

## World Heritage Sites

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## LAKE MALAWI NATIONAL PARK MALAWI

*Located on a peninsula between distant mountains at the southern end of Lake Malawi, this National Park with its deep clear waters and varied habitats, is home to over six hundred species of cichlid fish, nearly all endemic. Their importance for the study of evolution by adaptive radiation is comparable with that of the Galapagos Islands finches.*

### COUNTRY

Malawi

### NAME

Lake Malawi National Park

### NATURAL WORLD HERITAGE SERIAL SITE

1984: Inscribed on the World Heritage List under Natural Criteria vii, ix and x.

### STATEMENT OF OUTSTANDING UNIVERSAL VALUE

The UNESCO World Heritage Committee issued the following Statement of Outstanding Universal Value at the time of inscription.

#### Brief Synthesis

Located at the southern end of the great expanse of Lake Malawi, the property is of global importance for biodiversity conservation due particularly to its fish diversity. Lying within the Western Rift Valley, Lake Malawi is one of the deepest lakes in the world. The property is an area of exceptional natural beauty with the rugged landscapes around it contrasting with the remarkably clear waters of the lake. The property is home to many hundreds of cichlid fish, nearly all of which are endemic to Lake Malawi, and are known locally as "mbuna". The mbuna fishes display a significant example of biological evolution. Due to the isolation of Lake Malawi from other water bodies, its fish have developed impressive adaptive radiation and speciation, and are an outstanding example of the ecological processes

**Criterion (vii):** The property is an area of exceptional natural beauty with its islands and clear waters set against the background of the Great African Rift Valley escarpment. Habitat types vary from rocky shorelines to sandy beaches and from wooded hillsides to swamps and lagoons. Granitic hills rise steeply from lakeshore and there are a number of sandy bays.

**Criterion (ix):** The property is an outstanding example of biological evolution. Adaptive radiation and speciation are particularly noteworthy in the small brightly coloured rocky-shore tilapiine cichlids (rockfish), known locally as mbuna. All but five of over 350 species of mbuna are endemic to Lake Malawi and represented in the park. Lake Malawi's cichlids are considered of equal value to science as the finches of the Galapagos Islands remarked on by Charles Darwin or the honeycreepers of Hawaii.

**Criterion (x):** Lake Malawi is globally important for biodiversity conservation due to its outstanding diversity of its fresh water fishes. The property is considered to be a separate bio-geographical province with estimates of up to c.1000 species of fish half occurring within the property: estimated as the largest number of fish species of any lake in the world. Endemism is very high: of particular significance are the cichlid fish, of which all but 5 of over 350 species are endemic. The lake contains 30% of all known cichlids species in the world. The property is also rich in other fauna including mammals, birds and reptiles.

#### Integrity

The property is sufficiently large (94.1 km<sup>2</sup> of which 7km<sup>2</sup> is aquatic zone) to adequately represent the water features and processes that are of importance for long term conservation of the lake's rich biodiversity and exceptional natural beauty. The water area within the national park protects the most important elements of the

lake's biodiversity. It also protects all major underwater vegetation types and important breeding sites for the cichlids. Many other fish species of Lake Malawi are however unprotected due to the limited size of the park in relation to the overall area of the lake. Thus, at the time of inscription the World Heritage Committee recommended that the area of the national park be extended. The property's long term integrity largely depends on the overall conservation and management of the lake which falls under the jurisdiction of three sovereign states i.e. Malawi, Tanzania and Mozambique.

