

**AFRICA**

## **KENYA LAKES SYSTEM IN THE GREAT RIFT VALLEY**

**KENYA**



## WORLD HERITAGE NOMINATION – IUCN TECHNICAL EVALUATION

### KENYA LAKES SYSTEM IN THE GREAT RIFT VALLEY (KENYA) – ID No. 1060 rev

#### IUCN RECOMMENDATION TO 35<sup>th</sup> SESSION: To inscribe the property under natural criteria

##### Key paragraphs of Operational Guidelines:

77 Property meets natural criteria.

78 Property meets conditions of integrity or protection and management requirements.

114 Property meets management requirements for serial properties.

**Background note:** This nomination was submitted in 2001 and considered by the World Heritage Bureau in June 2001. At that time the Bureau noted several concerns, principally the unclear legal protection status of Lake Elementaita, but also the importance of Lake Natron in Tanzania to the viability of the Great Rift Valley flamingo population; threats from pollution and deforestation to Lake Nakuru; and incomplete management plans for the three components of the nomination. The Bureau noted that the nominated property fulfilled criteria (ii), (iii) and (iv) [now (ix), (vii) and (x)] and decided to defer the nomination until the gazettal of Lake Elementaita as a protected area and completion of management plans for all three lakes.

#### 1. DOCUMENTATION

**a) Date nomination received by IUCN:** 15 March 2010.

**b) Additional information officially requested from and provided by the State Party:** IUCN requested supplementary information after the field mission regarding the landfill project in Soysambu Conservancy and possible linkage to neighboring countries regarding coordination for the conservation of Lake Natron.

**c) Additional literature consulted:** Kenya Wildlife Service (2007). **Lake Nakuru Integrated Management Plan.** GLECA (2010). **Greater Lake Elementaita Conservation Area Management Plan.** Lake Bogoria National Reserve (2007). **Lake Bogoria Integrated Management Plan.** Adeka J.E., Strobl R.O. and Becht R. (2007). **An environmental system analysis of lake Elementaita, with reference to water quality.** Proceeding of Taals, the 12<sup>th</sup> World Lakes Conference. Harper D.M. et al. (2003). **Aquatic biodiversity and saline lakes: Lake Bogoria National Reserve, Kenya.** Hydrobiologia 500: 259-276. Birdlife International (2010). **Regional Thematic Analysis for a Serial Transnational World Heritage Nomination of the African-Eurasia Migratory Flyway” the Great Rift Valley Segment.** Birdlife International African Partnership Secretariat, Nairobi. Magin C. and Chape S. (2004). **Review of the World Heritage Network: Biogeography, Habitats and Biodiversity.** IUCN and UNEP-WCMC. Scott, J.J., Renaut R.W. and Bernhart Owen R. (2010). **Taphonomic Controls on Animal Tracks at Saline, Alkaline Lake Bogoria: Impact of Salt Efflorescence and Clay Mineralogy.** Journal of Sedimentary Research: 639-665. Wood J. and Guth A. (2010). **East Africa's Great Rift Valley: A Complex Rift System.** Michigan Technological University www.geology.com. Zaccara S. et al (2008). **Lesser Flamingo populations in eastern and southern**

**Africa are not genetically isolated.** Journal of African Ornithology, 79, 2. Childress B. et al (2007). **East African flyway and key site network of the Lesser Flamingo (*Phoenicopertus minor*) documented through satellite tracking.** Journal of African Ornithology, 78: 483-488. Brown A. and Abell R. (2008). **Freshwater Ecoregion Description: Southern Eastern Rift.** WWF, TNC. Raini, J.A. (2009). **Impact of land use changes on water resources and biodiversity of Lake Nakuru catchment basin, Kenya.** African Journal of Ecology 47: 39-45. Harper D.M. et al (2003). **Aquatic biodiversity and saline lakes: Lake Bogoria National Reserve.** Hydrobiologia, 500: 259-276. Matagi S.V. (2004). **A biodiversity assessment of the Flamingo Lakes of eastern Africa.** Biodiversity 5 (1): 13:26. McClanahan T.R. and Young T.P. (1996). **East African Ecosystems and their Conservation.** OUP. Brown L. (1971). **East African Mountains and Lakes.** EA Publishing.

