected to conflict with human economic activities.

Recovery Goal and Objectives

The goal of the recovery program is to establish a framework within which recovery actions are undertaken to ensure the long-term survival of the Rota bridled white-eye and to control or reduce the threats to the species to the extent that it no longer requires the protections afforded by the Endangered Species Act and therefore warrants delisting. Although subject to change, full recovery of the Rota bridled white-eye is currently envisioned as follows: a viable Rota bridled white-eye population will persist on protected and managed habitat throughout the species’ historical range on Rota. Threats to the species, primarily habitat loss and degradation and predation by introduced species, will be sufficiently abated to ensure the high probability of survival of the Rota bridled white-eye for at least 100 years.

Initial Action Plan

The goal of the initial phase of recovery is to reverse the population decline and increase the occupied range of the Rota bridled white-eye. The primary objectives of the initial phase of recovery will be to:

- (1) stop and reverse the decline in the population;
- (2) protect habitat within the Rota bridled white-eye’s current range and increase the availability of white-eye habitat; and
- (3) address predation threats to the species.

These objectives will be accomplished by using the full range of protection tools available (*e.g.*, section 7 consultations, incidental take permits, partnerships, etc.) and will be based on our current understanding of the ecological requirements of the species and what is needed to fully protect its habitat. Heightened public awareness through education may play a role in generating voluntary protection actions.

Recovery Actions

The recovery effort should build upon ongoing conservation efforts such as the quarterly monitoring and nest predation research described above. Specific actions that should be undertaken early in the process include the following:

- Assess the need for and feasibility of establishing a captive population to prevent the species from going extinct due to random catastrophic events until the population on Rota is of a sufficient size and distributed across the landscape of Rota in such a way as to protect it from such events.
- Conduct additional research on the habitat requirements of the Rota bridled white-eye.
- Develop and implement native high elevation wet forest restoration techniques to increase the availability of this habitat type on the Sabana.
- Conduct research on black drongo and Rota bridled white-eye interactions to determine if black drongo control is warranted and develop suitable control techniques, if necessary.
- Continue research on rat predation of white-eye nests to determine if rat control is warranted and continue efforts to register a rodenticide for aerial broadcast on Rota.
- Develop and implement a long-term Rota bridled white-eye survey and monitoring program.

Preplanning Decisions

Planning Approach

A recovery plan for the Rota bridled white-eye will be prepared pursuant to section 4(f) of the Endangered Species Act. Plan preparation will be conducted by Fred Amidon, the Pacific Islands Fish and Wildlife Office's lead biologist for the Rota bridled white-eye. The CNMI Department of Land and Natural Resources will also be integrally involved in the planning effort.

The species does not, at this time, warrant the appointment of a recovery team. Our lead biologist will coordinate recovery efforts within an informal network of experts and involved parties. Periodically, meetings among these parties may be convened for the species with the purpose of sharing information and ideas about advancing Rota bridled white-eye recovery. Plans for stakeholder involvement are addressed below.

Information Management

All information relevant to the recovery of the Rota bridled white-eye will be housed in the Pacific Islands Fish and Wildlife Office's administrative files. Our lead biologist will be responsible for maintaining a full administrative record for the recovery planning and implementation process for the species, and copies of new study findings, survey results, records of meetings, comments received, etc., should be forwarded to him.

Recovery Plan Schedule

Regional Office Review Draft	April 2005
Public Review Draft	August 2005
Public Comment Period	August – October 2005
Final Recovery Plan	August 2006

Stakeholder Involvement

Key stakeholders:

- Private landowners with Rota bridled white-eyes currently or historically on their lands
- Mariana Public Land Authority
- CNMI Department of Land and Natural Resources and Coastal Resource Management Office
- Mayor of Rota
- Rota Representatives to the CNMI Legislature
- Governor of the CNMI
- CNMI Resident Representative to Congress
- Conservation organizations such as Birdlife International

Stakeholder Involvement Strategy

Landowners and land managers that may contribute to or be affected by the listing and recovery of the Rota bridled white-eye will be invited to participate in the recovery planning process. A mailing list will be maintained and the Pacific Islands Fish and Wildlife Office will attempt to foster open and ongoing communications with all interested parties. Field biologists working on the Rota bridled white-eye and other Mariana Island natural resource issues will attempt to develop strong one-on-one working relationships with interested parties.

Early in the recovery planning process, a meeting with the CNMI Division of Fish and Wildlife will be held to exchange status information, identify recovery issues, and to identify additional cooperators in Rota bridled white-eye recovery efforts. The information emanating from this discussion will provide the initial platform for proceeding with recovery planning. It will also help identify private landowners and CNMI government agencies that could participate in Rota bridled white-eye recovery efforts. The CNMI Division of Fish and Wildlife will then be asked to participate on an ongoing basis in the recovery planning and implementation effort.

As needed, additional meetings and/or conference calls will be held to discuss particular issues, and stakeholders will be invited to participate as warranted by the purposes of the meeting. Advantage will be taken of all opportunities to interact with stakeholders in a productive and meaningful way.

Stakeholders will be afforded an opportunity to review and comment on a draft of the recovery plan in conformance with the Endangered Species Act. Stakeholders may also

be asked to contribute directly in developing recovery implementation strategies for planned actions. Strong, one-on-one working relationships with both experts and stakeholders will be developed over time.

Approved:

Acting



Regional Director, Region 1
U.S. Fish and Wildlife Service

10/25/04
Date

Citation

U.S. Fish and Wildlife Service. 2004. Recovery Outline for the Rota Bridled White-eye (*Zosterops rotensis*). Portland, Oregon. 16 pp.

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