#### **Protection and Management Requirements**

Lake Malawi National Park is protected under national legislation and the resources of the park are managed and controlled by the Department of National Parks and Wildlife. The park has a management plan and, there is also a strategic tourism management plan for Malawi which describes the tourism development for the site. Utilisation of park resources is restricted to curb the illegal harvesting of resources. There are five villages included within enclaves inside the property. The local population is dependent on fishing for a livelihood as the soil is poor and crop failure frequency is high. Whilst the property's terrestrial and underwater habitats are still in good condition, management planning needs to deal more effectively with the threats of rapid growth of human population and the impacts of firewood collection, fish poaching and crowded fish landing sites. Thus a key management priority is the maintenance of the lake ecosystem while taking into consideration the needs of the local community through collaborative management programmes. The implementation of the Wildlife Policy that mandates park management to work in collaboration with local communities within and outside park boundaries and share responsibilities and benefits accruing from the management of the park is important to enable effective management to be implemented. Potential threats from introduced fish species which could displace endemics, pollution from boats and siltation from the denuded hills, need to be minimised and require close monitoring. Collaboration with the governments of Tanzania and Mozambique needs to be maintained and strengthened for the long term protection and management of the entire lake ecosystem, and consideration of the potential for its extension is required.

#### **IUCN MANAGEMENT CATEGORY**

II National Park

#### **BIOGEOGRAPHICAL PROVINCE**

Lake Malawi (3.29.14)

#### **GEOGRAPHICAL LOCATION**

The Park is at the southern end of Lake Malawi (L.Nyasa) on and around the Nankhumba Peninsula. The Park includes the separate Mwenya Hills, Nkhudzi Hills and Nkhudzi Point at the eastern base of the peninsula, also Boadzulu Island, Mpande Island, the Maleri Islands with seven other offshore islets, and an aquatic zone which extends 100m offshore of all these areas. Location: 14° 02'S by 34° 53'E.

#### **DATES AND HISTORY OF ESTABLISHMENT**

1934: Forest Reserves on some of the islands protected;

1972: Forest protection extended to the hills of Cape Maclear, Mwenya and Nkhudzi;

1980: The National Park established under the National Parks Act NP (Est) Order 1980, Government Notice 205.

#### **LAND TENURE**

State, in Mangochi District, Southern Region, and Salima District, Central Region. Administered by the Department of National Parks & Wildlife (DNPW).

#### **AREA**

9,400 ha

#### **ALTITUDE**

474m (lake surface) to 1140m (Nkunguni Mountain).

#### **PHYSICAL FEATURES**

The National Park is on the very scenic northern tip of the Nankhumba peninsula which divides the southern end of Lake Malawi. The lake, lying within the Western Rift Valley, formed during Miocene tectonic activity, is a unique inland sea 584 kilometers long and is very deep. It forms a separate biogeographical province. The lake's water is permanently surface water temperatures range between 23° and 28°C, and are quite alkaline, with a pH of 7.8 to 8.5. There are marked seasonal variations in wind, temperature and rainfall. The water level fluctuates according to season with a long-term cycle of

fluctuation over years. Recent years have seen increases to the highest levels since recording began, probably due to increased rainfall and to forest clearing on the high plateau above.

In general, the hills of the Nankhumba peninsula are wooded and rise steeply from the lakeshore. Cape Maclear at the north end is rocky, predominantly biotite-granite. In general the soils are poor, rocky and very susceptible to erosion. There are a number of sandy bays including a fine beach near Chembe and Otter Point. The islands are mainly or entirely rocky, separated from each other and from the mainland by sandy flats and deep water. Habitat types vary from cliffs and bouldery shores to pebbly and sandy beaches and from wooded hillsides to occasional swamps and lagoons. There is a range of underwater habitats: sandy, weedy, rocky, the rock-sand interface and reed beds which has encouraged the unusually high degree of speciation among the lake's fishes.

## CLIMATE

The mean annual temperature is 22.7°C. The annual rainfall averages 766mm, falling in December to March, but is very variable. During the dry season from May to September, the south-easterly prevailing wind causes upwelling of lower waters.

## VEGETATION

The terrestrial areas of the park, except for the smallest islands, were once heavily wooded. Originally, this community comprised baobab *Adansonia digitata* and several species of *Ficus*, *Sterculia*, *Khaya*, and *Albizzia*. The ground flora has not been studied in depth. Through clearing of the forest, many woodland areas have been altered to shrubby vegetation and cultivation. The upper slopes are dominated by mountain acacia *Brachystegia glaucescens*. The underwater rocks are densely coated with algae which sustain much of the large population of fish.