**d) Consultations:** Four external reviewers were consulted. The mission met with officials, representatives and staff of various authorities concerned with the Kenya Lake System including the National Museum of Kenya, Kenya Wildlife Service (KWS), Kenya Forest Service, Baringo and Koibatek Councils, Soysambu Conservancy, Ututu Wildlife Conservation Trust, WWF in Nakuru, local Water Users' Associations, local Conservation Forest associations, and representatives of Nakuru town.

**e) Field Visit:** Geoffroy Mauvais, October - November 2010.

**f) Date of IUCN approval of this report:** 29 April 2011.

## 2. SUMMARY OF NATURAL VALUES

The nominated property, Kenya Lakes System in the Great Rift Valley (KLS) is a serial property comprising three lakes that are ecologically, geologically and hydrologically inter-linked and located in the Rift Valley Province of Kenya. From North to South the three lakes include:

Name	Area of Property (ha)	Area of Buffer zone (ha)
Lake Elementaita	2,534	3,581
Lake Nakuru	18,800	0
Lake Bogoria	10,700	0

The nominated property combines a total core area of 32,034 ha which includes the area covered by the water bodies of the three lakes, the area covered by Lake Nakuru National Park and Lake Bogoria National Reserve together with the riparian area of Lake Elementaita. A buffer zone of 3,581 ha surrounding Lake Elementaita is not included within the nominated property. These lakes are relatively shallow (except Bogoria which has a maximum water depth of 19 meters), alkaline and endorheic (not having any surface outlet). They are included among the sixty "Important Bird Areas of Kenya" by Birdlife International as they host 13 globally threatened bird species and support globally important populations and congregations of water birds. They also include sizable populations of mammals, including Black Rhino, Rothschild's Giraffe, Greater Kudu, Lion, Cheetah and Wild Dog. All three protected areas are managed as IUCN Category II with Lake Elementaita's buffer zone largely managed as Category IV under the IUCN system. All three areas have been designated Ramsar sites.

**Lake Bogoria National Reserve** lies about 10 km north of the equator in Baringo and Koibatek Districts, in the Rift Valley province. It includes the lake body (about 3,800 ha) and its surroundings (for a total of 10,700 ha) while the catchment surface is approximately 93,000 ha. The reserve provides habitat for regionally and nationally endangered species and contains many distinctive physiographic features and geothermal manifestations (fumaroles, hot springs, geysers). Terrestrial vegetation is primarily thorny bush land dominated by *Acacia sp.*, *Combretum sp.*, *Ficus sp.* and alkaline-tolerant grasslands (210 species of flora). The lake supports a dense growth of green algae (*Spirulina platensis*) which, in turn, is a key feeding ground for the itinerant Rift Valley population of Lesser Flamingos. Congregations of more than 1.5 million of Lesser Flamingos have been counted while more than 370 bird species also occur as well as a range of typical savannah woodland fauna, including a population of 350 Greater Kudu.

**Lake Nakuru National Park** is located 3 km to the south of the city of Nakuru and is included within the Nakuru municipality boundaries. With a population of 500,000 people, the urban, agricultural and industrial centre of Nakuru lies close to Lake Nakuru National Park. This park centres on a very shallow, alkaline lake (approximately

4,000 ha), surrounded by woodlands and grasslands for a total of 18,800 ha. Its catchment covers an area estimated around 180,000 ha. The park can be divided into different complementary ecosystems: the open water zone is where one finds the main primary producer (an algae called *Spirulina platensis*). A species of Tilapia (*Sarotherodon alcalicus grahami*) introduced in 1962 is now the main food source for fishing birds. The lake shores are open alkaline mud, with areas of marsh around the river inflows and springs, giving way to grassland. The lake is surrounded by a belt of woodlands dominated by Acacia. More than 550 plant species occur in the property.

Nakuru is internationally famous for its populations of Lesser Flamingo which can number up to 1.5 million at times. However, attempts by flamingos to breed here have not been successful. Nakuru is also a major feeding ground for Great White Pelicans, which nest on rocky islets in Lake Elementaita and move to Nakuru daily to feed. Large numbers of Palearctic waders winter at Nakuru or use the site on passage. More than 480 bird species have been recorded. The park has a wide range of typical African mammal species, particularly Black Rhino (population of 125 individuals), Rothschild's Giraffe (population of almost 200 individuals), and large numbers of waterbucks, gazelles, elands and Cape Buffalos.

