IUCN Conservation Outlook Assessment 2014 **(archived)**
Finalised on 10 July 2014

Please note: this is an archived Conservation Outlook Assessment for Kenya Lake System in the Great Rift Valley. To access the most up-to-date Conservation Outlook Assessment for this site, please visit https://www.worldheritageoutlook.iucn.org.

Kenya Lake System in the Great Rift Valley

SITE INFORMATION

Country:
Kenya
Inscribed in: 2011
Criteria:
(vii) (ix) (x)

Site description:
The Kenya Lake System in the Great Rift Valley , a natural property of outstanding beauty, comprises three inter-linked relatively shallow lakes (Lake Bogoria, Lake Nakuru and Lake Elementaita) in the Rift Valley Province of Kenya and covers a total area of 32,034 hectares. The property is home to 13 globally threatened bird species and some of the highest bird diversities in the world. It is the single most important foraging site for the lesser flamingo anywhere, and a major nesting and breeding ground for great white pelicans. The property features sizeable mammal populations, including black rhino, Rothschild's giraffe, greater kudu, lion, cheetah and wild dogs and is valuable for the study of ecological processes of major importance. © UNESCO

SUMMARY

2014 Conservation Outlook

Good with some concerns

The three lakes which make up the Kenya Lake System World Heritage site are subject to pronounced and unpredictable fluctuations in rainfall, water levels and alkalinity – factors which determine the movements of flamingoes and other birds between these lakes, and others beyond. Waterbird counts over the past 20 years suggest that bird populations are stable, but there are uncertainties over the future of the lakes as the catchment areas come under progressively more intensive land use and increasingly large volumes of water are used upstream. Management within the three reserves is well-planned and adequately resourced, but there is uncertainty over the extent to which land degradation, deforestation and upstream water use are being curbed in the lake catchment areas (which are experiencing high rates of population growth and development pressure).

Current state and trend of VALUES

Low Concern
Trend: Stable

The three lakes that make up the Kenya Lakes System World Heritage site are all subject to quite drastic fluctuations in water levels and associated ecological parameters, and it is these episodic fluctuations that drive the unpredictable mass movements of flamingoes and other birds. Bird counts have been carried out since 1991 and suggest overall stability in bird populations, but the annual and seasonal variability in these counts is so pronounced that only major changes in numbers could be detected. The deforestation and degradation of land in each of the lake’s catchment areas, and upstream use of water indicate a trend towards lower average lake levels, which would impact negatively on the scenic values of the lakes and their productivity. Mammal populations are growing quite strongly, especially in Lake Nakuru National Park where carrying capacity limits for some key species are being reached or even exceeded.

Overall THREATS

High Threat

The most important threats relate to the sustained supply of water to the lakes which is threatened by deforestation and degradation of the catchment areas, and by upstream water abstraction. The massive population of lesser flamingoes and other birds depend on a network of at least ten ‘flamingo lakes’, so any significant ecological change in any of the other lakes (in Kenya, Tanzania and Ethiopia) could have a devastating impact on the entire system. Water pollution is a significant threat, and there are minor issues related to tourism pressures, small-scale mineral extraction and invasive alien species. Potential future threats may arise from geothermal energy development, climate change, infrastructure development projects and oil exploration activities.

Overall PROTECTION and MANAGEMENT

Mostly Effective

There is little information on the effectiveness of current management in addressing threats to the property, but it was considered adequate at the time the nomination was evaluated in 2010 (IUCN, 2011). Management within the three reserves is well-planned and adequately resourced, but there is uncertainty over the extent to which land degradation, deforestation and upstream water use are being curbed in the lake catchment areas (which are experiencing high rates of population growth and development pressures).

FULL ASSESSMENT

Description of values

Values

World Heritage values

► **Outstanding natural beauty**
Criterion:(vii)

The three lakes, each with its own characteristic features, are areas of outstanding natural beauty. Flanked by the towering walls of the Great Rift escarpments, they nestle in the valley floor, their open waters set against the thorn-tree savannas, forests and marshes that surround them. The landscape is punctuated by volcanic cones, hot springs and gushing geysers. Massive congregations of flamingoes and other birds and a diverse array of large mammals inhabit the area, creating an unmatched experience of raw nature, truly one of the great wonders of the natural world (SoOUV, 2011).

