

World Heritage Sites

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LAKE TURKANA NATIONAL PARKS KENYA

Lake Turkana is the largest, most northerly and most saline of Africa's Rift Valley lakes and an outstanding site for the study of plant and animal communities. The parks are a stopover for migrant waterfowl and are major breeding grounds for the Nile crocodile and hippopotamus. The Koobi Fora deposits are rich in pre-human, mammalian, molluscan and other fossil remains and have contributed more to the understanding of Quaternary palaeoenvironments than any other site on the continent

Threats to the site: The Gibe III dam on the Omo River in Ethiopia will have potentially disastrous effects on the lake's inflow, salinity and levels and on the livelihoods of its tribal populations.

COUNTRY

Kenya

NAME

Lake Turkana National Parks

NATURAL WORLD HERITAGE SERIAL SITE

1997: Inscribed on the World Heritage List under Natural Criteria viii and x (Sibilo & Central Island).

2001: Extended to South Island National Park, also under Natural Criteria vii, ix & 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

Lake Turkana National Parks are constituted of Sibilo National Park, the South Island and the Central Island National Parks, covering a total area of 161,485 hectares located within the Lake Turkana basin whose total surface area is 7 million ha. The Lake is the most saline lake in East Africa and the largest desert lake in the world, surrounded by an arid, seemingly extraterrestrial landscape that is often devoid of life. The long body of Lake Turkana drops down along the Rift Valley from the Ethiopian border, extending 249 kilometers from north to south and 44 km at its widest point with a depth of 30 meters. It is Africa's fourth largest lake, fondly called the Jade Sea because of its breathtaking colour.

The property represents unique geo-morphological features with fossil deposits on sedimentary formations as well as one hundred identified archaeological and paleontological sites. There are numerous volcanic overflows with petrified forests. The existing ecological conditions provide habitats for maintaining diverse flora and fauna. At Kobi Fora to the north of Allia Bay, extensive paleontological finds have been made, starting in 1969, with the discovery of *Paranthropus boisei*. The discovery of *Homo habilis* thereafter is evidence of the existence of a relatively intelligent hominid two million years ago and reflect the change in climate from moist forest grassland when the now petrified forest were growing to the present hot desert. The human and pre-human fossils include the remains of five species, *Australopithecus anamensis*, *Homo habilis/rudolfensis*, *Paranthropus boisei*, *Homo erectus* and *Homo sapiens* all found within one locality. These discoveries are important for understanding the evolutionary history of the human species.

The island parks are the breeding habitats of the Nile crocodile *Crocodylus niloticus*, the hippopotamus amphibious and several snake species. The lake is an important flyway passage and stopover for palaeartic migrant birds.

Criterion (viii): The geology and fossil record represents major stages of earth history including records of life represented by hominid discoveries, presence of recent geological process represented by volcanic erosional and sedimentary land forms. This property's main geological features stem from the Pliocene and Holocene periods

(4million to 10,000 years old). It has been very valuable in the reconstruction of the paleo-environment of the entire Lake Turkana Basin. The Kobi Fora deposits contain pre-human, mammalian, molluscan and other fossil remains and have contributed more to the understanding of human ancestry and paleo-environment than any other site in the world.

Criterion (x): The property features diverse habitats resulting from ecological changes over time and ranging from terrestrial and aquatic, desert to grasslands and is inhabited by diverse fauna. In situ conservation within the protected areas includes threatened species particularly the reticulated giraffe, lions and gray zebras and has over 350 recorded species of aquatic and terrestrial birds. The island parks are the breeding habitats of the Nile crocodile, *Crocodylus niloticus*, the *Hippopotamus amphibius* and several snake species. Furthermore, the lake is an important flyway passage and stopover for palaeartic migrant birds, with the South Island Park also being designated as an important bird area under Birdlife International. The protected area around Lake Turkana provides a large and valuable laboratory for the study of plant and animal communities.

Remoteness has preserved the area as a natural wilderness. On the grassy plains yellow *speargrass Imperata cylindrica*, *Commiphora* sp., *Acacia tortilis*, and other acacia species predominate along with *A. elatior*, desert date *Balanites aegyptiaca* and doum palm *Hyphaene coriacea* in sparse gallery woodlands. *Salvadora persica* bush is found on Central and South Islands. The muddy bays of South Island have extensive submerged beds of *Potamogeton pectinatus* which shelter spawning fish. The principal emergent macrophytes in the seasonally exposed shallows are the grasses *Paspalidium geminatum* and *Sporobolus spicatus*.