**Lake Elementaita National Wildlife Sanctuary** is a shallow alkaline lake some 20 km south-east of Nakuru town. The property covers the lake area and its close riparian lands (2,534 ha) and a buffer zone is defined around the lake (3,581 ha) but is not included in the property. The catchment area is some 63,000 ha. To the east, the lake is bordered by the Ndundori-Ngorika-Gitare Hills and to the west by Eburru Hills which are part of the Mau Escarpment. Also to the east, the lake is flanked by small-scale agriculture and hotel development, while some ranches surround the remainder. Vegetation around the property consists of upland forest, woodland (mostly Acacia forest), bush land and grassland. The lake hosts important populations of Greater and Lesser Flamingo. Although it lacks fish, except in the peripheral hot springs, Elementaita also hosts a large population of Great White Pelicans (sometimes over 20,000 individuals) which breed on rocky islets. The pelicans move daily to Lakes Nakuru and Navaisha to feed. Greater Flamingos are known to have bred there ten years ago, but seem to have been displaced by pelicans. Approximately 450 species of birds have been counted within the property and its buffer zone including at least 49 recorded waterbird species and 10 Palearctic migrants. Healthy populations of typical African mammal species occur in the riparian and in the surrounding conservancies, including the Rothschild's Giraffe (around 150).

Although not part of the nominated property, Lake Natron in Tanzania is an integral part of the flamingo lakes system of eastern Africa being the breeding and nesting site for the population which moves between the soda lakes of the region. This site is therefore critically

important to the long term ecological functioning of the nominated Kenyan serial property.

### 3. COMPARISONS WITH OTHER AREAS

The property has been nominated under three natural criteria: (vii), (ix) and (x).

The three lakes within the nominated property are part of the “Flamingo Lakes” of the Eastern Rift Valley, a series of ten lakes occurring along the floor of the Eastern Rift Valley in Tanzania, Kenya and Ethiopia. Birdlife International notes the global significance of the Great Rift Valley as a migratory corridor for 500 million birds from 350 species who pass through this area en route from nesting sites of Eurasia to those of southern Africa. Birdlife specifically notes the nominated property as a foundation for national and transnational serial World Heritage properties within the Greater Rift Valley.

The nominated property belongs to Udvardy's East African Woodland/Savanna Biogeographical Province which is already represented on the World Heritage List by seven properties. However, the property is part of the more detailed WWF Northern Acacia-Commiphora Bushlands and Thickets terrestrial ecoregion, which is not yet represented on the World Heritage List. Further East Africa's “Saline Rift Valley Lakes” have been identified as an IUCN/Species Survival Commission global habitat type of potential outstanding universal value. Whilst part of Lake Turkana is included on the World Heritage List, this habitat type remains a gap on the World Heritage List.

The KLS is part of the Great Rift Valley which is an exceptional geomorphological feature in itself. The lakes are surrounded by escarpments, undulating hills and old volcanoes which form a distinctive panorama and landscape. This scenic beauty compares favourably to the dominant freshwater wetland ecosystems of the Pantanal Conservation Area (Brazil) and associated Amolar Mountains. Comparison may also be made with the Djoudj Bird Sanctuary (Senegal), however, the KLS illustrates a different and unique association of topographies, volcanic activities, multiple ecosystems and wilderness areas making it much more impressive than the landscape found within and around the Djoudj Sanctuary. The extremely large numbers of Lesser Flamingos moving between the three components of the nominated property is considered one of the world's most spectacular wildlife phenomena. Flamingos are found in a number of other locations in Africa including Namibia, Ethiopia, South Africa, Botswana and Uganda however not in the concentrations found in the KLS. The outstanding beauty of the KLS has been recognised for a long time and has been described as such by Sir Peter Scott (founding chairman of WWF) as “a sight of incredible beauty and interest and there can be no more remarkable ornithological spectacle in the world”.