► **Exceptional geo-morphological features of the Great Rift Valley**
Criterion:(viii)

Africa’s Great Rift Valley is one of the world’s most distinctive geo-morphological features, cutting through the continent from the Red Sea to southern Mozambique along two parallel fault lines. The Kenya Lake System includes a representative sample of some of its main geo-morphological features, including the three alkaline lakes, parts of the rift escarpment, and a range of volcanic features and associated geothermal manifestations (geysers, fumeroles and hot springs) (SoOUV, 2011).

► **Extraordinary soda lake ecosystem processes and trophic dynamics**
Criterion:(ix)

The three lakes are generally shallow, alkaline lakes with relatively small catchments and no surface outlets. Straddling the equator at altitudes of around 1,500m they are subject to high rates of evaporation and marked fluctuations in water levels. The alkaline lake waters support a prolific growth of green algae (Spirulina platensis), the main food of the itinerant Rift Valley population of lesser flamingoes (IUCN, 2011). The alkaline Rift Valley lakes are among the world's most productive ecosystems and, although these harsh environments are relatively species-poor, they feed extraordinary numbers of birds. They provide important insights into our understanding of trophic dynamics and ecosystem processes.

► Exceptionally diverse bird fauna, including rare and endangered species

Criterion:(x)

All three lakes are recognized as Important Bird Areas (Birdlife, 2012a,b,c) and listed as Ramsar Sites, on account of the numbers and diversity of birds, including many rare and endangered species. Records indicate as many as 480 bird species at Lake Nakuru, 450 species at Lake Elementeita and 370 species at Lake Bogoria (IUCN, 2011). These include 13 globally-threatened and 8 regionally-threatened species (UNEP-WCMC, 2012). Lake Elementeita supports the region's main breeding colony of Great White Pelicans (8,000 pairs) and there are globally important populations of Black-necked Grebe, African Spoonbill, Avocet, Little Grebe, Yellow-billed Stork, Black-winged Stilt, Grey-headed Gull and Gull-billed Tern (IUCN, 2011)

► World's largest congregations of lesser flamingoes

Criterion:(x)

Congregations of more than 1.5 million Lesser Flamingoes have been counted at Lakes Nakuru and Bogoria, as they move between the ten 'Flamingo Lakes' of East Africa. Such congregations are globally unique and constitute one of the world's most spectacular wildlife phenomena (SoOUV, 2011)

► Crucial flyway for bird migration

Criterion:(x)

The Great Rift Valley is of global significance as a migratory corridor for 500 million birds of 350 species which pass through the area en route between their summer breeding grounds in Eurasia and over-wintering sites in southern Africa (IUCN, 2011). The lakes serve as over-wintering sites for large numbers of Palearctic waders as well as being an important stop-over for birds on passage (Birdlife, 2012a)

▶ **Diverse assemblage of mammals, including rare and endangered species**
Criterion:(x)

The lake shore habitats, particularly those of Lake Nakuru National Park, support a diverse assemblage of large mammals, including important populations of endangered species such as black (and southern white) rhino, Rothschild’s giraffe, lion, cheetah and leopard (KWS, 2003)

Assessment information

Threats

Current Threats
High Threat

The most significant current threats are related to developments outside the property affecting the sustained inflow of water to the lakes. All three catchments have been subject to rapid intensification of land use over the past few decades and pressures continue to mount. Upstream abstraction of water for irrigation as well as deforestation and over-grazing are affecting the quality and quantity of the inflowing waters and may be affecting long-term lake levels. This in turn is likely to impact the ability of the lakes to sustain current populations of flamingoes and other birds. The lakes are small and ecologically isolated and the populations of birds they support are shared with at least seven other ‘flamingo lakes’ in the eastern Rift Valley which could come under

threat from external factors.

► Hyper-Abundant Species

Low Threat
Inside site

Lake Nakuru National Park is entirely surrounded by a 74-km electric fence that prevents animal dispersal, and has allowed large mammal populations to increase to a level where serious ecological imbalances are becoming apparent. For example, giraffe (now a population of 170 individuals, bred from 16 individuals that were re-introduced from western Kenya; KWS, 2002) are beginning to destroy the Acacia woodland by debarking the trees excessively (Birdlife, 2012a).

