

REPORT

ON

**Conservation biology of the endangered
Madagascar plover *Charadrius thoracicus*,
And promoting public awareness
of wetland conservation at Marambitsy bay**

BY

Sama Zefania

Malagasy League for Protection of Birds (ASITY)
BP 7503, Antananarivo, Madagascar
samazefania@yahoo.fr

Abstract

African Bird Club financed this project on the Conservation biology of the endangered Madagascar plover *Charadrius thoracicus*. The project was carried out in collaboration with the association ASITY and BirdLife International Madagascar between April and November 2004. My main objectives were to establish a population study and initiate a programme of public awareness. First, during this period I found 12 nests of Madagascar Plover in total which were found at Marambitsy bay and Mahavavy delta: 9 nests at Marambitsy bay (April & May), one nest at Mahavavy delta (September) and 2 nests at Marambitsy bay (November 2004). These data strongly suggest that the Madagascar plovers do not breed between June and August. Out of 12 nests that I found during this survey 2004, 11 nests had eggs (1 or 2 eggs) and one nest had a chick. I developed a floating chart to estimate egg-laying date for those nests that were found in advanced incubation. None of the 11 nests with eggs at Marambitsy bay appeared to produce any young, although it is not sure whether these eggs were predated or taken by local people. No predators were observed. However some areas are not far the village (around more 0,5 km from our village), and wild cats and dogs are likely to visit the site and village at night. Future studies will try and document predation events via studies of eggshell fragments. For the eggs in one nest survived beyond one month at Mahavavy delta, I suspect that these eggs were infertile or their embryos died during early development. Based upon these twelve nests the hatching success of Madagascar plover is very low (about 8%). I believe that these are the first data on the reproductive success of Madagascar plover. This very low nesting success is alarming and calls into further studies of their breeding ecology. Thus we need to know the nesting success and fledging success of Madagascar plovers over a longer time period and in other sites. Thus the biology of Madagascar plover (low breeding success, slow egg development, scattered breeding populations) makes it particularly vulnerable to extinction. In addition, Marambitsy Bay is not a protected area, so urgent actions are needed to declare the site protected. I anticipate that legal protection may improve the breeding conditions not only for Madagascar plover, but other endemic species as well

In comparison with previous results, I found 14 Juveniles & chicks and 8 eggs at Marambitsy bay on April 2002, and 9 eggs at December 2003. At Mahavavy delta, I found one nest with eggs of Madagascar plover on August 2003. So the productivity of Madagascar plover varied each year according to the survey period and unknown fate that may be linked with the not protected of site.

To improve public awareness of conservation in Marambitsy Bay, I met local people and the president of the village. I explained them my project and showed them the brochures and leaflets containing the photo of Madagascar plover and local threatened water birds. The text of these leaflets was made in the local dialect of Malagasy. The local people are now aware about the species and their local threatened bird; they'll facilitate our future project for preservation of this species. BirdLife Madagascar included a text and photo of Madagascar plover in their journal, that they distributed to the local people and authorities and helped them to understand the species. I'll continue to work with the local association to preserve the nesting area of threatened species in other project that we will think to request a funding. The local bird--protection association need some work of support from us for improve their life (as a purchase of nets fishing for the group), like this they can reduce their activity in the mangrove where nests some water bird. So I need more time and more money to continue this project and finish by May 2005.

Introduction

The statue of this project is to study the breeding success and threat on population of Madagascar plover by population study and to improve the wetland conservation at Marambitsy bay by public awareness. The main objectives of this project are (i) to complete and distribute data on conservation biology of Madagascar plover, (ii) to increase public awareness in order to reduce threats on this species with its breeding habitat, and (iii) other threatened water bird of site. We want to understand the degree of threat during the nesting period of this species. This project includes a population study of Madagascar plover and a public awareness. I carried out the fieldwork from April to November 2004; I anticipate that this work will be continuous up to get a good result of population study. The study area is found on the northwest part of Madagascar in Marambitsy bay and Mahavavy delta region.

I worked within the Malagasy league (ASITY). This association was created in 1996. It included ornithologists, bird conservationists, birdwatchers and amateurs who share an interest for conservation and protection of birds in Madagascar. It worked with environmental agencies to contribute conservation activities and collect information on bird distributions to create a database. A president, a vice-chairman, a treasurer and two secretaries represent the ASITY' s office. The association is funded by contribution from the annual subscription of members, and a percent of project costs from its funded projects. Most of our members have experience in field research, bird census, and studies in forest and wetland habitats whereas other members work with captive birds. Each member contributes to the long-term conservation of threatened species. ASITY developed some projects with BirdLife International Madagascar Programme in some habitats at Madagascar.

Madagascar plover *Charadrius thoracicus* is an endemic shorebird classified Vulnerable (Collar and *al* 2004). From our last survey (2003 and 2004), the number of this species is very lower than previous estimation, and it has a wider geographic distribution than previously thought. The number of species appears to fluctuate in most sites and its breeding sites are scattered. Barakoky of Marambitsy bay is the study area, which found on the north west of Madagascar, Mahajanga area. It's important for the population study of Madagascar plover (Zefania. 2003). It's the one known nesting site of Madagascar plover outside of other important breeding sites for instance Lake Tsimanampetsotsa.