The main soda lakes in the region are the three nominated areas as well as Magadi and Logipi in Kenya

(not protected and considered of less conservation interest), Natron and Eyasi in Tanzania and Langan Awass and Abijatta-Shalla in Ethiopia. As a system they are among the world's most productive ecosystems serving as feeding grounds to millions of birds. They also provide unique scientific insights into the ecological dynamics and food chains of these harsh yet highly productive biological systems. For instance, and like the KLS, the Abijatta-Shalla Lakes are located in the Great Rift Valley; both lakes are without outlets and the water is alkaline. Lake Abijatta is very shallow and, together with the deeper Lake Shalla, they provide an important feeding ground for a great number of lesser and greater Flamingos. Although these lakes account for over 400 species of aquatic and terrestrial birds, the KLS has a higher and more diverse avifauna with 450 species recorded and many more species of mammals included within its boundaries.

Lake Turkana in the Great Rift Valley was inscribed on the list of World Heritage Sites in 1997 as a serial nomination (three national parks) and is described as an outstanding laboratory for the study of plant and animal communities and their evolution. Sibiloi National Park lies on the lake's eastern shore, while Central Island National Park and South Island National Park lie in the lake. 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. Lake Turkana is the world's largest alkaline lake. While the KLS is much smaller than this cluster, it represents a unique place for the understanding of soda lakes ecosystem evolution complementing the values of Lake Turkana.

The KLS has some of the highest bird diversities in the world occurring in huge congregations. For instance, there are five species of Flamingo in the world, and the KLS supports two of them (the Lesser and the Greater Flamingo) with occasional congregations representing more than 75% of their total populations. Those two Flamingo species exist elsewhere in Africa but in no other place do they reach the concentrations found within the KLS and Lake Natron in Tanzania during the breeding season. The KLS are also home to over 100 species of migratory birds and support globally important populations of Black-Necked Grebe, African Spoonbill, Pied Avocet, Little Grebe, Yellow Billed Stork, Black Winged Stilt, Grey-Headed Gull and Gull Billed Tern. Comparison can be made with the Djoudj Bird Sanctuary, in Senegal, a fragile sanctuary for breeding and migrating birds which is known to support around one million water birds and is one of the main West African sanctuaries for Palearctic migrants. This property is similar to the KLS for its high concentrations of migrants, but the KLS has much higher concentrations of birds. For instance, flamingos number only in the thousands in Djoudj while the KLS hosts around 1.5 million Lesser Flamingos. In terms of breeding, Djoudj supports approximately 2,500 pairs of Great White Pelicans while more than 8,000 pairs are known to breed at Lake Elementaita. The nominated property includes the only suitable breeding site for Great



White Pelicans in the Great Rift Valley. In terms of bird species diversity, the list of birds for the KLS exceeds 450 while Djoudj Bird Sanctuary hosts only 400 species.

In conclusion, the KLS are a cornerstone of the soda lakes of the Rift Valley of Africa which "...are of extraordinary interest and are biologically unique; there is nothing quite like them in the world" (L. Brown, 1971). Within the relatively small size (less than 36,000ha. in total) exists one of the most diverse and spectacular avifaunal assemblages in the world. Overviews of the soda lakes of the Rift Valley emphasize that they "are among the world's most productive natural ecosystems. Conspicuous features of these lakes are enormous flocks of lesser flamingos grazing on the thick green suspensions of algae. In contrast to such prolific biological activity are the harsh physical and chemical conditions and a depauperate fauna". (McClanahan and Young, 1996).

## 4. INTEGRITY, PROTECTION AND MANAGEMENT

### 4.1. Protection

Each of the three sites is under a different form of protection:

**Lake Nakuru** is a National Park (managed by KWS);  
**Lake Bogoria** is a National Reserve (managed by two County Councils but under national policy set by and in cooperation with KWS);  
**Lake Elementaita** is gazetted as a National Wildlife Sanctuary under the responsibility of KWS and surrounded by a buffer zone that includes a Conservancy and a Wildlife Conservation Trust.

Although National Park designation for all three lakes would provide a more desirable level of protection, the existing forms of protection are adapted to the ongoing use of land and conservation practices in each site. However, Lake Elementaita as a National Wildlife Sanctuary is considered to have a somewhat weaker level of legal protection than the other two sites. The Wildlife Conservation and Management Act of 1989 is the principal Act that regulates the conservation and protection of the KLS. It stipulates that the KWS is in charge of wildlife management. The sites also benefit from catchment laws and policies introduced over the last 10 years, such as the Environmental Management and Co-ordination Act (1999), the Water Act (2002) or the Forest Act (2005), which have strengthened a more comprehensive approach to catchment management and conservation.