► Livestock Farming / Grazing

Low Threat

There are concerns about livestock grazing at Lakes Bogoria and Elementeita, where cattle and goats graze along the lakeshore habitats, causing increased rates of erosion, run-off and siltation (Birdlife, 2012c; pers. obs.; LBNR Committee, 2007)

► Mining/ Quarrying

Very Low Threat
Inside site
Outside site

Small-scale extraction of soda and sand on the eastern shores of Lake Elementeita is not a major threat, but any expansion of these operations could have a significant impact on the site (Birdlife, 2012c)

► Erosion and Siltation/ Deposition

High Threat
Inside site
Outside site

The catchment areas of the three lakes are relatively small (930 km2, 1,800 km2 and 630 km2 for Lakes Bogoria, Nakuru and Elementeita respectively), and subject to rapid deforestation, over-grazing and expansion of agriculture (IUCN, 2011). Forest cover in Lake Nakuru’s catchment was reduced from

47% in 1970 to just 26% in 1986 (IUCN, 2011), and nearly half the catchment is now under cultivation (Birdlife, 2012a). These land-use changes are resulting in increased soil erosion, run-off and siltation.

► Dams/ Water Management or Use

Very High Threat
Inside site
Outside site

Small irrigation dams have been constructed on rivers flowing into the lakes and river flows have reduced markedly (IUCN , 2012). At Lake Elementeita there is currently little water flowing into the lake because ‘farmers use most of the water for irrigation upstream (GLECA, 2010). Given the rate of population increase and intensification of land use in the area, this trend seems likely to accelerate, unless deliberate steps are taken to curb water abstraction.

► Water Pollution

High Threat
Inside site
Outside site

Pollution of the lakes’ water is a problem, especially affecting inflows from the growing agricultural and industrial town of Nakuru (population 500,000). Until recently, treatment of wastewater entering the lake from the town was inadequate (Birdlife, 2012a), but the municipality is now taking measures to reduce this threat and an expanded sewage treatment works has been commissioned (IUCN, 2011). In the wider catchments, intensification of agriculture and increased use of fertilizers may be increasing the nutrient load of inflowing waters and could lead to eutrophication.

► Tourism/ Recreation Areas

Low Threat
Inside site
Outside site

Lake Nakuru National Park attracts 300,000 visitors annually, and this is creating some pressures related to off-road driving, over-crowding and waste management. Lake Nakuru is one of Kenya’s most popular tourist destinations, and management of tourism impacts is generally good (IUCN,

2011). At present tourism exerts little pressure on either of the other two lakes and is a force for their conservation (Birdlife, 2012c)

► Other Ecosystem Modifications

High Threat

The three lakes are quite small (40 km2, 38 km2 and 25km2 for Lakes Nakuru, Bogoria and Elementeita respectively) and although the property includes surrounding lakeshore habitats (totaling 217km2), the three areas are isolated from one another. The primary functional linkages between them are associated with their shared role in supporting the lesser flamingo and other bird populations. The terrestrial components of the three lakes are not large enough to support viable populations of many species that would naturally occur in the area.

► Other

Data Deficient

The lesser flamingoes and other birds move great distances between the ten ‘flamingo lakes’ of the eastern Rift, and beyond, so are vulnerable to ecological changes or pollution of any of the other lakes. There is already a major soda factory on Lake Magadi, and a similar development has been mooted for Lake Natron (which serves, critically, as the main breeding site for lesser flamingoes).

► Invasive Non-Native/ Alien Species

Data Deficient
Inside site
Outside site

There is little available information on the occurrence of invasive alien species, but the management plan for Lake Bogoria recognizes that the reserve is suffering a ‘proliferation of invasive species’ (LBNR Committee, 2007). It is noteworthy that the ecology and trophic dynamics of Lake Nakuru has been fundamentally altered as a result of the introduction of the suitably-adapted cichlid fish, (Oreochromis alcalicus grahami) from another of the alkaline soda lakes, Lake Magadi. Prior to this introduction there were no fish in the highly alkaline waters of Lake Nakuru, and its introduction now supports a diversity of piscivorous birds that were not there previously

(including the pelicans which nest at Lake Elementeita) (KWS, 2003).

► Housing/ Urban Areas

High Threat
Outside site

Housing developments had started in part of Ututu Conservancy to the South of Lake Elementaita, and within a critical buffer zone, without any Environmental Impact Assessment having been undertaken. In December 2012, the National Environment Management Authority issued an Environmental Restoration Order to the developer, but progress has been slow in addressing the situation. A 1-year moratorium on development of new facilities in the riparian area of the lake was expected to be put in place by 30 March 2014 (State Party report, 2014; SOC report 2014).

