

Information Sheet on Ramsar Wetlands

1. **Date this sheet was completed/updated:** 26 May 1998

2. **Country:** Madagascar

3. **Name of wetland:** Lake Tsimanampetsotsa

4. **Geographical coordinates:**

24° 03' – 24° 12' South latitude
43° 46' – 43° 50' East longitude

5. **Altitude:** between 38 and 114 metres above sea level (The lake is at 38 metres.)

6. **Area:** The Tsimanampetsotsa Nature Reserve and a buffer area of 500 metres to the west of the lake form the Ramsar site cover a total area of 45,604 hectares.

7. **Overview:**

Lake Tsimanampetsotsa is a shallow lake with a maximum area of approximately 6000 hectares. The lake is saturated with lime sulphate, and in the surrounding area, especially to the west, there is a halophytic vegetation. The eastern boundary of the lake is a calcareous cliff, with very noticeable thorny shrubs and caves with freshwater. The lake is part of the nature reserve, which includes a large area of cliff.

8. **Wetland type:** Continental Q, Zk

9. **Ramsar criteria:** 1d, 2a

The criterion that best characterizes the site: 1d, 2a

10. **Map of site included? Please tick yes -or- no**

11. **Name and address of the compiler of this form:**

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12. **Justification of the criteria selected under point 9, on previous page:**

Lake Tsimanampetsotsa is the only lake saturated with lime sulphate that now exists in Madagascar. It is the habitat of significant populations of two vulnerable species of birds: *Charadrius thoracicus* (vulnerable) and *Phoeniconia minor* (almost endangered), plus one per cent of the regional population of *Phoenicopterus major* and *Sterna caspia* and an endangered blind fish population of *Typhleotris madagascariensis* (vulnerable) in the caves in the calcareous cliffs.

Lake Tsimanampetsotsa is a nature reserve and benefits from total protection of agriculture, hunting and deforestation. Its status also protects it against water pollution.

The Mahafaly plateau, located in the eastern part of the reserve, is the site of a large deposit of underground water and species, including the blind fish (*Typhleotris madagascariensis*). The bird *Coua verreauxi* which is considered almost endangered by the Red Book of Birds and which is rather common in the region has been identified.

The boundaries of the nature reserve include the lake where the lesser flamingo (*Phoeniconia minor*) is found, which is also considered to be almost endangered. In March 1998, there were 81 specimens of this species, according to the Projet ZICOMA/Peregrine Fund.

The area around the lake has a large population of endangered birds, including the *gravelot de Madagascar* (*Charadrius thoracicus*). This endemic species is considered vulnerable according to the Red Book of Birds and the presence of this bird is one of the reasons to consider Lake Tsimanampetsotsa as a Ramsar site. The minimum population set by the Ramsar Bureau for this species is ten specimens. According to the most recent survey made in March 1998, 55 specimens were recorded around Lake Tsimanampetsotsa (Project ZICOMA/Peregrine Fund). Because the *Charadrius thoracicus* is an endemic species to Madagascar, Lake Tsimanampetsotsa is the only protected area in the world for this species. Several couples have been found nesting in the western part of the lake up to 500 metres from the water line among clumps of grass. The lake is of major importance for the conservation of this endangered species.

The national committee recommends that the limit of the Ramsar site should include all of the nature reserve that protect sites of underground water and the lake. The boundary of the nature reserve follows the western shore of the lake. We suggest an extension of 500 metres west of the high water mark in order to permit the inclusion of the preferred habitat of the *Charadrius thoracicus* in the Ramsar site.

13. **General location:** Lake Tsimanampetsotsa is in the province of Toliara, 75 kilometres south of Toliara and 180 kilometres south-west of Betioky-Sud.

14. **Physical features:**

This Ramsar site includes the Tsimanampetsotsa Nature Reserve and an area west of the lake up to 500 metres from the upper water limit of the lake during periods of high water. This part is included in the Ramsar site because it is a breeding area for the *Charadrius thoracicus*, an endangered species whose habitat is the only protected area where it is found. Lake Tsimanampetsotsa is in a lake depression, in a pre-Flandrian marine depression on allomorphic soils. The lake is surrounded by regosols on dune

sand and the calcareous Mahafale plateau. The lake is saturated with lime sulphate. It is probably the relic of a system of wetlands that were much more extensive. The lake is 20 kilometres long and a maximum of 3 kilometres wide. During the dry season, the lake has a maximum depth of 2 metres. There is a calcareous cliff with flat areas, caves and underground rivers along the eastern part of the lake. The climate of this region is dry tropical. Average annual rainfall is very low, about 350 millimetres, but annual variation is very large. The average temperature is approximately 24° C. During the winter, there are often rather strong southerly or south-easterly winds.

15. **Hydrological values:**

Lake Tsimanampetsotsa is supplied by the resurfacing of the Andranonaombe from the water table. The hydrographical network is no longer present but there are fossil traces of a network of fluvial valleys that could not have formed under a more humid climate than the current climate and at a period when the groundwater was better supplied.