Whilst there are some concerns about the strength of protection afforded to Lake Elementaita, IUCN considers that the protection status of the nominated property meets the requirements set out in the Operational Guidelines

### 4.2. Boundaries

The property comprises three sites, each of them clearly defined on maps and demarcated on the ground by beacons and/or fences. Lake Elementaita National Wildlife Sanctuary is surrounded by a buffer zone, part of the Soysambu Wildlife Sanctuary and Ututu Wildlife Conservation Trust. Lake Bogoria and Lake Nakuru do not have formal buffer zones, however, wide gazetted terrestrial zones within the protected areas serve as buffer zones for the lake bodies.

It would be beneficial to extend the buffer zone of Lake Elementaita up to Nakuru National Park to restore connectivity and resilience between the two areas. This would help to solve many of the problems that the park currently faces (high tourism, growth in wildlife populations etc). It is pleasing to note that the KWS has agreed in principle with the Soysambu Conservancy to open a wildlife migratory corridor to connect Lake Nakuru and Lake Elementaita.

IUCN considers that the boundaries of the nominated property meet the requirements set out in the Operational Guidelines.

### 4.3. Management

Each site has a management plan in place: the Greater Lake Elementaita Conservation Area Management Plan (2010-2020), the Lake Nakuru Integrated Ecosystem Management Plan (2002-2012) and the Lake Bogoria National Reserve Integrated Management Plan (2007-2012). Those plans describe extensively the management and monitoring procedures that are applied. In each site, a management committee including various stakeholders related to the lakes' catchments is in place to monitor the implementation of the plan.

Nakuru is under direct management of KWS with appropriate staff numbers (170 permanent rangers), budget and means (including a plane, a research unit, an educational center, a rhino monitoring centre, etc.). A stakeholders' forum: Lake Nakuru Catchment Conservation and Development Forum meets regularly to monitor the implementation of the management plan.

Bogoria is managed by a multi-stakeholder management committee led by the two county councils (Baringo and Koibatek) that have authority to manage the reserve as provided for in the Wildlife Conservation & Management Act. A warden is in charge, supervises almost 40 staff and benefits from enough means and budget (including an education centre).

Elementaita does not yet have a locally based staff member directly responsible for the gazetted area, rather it depends upon the KWS warden based in Navaisha. This is a concern, however, most of the area which needs active management (buffer zone) is under private ownership and benefits already from conservation efforts. A local landowners and users association (the Greater

Lake Elementaita Conservation Area) provides a dynamic management structure that aims at controlling entry into the site and all related construction or developments within the catchment. There is still some soda extraction done by hand along the northwestern shore and grazing by nomadic pastoralists in the south of the property but with little or no impact.

IUCN considers the management of the nominated property meets the requirements set out in the Operational Guidelines

#### **4.4. Threats**

The property faces numerous pressures, however regulatory and management measures have significantly improved during the past few years.

##### **Water and forest management**

Increasing areas of forest and woodland cover have been lost to agriculture and human settlements in the catchment areas during the last thirty years. Small irrigation dams have also been constructed along rivers flowing into the lakes and river flows have reduced markedly while silt loads have risen, resulting in less water reaching the wetlands and the lakes.

Forest conservation is not a problem within the boundaries of the property, but a major concern for the catchments themselves as deforestation directly affects the quantity and quality of water which goes into the lakes. The catchment around Lake Nakuru has suffered serious deforestation with one reviewer noting catchment maps showing a progressive decline in the area of land under forests from 47% in 1970 to 26% in 1986. The new Forest Act (2005) provides a sound basis for addressing this issue in a participative and effective way and many programs of reforestation are now going on in the catchment areas, including in the Mau Escarpment which is an area which has suffered particularly serious deforestation.

Pollution of water is also a problem, mostly originating from the growing agricultural and industrial centre of Nakuru. Treatment of waste water entering the lake from the town has improved and water quality monitoring is now in place, as is an expanded sewage treatment works. Concerns about industrial pollution and surface runoff persist but it is important to note that the municipality of Nakuru is taking decisions to solve these issues (including moving the waste deposit which is above the lake).