## FAUNA

The Park was established primarily to protect Lake Malawi's very rich aquatic life, especially the small brightly coloured rocky-shore tilapiine cichlids known as *mbuna* (rockfish) and the larger haplochromine cichlids which being more plentiful, provide most of the food fish. The lake contains the largest number of fish species of any lake in the world: 3,000 in all with more than 800 species of *Cichlidae* of which the lake contains 30% of all known species (Ribbink *et al.*, 1983; PPF, 2003; Thieme *et al.*, 2005). Of these, all but five species are endemic to the lake: the endemism exceeds 99% and the degree of adaptive radiation and the explosiveness of the speciation is remarkable and not yet wholly explained. More than 70% of these fish are not described and the taxonomic affinities of many of them are uncertain. *Mbuna* are tolerant of relatively high and fluctuating pH levels, and are very specialised in their habitats, highly territorial, and most species of the dominant Haplochromines are mouth-brooders. They are not much eaten, being relatively difficult to catch among the rocks, but being beautifully coloured are targeted by the aquarium trade. The diversity of mollusc species and other invertebrates is also very high.

Mammals include chacma baboon *Papio ursinus*, blue monkey *Cercopithecus mitis*, vervet monkey *Chlorocebus aethiops*, spotted hyena *Crocuta crocuta*, African clawless otter *Aonyx capensis*, spotted-necked otter *Lutra maculicollis*, leopard *Panthera pardus*, rock hyrax *Procavia capensis*, yellow-spotted hyrax *Heterohyrax brucei*, elephant *Loxodonta africana* (VU (which occasionally come down to the lake between the Mwenya and Nkhudzi Hills), red river hog *Potamochoerus porcus*, hippopotamus *Hippopotamus amphibius* (VU), greater kudu *Tragelaphus strepsiceros*, bushbuck *T. scriptus*, plains zebra *Equus quagga*, klipspringer *Oreotragus oreotragus*, impala *Aepyceros melampus*, Cape grysbok *Raphicerus melanotis* and grey duiker *Sylvicapra grimmia*. The varied birdlife includes black eagle *Aquila verreauxii*, African fish eagle *Haliaeetus vocifer* along the shoreline and many waders. The islands, especially Mumbo and Boadzulu, are important nesting sites for several thousand white-breasted cormorant *Phalacrocorax lucidus*. Reptiles include a few African python *Python sebae sebae* and crocodile *Crocodylus niloticus* and abundant water monitor lizards *Varanus niloticus* especially on Boadzulu Island. A list of snakes is given in Tweddle (1984).

## CONSERVATION VALUE

Lake Malawi National Park is the only lacustrine park in Africa, protecting several hundred species of fish, most of which are endemic. Lake Malawi's importance in the study of evolution by adaptive radiation is comparable to that of the Galapagos Islands and their finches. It lies within a WWF Global 200 Freshwater Eco-region.

## CULTURAL HERITAGE

Fourth century Iron Age sites have been found in areas of the Park.

## LOCAL HUMAN POPULATION

Much of the lakeshore is heavily populated. Five shoreline villages, Chembe, Masaka, Mvunguti, Zambo and Chidzale, are included within enclaves, cut off by Park and lake. Their numbers were about 5,400 in 1977 but the country's population has increased greatly since then. As the soil of the peninsula is poor and crops fail about 50% of the time, local people are dependent on fishing for a livelihood. Some 40,000 people make a living directly from the lake in offshore fisheries, catching 70% of the country's animal protein intake (PPF, 2003): tens of thousands of tonnes of fish are taken from the lake. The Park has been zoned to allow traditional seine fishing methods aimed at catching migratory fish in limited areas, although in most of the Park the resident fish are completely protected. However, overfishing remains a threat.