Potential Threats

Data Deficient

Four potential threats are (1) geothermal energy development, (2) climate change, (3) infrastructure development around the lakes and (4) oil and gas exploration activities. Although there are no specific immediate threats in any of the latter three categories, and their potential impact is unknown, they deserve recognition. The planned development of geothermal power plants in the vicinity of the property, including at Lake Bogoria, is a more immediate potential threat, with their completion anticipated by 2017.

► Storms/Flooding, Temperature changes

Data Deficient
Inside site
Outside site

Whilst the property has demonstrated extreme resilience to fluctuations in climate and water levels, the possible future impacts of climate change are unpredictable (IUCN, 2012)

► Commercial/ Industrial Areas

Data Deficient

Outside site

The lakes lie astride the main ‘transport and infrastructure corridor’ between the port of Mombasa and countries to the north-west (Uganda, Rwanda, Sudan and DRC). As this corridor develops further, and branches to the north and south are developed, it is likely to further disrupt landscape connectivity, particularly for large mammals. A particular concern is that any mis-placed power transmission lines could kill large birds on passage, and/or flamingoes as they move between the lakes.

► Oil/ Gas exploration/development

Data Deficient
Outside site

Although there is no oil or gas exploration activity presently underway within the property, there have been major recent oil discoveries in other parts of the Rift Valley, including the Lake Turkana Basin, less than 200km to the north of L. Bogoria. These finds are stimulating further exploration activity elsewhere in the Rift Valley and part of the property (at Lake Bogoria) is included within an oil exploration concession (Tullow Oil Concession Map, 2011)

► Renewable Energy

High Threat
Inside site
Outside site

There are plans for the development of geothermal energy in the Bogoria-Silali block, including Lake Bogoria, with eight 100 MW power plants projected to be completed by 2017 (SOC report, 2014). The exact location of the proposed power plants, and their current status in the planning process, are unknown.

Protection and management

Assessing Protection and Management

► Relationships with local people

Mostly Effective

Local stakeholders are involved at a number of levels, with broad representation on the management committees of each site (GOK, 2010). Wildlife-human conflict around Lake Nakuru National Park (LNNP) has been minimized through the erection of a game-proof electric fence, which has gone a long way towards resolving past conflicts and improving relationships with local people. To further enhance support for the park, LNNP supports social and enterprise projects and community conservation committees in neighbouring communities (KWS, 2002).

► Integration into regional and national planning systems

Some Concern

There are no formal mechanisms for regional co-ordination between the Kenyan, Tanzanian and Ethiopian authorities responsible for management of the ten ‘flamingo lakes’ of the eastern Rift Valley. There is a National Steering Committee for the Kenya Lakes System, chaired by the Director of KWS that supervises the three site management committees. It meets three times a year (GOK, 2010).

► Management system

Mostly Effective

Each site has a management plan which describes the management and monitoring procedures to be carried out on a catchment-wide basis by a wide range of stakeholders. In each case, there is a multi-stakeholder committee which meets on a regular basis to co-ordinate management. Three separate plans cover the periods 2002-12, 2007-12 and 2010-20 for LNNP (KWS, 2002), LBNR (LBNR Committee, 2007) and the Greater Lake Elementeita Conservation Area (GLECA, 2010) respectively. In each case the plan area is zoned for particular uses and management interventions, with the GLECA area (for example) divided into a Core Zone (coinciding with the area designated as World Heritage) covering the lake and its islands and shoreline, with adjacent areas designated as Buffer, Riverine and Controlled Development Zones (GLECA, 2010). At Lake Bogoria, the terrestrial part of the LBNR is divided between designated zones for ‘grazing’, ‘wilderness’ and

'natural preservation areas' (LBNR Committee, 2007).

► Sustainable finance

Mostly Effective

Management of the property is financed through budget allocations made by KWS and the Baringo County Government which manage LBNR. In 2007/8, these allocations amounted to about US$ 450,000 for LNNP and US$ 200,000 for LBNR (KWS, 2002). These amounts are financed indirectly from gate entry fees and other tourism-related revenues (lodge concession fees, camping and guide fees etc) that are generated across the national parks system, pooled and allocated according to perceived needs and priorities. LNNP is one of the most popular wildlife destinations in the country and generates a substantial profit that is used to cross-subsidize other less profitable parks and operations elsewhere in Kenya.

► Education and interpretation programs

Mostly Effective

There are environmental education centres, used extensively by local schools, at LNNP and LBNR (UNEP-WCMC, 2012). LNNP operates an ambitious schools outreach programme which involves hosting school parties at the park and disseminating environmental education materials (KWS, 2002).

► Tourism and interpretation

Mostly Effective

The Kenya Lakes System attracts a large number of national and international visitors, averaging about 400,000 annually (2005-7, GOK, 2010), of whom about 155,000 (40%) are foreign non-residents. Most of these visitors go to LNNP, which has three high-end tourist lodges, nine campsites, two hostels, an airstrip, an education centre and other tourist facilities (UNEP-WCMC, 2012). At the other two lakes, most tourist facilities are located outside the reserves.

► Monitoring

Mostly Effective

Waterbird counts have been conducted at all three sites (and other Kenyan

wetlands) twice each year since 1991 (UNEP-WCMC, 2012). There is a wide-ranging monitoring programme at LNNP which includes automatic flow detectors on all the inflowing rivers, as well as regular monitoring of water quality and weather. Mammal counts and vegetation transects are also conducted on a regular basis to determine whether carrying capacity limits are being reached (KWS, 2002).

► Implementation of Committee decisions and recommendations

Data Deficient

The property was listed in 2011 at which time the SP was encouraged to (1) strengthen the legal status and on-the-ground management of Lake Elementeita, (2) enhance the functional linkages between the three components of the site through the establishment of wildlife corridors and (3) curb deforestation in the catchment areas especially the Mau escarpment that serves Lake Nakuru (UNESCO, 2011). There is no recent information on the extent of implementation of these recommendations.

► Staff training and development

Mostly Effective

At the time of nomination, there were about 170 KWS staff at LNNP, 40 staff at LBNR and no full-time staff at Lake Elementeita (IUCN, 2011). Members of staff are generally well-trained as KWS has its own training institute at Naivasha and a Law Enforcement Academy located in Tsavo West National Park. (UNEP-WCMC, 2012).

► Sustainable use

Some Concern

The principal form of consumptive resource use within the property is livestock grazing, which affects the shores of Lakes Elementeita and Bogoria. There are no clearly defined strategies to regulate grazing within the reserves, which has been practiced since before these two areas became protected areas (LBNR Committee, 2007; GLECA, 2010). A small portion (<10%) of the LBNR is designated as a grazing area, but in practice grazing seems to be much more widespread (LBNR Committee, 2007; pers.obs.)

► Research

Data Deficient

The LNNP management plan proposes the establishment of a research committee to co-ordinate research programmes throughout the park's catchment area (KWS, 2002). Nine broad research topics are identified for priority attention including important issues such as hydrology, park carrying capacity, flamingo mortality etc (KWS, 2002). The Soysambu Wildlife Conservancy (part of the buffer zone around Lake Elementeita) plans to establish a research centre within the conservancy (UNEP-WCMC, 2012).

► Legal framework and enforcement

Mostly Effective

Each of the three component sites is wholly owned by the Government of Kenya and managed according to different legal and institutional arrangements (GOK, 2010). Lake Nakuru is a National Park, managed by Kenya Wildlife Service (KWS), while Lake Bogoria is designated as a National Reserve and managed by the Baringo County Government. Lake Elementeita is a National Wildlife Sanctuary, managed by KWS, with its surrounding lands (outside the property) under private ownership and managed as a Wildlife Conservancy. The Wildlife Conservation and Management (Amendment) Act of 1989 provides the legal basis for management of all components of the property, but they also benefit from a number of other pieces of legislation that serve to strengthen the provisions for catchment protection, including the Environmental Management and Co-ordination Act (1999), Water Act (2002) and Forest Act (2005)

► Management effectiveness

Mostly Effective

Management within the boundaries of the property is generally well-resourced and quite effective, sufficient to satisfy the requirements set out in the Operational Guidelines (IUCN, 2011). There are about 170 staff at LNNP and 40 at LBNR, together with necessary management infrastructure, vehicles and equipment. Management at Lake Elementeita falls under KWS staff from Naivasha (some distance away), and depends to a large extent on the involvement of conservation-oriented landowners from the surrounding

'buffer zone' (IUCN, 2011).

▶ Boundaries

Some Concern

Two of the three lakes lie within protected areas that include significant areas of terrestrial habitats, serving as 'buffer zones' for the water bodies they surround. The third (Lake Elementeita) borders onto the privately-owned Soysambu Wildlife Conservancy, which has been designated as a Buffer Zone (outside the World Heritage property). Each site is demarcated on the ground with concrete beacons or fences, and Lake Nakuru is completely enclosed by a 74-km electric game-proof fence (Birdlife, 2012a). It would be beneficial to restore landscape connectivity and ecological resilience by establishing a wildlife corridor between Lake Elementeita and Lake Nakuru National Park, something that has now been agreed in principle (IUCN, 2011)

Overall assessment of protection and management

Mostly Effective

There is little information on the effectiveness of current management in addressing threats to the property, but it was considered adequate at the time the nomination was evaluated in 2010 (IUCN, 2011). Management within the three reserves is well-planned and adequately resourced, but there is uncertainty over the extent to which land degradation, deforestation and upstream water use are being curbed in the lake catchment areas (which are experiencing high rates of population growth and development pressures).

▶ Assessment of the effectiveness of protection and management in addressing threats outside the site

Data Deficient

The management plans for each site provide for integrated catchment-wide strategies for dealing with issues that affect the quality and quantity of water flowing into the lakes, but there is little information on the effectiveness of implementing these strategies. While there have been reported improvements in the management of sewage and reduction of pollution from Nakuru municipality (IUCN, 2011), there is reported to be little water flowing into Lake Elmenteita from its three main rivers 'because farmers use most of

the water for irrigation upstream' (GLECA, 2010).

State and trend of values

Assessing the current state and trend of values

World Heritage values

▶ **Outstanding natural beauty**

Low Concern
Trend:Deteriorating

The natural beauty of the lakes is protected within the context of the surrounding shoreline habitats by national park and reserve status at Lakes Nakuru and Bogoria. The shoreline habitats around Lake Elementeita are less secure, as they lie within private property (designated as Wildlife Conservancy and recognized as a Buffer Zone outside the World Heritage property; IUCN, 2011) The riparian area to the South of Lake Elementaita has already been impacted by uncontrolled urban development. The aesthetic qualities of the lake landscapes vary according to natural fluctuations in the lake levels (which can leave vast expanses of unattractive exposed mudflats during drier periods), which may be exacerbated by deforestation and degradation of the catchment areas

▶ **Exceptional geo-morphological features of the Great Rift Valley**

Good
Trend:Stable

The geo-morphological features of the Rift Valley can be considered secure

▶ **Extraordinary soda lake ecosystem processes and trophic dynamics**

Data Deficient
Trend:Data Deficient

The ecological processes characteristic of the alkaline lakes are likely to be responding to changes in the quality and quantity of the inflowing waters. Deforestation, over-grazing, soil erosion and water abstraction in the catchment areas are probably having an impact, but there are presently no

supporting data to confirm this. The trophic dynamics at Lake Nakuru has been significantly altered following the introduction of a unique cichlid fish from Lake Magadi, (another of the alkaline ‘flamingo lakes’ of Kenya). Prior to 1962 there were no fish in Lake Nakuru, and consequently no fish-eating birds (KWS, 2003).

► Exceptionally diverse bird fauna, including rare and endangered species

Data Deficient
Trend:Data Deficient

It is not known how overall bird diversity is responding to environmental changes, but waterbirds have increased considerably in numbers and diversity since the introduction of fish to Lake Nakuru in 1961/2 (Birdlife, 2012a). Subsequently there was a trough in waterbird numbers (other than flamingoes) in the mid-90s attributed to major changes in the food chain associated with a period of low lake levels (Birdlife, 2012a), but they subsequently recovered when the lake level rose again. It seems likely that future demands for water abstraction will cause water levels to drop more generally, affecting waterbird populations more permanently.

► World’s largest congregations of lesser flamingoes

Low Concern
Trend:Stable

Lesser flamingo numbers on each of the lakes fluctuate drastically and rather unpredictably. January waterfowl counts conducted annually since 1991 indicate that the Kenyan population of lesser flamingoes has fluctuated between 280,000 and 1,450,000 birds between 1992 and 2007 (UNEP-WCMC, 2012), but no clear trend in population size is apparent

► Crucial flyway for bird migration

Good
Trend:Stable

The status and trends in waterbird numbers at key wetlands in Kenya have been monitored since 1991 and indicate stable overall numbers of birds recorded (UNEP-WCMC, 2012), with seasonal peaks during March and

September (while birds are on passage).

► Diverse assemblage of mammals, including rare and endangered species

Good
Trend:Improving

Mammals are counted on a quarterly basis in Lake Nakuru NP, biannually in the Lake Elementeita area, but not in the Lake Bogoria National Reserve (UNEP-WCMC, 2012). In the areas that are counted, there has been a steady increase in numbers of most prominent species (IUCN, 2011), so populations have reached, or even exceeded the area's carrying capacity resulting in some habitat damage (Birdlife, 2012a).

Summary of the Values

► Assessment of the current state and trend of World Heritage values

Low Concern

Trend: Stable

The three lakes that make up the Kenya Lakes System World Heritage site are all subject to quite drastic fluctuations in water levels and associated ecological parameters, and it is these episodic fluctuations that drive the unpredictable mass movements of flamingoes and other birds. Bird counts have been carried out since 1991 and suggest overall stability in bird populations, but the annual and seasonal variability in these counts is so pronounced that only major changes in numbers could be detected. The deforestation and degradation of land in each of the lake's catchment areas, and upstream use of water indicate a trend towards lower average lake levels, which would impact negatively on the scenic values of the lakes and their productivity. Mammal populations are growing quite strongly, especially in Lake Nakuru National Park where carrying capacity limits for some key species are being reached or even exceeded.

Additional information

Key conservation issues

▶ Ecological monitoring

National

Monitor key ecological indicators, particularly those related to the quantity and quality of water (in each of the lakes, inflowing streams and underground aquifers) so as to detect any potential threats in a timely manner. Develop a rapid response strategy to deal with any possible pollution incident, or other potential threat.

▶ Invasive alien exotics

Local

Monitor invasive exotic plants and animals and carry out necessary programmes to eliminate them

▶ Compliance with EIA procedures and environmental safeguards

Local

Ensure that all major developments in the catchments of the three lakes (particularly those involving significant use of water and/or those likely to produce effluents) are subject to rigorous EIA procedures and that appropriate environmental safeguards are implemented where necessary.

▶ Ecological connectivity

National

Develop wildlife corridors and make strategic land acquisitions to enhance ecological connectivity between the three lakes, particularly the linkage between Lakes Nakuru and Elementaita via Soysambu Conservancy.

▶ Protection of other ‘Flamingo Lakes’

Regional

Monitor developments at all the Flamingo Lakes and ensure that any associated developments comply with necessary environmental safeguards so as to maintain the integrity of essential flamingo habitat and key components of the Rift Valley flyway for migratory birds.

► Trans-boundary cooperation

Regional

Enhance trans-boundary cooperation over management of all ten of the ‘Flamingo lakes’ of the Eastern Rift Valley, including particularly Tanzania’s Lake Natron, where the lesser flamingoes breed. Pursue the goal of extending the existing world heritage property to include other lakes in Tanzania and Ethiopia.

► Pollution control

Local

Establish rigorous procedures and standards for management of effluent flowing into the lakes, especially around Nakuru municipality.

► Protection of Lake Elementaita

Local

Strengthen the legislative support for protection of Lake Elementaita and improve its on-the-ground management with appropriate allocation of staff and resources

► Deforestation and catchment protection

Local

Reduce deforestation, land degradation and soil erosion in the lake catchment areas through protection of remaining forests (especially threatened forests on the Mau escarpment), improved land management practices, forest restoration and tree planting programmes

Projects

Compilation of active conservation projects

№	Organization/ individuals	Project duration	Brief description of Active Projects
1	Soysambu Conservancy		Lake Elementeita Buffer Zone
2	WWF		Lake Nakuru National Park (water monitoring etc)
3	Ututu Wildlife Conservation Trust		Lake Elementeita Buffer Zone
4	National Museums of Kenya/Kenya Wildlife Service/Nature Kenya		Annual Water fowl count – every January and July
5	Kenya Forest Service		Rehabilitation of Mau Forest

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8	KWS (2003). Lake Nakuru National Park – The Official Guide. Kenya Wildlife Service
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