The effective management of water resources in an integrated manner is critical to the integrity of the property. Continued efforts will be needed to mitigate threats through the management plans of the lakes and to build upon the improvements resulting from the recent Water Act (2002) which allows for more participative management of shared water resources.

##### **Mining issues**

This concerns essentially Elementaita where artisanal extraction of soda and sand exists, as well as a diatomite extraction site outside the buffer zone (east of the sanctuary). At current levels this small scale mining does not pose a significant threat to the property.

##### **Livestock**

This concerns mainly the southern area of Elementaita where overgrazing is still an issue. While it does not threaten directly the value of the site, it may lead to conflicts between users and between wildlife and cattle. It is thus important that cattle grazing is progressively prohibited within the property and its buffer zone.

##### **Encroachments and settlements**

The limits of the property are known and clearly demarcated on the ground (and in the case of Nakuru, a fence exists). A risk of new settlement still exists in the eastern part of the Elementaita buffer zone, but the Gleca Management Committee is charged with controlling any new development or land-use conversion.

##### **Ecological and climatic changes**

While unpredictable, they may greatly affect the property and records in the past 80 years have shown huge water level fluctuations in all lakes (including complete drying out of Elementaita and Nakuru). Measures can be taken to mitigate some of those risks, mostly linked to water management in the catchment, and until now, the property has been resilient to these climatic fluctuations.

##### **Tourism**

Up to 300,000 visitors enter Nakuru NP per year, presenting a significant management challenge. However, KWS has plans to mitigate ecosystem impact and until now, has successfully controlled direct or indirect consequences of over population in the park. This impact is concentrated in the terrestrial part of the property more than the lake itself. The possible extension of the park to the south by merging with the Soysambu Conservancy would offer an effective way to dilute this tourism pressure in a larger conservation area.

##### **Infrastructure development**

A pipeline is under construction near the buffer zone of Elementaita but it will be buried. The main current threat comes from a proposed landfill site which could occur on the border of Nakuru National Park, in the Soysambu Conservancy and would jeopardize the connectivity between the two sites. While this project does not concern the property itself, it could impact considerably the ecological functioning of the ecosystem and would prohibit the possibility of reconnecting Nakuru to Naivasha. The State Party has recently advised that this proposed development has been stopped and alternative areas will be investigated.

In summary, despite a number of concerns on the protection of Lake Elementaita and surrounding land use threats, IUCN considers the nominated property meets

the conditions of integrity as outlined in the Operational Guidelines.

## 5. ADDITIONAL COMMENTS

### 5.1 Justification for Serial Approach

#### a) Justification for the serial approach?

Large numbers of birds move between each of the sites, sometimes on a daily basis. All three are thus strongly linked in a "flamingo system" after the dominant species using the lakes. The serial nomination is justified as no one of the three sites on its own would adequately display and protect this unique Rift Valley "flamingo system".

One major component of this system, however, is missing, which is the breeding ground for the Lesser Flamingo at Lake Natron in Tanzania. For now, there is no indication that this lake is not going to continue to play its role in the future. The addition of Lake Natron should be however investigated in the future by both State Parties as any threat that may impact this site would have consequences on the property.

#### b) Functional linkages between the separate component parts of the nominated property

Lakes Elementaita, Nakuru and Bogoria are part of a system of lakes in the Eastern Rift Valley that share a common volcanic landscape, and have in common their geological history, human history, hydrological processes and associated ecological features. Geographically, they lie on the floor of the Rift Valley and share common geological origins; hydrologically, they are linked by a complex surface and underground water system; ecologically, they share and exchange a huge number of species and individuals of birds (resident and migratory) which utilize different sites to fulfil their needs. Functionally, they are all gazetted protected areas, managed under a common authority (KWS Chaired National Steering Committee).

#### c) Overall management framework for all the component parts of the nominated property

Each site is now managed by a specific management committee, implementing a management plan. Some stakeholders are common to the three sites, such as Water Resources Authorities, Kenya Forest Service, Kenya Forest Service and the National Museum of Kenya. The three committees fall under the umbrella of KWS which ensures technical support and coordination among all the sites. The committee, chaired by KWS, meets at least three times a year to review the progress of conservation within the cluster.

### 5.2 Evolution since the previous assessment in 2001

As noted in the background note, this nomination was submitted first in 2001 for the same cluster. Since that time a number of matters have been addressed including two new laws (Water Act and Forest Act) which have been enacted to regulate the management of the

catchment areas in a more integrated and participatory way; Lake Elementaita has been gazetted as a protected area (National Wildlife Sanctuary); all three sites now have management plans addressing issues raised in 2001; and a national steering committee has been created to ensure management and stakeholder coordination between the three sites.

## 6. APPLICATION OF CRITERIA

The KLS in the Great Rift Valley (Bogoria, Nakuru and Elementaita) is proposed for inscription under three criteria: (vii), (ix), and (x).

#### Criterion (vii): Superlative natural phenomena or natural beauty and aesthetic importance

The property demonstrates outstanding scenic beauty. It combines many distinctive associated landforms and ecosystems: steep fault scarps, cinder cones and craters, ramp, box faults, geysers, hot springs, open waters, marshes, rivers and waterfalls, Acacia and Euphorbia forests and open grasslands. Birds congregate in millions on the shores of the lakes and offer, with the backdrop of faulted scarps, hot springs and geysers, an exceptionally stunning display of ecological dynamics and large scale wildlife movements. Their daily movements from one lake to another create an unparalleled natural spectacle set amid the terrestrial plants and animal species that occur around the lakes.

IUCN considers that the nominated property meets this criterion.

#### Criterion (ix): Ecological processes

The shallow alkaline endorheic lakes of the KLS are of great scientific interest to limnologists studying the high productivity of these distinct ecosystems. The low species diversity and abundant resident population make soda lakes especially appealing environments in which to conduct investigations of trophic dynamics and ecosystem processes. The production of huge biomass quantities in these distinctive soda lakes and the food chain that this green algae supports are also of international scientific value. The bird migration phenomenon which occurs there is an ecological process of major importance that illustrates adaptation to seasonal changes in the environment as well as breeding cycles.

IUCN considers that the nominated property meets this criterion.

#### Criterion (x): Biodiversity and threatened species

Within the relatively small size of each of the components, some of the highest levels of bird diversity in the world are recorded. The soda lakes are a key feeding ground for millions of birds, including the itinerant Rift Valley congregations of the Lesser Flamingo, of which they sustain 75% of the global population. Many other species, like the Great White Pelican, occur there in numbers of several hundred thousand individuals. As part of the largest bird migration in the world the lakes also provide

critical support to millions of migrants that winter or stop over in Kenya. Over 450 bird species are recorded in the property which has been designated as Important Bird Areas by BirdLife International.

IUCN considers that the nominated property meets this criterion.

## 7. RECOMMENDATIONS

IUCN recommends that the World Heritage Committee adopt the following draft decision:

The World Heritage Committee,

1. Having examined Documents WHC-11/35.COM/8B and WHC-11/35.COM/INF.8B2,

2. Inscribes the **Kenya Lake System in the Great Rift Valley (Kenya)** on the World Heritage List under natural criteria (vii), (ix) and (x);

3. Adopts the following **Statement of Outstanding Universal Value**:

### **Brief synthesis**

*The Kenya Lake System is composed of three alkaline lakes and their surrounding territories: Lake Bogoria, 10,700 ha; Lake Nakuru, 18,800 ha; and Lake Elementaita, 2,534 ha. These lakes are found on the floor of the Great Rift Valley where major tectonic and/or volcanic events have shaped a distinctive landscape. Some of the world's greatest diversities and concentrations of bird species are recorded within these relatively small lake systems. For most of the year, up to 4 million Lesser Flamingos move between the three shallow lakes in an outstanding wildlife spectacle. Surrounded by hot springs, geysers and the steep escarpment of the Rift Valley with its volcanic outcrops, the natural setting of the lakes provides an exceptional experience of nature.*

### **Criteria**

#### **Criterion (vii)**

*The Kenya Lake System presents an exceptional range of geological and biological processes of exceptional natural beauty, including falls, geysers, hot springs, open waters and marshes, forests and open grasslands concentrated in a relatively small area and set among the landscape backdrop of the Great Rift Valley. The massed congregations of birds on the shores of the lakes including up to 4 million Lesser Flamingos which move between the three lakes is an outstanding wildlife spectacle. The natural setting of all three lakes surrounded by the steep escarpment of the Rift Valley and associated volcanic features provides an exceptional experience of nature.*

#### **Criterion (ix)**

*The Kenya Lake System illustrates ongoing ecological and biological processes which provide valuable insights*

*into the evolution and the development of soda lake ecosystems and the related communities of plants and animals. Low species diversity and abundant resident populations of birds and other animals make the soda lakes of the property especially important environments in which to conduct investigations of trophic dynamics and ecosystem processes. The production of huge biomass quantities in these distinctive soda lakes and the food web that this green algae supports are also of international scientific value, and provide critical support to birds, which visit the property in large numbers as part of their migration in response to seasonal and episodic changes in the environment.*

### **Criterion (x)**

*The Kenya Lake System is the single most important foraging site for the Lesser Flamingo in the world with about 1.5 million individuals moving from one lake to the other and provides the main nesting and breeding grounds for Great White Pelicans in the Great Rift Valley. The lakes' terrestrial zones also contain important populations of many mammal and bird species that are globally or regionally threatened. They are home to over 100 species of migratory birds and support globally important populations of Black-Necked Grebe, African Spoonbill, Pied Avocet, Little Grebe, Yellow Billed Stork, Black Winged Stilt, Grey-Headed Gull and Gull Billed Tern. The property makes a critical contribution to the conservation of the natural values within the Great Rift Valley, as an integral part of the most important route of the African-Eurasian flyway system where billions of birds are found to travel from northern breeding grounds to African wintering places.*

### **Integrity**

*The three lakes constituting the property represent the most significant Rift Valley lakes within Kenya, and are an essential component of those in the Great Rift Valley as a whole. Each of the three components of the property is gazetted as a protected area and whilst the property is of small size, it contains the main ecosystems and features that support its Outstanding Universal Value. Surrounded by an area of rapidly growing population, the property is under considerable threat from surrounding pressures. These threats include siltation from soil erosion, increased abstraction of water in the catchment, degradation of land, deforestation, growth in human settlements, overgrazing, wildlife management, tourism and pollution coming from Nakuru town. Management authorities must be vigilant in continuing to address these issues through effective multi-sector and participatory planning processes.*

### **Protection and management requirements**

*Each component of the property enjoys adequate legal protection, up to date management plans and a satisfactory on-ground management presence. In order to maintain and enhance the Outstanding Universal Value of the property it will be important to sustain and enhance this effective management, and to address a range of long term issues. These include catchment level management of threats and development with particular*



*emphasis on management of groundwater and surface pollution and forest cover, inter-sectoral and participatory management processes especially with respect to environmental impact assessment of adjoin development and the building of increased ecological connectivity between the component parts of the system. Transboundary cooperation is also important as the values of the property are partly dependant on protection of other lake and wetland areas that support migratory species. In this regard there is potential for other areas, including Lake Natron in Tanzania, to be considered as part of a future transnational serial World Heritage property.*

4. Commends the State Party on the significant efforts to improve conservation of the nominated property and to reduce the impacts of surrounding land use through effective management of development and threats within the lake catchments.

5. Also commends the State Party on its decision to abort the proposed landfill development close to Lake Nakuru National Park in order to avoid impact and keep open options for ecological connectivity between Lake Nakuru and Lake Elementaita through the Soysambu Conservancy.

6. Encourages the State Party to continue to strengthen the protection and management of the property, including in relation to the following issues:

- a) to upgrade the protection of Lake Elementaita through strengthened legal protection; recruitment of site-specific staff; and prohibition of cattle grazing so that it is afforded a similar standard of protection as the other components of the property;
- b) to take any effective action which could reinforce the link between and the conservation of the three parts of the property, including protecting secondary ecological areas and opening wildlife corridors such as that linking Lakes Nakuru and Elementaita through the Soysambu Conservancy;
- c) to enhance catchment-wide efforts to curb deforestation especially on the Mau Escarpment within the watershed of Lake Nakuru;

7. Considering the property's essential function within the lakes and wetlands in the region, encourages the States Parties of Kenya and Tanzania, and other relevant States Parties, to cooperate regarding the effective conservation of Lake Natron and other lakes in the region, and to consider further potential serial extensions as part of a potential transnational serial World Heritage property, taking account of relevant recent thematic studies by Birdlife and IUCN.