Methods

Population study: I searched for nests of Madagascar plover, captured adults using funnel trap, took blood samples and ringed the plovers with a metal ring of SAFRING. I used a floating chart to estimate the incubation stage of the eggs, and estimate the hatching date. I followed each nest to study their hatching success. I took GPS data for each nest, dates of captures, and others data about nesting. I spent several times in field to collect the data on the captures. After locating the nests, I checked them every 3 or 4 days to follow if the eggs are yet there or no and determinate if possible the fate of nest. I measured also sizes of chicks and adults, and searched for colour-ringed birds around the sites to know the site-fidelity of species.

Public awareness: I met with local people and authorities representative of Malagasy state for several times, and explained the project to them and describe its conservation importance. I designed and printed leaflets and brochures, which included text and scanned photos of species; its distribution and others local threatened water bird. All texts are made in local dialect of Malagasy. I distributed any leaflets in the villages around the sites.

BirdLife Madagascar produced a journal including Madagascar plover data and photo in Malagasy language. This information improved the knowledge of local people about the species and added any dimensions of my public awareness.

Results

Population study

I started the observation at Marambitsy bay on April 2004 and I give a report to the African Bird Club after November 2004 because I think to continue the study to another site, which is protected as Lake Tsimanampetsotsa. I made also a few observation of nest at Mahavavy delta.

Between April and November, I found 12 nests, 11 of which contained eggs and one nest with chick. They were found at Marambitsy bay and Mahavavy delta: nine nests at Marambitsy bay on April and May, one nest at Mahavavy delta at September 2004 and 2 nests at Marambitsy bay at November 2004. I didn't found new nest from June to August in the same area. Among these 11 nests, 8 nests contain each two eggs and 3 others nests with one egg each. Most of eggs were laid before May except one egg, which was seen to lay at May. The stage of development of eggs (incubation stage) in each nest may be knew after using a floating chart: 0°, 30°, 90° down, 90° up, +1 and +2 (that has been developed for the Kentish Plover, O Pinneau 1987).

None of the nests with eggs produced chicks; the pairs of Madagascar plover lost their eggs after some days of their sighting. I don't know if people who saw me working there took out the eggs or there are predators (fate unknown). Some eggs were disappeared after one or 2 weeks after their finding, except one nest at Mahavavy, which disappeared after five weeks of the detection of the nest (Annex 1). But these eggs may be infertile; their embryos may be died by the hot from the sun during their early development.

Based upon these twelve nests the hatching success of Madagascar plover is very low (about 8%). This very low nesting success is alarming and calls into further studies of their breeding ecology.

Thus we need to know the nesting success and fledging success of Madagascar plovers over a longer time period and in other sites (Lake Tsimanampetsotsa). This low breeding success, slow egg development and the scattered breeding populations) may make the species particularly vulnerable to extinction.

In April 2002, I found in the same site 14 Juveniles & chicks and 8 eggs, and 9 eggs at December 2003. So the productivity of Madagascar plover varied each year according to the survey period and unknown fate that may be linked with the not protected of site.

Public awareness

I met local people with the head of quarter of each quarter around the study area. I explained them my project and showed them some brochures and any leaflets containing photo of Madagascar plover and local threatened water bird of study area. The text in these leaflets is made in local language.

The brochures concern mainly the 4 threatened species of water bird in the study area Madagascar plover, *Charadrius thoracicus*, Madagascar fish-eagle, *Haliaeetus vociferoides*,

Sacred Ibis *Threskiornis bernieri* and Hum bolt's Heron *Ardea humbloti*. I explained there for each species some information about the local distribution of species (where did they find in the study area?), and potential threats to their breeding success (annex 2).

Another leaflet was printed containing each a data concerning Madagascar plover only. I explained the last data about the population size, the distribution, the threat and some nesting stages of Madagascar plover.

The local people are now aware about the threatened species; they'll now facilitate our future project for preservation of this species. BirdLife Madagascar included a text and photo of Madagascar plover in their journal, that they distributed to the local people and authorities and helped them to understand the species.

I'll continue to work with the local association to preserve the nesting area of threatened species in other project that we will think to request a funding. The local association need some work of support from us for improve their life (as a purchase of nets fishing for the group), like this they can reduce their activity in the mangrove where nests some water bird.

Conclusions & Recommendations

1. The Madagascar plover is a highly endangered bird, and my data suggest some reasons for the endangerment:

- The hatching success of Madagascar plover is very low, since only 8 % of nests hatched)
- The period of development of egg (incubation) appears to be longer in Madagascar plover than in the co specific Kittliz's plover (around three weeks), although more data are needed to support this
- The Madagascar plover has a shorter breeding season than the White-fronted plover that breed all year around
- The nests are scattered even in a breeding site and breeding sites are far away from each other.

2. The most important nesting period of Madagascar plover is April May at Marambity bay. The main threat that causes a low number of Madagascar plover may correspond to the frequent loss of nests (most of eggs disappeared, one chick was seen); the scarce of nest (few nest found). So the capacity of the species to increase its number is very low, so Madagascar plover is really endangered by a low rate of breeding. This needs to be confirmed by follow-up studies.