Integrity

The property covers a total area of 161,485 ha. The area around the property is sparsely populated due to its isolated location, inadequate freshwater and national protection status. It is an important habitat for hippopotamus and the world's largest colony of crocodiles (and the largest Nile crocodile breeding ground in the world). Physical evidence through scientific studies indicate the area's continued support for habitation of flora and fauna of diverse species over millions of years to the present. In addition, volcanic eruptions and extensive lava flows, geological faulting within the Great Rift Valley, and the formation of sedimentary deposits have assured preservation of fossil remains, which are significant in understanding the history of life especially human evolution. The adjacent Mount Kulal Biosphere Reserve serves as a water shed for the Lake Turkana Basin and as a wildlife dispersal area. It thereby assures the protection of the biological and natural processes making it an important site for avian habitation and migration, particularly water birds.

The area is managed under two State Acts ensuring protection, conservation and sustainability of the environment and addressing for example. post-archaeological excavation, illegal grazing, poaching and over fishing.

Protection and Management Requirements

The property enjoys the highest level of legal protection by both the Kenya Wildlife Act cap 376 as well as the Antiquities and Monument Act cap 215 (currently the National Museums and Heritage Act of 2006) under Kenyan legislation. Sibiloi National Park was legally designated as a national park in 1973 whereas South and Central Islands were legally designated in 1983 and 1985 respectively. The property is co-managed by Kenya Wildlife Service (KWS) and the National Museums of Kenya (NMK). Following the extension of the property in 2001, a first management plan was developed for the period of 2001 to 2005. The long term planning foresees the development of an integrated management plan for the area. Formalization of the existing collaboration between KWS and NMK and other stakeholders through a Memorandum of Understanding will be necessary for the successful implementation of the plan.

Challenges and potential threats have been identified: these include severe droughts, livestock encroachment into the property, impacts from climate change, poaching, siltation, receding water level, human-wildlife conflicts and poor infrastructure in the area. Mitigation measures and strategies are required for the sustainable long-term management of the property and the development of an integrated management plan taking into account reforestation, law enforcement, education and awareness-raising, alternative livelihoods, resource mobilization and appropriate forms of infrastructure development (roads, electricity, telecommunication, etc.).

INTERNATIONAL DESIGNATION

1978: Mount Kulal recognised as a Biosphere Reserve under the UNESCO Man and Biosphere Programme (700,000 ha. Includes South Island and the waters of Lake Turkana).

IUCN MANAGEMENT CATEGORY

Sibiloi & Central Island National Parks: II National Parks
South Island National Park: II National Park

BIOGEOGRAPHICAL PROVINCES

Somalian (3.14.07) and Lake Rudolf (3.21.07)

GEOGRAPHICAL LOCATION

Sibiloi National Park is on the eastern shore of Lake Turkana (formerly Lake Rudolf) 720 km north of Nairobi between 3° 39' to 4° 00'N and 36° 11' to 36° 34'E. Central Island is midway down Lake Turkana in Rift Valley Province at 3° 30'N by 36° 02'E. South Island is at the southern end of the lake, at 2° 23'N by 36° 44'E. The Park extends 1 km out from the island's shore.

DATES AND HISTORY OF ESTABLISHMENT

1973: Sibiloi established as a National Park by Legal Notice 160;

1978: Mount Kulal Biosphere Reserve was designated beside southeast Lake Turkana: the Reserve includes the waters of Lake Turkana, also South Island;

1983/5: South and Central Islands gazetted as National Parks by Notices 12 & 18.

LAND TENURE

State, in Marsabit District of Eastern Province. Administered by the Kenyan Wildlife Service (KWS).

AREA

161,485 ha. Sibiloi: 157,085 ha. Central Island: 500 ha. South Island: 3,900 ha.

ALTITUDE

307m to 615m.