16. **Ecological features:**

Surface water saturated with lime sulphate
Mud pools saturated with lime sulphate
Halophyte vegetation
Savannah with palms and introduced grasses
Thorny shrubs with baobabs on a calcareous cliff
Caves with lakes and underground rivers

17. **Noteworthy flora:**

The low horny bushes on the calcareous cliff are quite noticeable. There are numerous endemic species, composed primarily of members of the Bombacaceae, Didieraceae, Euphorbiaceae and Fabaceae families.

18. **Noteworthy fauna:**

From 1992 until 1998, waterfowl were counted twice a year by teams from WWF-Madagascar, Project ZICOMA and the Peregrine Fund. Recently, up to 666 pink flamingos were counted, especially the *Phoenicopterus roseus*, but also up to 100 specimens of *Phoeniconia minor*, which are almost endangered. The site is the habitat of up to 55 *Charadrius thoracicus* (recorded in March 1998), an endangered endemic species (vulnerable) that lives in clumps of grass around the lake. In addition, there is a colony of *Sterna caspia*, which could be as large as 200 specimens, a number that is above the minimum established by Wetlands International for a major site for this species. Apart from the presence of endangered species, the presence of more than one per cent of the world or regional population of non-endangered species such as the *Sterna caspia*, argue in favour of designation of the lake as an area of importance for the conservation of birds (ZICO), according to the criteria of BirdLife International. In the caves and underground streams of the Mahafaly Plateau, there is a population of blind fish *Typhleotris madagascariensis* (vulnerable). The forest around the lake is the only known site for this type of habitat for the carnivore *Galidictis grandidieri*, only

identified in 1986 and considered endangered by IUCN. It is also the habitat for large populations of birds that do not exist elsewhere, such as *Coua verreauxi* (almost endangered) and the *Pseudocossyphus imerinus* and endangered lemurs such as the *Propithecus verreauxi verreauxi* (vulnerable) and the *Lemur catta* (vulnerable). There are large populations of *Geochelone radiata* (vulnerable) and *Pyxis arachnoides* (vulnerable), two of the four land tortoises endemic to Madagascar. The land portion of the Tsimanampetsotsa Nature Reserve is by far the largest of the three protected areas that are a habitat for these two species. *G. radiata* is threatened elsewhere by hunting, but in the region of the lake it is protected by a local taboo.

19. Social and cultural values:

There are no fish in the lake because of its high lime sulphate composition. The riparian forest is sparsely exploited for firewood and building materials by local inhabitants. The savannah on the western shore is used as a grazing area for cattle. The caves in the calcareous cliffs are important sites for the local inhabitants as potential sources for water, and the Grotte Mitoho is a sacred site. There are also sacred sites on the Tsimanampetsotsa Nature Reserve. The Mahafale people inland have several taboos concerning hunting animals. They do not usually eat lemurs or tortoises. Because the water in the lake is brackish, the local inhabitants consider that it is a closed sea, therefore sacred, and must not be crossed. It has to be avoided. The Mpitankazomanga and the Mpanarivo are very respected in the region. They have all the powers of decision and management.

20. Land tenure/ownership of:

Except for the western part of the site, the nature reserve, the rest of the site is part of the Domaine Forestier National, which belongs to the government.

21. Current land use:

Outside of the reserve, above all west of the lake, the land is used for grazing cattle and goats. In the region, there is very little agriculture except for raising cattle, because of the poor soils.

22. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land use and development projects:

The grazing of goats in thorny shrubs on the cliff could affect the diversity of the vegetation. The gathering of wood for construction and for firewood could reduce the vegetative cover at the local level.

23. Conservation measures taken:

The Ramsar site includes the Tsimanampetsotsa Nature Reserve and an area of 500 metres from the waterline towards the west where there are nests of *Charadrius thoracicus* in a region of pools with halophytic vegetation. The Tsimanampetsotsa Nature Reserve (number 10), with an area of 43,200 hectares, was created on 31

December 1927. It includes a large area of thorny shrubs on the cliffs. The status of the Tsimanampetsotsa Nature Reserve prohibits practices such as hunting, gathering, use, cutting and entry, except for representatives of the Administration Forestière and the management authority of the protected area and hunters with a research permit issued by MEF. The conservation and management plan is being developed.

24. Conservation measures proposed but not yet implemented:

The government has declared this area to be a protected area.

25. Current scientific research and facilities:

From 1992 until March 1998, there were surveys of waterfowl twice a year by a WWF/ZICOMA/Peregrine Fund team. The results have been published in the summaries of surveys for Africa published by WRB. The site is visited each year by the Ecole Supérieure des Sciences Agronomiques (ESSA-Forêts) of the University of Antananarivo for the training of students in forest ecology.

26. Current conservation education:

This activity will be included in the management plan.

27. Current recreation and tourism:

Tourists visit the site, especially the Grottes de Mitoho where there are the blind fish. There is a need to revise the status of part of the reserve in order to promote recreation and tourism.

28. Jurisdiction:

The lake is under the functional jurisdiction of the Ministère des Eaux et Forêts through decentralized directives of the Direction Inter-Régionale des Eaux et Forêts de Toliara and the Cantonnement Forestier de Betioky, 130 kilometres away (four hours).

29. Management authority:

Cantonnement Forestier, Ministère des Eaux et Forêts, Betioky-Sud and ANGAP

30. Bibliographical references: