Lake Turkana National Parks

2025 Conservation Outlook Assessment

SITE INFORMATION

Country: Kenya
Inscribed in: 1997
Criteria: (viii) (x)

The most saline of Africa's large lakes, Turkana is an outstanding laboratory for the study of plant and animal communities. The three National Parks serve as a stopover for migrant waterfowl and are major breeding grounds for the Nile crocodile, hippopotamus and a variety of venomous snakes. The Koobi Fora deposits, rich in mammalian, molluscan and other fossil remains, have contributed more to the understanding of paleo-environments than any other site on the continent. © UNESCO

SUMMARY

2025 Conservation Outlook

Finalised on 11 Oct 2025

CRITICAL

Lake Turkana’s unique qualities as a large lake in a desert environment have been under threat as the demands for water escalate and the financial capital to build some of the largest dams in Africa became available. Historically, the lake’s level has been subject to natural fluctuations in response to the vicissitudes of climate, however, since 2020, the river inflows have exceeded evaporation losses, a situation that will continue with global warming-induced evaporation and associated increasing rainfall. This situation is compounded by faster runoff response to rainfall due to ongoing land use pressures that degrade the lake's catchments in both Kenya and Ethiopia. The lake’s major source of water, Ethiopia’s Omo River, is being developed with a cascade of major hydropower dams and irrigated agricultural schemes. Dam construction works have run into financial difficulties, and the lake levels have risen dramatically, thereby inundating the lake margins, which tends to be to the benefit of fisheries. Hence the future impacts on the lake from developments in Ethiopia remain uncertain. Apart from the hydrological impact of major changes on the lake, and hence at the site, the challenges at the management level remain, with wildlife populations in decline because of increasing human population pressure and associated extreme poverty, lack of infrastructure investment, poaching pressure, over-grazing by domestic stock, and habitat reduction associated with the rising lake water levels. Increased levels of investment in management and monitoring activities of environmental impacts on Lake Turkana are essential but are not forthcoming from government. Tourism levels are low and KWS deems the site among its "dormant" national parks. A positive step is the recent establishment of a simple private tourist camp on South Island, which thereby maintains a vital presence that inhibits poaching in that portion of the site. The creation of community conservancies bordering Sibiloi National Park, as envisaged in the Management Plan and encouraged by KWS policies, are vital to conserve the important buffer zones, and are a priority to be promoted. The annual Nature Kenya survey of Key Biodiversity Areas (KBAs) of Kenya in 2023 deemed Lake Turkana's "state" to be "unfavourable", the "pressure" on the lake to be "very high", and the likelihood of conservation actions being implemented to be

"low". Hence the importance of ensuring the conservation of these three national parks is significant.

FULL ASSESSMENT

Description of values

Values

World Heritage values

Fossil deposits **Criterion:(viii)**

Fossil deposits in Sibiloi National Park include pre-human, mammalian, molluscan and other fossils that have contributed more to the understanding of human ancestry and palaeo-environments than any other site in Africa (World Heritage Committee, 2012). The fossil remains include a petrified forest thought to have grown seven million years ago (when the area was much wetter than it is today), together with a great diversity of extinct fauna including giant tortoise, crocodile, behemoth mammoth, rhinos, otters and hippos (UNEP-WCMC, 2012). The complexity of the fossil record enables the reconstruction of palaeo-environments dating back four million years (World Heritage Committee, 2012). Five species of hominid fossil have been discovered including the earliest of the australopithecines, Australopithecus anamensis, estimated to be 3.8-4.2 million years old (World Heritage Commitee, 2012; Hilton-Barber and Berger, 2002).

Complex of geological features **Criterion:(viii)**

Lake Turkana is Africa’s fourth largest lake and the most saline of these four (World Heritage Committee, 2012). It is situated in a semi-desert environment, characterised by recent volcanic, erosional and sedimentary land forms. The area’s main geological features stem from the Pliocene and Holocene periods (from four million to 10,000 years ago). The World Heritage property (1,615 km2) covers three separate National Parks – Sibiloi (on the north-eastern shores of the lake), Central and South Islands, together with an aquatic zone stretching 1 km into the lake in the case of Central Island. These three areas encompass this diversity of geological features, including extensive sedimentary deposits, volcanic features and geological faulting (World Heritage Committee, 2012), and palaeo shorelines. Ongoing research by Turkana Basin Institute (TBI) includes basin geology and recording movements in the earth's crust (TBI, 2025).

Diversity of terrestrial, aquatic and lakeshore habitats in a semi-desert environment **Criterion:(x)**

The parks include a great diversity of aquatic, shoreline and semi-desert terrestrial habitats (UNEP-WCMC, 2012). The waters of the lake are 2.5 times saltier than the normal maximum limit of drinking water, but although the lake water is consumed by humans and livestock in the absence of alternative potable sources, the water contains levels of fluoride that are far in excess of acceptable drinking levels, and are hazardous, causing skeletal fluorosis, a crippling disease that is widely seen amongst people living along the lakeshore (AfDB, 2010; University of Oxford, 2012). The lake supports a diversity of freshwater fish species and, where suitable muddy substrate exists, beds of submerged aquatic macrophytes (Potamogeton pectinatus) and shoreline grasses (UNEP-WCMC, 2012). The lakeshore substrates vary from rock to pebble, sand and mud (Birdlife, 2012), while terrestrial habitats include Acacia savannas, Commiphora bushlands, grassy plains, rocky ridges and groves of desert date and doum palms (World Heritage Committee, 2012).

Diversity and abundance of birds **Criterion:(x)**

Lake Turkana is an internationally recognized Important Bird Area (Birdlife, 2012), with, according to the latest available data, 84 water bird species, including 34 Palaearctic migrants (for which it serves as an important flyway and stop-over site for birds on passage). More than 10% of the entire East African/South East Asian population of Little Stints (more than 100,000 individuals) may winter here. At least ten regionally threatened species of birds breed, including African skimmer (UNEP-WCMC, 2012).

Lesser flamingoes also pass through, feeding on the small saline lakes that characterise parts of the lake. The results of the recent biodiversity survey are awaited (State Party of Kenya, 2025).

▶ **Rare and endangered fauna** **Criterion:(x)**

According to historic data the lake supported the world's largest colony of Nile crocodile (World Heritage Committee, 2012), with an estimated population of 14,000 individuals reported breeding on Central Island (in 1968; BirdLife, 2012). Field observations show the crocodile population is a fraction of the size it once was due to increasing anthropogenic pressures (EAWLS, 2014). Rare, endangered and relatively recent extinct mammals include hippopotamus, wild dog, lion, cheetah, reticulated giraffe, Grevy's zebra and Lelwel hartebeest (UNEP-WCMC, 2012). Aerial wildlife census counts were done between 1978 and 1997, but nothing since. The national wildlife census in 2021 did not include Lake Turkana and the results of the 2024 National Wildlife Census have not yet been published.

▶ **Endemic species of fish** **Criterion:(x)**

According to the latest available data, the lake supports over 60 species of freshwater fish, including eleven endemic species (FishBase, 2017). The Lake Turkana National Parks Management Plan 2018-2028 includes action plans to liaise with KMFRI on fish populations. None have been reported. The results of the UNESCO-supported biodiversity survey in September 2024 are awaited (State Party of Kenya, 2025) and UNESCO / WFP's 10-year lake fisheries project (UNESCO / WFP, 2024) should provide an update.

Assessment information

Threats

Current Threats

High Threat

Over-grazing, poaching, over-fishing and tree-cutting persist. These factors enhance the potential for conflicts between local inhabitants of the region. The cumulative impact of all these threats are likely to continue to significantly affect the site, and it is vital that the ambitious objectives of the Lake Turkana National Parks Management Plan 2018-2028 be implemented, a priority being the intentions to create buffer zones and meaningfully engage local communities in the necessary conservation measures. The site also faces threats originating outside its boundaries. The inflowing rivers have been progressively dammed for hydropower, irrigation and other purposes. Although, the irrigated sugar plantation developments in the Lower Omo have collapsed, these might be revived. The construction of the Gibe IV (Koysha) dam has been delayed due to financial difficulties. The interaction of climate change and periods of drought and heavy rainfall with other factors such as water regimes, governance, environmental degradation, and land use pressures, make Lake Turkana a very vulnerable trans-boundary ecosystem.

▶ **Dams & Water Management/Use** **Very High Threat**

(Damming of inflowing rivers and upstream use of waters)

Inside site, localised(<5%)
Outside site

Ethiopia's Omo River accounts for over 80% of the inflow to Kenya's Lake Turkana (Avery, 2017). The river hydrology is being transformed by a cascade of five dam / hydropower projects, named Gibe I to V. The Gibe III dam was commissioned in December 2016, and the Gibe IV (Koysha) dam construction downstream is 66% complete (Addis Insight, 2024). Koysha will be the third largest dam in Africa. Water that used to flow naturally into the lake has been impounded since the Gibe III dam was commissioned, with river discharges since regulated according to hydropower generation requirements (AfDB, 2009; UNESCO / IUCN, 2015; KWS / NMK, 2019). River water was also being abstracted for large-scale irrigation and other uses (AfDB, 2009; 2010a; State Party of Kenya, 2012; Univ. of Oxford, 2012, 2013; Avery et al., 2018; KWS / NMK, 2019; RRA, 2019). But the huge sugar plantation schemes abstracting water from the Omo River have seemingly since collapsed (Kamski et al., 2023).

The Omo-Gibe Master Plan warned that the flow of Ethiopia's Omo River should not be altered without a bilateral agreement between Ethiopia and Kenya (OGBMP, 1996; reviewed by AfDB, 2009; Univ. of Oxford, 2012; EIB, 2010), and this was not done. The 2024 State Party Report for Kenya on the Lake

Turkana National Park World Heritage site refers to ongoing lack of success engaging Ethiopia in regard to discussing impacts (State Party of Kenya, 2024). It states that "The reconvening of the Joint Technical Expert Committee between Ethiopia and Kenya to discuss conservation of the Lake Turkana World Heritage Site is one of projected outcomes of the funding proposal being finalised" (State Party of Kenya, 2025).

Two main aspects of concern for the OUV of the site have previously been reported: 1) The impacts on the lake ecology of altered river inflow hydrology, notably the loss of the all-important Omo river's annual flood season (AfDB, 2009 & 2010a; EIB, 2010; Univ. of Oxford 2012 & 2013; SOC, 2015; Avery et al., 2018); 2) The increased irrigation abstractions that were being developed downstream to exploit the regulated Omo river flows downstream from Gibe III and that would reduce freshwater inflow to the lake (ibid.).

The current scenario is one of climate changing with rising lake levels and inundation of shoreline terrestrial habitat. The increasing surface water runoff response to rainfall that is arising with changing climate exacerbated by catchment degradation are tending to offset the impact of irrigation abstractions (Avery et al., 2018; Avery, 2018). The latest information is that the various irrigated plantation developments taking water from the Omo River have evidently collapsed (Kamski et al., 2023).

The Gibe III dam's vast reservoir has meanwhile been trapping sediments and nutrients that would otherwise flow to the lake. The consequences include erosion of the river channel downstream, changing the flooding regime of the river downstream, altering the nutrient scouring effects of the river floods, and impacting the replenishment of oxbows and other natural depressions that would otherwise be inundated by floodwaters that spill from the river and recharge the underlying aquifers. The completion of the Gibe IV (Koysha) reservoir will compound this river flow regulation and nutrient and sediment capture.

Studies of the Omo delta have confirmed the above concerns. The Omo channel has deepened and "the delta morphology became less dynamic and less complex" (Zen et al. 2023). In other words, a consequence of the Gibe III dam has impacted the diversity of the Omo delta. One can expect ecological diversity to be affected in all the bays and lake shores whose diversity stems from that lake's natural non-uniformity.

The major irrigated agricultural developments have notably included the Ethiopian government's Kuraz Sugar Development Project, originally planning 245,000 ha, but reduced to 100,000 ha that was annexed along the Omo river from two national parks and a wildlife reserve. Areas downstream were developed for large-scale cotton production by private developers. The plantations along the river were however believed to have limited impact on the OUV of the site in 2015 (UNESCO/IUCN, 2015). According to Ethiopia, the Kuraz sugar scheme will use 4-6% of the river flow of the Omo River for irrigation purposes once the whole sugar scheme is in operation (State Party of Kenya, 2015). Predictions of other sources however have been much less conservative, suggesting severe potential danger to the OUV, depending on the full extent of abstractions (Avery et al, 2018). The draft EIA for the Kuraz project dated 2012 stated that 29% of the river water would be abstracted under full operation. In the later Kuraz feasibility report dated December 2014, it was stated that 18% of the river would be abstracted. On the other hand, increasing runoff is being forecast with climate and catchment change and this tends to offset the irrigation abstractions (Avery et al., 2018). And to further compound the debate, the large scale irrigated sugar plantations in Ethiopia have since collapsed due to "cost overruns, design errors, technical overhauls, social conflicts" (Kamski et al., 2023). The cotton plantations in the Lower Omo are also believed to have collapsed. The impacts on the lake fisheries part of the OUV therefore have to be closely monitored, and perhaps the UNESCO / WFP's recently launched 10-year fisheries project (UNESCO / WFP, 2023) will contribute to this purpose in addition to that project's ambitious objective to exploit the lake's fisheries resources as a poverty alleviation measure.

► **Recreational Activities** — **Low Threat**

(Destruction and disappearance of fossils) — Inside site, localised(<5%)

The Lake Turkana fossil sites are not threatened by the lower Omo developments. The fossil bed are however poorly protected and vulnerable to rising lake levels and are negatively impacted through trampling by livestock and looting of fossils by pastoralists and visitors (KWS/NMK, 2019). The petrified forest site is unprotected and encroached by livestock.

▶ Other Human Disturbances

High Threat

(Destruction of crocodile nests)

Inside site, throughout(>50%)
Outside site

Observations in 2012 noted that crocodiles heavily persecuted by fishermen who destroy nesting sites they come across, including those on South and Central Island NPs (Mission Report, 2012; EAWLS, 2012). The threats continue as fishermen are constantly encroaching into the waters of the World Heritage site (KWS/NMK, 2019). The situation today has not changed and a recent private report concluded that crocodile numbers within the site are no longer globally significant, which reflects poorly on the OUV of the site. There is no permanent ranger presence on the islands and fishermen often camp on the shores where the crocodiles nest, sometimes doing so under the pretext that they are sheltering from the lake's dangerous winds and waves. Fishing is not permitted unless under license for sport tourism, and trespassing fishermen are often arrested (KWS/NMK, 2019).

▶ Logging, Harvesting & Controlling Trees

Low Threat

(Tree cutting for fuelwood and livestock enclosures)

Inside site, throughout(>50%)
Outside site

Trees are reportedly taken for fuelwood and charcoal from within Sibiloi NP and elsewhere (UNEP-WCMC, 2012), exposing the thin soils to strong winds. Fishermen that camp illegally on the island national parks will also require fuelwood, which is a threat to the scarce woody species on those islands. With ever-increasing population in the Lake Turkana region, there is escalating fuelwood demand, and wooded areas are targeted as a consequence. In addition, pastoralists bring their livestock into Sibiloi NP for pasture and water, and in so doing they degrade the habitat through trampling, overgrazing, and they cut woody vegetation to construct livestock enclosures (KWS / NMK, 2019). On the one hand grasslands are increasingly becoming woody and bush and weed encroached due to degradation by livestock, and on the other hand the original wooded area habitats are impacted as they are exploited as sources of fuelwood and material for livestock stockades (KWS/NMK, 2019). The diversity of Sibiloi NP is affected as the wildlife includes both grazers and browsers. The recent state of conservation report states that community engagement meetings have taken place to resolve encroachment and that additional resources and park rangers have been deployed to deal with illegal fishing and subsistence poaching (State Party of Kenya, 2025). However, the report does not provide supporting indicators of success.

▶ Identity/social cohesion/ changes in local population and community that result in negative impact

Low Threat

(Social unrest arising from tribal conflicts over resources)

Inside site, scattered(5-15%)
Outside site

The lake supports livelihoods of about 500,000 people of different ethnic groups. Most of these people suffer extreme poverty, a large part of the increasing population is young, and the development indices of the region are much lower than the national average in both Kenya and Ethiopia. Literacy levels are very low (County Integrated Development Plans). As the population is quite mobile, cross-border conflicts over water and other natural resources are a persistent concern in the region. In a recent conflict, 22 fishermen are reported killed near Todenyang on the northeastern lakeshore by armed militia from across the border (The Star newspaper, 2025). Causes and patterns of conflict are complex and intertwined with for example increasing human population, displacement of people from their traditional lands by developments in the Lower Omo, environmental degradation, competition over resources, livestock rustling, ethnicity, politics and lack of economic opportunities for the population (UN Country teams of Ethiopia and Kenya and IGAD).

Remote-sensed water level monitoring by satellites shows that Lake Turkana fell two metres during the filling of Gibe III's reservoir (KENWEB, 2017; Avery et al., 2018), and the fisheries is reported to have declined (as reported in the film "Water to Dust" screened on National TV in Kenya in 2017), thus enhancing the chances for conflict. While the Central Island and South Island NPs are uninhabited, they

are nonetheless encroached by fishermen who regularly camp on the shores, and South Island NP is used by pastoralists as a dry-season grazing refuge for sheep and goats (KWS / NMK, 2019). Nests and eggs are either looted or trampled by humans and livestock (EAWLS, 2012; KWS/NMK, 2019). Local pastoralists are allowed grazing rights in Sibiloi NP in the dry season and pressure for resources from the park is escalating (UNEP-WCMC, 2012; KWS/NMK, 2019).

The Management Plan 2018-2028 (reference KWS/NMK, 2019) envisages formulation of a new grazing plan with the communities. With the increasing human population pressure in the areas surrounding the site, this will be a challenge to enforce, and needs to be very closely monitored.

The recent state of conservation report states that "community engagement meetings have been held to resolve Human Wildlife Conflict and encroachment in to the property" (State Party of Kenya, 2025). That report also states that "several sensitization engagement meetings were held with the local communities. These meetings were held with the herders and fishermen and extended to areas outside the property area on the western shores of the Lake" (State Party of Kenya, 2025). The report further states that the following Management Plan objective remains 'pending': "Create a buffer zone to the property taking into consideration other critical aquatic and terrestrial areas with complementary legal and/or customary restrictions on its use and development" (State Party of Kenya, 2025). There are no supporting indicators of success and the buffer zone is critical to the survival of the site.

► Fishing, Harvesting & Controlling Aquatic Species

Data Deficient

(Overfishing and diminishing fish stocks)

Inside site, widespread(15-50%)
Outside site

Since the 1960s, fishing has been an important livelihood, being practiced throughout the lake on an artisanal basis, principally by Turkana fishermen. Illegal fishing activities are taking place inside the site and fisheries resources are not being adequately protected (KWS/NMK, 2019). There are, however, no fish stock assessment data to enable assessment of the broader impact of over-fishing on the fisheries resource. There have long been reports that the lake is over-fished (OGBMP, 1996), and hence the protected areas are vital for the lake.

Numerous fisheries expert studies have demonstrated that the lake fisheries ecology is highly dependent on the annual Omo seasonal flood, and hence that development-induced hydrological changes in the Omo Basin would be detrimental (Lake Turkana Project 1972-75; Lake Turkana Limnological Study 1985-88; Omo-Gibe Basin Integrated Development Master Plan, OGBMP, 1996; Kolding; Ojwang et al. 2018; Gownaris et al. 2016; Muska et al. 2012).

Due to the major Gibe III power plant's vast reservoir storage capacity, the annual Omo lake flooding regime has been altered, and this results in negative effects on the recruitment of young fish and the production of adults of all kinds of species with commercial value. The Gibe III dam has permanently dampened the seasonal oscillations in lake water level that were important for nutrient cycling and triggering fish breeding and migration. The completion of Gibe IV downstream compounds this. The loss of these oscillations was predicted to decrease fisheries yield by over two thirds (Gownaris et al., 2016). Declining lake levels due to irrigation abstractions also have the potential to lead to the loss of important fish habitat, including, for example, the productive Ferguson's Gulf fishery (Hodbod et al., 2019, Ambio). However, the irrigation plantations have since largely collapsed (Kamski et al, 2023), the catchment rainfall has increased, catchment land use pressures are rising, and the runoff response to rainfall is hence increasing (Avery et al., 2018; Byrne et al., 2023). A consequence has been the rising lake levels (Avery, 2020/24), contrary to past fears.

► Renewable Energy

Data Deficient

(Wind turbines and transmission lines)

Outside site

The Lake Turkana Wind Power project, located to the southeast of the lake, comprises 365 wind turbines, with its facilities occupying approx. 87.5 acres. Construction commenced in October 2014, and by July 2017, its 310 MW capacity was ready for commercial operations, but there were delays building the power line to connect the national grid. The wind farm today is operational. The project's impact on biodiversity, particularly on birds, is unknown.

► Changes in Temperature Regimes, Changes in Precipitation & Hydrological Regime

High Threat
Inside site, throughout(>50%)
Outside site

(Drought and climate change)

The interaction of climate change and periods of drought with other factors such as water regimes, governance, environmental degradation and land use makes Lake Turkana a very vulnerable trans-boundary ecosystem (Anon., n.d). The lake shows pronounced inter-and intra-annual fluctuations in water level as a function of the rainfall in distant upland areas, opposed by a high evaporation rate. Rainfall is the most unpredictable feature of the Turkana climate, yet it is also the most disruptive when it does occur. A recent study by the United Nations Environment Programme (UNEP) predicts that, over the next 20 years, climate change could likely lead to heavier rains over Lake Turkana’s inflowing rivers, which would raise water levels in the lake and increase the likelihood of severe flooding (UNEP-DHI, 2021). The past several years have already been marked by increasing lake level due to these precipitation increases. Since 2019/2020, most of the East African Great Lakes experienced a significant increase in their water level compared with their mean level over the previous decades. For east Africa’s four largest lakes, including Lake Turkana, water levels in January 2024 are the highest recorded since 1992. At Lake Turkana, January 2024 water levels are 0.7 m higher than January 2021 values (Gbetkom & Crétaux, 2024).

Periodic droughts and heavier rainfall exacerbate the problems associated with upstream use of water, denying the lake of the fresh water needed to compensate for evaporation losses. Furthermore, the salinity of the lake can be expected to increase further due to increased evaporation rates due to rising lake water temperature with global warming (Univ. of Oxford, 2012; International Rivers, 2016; JGLR, 2018). On the other hand, there is an increasing rainfall trend and catchment runoff proportions will increase with anthropogenic activity, increases that tend to offset the increased evaporation loss (Univ. of Oxford, 2012; JGLR, 2018; RVBP, 2020).

► Hunting, Collecting & Controlling Terrestrial Animals

High Threat
Inside site, throughout(>50%)
Outside site

(Poaching and fishing)

Although the wildlife resources in national parks are protected by law, the protection means are ineffective with little control over poaching, livestock and fishing encroachments into the parks. In Sibiloi NP, the inadequate wildlife protection and widely accessible firearms are leading to a decline in wildlife populations, with the few remaining large mammals being concentrated in the most secure parts of the site, confirming that poaching is a significant threat (KWS/NMK, 2019). Within the lake, crocodiles and turtles are threatened as they become entangled in nets and drown, and will also take baited fishing hooks on long lines and then drown (EAWLS, 2012; 2014). Reticulated giraffe have become extinct since the site was listed (State Party of Kenya, 2012). Grevys zebra are endangered nationally and may no longer be present in Sibiloi NP. The Northern topi (Tiang) population is approaching "vulnerable" or "near threatened" status (KWS/NMK, 2019). Large carnivores are listed amongst Sibiloi's wildlife (lion, leopard, cheetah, spotted hyaena, striped hyaena), but current numbers are not stated in the Management Plan 2018-2028. Lion are especially vulnerable nationally and numbers if any in Sibiloi NP are not known (KWS/NMK, 2019). National experience is that large carnivores will occasionally take livestock and pastoralists will often retaliate by poisoning carcasses with catastrophic widespread consequences for other scavenging wildlife and birds. Sibiloi NP is supposed to host Beisa oryx, gerenuk, Grant’s gazelle, and Burchell's zebra, but previous assessments declared these virtually absent. Greater kudu were not previously mentioned although listed on the KWS Tourist map for Sibiloi NP. A major factor displacing the wildlife population is the encroachment of livestock. Central Island and South Island NPs are not permanently inhabited and lack fresh water sources and hence pastoralism is not practiced in these parks, but KWS have reported sheep and goats on South Island NP during the dry season (KWS/NMK, 2019). Fishing is a significant threat to the wildlife diversity of the islands, notably crocodile, turtle and nesting bird populations, as fishermen camp on the beaches, sometimes under the pretext that they are sheltering from the lake's fierce winds and waves. There have been reports of flamingos being chased on Central Island's Flamingo Lake and disturbance of littoral zone habitats by illegal fishermen.

Potential Threats

Low Threat

By far the greatest potential threat to the lake ecology is the progressive development-induced change to the inflowing hydrology in Ethiopia. The lake's ecological diversity was a consequence of its natural erratic variability and its reliance on seasonal flood-driven level oscillations. The threat of the depletion of inflowing waters for irrigation has diminished with the collapse of Ethiopia's over-ambitious irrigated sugar plantations in Lower Omo, but might revive, and this situation should be monitored. The potential threat from oil exploration and extraction on Lake Turkana is currently unknown, and is nowhere near being utilised. But, but given the distance of the oil fields from the site, impacts are limited, although any accidental spills near a tributary of the lake could lead to significant impacts.

▶ Oil & Gas exploration/development

Low Threat

(Oil exploration and development)

Outside site

Oil exploration has been taking place across the Lake Turkana basin (State Party of Kenya, 2012), and significant finds have been made outside the site in the South Lokichar basin to the south-west of the lake. Development of these resources seemed set to transform the local economy, with construction of major new infrastructure planned, and significant associated risks. For instance, the government of Kenya has been undertaking social and environmental impact assessments for the development of a crude oil export pipeline between Lokichar and Lamu(the Government of the Republic of Kenya through the Ministry of Energy and Petroleum, 2016). Exploration licenses for the oil exploration blocks covering Lake Turkana - including some parts of the site - had been attributed to Tullow Oil plc. But in 2015, Tullow Oil declared a policy not to explore or exploit hydrocarbon resources within World Heritage properties (McDade, 2015). The oil extraction process in South Lokichar basin requires water and Tullow has explored a range of water sources, including distant sources like the Indian Ocean, local groundwater, Lake Turkana, and the existing Turkwel hydropower dam, which is the preferred source. The Turkwel dam is on one of the three main basins that drain to Lake Turkana. Water will be taken by pipeline from the dam to feed the oilfield and communities that live along the pipeline.

The updated hydrological study for the existing Turkwel dam was submitted to Tullow (TKBV, 2020), and an ESIA of the water pipeline was in progress. The amount of water abstraction proposed was 0.46 m3/s, which is 2.5% of the Turkwel river's mean annual flow, and this is a fraction of the total annual average freshwater inflow to the lake of 632 m3/s (Avery et al., 2019). Evaporation alone from the Turkwel reservoir is 1.25 m3/s. Kenya's Rift Valley Basin Plan envisages irrigation abstractions from the Turkwel River increasing to 6.28 m3/s by 2040 (RVBP, 2020), Kenya's Kerio Valley Development Authority also commissioned a sugar plantation study that required 18 m3/s, the entire Turkwel river flow (KVDA, 2013). Thus, the oilfield and community domestic water needs planned to be served from Turkwel dam are very small in comparison to irrigation water demands. It has also been suggested the dam might supply water to the planned resort city on the lake at Eliye (RVBP, 2020; cited in TKBV, 2020).

The downturn in oil prices and the global Covid-19 pandemic resulted in a near shutdown in Tullow's oil development activities. But, potential threats from oil exploration in the vicinity or within the watershed of Lake Turkana or within the lake itself, still exist from prospecting by other oil and energy development companies. A geothermal project was being developed on the Barrier Complex that forms the southern boundary dividing the lake from the Suguta Valley, and details of water requirements and sourcing had not yet been provided.

Insofar as water resource depletion affecting the lake and the site, the biggest threats are the irrigation abstraction projects, both in Kenya and Ethiopia. In Kenya as a whole, irrigation accounts for about 80% of national water demand (NWMP, 2013). Kenya had planned a 10,000 ha irrigation project at Todenyang based on abstracting water from the Omo river too (Univ of Oxford, 2012; Avery et al., 2019; RVBP, 2020). It is interesting to note that the Lower Omo irrigated sugar and cotton plantation developments have since collapsed (Kamski et al., 2023).

▶ Commercial & Industrial Areas

Low Threat

(Regional infrastructure)

Outside site

The governments of Kenya, South Sudan and Ethiopia are collaborating on a major new infrastructure corridor named LAPSSET (Lamu Port, Southern Sudan, Ethiopia Transport Corridor) through northern Kenya linking the Indian Ocean with other parts of the region. This ambitious infrastructure project comprises a deep sea port at Lamu, inter-regional railway lines and highways, crude oil pipeline, product oil pipeline, three international airports (including at Lake Turkana), three resort cities (one at Eliye on Lake Turkana) and a dam on Tana River (LAPSSET, 2017). There has been little activity since.

▶ Dams & Water Management/Use

Low Threat

(Upstream water use including irrigation)

Outside site

There is progressive development-induced change to the inflowing hydrology of Lake Turkana, and in particular the threat of the depletion of inflowing waters through abstraction by planned irrigation developments, and these pose a major threat to the ecology of the lake. These irrigation abstraction risks derive from a host of irrigation developments, not only from Kuraz Sugar Scheme in Ethiopia, but also cotton and other plantations, and from Kenya too in the form of KVDA's planned sugar plantation development, and Kenya's Todenyang irrigation project that was also planned to take water from the Omo river (RVBP, 2020). In future, there may also be an expansion of community run irrigation schemes in Ethiopia's Lower Omo as an attempt to offset the loss of flood recession-agriculture due to the Gibe III dam (Tebbs et al, 2019, OTuRN).

It is notable that the sugar plantation developments in Lower Omo collapsed (Kamski et al., 2023), and the potential irrigation schemes in Kenya have not materialised. Hence the above potential risks have not materialised.

▶ Renewable Energy

Data Deficient

(Proposed geothermal power plant project)

Outside site

A geothermal power station has been proposed at the Barrier Volcanic Complex, approximately 10km south of the site (WH Committee, 2019). Little information is available on this project such as the technology proposed. In 2019 the WH Committee requested the State Party to ensure an EIA for such a proposal is submitted to the World Heritage Centre before making a decision but the 2020 State Party provided no updates on this development (State Party of Kenya, 2020). This project is no longer referred to.

Overall assessment of threats

High Threat

The recent lake level rise is submerging terrestrial habitat and reaching the site's building infrastructure that was built below the historic high water marks. This lake inundation is likely to persist and the location of site infrastructure must be reviewed. The important annual Nature Kenya survey in 2023 of Key Biodiversity Areas (KBAs) of Kenya deemed Lake Turkana's "state" to be "unfavourable", the "pressure" on the lake to be "very high", and the likelihood of conservation actions being implemented to be "low". Over-grazing, poaching of wildlife, over-fishing, tree-cutting and charcoal-production, are compelling factors indicative of ever-increasing demands for natural resources from within, and surrounding the site.
The values of the site are threatened by the accumulation of different factors in the wider Lake Turkana region beyond the site boundaries. These include the progressive damming of the inflowing rivers and upstream use of water for irrigated agriculture and other water uses, although the large-scale ambitious irrigated sugar plantations in the Lower Omo have since collapsed. The cascade of Omo River hydropower plants had raised concerns of far-reaching ecological consequences, dampening the ecologically important lake rise and fall cycles, exposing saline soils, affecting lake water quality, reducing the extent of seasonal flooding and nutrient cycling and replenishment, and capturing of sediment within the dam reservoirs that would otherwise reach the lake and sustain the

Omo delta's natural development. Some of those impacts on diversity have already been observed, namely the diversity loss of the Omo delta due to the damming of the Omo river by the Gibe III dam. The challenges of these Omo river changes is perhaps being overtaken by the pressures of human population increase, poverty, and competition for diminishing resources by people living around the shores of the lake, as illustrated by recent conflicts and people killed at Todenyang by militia from over the border with Ethiopia. The discovery of significant oil deposits in the lake basin and progressive geothermal exploration are locations that are far from the site, and unlikely to be a threat. Concerns have been expressed regarding the LAPPSET corridor project from Lamu to South Sudan which includes plans for a resort city on the western side of the lake, but this corridor is likewise far from the site and unlikely to impact the OUV negatively.

Protection and management

Assessing Protection and Management

▶ **Involvement of stakeholders and rightsholders, including indigenous peoples and local communities, in decision-making processes** — **Some Concern**

The World Heritage site (the site covering 1,615 km2) comprises three separate national parks, namely Sibiloi National Park (1,571 km2), South Island National Park (SINP) (39 km2) and Central Island National Park (CINP) (5 km2) managed by Kenya Wildlife Service (KWS). The National Museums of Kenya (NMK) manage the fossil sites in Sibiloi NP. Neither of the island parks has a permanent KWS presence, and while South Island NP falls under the jurisdiction of Sibiloi NP within Marsabit County, Central Island NP is managed from Kalokol on the other side of the lake within Turkana County.

In August 2019, the Kenya Govt gazetted into law the Lake Turkana National Parks Management Plan 2018-2028 (GoK, 2019). This plan was gazetted under the The Wildlife Conservation and Management Act (No.47 of 2013) and it is unclear to what extent local communities were involved in the development. The plan "defines the principles and strategies that stakeholders of the Lake Turkana National Parks have designed to address conservation, pre-historic and cultural heritage, tourism development, community partnership, and protected area administrative issues in the Protected Areas and their adjacent areas. The Plan aims to provide managers and stakeholders in Lake Turkana National Parks a practical framework for conserving and protecting natural and cultural resource values at the Lake Turkana National Parks to maintain its international recognition as a world heritage site". However, the extent to which this has been implemented on the ground is not clear.

▶ **Legal framework** — **Mostly Effective**

Kenya's museums and archaeological sites are managed by the National Museums of Kenya (NMK). NMK also serves as the State Party of Kenya representative reporting to UNESCO in regard to Kenya's World Heritage sites. NMK is governed by The National Museums and Heritage Act, Chapter 216, Revised Edition 2012 [2006].
Kenya's wildlife are the responsibility of the Kenya Wildlife Service (KWS) and governed by the Wildlife (Conservation and Management) Act (No.47 of 2013). Kenya's national parks are managed by KWS.
The Lake Turkana National Parks Management Plan 2018-2028 was gazetted into law under Gazette Notice No.7980 dated 23 August 2019 under the Wildlife Conservation and Management Act, 2013.

▶ **Governance arrangements** — **Some Concern**

Management faces considerable challenges in such a remote and inhospitable location, with its harsh arid climate, and poor infrastructure and social facilities. The divisions of responsibility are complicated. The national parks are managed by KWS who provide the ranger force that manages security and tourist entry. NMK manages the museum and fossil beds within the parks. NMK is the State Party of Kenya representative that reports to the World Heritage Committee. The gazetted Management Plan 2018-2028

is a joint effort between KWS and NMK, gazetted into law under the Wildlife Conservation and Management Act. KWS and NMK are separate national bodies, each governed by differing legislation, and furthermore complicated in that the World Heritage site spans the jurisdiction of two different devolved county governments, whereas the lake shorelines as a whole fall under three devolved county governments and in the north border Ethiopia. KWS has its own management challenges with more budget cuts resulting from the Covid-19 pandemic, and the Lake Turkana National Parks are considered "dormant" from a revenue generating perspective, and hence will remain a very low priority. These parks urgently need revitalising through the mobilisation of financial and support mechanisms. Public-Private-Partnership (PPP) arrangements are welcomed by the government, with enabling legislation being formulated, and these possibilities should be actively encouraged and supported.

► Integration into local, regional and national planning systems (including sea/landscape connectivity) **Data Deficient**

The Lake Turkana Management Plan 2018-2028 was produced by KWS and NMK, both of which are national bodies representing national interests. But the Plan's Objective 1 is to establish and strengthen "community communication and collaboration mechanisms" (p.123, KWS/NMK. 2019). The Plan's Objective 2 "supports the establishment of community wildlife conservancies" around the Lake Turkana national parks in collaboration with the respective county governments (p.125, KWS/NMK, 2019). But to date, buffer zones and conservancies have yet to be formed in this area, and are to be encouraged as the communities would benefit from the support that this investment would provide.

► Boundaries **Serious Concern**

The Management Plan 2018-2028 recommended clear delineation with "unbreakable" beacons, and where geographically feasible, recommended a road to be cleared along the boundary. According to the nomination documents (WHC online) the boundary of Central Island National Park extends for 1km from the shoreline into the lake, whereas none of the lake waters are included within Sibiloi National Park or South Island National Park. However, the boundaries described in the 2018 to 2028 management plan extend 2 km into the lake from the shorelines of all three national parks. The management plan provides maps of these extended boundaries, and specifies (in Action 1.6, p44) that 'KWS will collaborate (with other agencies) to have 2km of Lake Turkana waters gazetted as protected areas under the Wildlife Conservation and Management Act 2013'. Nevertheless it is problematic in apprehending anyone encroaching into protected areas as it can be disputed and is hard to prove. Each island national park has small sister islands, and without any geo-referenced map being available, members of the public have no idea where the protected areas begin. The Management Plan 2018-2028 recommended visible buoys (KWS/NMK, 2019, p.92). This is challenging as winds can be fierce and the lake can be very choppy, and the buoys are liable to drift, or more likely vandalised and sunk. It is also complicated by the fact that the shoreline is not fixed, varying with the water level fluctuations. Sibiloi NP protects about 13% of the Lake’s shoreline, including some important shoreline habitats. Two out of the lake's three main island clusters are within the World Heritage Site, and these include valuable shoreline habitats and small sister island outcrops much favoured by birds. However, the bulk of the lake’s important biodiversity exists outside the site where there is no special protection status (UNESCO/IUCN, 2012). It is thus doubly vital that the protected areas be protected with an acceptable mechanism agreed with the communities and county governments to police the boundaries. And in the case of the islands, permanent ranger presence on the islands equipped with boats is essential. Ideally all fishing boats would be equipped with GPS equipment, but that will be beyond the means of local fishermen. As constant abuse of the boundaries is likely, it would be preferable to extend the protected areas much further out into the lake. The one positive development that can be reported in 2025 has been the establishment of a privately run rustic tourist camp on South Island which maintains a presence on that island.

► Overlapping international designations **Data Deficient**

None

► Implementation of World Heritage Committee decisions and recommendations **Serious Concern**

The Committee has made various recommendations to the State Party including in relation to developing an operational plan and a monitoring and evaluation system for the Management Plan, updates of planned development projects in the Omo-Turkana Basin and providing an EIA for the Kuraz Sugar Development Project, the Gibe IV (Koysha) dam under construction and the planned Gibe V dam and to reconvene the Joint Technical Experts Committee (JTEC), established under the Ethiopia-Kenya Joint Ministerial Commission, to discuss the development of the Strategic Environmental Assessment (SEA) to assess the cumulative impacts from developments in the Omo-Turkana Basin. Many of these recommendations stem from the 2020 reactive monitoring mission.

Although the State Party has made progress on some points, there remain numerous outstanding issues, especially in the impacts affecting the site from developments in Ethiopia. The Lower Omo's irrigated sugar plantation developments have largely collapsed (Kamski et al., 2023), whilst the Gibe IV (Koysha) dam is incomplete and facing funding difficulties (Addis Insight, 2024). Notwithstanding this, the Omo river continues to be regulated by the Gibe III dam. No time frame to develop a SEA has been provided and the reconvening of the Joint Technical Expert Committee between Ethiopia and Kenya has not occurred. Additionally, there is a need to provide an update on the status of the water level of Lake Turkana, as current records indicate a significant increase with uncertain impacts on aquatic species and park infrastructure. Nevertheless, community engagement and sensitisation meetings have been held. Additional resources, rangers and patrols have been deployed. Education and awareness creation exercises are stated to be a routine activity in the park and outlying areas. Community and illegal herders were removed from the park in 2024, vegetation has recovered, an increase in wildlife grazers has been recorded, a core management system with local communities will be established with clear regulations regarding the use of the site resources, and a total ban on illegal grazing has been issued (State Party of Kenya, 2025).

Details of the results of the above activities should be provided as concerns remain. Still pending are the long term monitoring system, national overarching Master Plan, and buffer zone creation. It is many years since a wildlife census was done. The 2021 National Wildlife Census did not include the Lake Turkana National Parks (KWS, 2021), and the results of the 2024 national wildlife census are not yet available. Anecdotal observations are that the parks are degraded, crocodile numbers are drastically reduced as their nests are raided by fishermen, and along with turtles, crocodiles drown when caught in fishing nets and when snared on baited long lines. Hippo numbers are low and confined to Sibiloi NP, and the Omo and Kerio deltas. Terrestrial animals in general are regrettably drastically reduced due to long term poaching and competition from livestock and their herders, and there are still no buffer zones. Giraffe were last recorded in 1987. Fish poaching is rampant and widespread, and unlikely to reduce, especially on the islands where there is no permanent ranger presence. The museum and exhibits have long been neglected, and at times looted by poachers.

Now that the DSCOR has been adopted, effective implementation and addressing the Committees recommendations will be critical for removal of the property from the WH in Danger list.

► Climate action — Data Deficient

The climate of the site has been characteristically arid for thousands of years. The lake area is dry and hot, with little rainfall that is sparse, and erratic. Modern-day "climate change" records global warming, and in the lake area annual rainfall volumes have been on an increasing trend for decades. However, climate consequences are far out-weighed by land use pressures and by poaching of both wildlife and fisheries. And land degradation and loss of vegetation cover exacerbates the warming and desiccation of land surfaces and leads to erosion. Although at the national level there are various climate-related policies like a national climate strategy and adaptation plan, the extent to which climate change is being addressed at the site level is unclear.

► Management plan and overall management system — Some Concern

The Lake Turkana National Parks Management Plan 2018 - 2028 was gazetted in 2019 and lists many worthwhile objectives. But, little has been achieved to date, albeit impacted by Covid lockdowns, and

tourism numbers are low.

► Law enforcement — Serious Concern

This largely entails anti-poaching which requires vehicle and boat resources and puts rangers in conflict with the communities responsible. Apprehending offenders is difficult as the nearest police stations and law courts are far away on rough roads and ties up rangers and vehicles in order to take offenders to these places. The courts are in Marsabit and Lodwar, which are far away, and KWS staff simply do not have the resources nor logistics to follow this through. They are required to apprehend, accommodate and transport suspects to Marsabit or Lodwar, and thereafter attend court as witnesses. The biodiversity is not adequately protected, and the sites are subject to constant human encroachment. Authorities are hampered prosecuting violations of the law in the park, for several reasons. The land border of Sibiloi NP needs to be rehabilitated, and in the case of illegal fishing, KWS rangers are constantly faced with disputes as there is no visible demarcation of the protected area within the lake. And even if the boundary is demarcated, that zone keeps changing as the lake levels rise and fall, and markers in the form of buoys are liable to be either sunk or cut adrift by poachers. An effective gps-based mechanism to enforce the boundary needs to be agreed with the county administration and communities. The answer to law enforcement lies in community engagement in genuine wildlife conservation roles through the creation and operation of appropriately funded conservancies as buffer zones and with community rangers trained by KWS.

► Sustainable finance — Serious Concern

In 2019, it was reported that the site is significantly under-resourced, with financing for management being provided from KWS general resources (mostly generated from tourism at other parks). That financing situation has not improved since that time, and in 2020 the Covid-19 pandemic resulted in a catastrophic collapse in tourism revenue globally. This situation meant that available government funds were directed to salaries and the flagship national parks. The Management Plan 2018-2028 (KWS/NMK, 2019) does not include any budget estimates for its ambitious implementation programme. Measures to attract external sources of funding support are likely to be needed to save and sustain the property, and PPP initiatives need to be urgently explored.

► Staff capacity, training and development — Serious Concern

Information dating from 2012 indicated that the Lake Turkana National Parks World Heritage site had 40 staff members split between the three national parks (Sibiloi, Central and South Island NPs), the vast majority of which are security personnel. This number was however insufficient to ensure effective management of the entire area especially in more remote areas of the parks (KWS, Consultation, 2013). There was no information on staff training and development, but it had been noted that the staffing situation in the national parks is particularly difficult, with many staff positions remaining unfilled and very high levels of staff turn-over (Mission Report, 2012). The Management Plan 2018-2028 gazetted in 2019 stated there are 40 permanent staff split between two national parks (Sibiloi NP and South Island NP), and that the ideal staff number is 88 permanent personnel (State Party of Kenya, 2020). Central Island NP was not mentioned. Thus the status quo was basically unchanged, with no ranger presence on either of the island national parks. It was previously reported that besides being understaffed, the park management had insufficient vehicles and fuel, and rangers were under-armed and out-numbered compared to poachers and the local populace. That depressing state of affairs will have been exacerbated by the challenges of the Covid period, with considerable investment needed in personnel development and training, vehicles, boats, plant, machinery, offices, telecommunication equipment, and buildings (State Party of Kenya, 2020). The latest State Party Report states that additional resources have been deployed but no further details are provided (State Party of Kenya, 2025). That report also notes that some of the KWS and NMK facilities and buildings have been affected by the high lake levels which is a serious concern.

► Education and interpretation programmes — Serious Concern

The natural resources of the property are threatened, and in terms of alternative livelihoods for the surrounding communities, the low literacy levels and lack of education is the biggest challenge to finding

a solution. A survey by KMFRI published in 2017 encapsulated all these issues (KMFRI, 2017). From 2015 to 2016 KMFRI interviewed 300 respondents around the lake, the first of two objectives being to explore the socio-economic impacts of development projects on Lake Turkana's fisheries and communities (KMFRI, 2017). - 91% of respondents had experienced resource use conflicts, 83% stated that the frequency of conflicts was increasing. - 81% experienced violent conflicts over competition over pasture, 76% over fishing areas. - Only 15% reported violent conflicts over fishing in protected areas. - 82% and 68% respectively of residents in Turkana and Marsabit Counties had no formal education. With a human population growth that is double the national average, the competition for resources is an increasing challenge facing the lake and the property. The current Management Plan 2018-2028 includes a comprehensive community partnership and conservation education programme. The purpose will be "To enhance community support for conservation at the property and promote conservation-sensitive land-uses to improve community livelihoods". The plan overall is ambitious, especially in view of the general lack of funding for KWS and the property itself. The availability of resources needed to carry out this plan are a concern, all of which were compounded by the critical collapse of tourism revenue resulting from the Covid-19 pandemic. This adversely affected all of Kenya's national parks. And as mentioned earlier, the full engagement of the devolved county administrations is vital as they themselves have community wildlife conservation programmes and budgets (Marsabit, Turkana and Samburu Counties). Tourism in general in Kenya has recovered since Covid, but the Lake Turkana National Parks remain remote with low visitor numbers, and are deemed by KWS to be "dormant" insofar as revenue generation (KWS, 2024).

► Tourism and visitation management — Mostly Effective

There are very few visitors to any of the parks due to their remoteness, although remoteness is part of their appeal to the adventure tourist. Central Island can only be reached by boat or helicopter. South Island, likewise, although light aircraft with skilled pilots occasionally land there. Sibiloi is accessible by road, from the lake and by air. The lake can be rough and access by air to the islands can be very hazardous due to strong winds. Boat access can also be challenging depending on lake conditions. The total visitors for Sibiloi NP and Central Island NP during the 1990s averaged about 500 visitors per year to each park (Njuguna, 2001). South Island was not mentioned. The current 2018-2028 Management Plan provides no data on tourism statistics. There is a small museum near the shore at Koobi Fora within Sibiloi NP, and three notable fossils (a giant tortoise, crocodile and elephant) are protected in situ within specially-constructed buildings not far from museum. There are remnants of a petrified forest near Alia Bay, not far from the park HQ. There is a designated camping site with rudimentary facilities on Central Island NP, but no fresh water. No facilities exist on South Island NP apart from a recently created camp operated by a private tourism operator. There are bandas at Alia Bay and Koobi Fora in Sibiloi NP, and there are several designated campsites with rudimentary facilities. In Sibiloi NP there is an adequate network of 4x4 tracks to provide for suitably-equipped visitors. Boats can land on the shores and beaches of all the national parks. The scenic values of the property and its fossil sites clearly present significant opportunities for the development of tourism, but the wildlife experience needs to be improved.

► Sustainable use — Serious Concern

Since the establishment of Sibiloi NP local pastoralists have been allowed grazing rights within the park during periods of drought. Regulation of this access has, however, not been effective and much of the park is used by pastoralists throughout the year (Mission Report, 2012; KWS/NMK, 2019). Likewise, sheep and goats are being taken onto South Island during the dry season. Fishermen are constantly illegally fishing within the national parks using nets and long lines. Available evidence suggests that wildlife populations are declining, and that local community-use of resources is not organized within the framework of an agreed programme for sustainable use. Although there is a new management plan in place, it is very doubtful that KWS / NMK will have the resources to implement the plan. There have been government budget cuts, and this will be exacerbated by the challenges of the Covid-19 pandemic, and the Lake Turkana National Parks will be low on the priority list for allocation of available funds.

► Monitoring — Serious Concern

The lack of data and impact assessments or official monitoring activities have long been a severe problem for the site. There have been sporadic targeted fisheries surveys over the years (Avery et al., 2018) and UNESCO / WFP recently launched "Lake Turkana: First comprehensive survey in 50 years ..." (UNESCO / WFP, 2024). The initial results are not yet published. Furthermore, the impact assessments of significant development projects, such as Gibe III dam, Gibe IV dam, and various plantation development projects irrigated from the Omo River did not sufficiently take into account the cumulative or cross-border environmental impacts (UNESCO World Heritage Centre - IUCN, 2015; Avery et al., 2018). Things have moved on, as the sugar plantations have since collapsed (Kamski, 2023), and the Gibe IV dam construction has run into financial difficulties (Addis Insight, 2024). However, the regulation of the Omo river flows by the Gibe III dam continues, and hence the annual flood characteristics have permanently changed. Lake ecological and water level monitoring data have been published by scientists with interests in the future of the lake, but there are still no recent wildlife counts, and Kenya's national fisheries research institute were unable to provide recent fish catch data with which to assess the impacts of the Gibe III filling. The 2018-2028 Management Plan included neither wildlife nor fisheries statistics. And meanwhile wildlife numbers continued to be seriously impacted by increasing human population pressure, and the associated livestock incursions were competing for the available grazing and forage, and poaching of fisheries a serious concern. The Management Plan 2018-2028 included a plan for a wildlife census, and the baseline survey was scheduled to be done by December 2020 (KWS/NMK, 2019). A national wildlife census was done in 2021 but did not include Sibiloi. The results of the latest national wildlife census in 2024 are not yet available. The State Party of Kenya had earlier mentioned national monitoring plans for Grevy's zebra, lion, hyaena and cheetah, and talked of a preliminary wildlife survey in Sibiloi for which results were stated to be attached to the State Party of Kenya report. But, only a bird survey was attached to that report, and since then a herpetofauna survey of Sibiloi NP was reported in 2023. A biodiversity survey was jointly conducted between KWS, Wildlife Research and Training Institute (WRTI) and NMK in August and September 2024 with support from UNESCO. The report of the survey is being finalised (State Party of Kenya, 2025). The Management Plan presumes that all such monitoring would be carried out in-house.

► Research — Serious Concern

There are no recent wildlife census data, although stakeholder reports suggest significant declines in the populations of key species of endangered fauna, including crocodile. Certain flagship species, such as reticulated giraffe and Grevy’s zebra were reported to have disappeared altogether from the area since the site was listed (State Party of Kenya, 2012). Grant’s gazelle, lions, and plains zebra were reported virtually absent. The national endangered status of Grevy's zebra is confirmed in the 2018-2028 Management Plan (KWS/NMK, 2019), and although mentioned prominently throughout the document, no numerical data were provided for Sibiloi NP. Oryx and gerenuk were reported "near threatened", and "threatened" (ibid., p.10). There were no numerical data for northern topi in Sibiloi NP, and it had been stated to be "only a matter of time" before "near threatened" or "vulnerable" status is reached, but also listed as "threatened" . Northern topi, Burchell's zebra and Grant's gazelle are still to be seen near Park HQ. Lion are nationally classified by IUCN as vulnerable, and are referred to throughout the Management Plan, but with no supporting numeric data provided. With the levels of livestock incursions occurring accompanied by armed herders, any carnivore existing with Sibiloi NP will be increasingly vulnerable. A herpetofauna survey in Sibiloi NP reiterated the same pressures and reported the park threatened by climate change and land use activity (Kirchhoff et al. 2023). The latest state of conservation report states that there have been improvements in the numbers of grazers, and cheetah have been seen (NMK, 2025), but anecdotal observations are not optimistic.

► Effectiveness of management system and governance in addressing threats outside the site — Serious Concern

The main threat to the lake's natural resources include land use pressures due to human population increase and consequent increasing runoff response to rainfall leading to rising lake levels (Avery et al., 2018). The damming of the Omo river has arrested the nutrient flow into the lake and in so doing has interrupted sediment flow which impacts the Omo delta and the lake ecology, and thereby impacting the site's biodiversity values (Avery et al., 2018). In recent years the Kenyan and Ethiopian governments

signed agreements on several initiatives to enhance collaboration in the border-region, and a comprehensive study dated 2019 concluded that "...Mutual gains for both basin countries can be achieved if the basin countries develop an arrangement for water cooperation. Possible transboundary mutual gains between Climate Change (CC), Water Resources Developments (WRD) and Rehabilitation and Adaption Measures (RAM) were identified" (SECCI, 2021).
But there is little progress and the hydropower dam projects are indirectly supported by international donors like IMF and World Bank which favour the economics of the huge hydropower generating capacity (green energy) of these Omo river dams.

Protection and management of the site is severely constrained by its remote location, lack of infrastructure and low levels of funding. The current Management Plan 2018-2028 was gazetted into law in 2019, but the parks' wildlife and other resources decline. Data in the form of SEA and wildlife census is unavailable. In recent years, however, the governments of Ethiopia and Kenya signed a few agreements on mitigating impacts of development initiatives and enhancing cross-border collaboration with, among others, the aim to reduce environmental degradation, but there is no visible progress, a situation compounded by the political situation in Ethiopia.

▶ **Effectiveness of management system and governance in addressing threats inside the site** — **Serious Concern**

A comprehensive management plan has been in place since 2019.

KWS continue to address threats inside the site, but are constrained by resource availability, as these parks are deemed "dormant" insofar as revenue generation (KWS, 2024).

Overall assessment of protection and management — **Serious Concern**

Protection and management of the site is severely constrained by its remote location and the fact that it comprises three separate national parks some distance apart, and connected only by the inhospitable lake waters. The site lacks infrastructure, and has low levels of funding, and existing building infrastructure is affected by the current high lake levels. The two island national parks have no resident ranger presence and hence limited control over encroachments and poaching by fishermen. However, a comprehensive Management Plan 2018-2028 is still in place, and KWS remains committed, but there is little progress. The current KWS Strategic Plan refers to the site as amongst its "dormant" national parks, hence very little tourism revenue is generated. Data in the form of an SEA requested by UNESCO and an up to date wildlife census are unavailable, although a recent biodiversity survey has been done in Sibiloi, and the results are awaited with interest. Whereas the governments of Ethiopia and Kenya have agreements on cross-border collaboration, the recent and ongoing situation in Ethiopia has not been conducive, as epitomised by the collapse of the large-scale irrigated sugar plantation ambitions in Lower Omo, and as also epitomised by the ongoing financial difficulties in the construction of the Gibe IV (Koysha) dam on the Omo river. The important focus is to sustain recent progress reported within the site, and to restore infrastructure damaged by the high lake level, and to implement the management plan's objective to create buffer zones through formation of community conservancies managed by community members and rangers.

State and trend of values

Assessing the current state and trend of values

World Heritage values

▶ **Fossil deposits** — **Low Concern**
Trend:Stable

The fossil deposits at Koobi Fora and other locations are very vulnerable although most excavation sites are re-buried once investigations are completed (Mission Report, 2012). However, some of the fossil beds have been subject to trampling by herders and livestock (KWS/NMK, 2019). The petrified forest and 'special fossil exhibits' (tortoise, crocodile and elephant) appear to suffering neglect.

▶ Complex of geological features

Low Concern
Trend:Deteriorating

The existing geological attributes and geomorphological formations of the Site are unlikely to be altered significantly by development activities in the Lower Omo. The biggest threat is the increasing pressure on remaining pastures and woodland within the Site that will lead to erosion. There is little care for the unique petrified forest with a proliferation of livestock trails forming conduits for stormwater runoff and erosion. Observant tourists will see petrified artefacts washed into the nearby water course by storm water. Those artefacts will in time be washed down the watercourse and reduced to sand and lost forever.

▶ Diversity of terrestrial, aquatic and lakeshore habitats in a semi-desert environment

Low Concern
Trend:Deteriorating

Dampened seasonal fluctuations resulting from the damming the Omo River alter the characteristics of the shoreline. Although the Gibe III dam had been designed with capacity to release compensatory ecological floods, this option was set aside as the flood would damage the downstream intakes of irrigation developments and the ongoing construction of the Gibe IV (Koysha) dam. Hence the dams will impact the lake by dampening its seasonal fluctuations and eliminating the traditional silt deposition and nutrient flushing of the flood plains. The dams arrest the passage of the silt and nutrients that would otherwise feed the Omo delta and lake beyond. There were concerns that abstractions from the Omo river for agriculture deplete water volumes in the Omo River, but this is being offset by the increasing river flow volumes (Avery et al., 2018). Note that the large-scale irrigated agriculture projects have since collapsed (Kamski et al., 2023), but future agriculture plans are not known. Meanwhile, the recent rainfall trend and the more rapid response of runoff to rainfall (a consequence of human land use changes in the catchment) will persist. These catchment land use changes are occurring throughout the Rift Valley in Ethiopia and Kenya, and are a major factor contributing to rising lake levels (Avery, 2018, 2020/24). Furthermore, the salinity of lake waters adjusts as the balance between rate of inflow and evaporation changes, with unpredictable consequences for the lakeshore and aquatic vegetation (and associated ecology).

▶ Diversity and abundance of birds

High Concern
Trend:Data Deficient

The WH Committee previously reported that there are no recent data on trends in the diversity and abundance of birds (World Heritage Committee, 2015). That "no data" status was confirmed in the Bird Monitoring Report dated 2016 that was attached to the State Party of Kenya's 2020 report (NMK, 2020). The Omo-Turkana basin supports over 350 resident and migratory bird species, making it an Important Birdlife and Biodiversity Area (BirdLife International, 2021). Yet only two studies have been published on the lake’s waterbirds (Obiero et al. 2023). The main concerns for birds originate outside the site in the wider Lake Turkana region where ongoing loss of habitat and rangeland degradation are widespread. Vast areas of land in Lower Omo are being converted from national parks and reserves into mono-culture plantations and the Omo delta's ecology is threatened by damming of the river and deprivation of sediments and nutrients (Univ of Oxford, 2012). The Omo delta is a critical lake wetland and bird habitat. The Turkwel and Kerio deltas are likewise liable to be affected by upstream dam and irrigation developments. They are also already invaded by the invasive Prosopis juliflora (ibid.). If the lake level were to fall, the future of the crater lakes within Central Island NP would be threatened, notably the unique Flamingo Lake which is naturally shallow and highly saline (EAWLS, 2014). Concerns have also been expressed about the impact on flying birds of the huge wind farm between Loiyangalani and South Horr (on the edge of the Mt Kulal Biosphere Reserve, and not far from the lake).

▶ Rare and endangered fauna

Critical
Trend:Data Deficient

There are no recent wildlife census data, although stakeholder reports suggest significant declines in the populations of key species of endangered fauna, including crocodile. Certain flagship species, such as reticulated giraffe and Grevy’s zebra were reported to have disappeared altogether from the area since the site was listed (State Party of Kenya, 2012).

The national endangered status of Grevy's zebra is confirmed in the 2018-2028 Management Plan (KWS/NMK, 2019), and although mentioned prominently throughout the document, no numerical data were provided for Sibiloi NP. Oryx and gerenuk were reported "near threatened", and "threatened". There were no numerical data for northern topi in Sibiloi NP, and it had been stated to be "only a matter of time" before "near threatened" or "vulnerable" status is reached, but also listed as "threatened" . Northern topi, Burchell's zebra and Grant's gazelle are still to be seen near Park HQ. Lion are nationally classified by IUCN as vulnerable, and are referred to throughout the Management Plan, but with no supporting numeric data provided. With the levels of livestock incursions occurring accompanied by armed herders, any carnivore existing within Sibiloi NP will be increasingly vulnerable.

Other aquatic animals in the ecoregion include Hippopotamus amphibious, Crocodylus niloticus, and an endemic freshwater turtle, the recently discovered and imperiled Turkana mud turtle (Pelusios broadleyi). Three frog species are endemic to the ecoregion (Bufo chappuisi, B. turkanae and Phrynobatrachus zavattarii). Because many species found in and around the lake are endemic, the ongoing hydrological and environmental changes are likely to threaten their existence, potentially before they are even discovered (Obiero et al. 2023).

▶ Endemic species of fish

High Concern
Trend:Data Deficient

Significantly, even Ethiopia's Omo-Gibe Integrated Development Master Plan in 1996 commented ".... the lake is reportedly already over-fished and reductions in yield are likely no matter what developments take place in the Omo-Gibe Basin" (researched by Univ of Oxford, Section 2.2.6, 2012; OGBMP, 1996). That Master Plan further stated in 1996 that "....in the international context a bilateral agreement should be reached between the two countries before either country changes the natural flow of the river" (ibid). Years later today when Gibe III had been commissioned and Gibe IV (Koysha) dam's construction is 66% complete, that agreement is still not in place. The state of conservation report for 2024 states that efforts to engage the State party of Ethiopia have not been successful (State Party of Kenya, 2024).

A Kenyan socio-economic survey carried out between 2015 and 2016 reported that the majority of fisher folk on Lake Turkana were expecting the damming of the Omo River and the irrigation plantations to significantly affect flows and affect water levels (KMFRI, 2017). The survey was conducted whilst the lake level was falling during the Gibe III filling period. 76% of respondents were already citing competition over fishing areas as a cause of violent conflict. Over 90% had experienced resource conflicts and over 80% stated these conflicts were increasing.

A progression of scientific studies have pointed out the threats to Lake Turkana's fisheries. The importance of the natural annual Omo flood to the lake ecology and fisheries was first established by the Lake Turkana Project 1972-75, followed shortly by the Lake Turkana Limnological Study 1985-88. And in 1992, Kenya's National Water Master Plan warned that increased water consumption in the Omo basin would lead to concentration of dissolved matter in the lake water, and that if this reached the point where fauna and flora cannot survive, the existing fishery and crocodile population would collapse (AfDB, 2009 & 2010; Univ of Oxford, 2012; JICA/NWMP, 1992). Others have since either reiterated or confirmed those warnings (Kolding, AfDB, EIB, Ojwang et al. 2018, KMFRI, Muska et al. 2016, Gownaris et al., 2012 etc). A recent scientific study has confirmed the changes to the hydrological diversity of lake inflows due to the lower Omo developments, with a knock-on effect expected on ecological diversity (JGLR, 2018). Another recent study based on remote sensing has predicted a decline in primary production in the lake as a result of the Lower Omo and dam and irrigation developments (RRA, 2019). These results simply

confirm all the warnings over the decades.

Summary of the Values

▶ **Assessment of the current state and trend of World Heritage values**

High Concern
Trend: Deteriorating

Although the site retains its value as one of the world's most important fossil sites, its aquatic biodiversity remains under pressure from distant development activities in Ethiopia, but in particular from local human population increase and associated over-grazing, illegal fishing, and wildlife poaching. Upstream sugar irrigation projects in the Lower Omo basin in Ethiopia have largely collapsed and the recent wet years have meant that the lake levels have increased significantly, reaching a level last witnessed in the early 1900s. The lake's hydrological cycles have changed as predicted, and there is already evidence of biodiversity loss in the Omo delta, and total regulation of the Omo river flows will be achieved once the construction of the massive Gibe IV (Koysha) dam is complete. This Koysha project is 66% complete, having been delayed by financing difficulties. Although there is little monitoring of the area's biodiversity and resources, there is no evidence to change earlier local reports that prominent wildlife species are in decline, with several species having become locally extirpated as a result of poaching as well as encroachment by livestock and the local populace since the site was inscribed.

Additional information

Benefits

Understanding Benefits

▶ **Fishing areas and conservation of fish stocks**

Fishing is an important livelihood to lakeshore residents.

Factors negatively affecting provision of this benefit :
- Climate change Impact level - Moderate, Trend - Continuing
- Overexploitation Impact level - High, Trend - Continuing
- Invasive species Impact level - Moderate, Trend - Continuing
- Habitat change Impact level - Moderate, Trend - Increasing

Prosopis juliflora is overwhelming the river deltas (Univ. of Oxford, 2012). It is also clogging the shores of Ferguson's Gulf in the vicinity of Kalokol.

▶ **History and tradition**

There are important archaeological sites on both the western and eastern shores of the lake.

Factors negatively affecting provision of this benefit :
- Climate change Impact level - Low, Trend - Continuing
- Invasive species Impact level - Low, Trend - Continuing
- Habitat change Impact level - Low, Trend - Continuing

Data deficient, but with the ever increasing pressure for pasture, these areas are being encroached upon and trampled by livestock and their herders.

▶ **Natural beauty and scenery**

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Factors negatively affecting provision of this benefit :
- Climate change Impact level - Low, Trend - Continuing

- Overexploitation Impact level - Moderate, Trend - Increasing
- Invasive species Impact level - Low, Trend - Continuing
- Habitat change Impact level - Moderate, Trend - Increasing

The main consideration is increasing human population, and constant encroachment into protected areas, which degrades the natural landscape. Whereas one used to see plentiful wildlife, nowadays one is more likely to see livestock instead, but even livestock are suffering due to over-grazing and increasing pressure on natural resources whose degradation is resulting in declining rangeland productivity.

► Importance for research

The western and eastern shores of the lake include important sites for archaeological research and especially within the Sibiloi National Park on the northeastern shore (SoOUV, 2012). This mainly benefits people from outside the community, and local people in the vicinity of Sibiloi claim they derive no direct benefit, they never see the outcome of the research, and none of their community is being educated in this research discipline (KWS/NMK, 2019). Similar complaints about job creation are routinely targeted by NGOs at the oil exploration industry. Expectations are generally unrealistic, as specialist skills take many years to acquire, and tend to be short-term inputs. The local skills base is predominantly pastoralism, literacy levels are low, the development of alternative livelihood skills being hampered by lack of education, this being a challenge facing county governments.

The Management Plan states the following: "In view of the fact that research carried out in the LTNPs potentially comprises anthropological, geological, paleontological, archaeological and ecological disciplines, it is imperative that the core team is led by, or composed of NMK and KWS staff. Under this management programme, NMK will seek research collaboration with other stakeholders to maintain a robust research presence in the LTNPs" (KWS/NMK, 2019).

Factors negatively affecting provision of this benefit :
- Climate change Impact level - Low, Trend - Continuing
- Overexploitation Impact level - Moderate, Trend - Continuing
- Invasive species Impact level - Low, Trend - Continuing
- Habitat change Impact level - Low, Trend - Continuing

► Collection of wild plants and mushrooms

Data deficient.

► Livestock grazing areas

Livestock forms an important livelihood for the local population around Lake Turkana (UN Country teams of Ethiopia and Kenya and IGAD, sd).

Factors negatively affecting provision of this benefit :
- Climate change Impact level - Low, Trend - Continuing
- Overexploitation Impact level - High, Trend - Continuing
- Invasive species Impact level - Low, Trend - Continuing
- Habitat change Impact level - High, Trend - Continuing

Livestock encroachment into protected areas is now near constant, whereas it had been intended to serve as a drought refuge only. The rising numbers of pastoralists cannot rely on livestock livelihoods due to increasing human population, land degradation, and ongoing land adjudication in the northern rangelands as a whole. Another recent competing factor is the periodic emergence of locusts. Locusts tend to favour degraded landscapes for breeding .

► Cultural identity and sense of belonging

The Management Plan objectives include establishing a cultural and natural heritage outreach programme as part of local education curriculum (KWS/NMK, 2019, p.84). The Covid period upset plans throughout the world and Kenya and no progress has been reported.

► Water provision (importance for water quantity and quality)

The water of the main lake is 2.5 times more saline than the normal maximum limit of drinking water and contains excessively high fluoride concentration and therefore unsuitable for drinking and irrigation (Avery, 2010, 2012; Avery et al., 2018). The lake wetlands also include small lakes of varying salinity, notably three lakes on Central Island NP. The various lake waters support a diversity of freshwater fish species, hippo, birds, insects, reptiles including crocodile, turtles, snakes (Wetland Encyclopaedia, Ojwang et al., 2016). Where suitable muddy substrate exists, the lake also supports beds of submerged aquatic macrophytes (Potamogeton pectinatus) and shoreline grasses (UNEP-WCMC, 2012). The lake is part of the Turkana jet, a source of wind energy that induces lake currents and mixing, and the 20 km3 of annual evaporation contributes to the micro-climate within this desert area (Ferguson & Harbott, 1982; Avery et al., 2018). The lake wetlands include deltas where the Omo, Kerio and Turkwel basins discharge to the lake (EAWLS, 2012 & 2014).

Factors negatively affecting provision of this benefit :
- Climate change Impact level - Low, Trend - Continuing
- Pollution Impact level - Low, Trend - Continuing
- Overexploitation Impact level - Very High, Trend - Continuing
- Invasive species Impact level - Moderate, Trend - Continuing
- Habitat change Impact level - High, Trend - Continuing

The main challenges are escalating human population and associated land use pressures and development-induced changes to the freshwater inflow hydrological diversity (quantity, quality, variability), this being the lake's principal ecological driver (Kolding; AfDB, 2009; Univ of Oxford, 2012; Wetland Encyclopaedia, Ojwang et al., 2016; Avery et al., 2018; RRA, 2019).

► Collection of timber, e.g. fuelwood

Trees are reportedly taken from within the protected area for fuelwood and charcoal (UNEP-WCMC, 2012), and are cut to provide stockade material for livestock enclosures (KWS/NMK, 2019).

Factors negatively affecting provision of this benefit :
- Climate change Impact level - Low, Trend - Continuing
- Pollution Impact level - Low, Trend - Continuing
- Overexploitation Impact level - Very High, Trend - Continuing
- Invasive species Impact level - Low, Trend - Continuing
- Habitat change Impact level - High, Trend - Continuing

► Outdoor recreation and tourism

Potential as tourist sites but impacted by Covid and yet to be developed to full potential and currently deemed by KWS to be amongst Kenya's "dormant" national parks. Livestock encroachment must be addressed & reduced to preserve habitat and restore wildlife numbers, and poaching of fisheries must be addressed as crocodile and turtles drown when captured by nets and baited long lines.

Factors negatively affecting provision of this benefit :
- Climate change Impact level - Low, Trend - Continuing
- Overexploitation Impact level - Very High, Trend - Continuing
- Invasive species Impact level - Low, Trend - Continuing
- Habitat change Impact level - Moderate, Trend - Continuing

► Contribution to education

The Management Plan 2018-2028 objectives include establishing and equipping educational facilities in the parks, especially in Sibiloi National Park, Kalokol, Loiyangalani and Illeret; establishing a cultural and natural heritage outreach programme as part of local education curriculum; promoting environmental education through awareness campaigns using schools, local barazas, women groups and work- shops (KWS/NMK, 2019).

Factors negatively affecting provision of this benefit :
- Overexploitation Impact level - Low, Trend - Continuing
- Habitat change Impact level - Low, Trend - Continuing

Summary of benefits

The flora and fauna of Lake Turkana National Parks are accessible by the local population and comprise important and diverse natural habitats that include landscape diversity, fish, bird, insect and wildlife stocks, wood, fodder for livestock, and wild plants for medicinal use. The Site has historical, recreational and cultural value, and provides natural beauty for tourism and educational and research benefits. Due to a lack of data and poor access, not all the benefits or their extent can be quantified, but the lake is a vast water body that contributes to the micro-climate of a desert area, its strong winds and incoming solar radiation are sources of energy, and the water body forms a physical divide between different ethnic communities.

Projects

Compilation of active conservation projects

№	Organization	Brief description of Active Projects	Website
1	Friends of Lake Turkana	Friends of Lake Turkana is a Kenyan organization whose objective is to strengthen natural resource management in the Lake Turkana Basin. The organisation has engaged stakeholders from Lake Turkana basin in dialogue about the current status of oil exploration and production, dam construction and other major infrastructural development in the region and the implication of these initiatives on the land rights, environment and culture of the people.	http://www.friendsoflaketurkana.org/
2	Save Lake Turkana Movement	A Kenyan youth-driven organization that raises awareness about Lake Turkana https://www.youtube.com/watch?v=AVskqANY8FE&feature=youtu.be	savelaketurkana@gmail.com
3	National Museums of Kenya (NMK)	Fossil and anthropological research	https://www.museums.or.ke
4	Kenya Wildlife Service (KWS)	Wildlife conservation and management	https://kws.go.ke
5	Kenya Marine and Fisheries Research Institute (KMFRI), UNESCO, World Food Programme (WFP)	A national research institution with an office in Kalokol whose mandate encompasses the whole lake fisheries	https://www.kmfri.co.ke
6	Turkana Basin Institute (TBI)	Supporting research and exploration in the Lake Turkana Basin of Northern Kenya	https://www.turkanabasin.org

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