PHYSICAL FEATURES

Lake Turkana is the largest desert lake in Africa, its fourth largest lake by volume and the most northerly of Kenya's Rift Valley lakes. It occupies the beds of two grabens at the northern end of the Kenyan Great Rift valley in barren drought-prone country. It measures 249 km by an average width of 30 km but 48 km at its widest; it is 35m deep. It has three volcanic islands, north, central and south: Central Island is a small active volcano with three saline crater lakes; South Island measures 11 x 4.5 km. Both islands have rocky shores. Nearly 90% of the lake's water comes from Ethiopia via the Omo River, the delta of which extends into Ethiopia. Most of the rest comes from two southern tributaries, the Kerio and the Turkwel, which has been dammed. There is no outflow and with reduced inflows and high evaporation the chloro-carbonate alkaline water is subject to marked 3-4 meter seasonal fluctuations in level. Although it is 2.5 times saltier than the maximum normal limit for drinking water, it is still drinkable, but is becoming increasingly saline (Hathaway, 2010). The level dropped 10m between 1975 and 1992. Its striking jade-green color is due to the presence of blue-green algae *Microcystis aeruginosa* in the phytoplankton. The lake shore is mostly rocky or sandy, with mud in Allia Bay in the National Park and little vegetation anywhere (Fitzgerald, 1981). The borders of all the Parks extend one kilometre off shore into the lake. Rich fossiliferous deposits are found for 60 km north from Allia Bay and up to 20 km inland. The plains are flanked by volcanic formations including Mount Sibiloi, the site of the remains of a petrified forest estimated to have grown seven million years ago.

CLIMATE

The climate is very hot, arid and very windy. The air temperature ranges between 19.2°C and 39.9°C with a mean daily temperature range of 31°C to 33°C. The months of October to January are the warmest and driest, July and August are the coolest. During this period the area is subject to the frequent and strong southerly and south-easterly winds. The total annual rainfall is less than 200mm and is unpredictable though most likely between March and May. It may not rain for years (ILEC, 2002), and the long drought between October 1998 and May 2001 was very destructive, especially where trees taken for fuelwood and charcoal.

VEGETATION

Remoteness has preserved the area as a natural wilderness. On the grassy plains yellow speargrass *Imperata cylindrica*, *Commiphora* sp., *Acacia tortilis*, and other acacia species predominate along with *A. elatior*, desert date *Balanites aegyptiaca* and doum palm *Hyphaene coriacea* in sparse gallery woodlands. Toothbrush bush *Salvadora persica* is found on Central and South Islands. The northeastern shore of the lake is mostly rocky or sandy. The muddy bays of South Island have extensive submerged beds of *Potamogeton pectinatus* which shelter spawning fish. The principal emergent macrophytes in the seasonally exposed shallows are the grasses *Paspalidium geminatum* and *Sporobolus spicatus* (Njuguna, 2001).

FAUNA

Despite the low carrying capacity of the area the fauna is relatively diverse, especially in breeding and migrant birds. The island Parks were established to protect the breeding habitats of the Nile crocodile *Crocodylus niloticus*, hippopotamus *Hippopotamus amphibius* (VU), puff-adder *Bitis arietans*, cobra *Naja haje* and Egyptian saw-scaled viper *Echis pyramidum*. The lake is an important flyway for migrant birds. Over 350 species of aquatic and terrestrial birds are known for the region, which is recognised by BirdLife International as an Important Bird Area, and a priority for conservation. On South Island 220,000 waterbirds of 84 species have been recorded, with 34 Palearctic migrants. As recorded in 1992 by Bennin & Njoroge (1999) key species making up 1% or more of the population include the pink-backed pelican *Pelecanus rufescens* (1,060), greater flamingo *Phoenicopterus rubra* (3,000), spur-winged plover *Vanellus spinosus* (6,930), ringed plover *Charadrius hiaticula* (13,600), Caspian plover *C. asiaticus* (500), Kittlitz's plover *C. pecuarius* (8,600) and little stint *Calidris minuta* (113,000). At least 23 bird species are known to breed in the environs of the lake, including the goliath heron *Ardea goliath*. Regionally threatened bird species in the area include ostrich *Struthio camelus*, great egret *Casmerodius albus*, saddle-billed stork *Ephippiorhynchus senegalensis*, banded snake-eagle *Circaetus cinerascens*, African fish eagle *Haliaeetus vocifer*, fox kestrel *Falco alopex*, Heuglin's bustard *Neotis heuglinii*, Abyssinian ground hornbill *Bucorvus abyssinicus*, African skimmer *Ryncops flavirostris* and Somali sparrow *Passer castanopterus* (Bennun & Njoroge, 2001; Stattersfield *et al.*, 1998). The site is also an important staging post for migrating warblers and wagtails (KWS, 1992).