3. Only one known breeding site of Madagascar Plover is currently protected: Lake Tsimanampetsotsa, except of Baly bay where we had not yet breeding data. My previous surveys indicated that Marambity Bay holds similar population sizes to Lake Tsimanampetsotsa, although the present report shows that the nesting success was very poor this year in Marambity Bay. Urgent attention is needed to declare Marambity Bay as a protected site.

The population study needs to be continued to determine the cause of nest failure. It is also important to study other sites to see if other populations are also producing few chicks.

Acknowledgement

- I acknowledge the African Bird Club and their staff, which funded the project and facilitated the way to get the funding for this project.

- I acknowledge also the support of the following peoples:
 - Dr TAMAS Szekely and Pr Richard Ffrench-Constant, University of Bath, UK, for their material and technical support for this project.
 - Pr RAMILJAONA Olga and Dr RAKOTONDRAINY Aimé, University of Antananarivo, Madagascar, who helped me to get a research, permit to carrying out this project in field.
 - Dr ROGER Safford, BirdLife International UK and the staff of BirdLife Madagascar, who helped me to increase the public awareness and to establish the report.
 - Mr RAMANAMPAMONJY Julien, President of Malagasy League for the Protection of Birds (ASITY), and the member of office member, for their help to get the funding and to finish this project.
 - Ministry of Water and Forest and Environment, and National Association for Management of Protected Areas (ANGAP), and their regional staffs, for endorsing research permits for fieldwork.

Bibliography

Collar, N., Crosby, M. & Stattersfield, A. (2000). The world list of Threatened birds. Second édition. Cambridge, UK. : Birdlife International.

Collar, N., Crosby, M. & Stattersfield, A. (1994). Birds to watch 2: The world list of Threatened birds. Second édition. Cambridge, UK. : Birdlife International.

Pinneau O. 1987. Leaflet showing an estimation of hatching date of *Charadrius alexandrius*

Sharpe F., Zefania S., Szekely, T., and Richard, F.C. 2002. Report on Madagascar Plover fieldwork in Toliary around at November and December 2002. Report of mission, copy to University of Bath (UK), Conservation International and BirdLife Madagascar.

Zefania S. et Olivier S.M. 2001. Localisation of nesting sites counts of nesting colonies of large waterbirds with public awareness, Lake Sariaka (Baly bay National Park). A field work report for the African Bird Club, UK.

Annex 1. Fate of 12 Madagascar plover nests in Marambitsy Bay and Mahavavy delta.

Nest number	GPS Reading	Sites	Clutch size	First floating chart of eggs	First sighting of nest	Last sighting of nest	Fate of nest	Hatching success	Fledging success
Nest 1	S15°55.006' E45°39.649'	Marambitsy bay	2 eggs	0° - 30°	2 nd May 2004	6 th May 2004	Eggs disappeared	0	0
Nest 2	S15°54.933' E45°39.646'	Marambitsy bay	2 eggs	0°	2 nd May 2004	5 th May 2004	Eggs disappeared	0	0
Nest 3	S15°53.873' E45°39.402'	Marambitsy bay	1 egg	30°	3 rd May 2004	4 th May 2004	Eggs disappeared	0	0
Nest 4	S15°51.560' E45°38.557'	Marambitsy bay	2 eggs	+1 and +2	4 th May 2004	12 th May 2004	Eggs disappeared	0	0
Nest 5	S15°51.348' E45°38.428'	Marambitsy bay	2 eggs	90° up and 90° down	4 th May 2004	10 th May 2004	Eggs disappeared	0	0
Nest 6	S15°54.994' E45°39.273'	Marambitsy bay	2 eggs	0°	8 th May 2004	11 th May 2004	Eggs disappeared	0	0
Nest 7	S15°53.967' E45°39.336'	Marambitsy bay	1 egg	0°	8 th May 2004	11 th May 2004	Eggs disappeared	0	0
Nest 8	S15°52.662' E45°38.730'	Marambitsy bay	1 eggs	0°	8 th May 2004	12 th May 2004	Eggs disappeared	0	0
Nest 9	S15°51.356' E45°38.722'	Marambitsy bay	1 chick	-	4 th May 2004	8 th May 2004	Unknown	1 chick	Unknown
Nest 10	S15°50.499' E45°47.111'	Mahavavy delta	2 eggs	+1, +2 and broken shell	20 th September 2004	23 rd October 2004	XXXX	0	0
Nest 11	S15°55.050' E45°39.689'	Marambitsy bay	2 eggs	0°	5 th November 2004	9 th November 2004	Eggs disappeared	0	0
Nest 12	S15°55.006' E45°39.649'	Marambitsy bay	2 eggs	0°	6 th November 2004	10 th November 2004	Eggs disappeared	0	0

XXXX = A piece of broken eggshell was seen at 25th October 2004. I followed the parent during some days but I'm never seen chick with them and I wasn't heard a warning sing for chick.

Annex 2: Brochures and leaflets I used to improve public awareness of wetland birds in Marambitsy Bay.