## VISITORS AND VISITOR FACILITIES

There is some tourist development within the boundaries. There are several small hotels designed to blend in with the environment. The recreation site at Cape Maclear is heavily used and includes a resthouse, bar, caravan and camping site. The World Wide Fund for Nature sponsored the development of an environmental education complex located within the Park boundaries at Cape Maclear, the Lake Malawi National Park Museum and Aquarium. The complex comprises an environmental interpretation centre, an aquarium, and a research library/conference area which became operational in 1990. Additional developments have included a youth hostel and glass-bottomed boat for aquatic interpretation. The centre aims to educate local people, as well as foreign visitors. Exhibits range from the formation of the Rift Valley to the historical and cultural heritage, the creation of the Park, and World Heritage designation, and the importance of protecting it (DNPW, pers.comm.1995). Being without marine hazards, the lake is a most attractive site for learning to dive, and freshwater scuba diving is a growing sport. Other activities are snorkelling, kayaking, hill-walking and swimming (though still waters may harbor bilharzia). There is an airstrip at Makokala to the southwest.

## SCIENTIFIC RESEARCH AND FACILITIES

There is a research station at Monkey Bay owned by the Department of Fisheries and a Research Sub-unit runs research and monitoring programs. Most research has concentrated on fish, conducted mainly by overseas scientists and latterly, by Malawian graduate students (DNPW, pers. comm., 1995).

## MANAGEMENT

This was the world's first freshwater underwater Park. Its aim is to protect examples of Lake Malawi's aquatic communities so the steep hills immediately behind the shoreline are protected to prevent eroded sediments polluting the lake. A management plan is being implemented. A managed fishing zone is designated just offshore incorporating some islands within the park, but trawling is prohibited. Other fishing methods such as gill netting, long line and trapping are prohibited within the 100m aquatic zone of the Park. The management plan details four conservation zones within the Park: Special zone, Wilderness zone, Natural zone and General zone. Most of the terrestrial area is in the Natural or Wilderness zones; the lake habitats are in the Special zone. Reforestation of the peninsula is a critical part of protecting the water quality. There are plans to plant trees in a 1,200ha section in the south of the peninsula to supply fuelwood and poles to local people. A forestry nursery has been started in the Park to begin reforestation of the peninsula. The goal is to plant 30,000 seedlings annually both in the Park and in nearby village enclaves for future firewood and building purposes. A small demonstration plot adjacent to junior staff housing should provide fuelwood to staff members. In 1999 the Lake Malawi/Niassa Transfrontier Conservation Area was proposed by the Peace Parks Foundation of southern Africa. It will include other parks in Malawi, Lago Niassa Reserve in Mozambique, the Selous Reserve and a corridor to the sea in Tanzania (PPF, 2003).

## MANAGEMENT CONSTRAINTS

Although there are no human settlements within the Park boundaries, much of the lakeshore is heavily populated and local people depend on fishing for a livelihood. Overfishing and pollution threaten the lake's fish, especially the cichlids for which the Park is the only refuge in the country. The brightly-coloured *mbuna* also provide a substantial export trade to collectors. The Park was threatened by a \$15 million luxury resort development at Cape Maclear (J. Thorsell, pers. comm., 1993) the water around which is already polluted by powerboats. Clearing of timber for building, firewood and cultivation has increased, particularly on Nankoma Island, part of Mumbo Island, around Chembe village and in the Mwenya and Nkhudzi Hills. Because of the limnological characteristics of the lake, should it be contaminated, the renewal time would be some 1,700 years. Effective protection of the water zones of the Park (only 0.04% of the lake's area) can only be ensured by proper management of the whole lake.

A threat may come from overfishing of commercially valuable species: the African Development Fund granted US\$10 million to promote fisheries in the lake in 2003.

## **STAFF**

20 full-time and 33 temporary workers (DNPW, pers. comm., 1995).

## **BUDGET**

Annual budget of US\$ 50,000 (undated information). Between 1987 and 1990 the WWF granted US\$ 109,000 for improvements in the management, infrastructure, recreational facilities and for local education and awareness programs.

## **LOCAL ADDRESSES**

The Director, Department of Parks and Wildlife, P.O.Box 30131, Lilongwe, Malawi.

The Parks and Wildlife Officer, Lake Malawi National Park, PO Box 48, Monkey Bay, Malawi.

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## **DATE**

March 1983. Updated 10-1986, 3-1990, 10-1995, 4-2003, 10-2003, 3-2005, May 2011.