Mammals in the area include olive baboon, *Papio anubis*, wild dog *Lycaon pictus* (EN), striped hyaena *Hyaena hyaena*, caracal *Caracal caracal*, lion *Panthera leo* (VU) and cheetah *Acinonyx jubatus* (VU), warthog *Phacocoerus aethiopicus*, hippopotamus (VU), reticulated giraffe *Giraffa camelopardalis reticulata*, plains and Grevy's zebras *Equus quagga* and *E. grevyi* (EN), Grant's gazelle *Gazella granti*, Beisa oryx *Oryx gazella beisa*, lelwel hartebeest *Alcelaphus buselaphus lelwel* (EN), topi *Damaliscus lunatus tiang*, greater kudu *Tragelaphus streptoceros*, lesser kudu *T. imberbis*, gerenuk *Litocranius walleri* and dikdik *Rhyncotragus guntheri*. 60 fish species, seven being endemic, live in the lake. These fish support the world's largest populations of Nile crocodile *Crocodylus niloticus*: approximately 14,000 breed on Central Island (Fitzgerald, 1981; KWS, 2001).

CONSERVATION VALUE

These remote parks are globally of great value for the conservation of waterbirds, the Important Bird Area of South Island Park especially. Counts in 1992 recorded over 220,000 waterfowl. Protected areas around Lake Turkana, including the adjacent Biosphere Reserve of Mount Kulal extending over the lake, provides a large and valuable laboratory for the study of plant and animal communities. The Park also lies within a WWF Global 200 Eco-region. The Koobi Fora deposits are rich in pre-human, mammalian, molluscan and other fossil remains and have contributed more to the understanding of palaeoenvironments than any other site on the continent.

CULTURAL HERITAGE

At Koobi Fora to the north of Alia Bay, extensive palaeontological finds have been made, starting in 1972 with the discovery of *Homo habilis*. These are evidence of the existence of a relatively intelligent hominid two million years ago and reflect the change in climate from moist forest grasslands when the now petrified forests were growing to the present hot desert. The human and pre-human hominid fossils include the remains of four species, the most important being the 1999 discovery of 3.5-million year old *Kenyanthropus platyops*. Other findings include several ancestors of modern animal species. Over 100 archaeological sites have been discovered so far (KWS, 1996). This is the only archaeological conservation area in Kenya gazetted as a National Park.

LOCAL HUMAN POPULATION

No-one lives in Sibiloi and Central Island National Parks, but Gabbra, Rendille and Turkana pastoralists are allowed to bring cattle and goats into the Park during the dry season. The Park on South Island is in the centre of an area inhabited by the diminishing 200-strong El-Molo tribe of fishermen. The total population centred on the lake numbers some 300,000 in six tribal groups, most extremely poor and with high potential for violent conflict over the decreasing resources, including with tribesmen from Ethiopia and Sudan (Hathaway, 2010).

VISITORS AND VISITOR FACILITIES

A unique archaeological site for hominid remains and relics of giant tortoise, crocodile and behemoth mammoth. Very few visitors travel to these National Parks although their tourist potential is quite high. Visitors to Sibiloi and Central Island Park during 1992-1998 ranged from 1,294 in 1996 to 458 in 1998,

with more people visiting Sibiloi. There is an airstrip at the Turkwel dam, camping facilities at the Koobi Fora Museum & Research Base and at Rocodoni facing Mount Sibiloi, but visitors must bring their own supplies. There are three hotels; Oasis Lodge at Loiyangalani at the southeast end of the lake, provides a base and motor boats for visitors to travel to South Island Park for bird watching and game viewing.

SCIENTIFIC RESEARCH AND FACILITIES

Extensive archaeological work, still ongoing, was done in the area by Richard Leakey and many others in the 1960s and 1970s (KWS, 1996). Very important ancestral human fossils have been recorded from the area, including the remains of *Australopithecus robustus*, *Homo habilis*, *Homo erectus* and *Homo sapiens*. Fossils of other African mammals have also been found there: black and white rhinoceros, an extinct giant otter, hippotamus, pygmy hippotamus, african elephant and camel. Although there is no formal and systematic monitoring programme for the Lake Turkana sites, KWS, the National Museums of Kenya and the Department of Resource Surveys and Remote Sensing carry out some monitoring in the Parks. Public and private universities provide expertise in research, monitoring and impact assessment. A survey of birds was undertaken in 1992 (Bennin & Njoroje, 1999). The Kenyan Wildlife Service Training Institute, in Naivasha, and the Mweka African College of Wildlife Management in Moshi, Tanzania, are valuable training centres for wardens and rangers of the region.

MANAGEMENT

The Kenyan Wildlife Service has agreed memoranda of understanding with the National Museums of Kenya for the conservation of fossil sites, with the Kenyan Fisheries Department for lake fisheries and the Kenya Forestry Department for catchment forests, especially for managing South Island National Park. However, local people are allowed to use areas in Sibiloi and Central Island National Parks during the dry season, November-February. With assistance from the UNESCO World Heritage Fund a five year Integrated Management Plan was developed for Lake Turkana and its parks. Its goals are conservation of the archaeological sites, park habitats and biodiversity and its objectives promotion of environmental awareness, education and ecotourism, scientific research and monitoring, collaboration with stakeholders and alleviation of poverty (Njuguna, 2001).

MANAGEMENT CONSTRAINTS

The area's protection is largely nominal but because of its remoteness, there has been relatively little direct pressure on the environment. However, local people are beginning to become more sedentary, increasing the grazing pressure from livestock which is now becoming a problem particularly along the shores of Lake Turkana. It also causes unauthorised trespassing into the Park and increased soil erosion in the strong winds of the area. The collection and cutting of *Salvadora persica* by local fisherman is also exposing soil to erosion. Pressure on fish populations in the lake is increasing, although attempts to introduce industrial scale fishing projects have so far failed. African skimmers nesting on South Island have been disturbed in recent years by fisherman. The water level of the lake has been dropping steadily for some years: a decline of 10m was recorded between 1975 and 1993, primarily due to reduced inflow from the Omo River in Ethiopia due to irrigation and drought upstream. Long droughts from 1999 to 2000 and from 2007 to 2009 have also led to severe losses of livestock and wildlife, to tribal conflicts and to starvation.

In addition, the Gibe III dam now under construction on the Omo to supply electricity and control flooding will reduce the flow of freshwater even further, increasing the already extremely high salinity of the water, threatening the coastal tribes and the fish they now depend on. According to recent reports (ARWG, 2009; Hathaway, 2010; Angelei & Pottinger, 2010), the dam which is part of the largest hydroelectric project in Africa, could decrease the flow to the lake by 85% and lower the shoreline by up to 12 metres. In addition, its effect on the 200,000 lower Omo tribesmen dependent on the river may cause disastrous hardship and consequent violent conflicts. The ARWG report is a particularly trenchant and detailed comment on the project. However, the dam is considered essential by the government, will also supply power to surrounding countries, including Kenya, and is well financed by the leading Chinese bank among other lenders. Upstream irrigation and a hydropower dam also affect the supply from the Turkwel.

STAFF

The three Lake Turkana Parks are managed by a work force of forty-three: one warden, 22 rangers, and 12 support staff (KWS, 1996; 2001).

BUDGET

Funding for the site comes from central government, donors and from visitor fees. In 1996 funding for the Lake Turkana ecosystems amounted to US\$50,000. The Provisional Integrated Management Plan gave a 5-year tentative budget of US\$335,000 (Njuguna, 2001).

LOCAL ADDRESSES

The Director, Kenya Wildlife Service, P.O. Box 40241, Nairobi, Kenya.

The Warden, Sibiloi, National Park, Box 219, Lodwar, Kenya.

Kenyan Fisheries Department, P.O. Box 58187, Nairobi, Kenya.

National Museums of Kenya, P.O. Box 40658, Nairobi, Kenya.

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DATE

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