



# Ramsar Information Sheet

Published on 28 May 2024

Update version, previously published on : 27 August 2001

## Kenya Lake Bogoria



Designation date	27 August 2001
Site number	1097
Coordinates	00°15'55"N 36°06'11"E
Area	10 700,00 ha

## Color codes

Fields back-shaded in light blue relate to data and information required only for RIS updates.

Note that some fields concerning aspects of Part 3, the Ecological Character Description of the RIS (tinted in purple), are not expected to be completed as part of a standard RIS, but are included for completeness so as to provide the requested consistency between the RIS and the format of a 'full' Ecological Character Description, as adopted in Resolution X.15 (2008). If a Contracting Party does have information available that is relevant to these fields (for example from a national format Ecological Character Description) it may, if it wishes to, include information in these additional fields.

## 1 - Summary

### Summary

Lake Bogoria is an alkaline soda lake located in the East Africa Great Rift Valley at an altitude of 963m asl. The Ramsar site covers the entire National Reserve with an area of 10,700 ha and is managed by Baringo County Government. The site is designated as a UNESCO World Heritage Site, an Important Bird Area (IBA) and a critical refuge for the lesser flamingo and other threatened species. It is also an important stop-over site for migratory birds.

The lake which is hydrologically dominated by hot springs is significant in the provision of different ecosystem services. The open shoreline fringe often littered with lava boulders is narrow and is dominated by the salt-tolerant species *Sporobolus spicatus* and *Cyperus laevigatus* around the hot-springs. The terrestrial vegetation is mainly a thorny bushland dominated by *Acacia*, *Salvadora*, *Balanites* and *Commiphora* species, with patches of riverine woodland consisting of *Ficus capensis*, *Acacia xanthophloea* and *Acacia tortilis*.

The Ramsar site is important for the socio-economic development as it supports significant nature-based tourism and has cultural values to the local community. The site is also important for scientific research and education purposes. There is a management plan for the National Reserve which is under implementation.

## 2 - Data & location

### 2.1 - Formal data

#### 2.1.1 - Name and address of the compiler of this RIS

##### Responsible compiler

Institution/agency	Wildlife Research and Training Institute
Postal address	P.O. Box 842-20100, Naivasha, Kenya

##### National Ramsar Administrative Authority

Institution/agency	Kenya Wildlife Service
Postal address	P. O. Box 40241 - 00100, Nairobi, Kenya

#### 2.1.2 - Period of collection of data and information used to compile the RIS

From year	2016
To year	2022

#### 2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)	Lake Bogoria
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#### 2.1.4 - Changes to the boundaries and area of the Site since its designation or earlier update

(Update) A. Changes to Site boundary	Yes <input type="radio"/> No <input checked="" type="radio"/>
(Update) B. Changes to Site area	No change to area
(Update) For secretariat only: This update is an extension	<input type="checkbox"/>

#### 2.1.5 - Changes to the ecological character of the Site

(Update) 6b i. Has the ecological character of the Ramsar Site (including applicable Criteria) changed since the previous RIS?	Yes (likely)
(Update) Are the changes	Positive <input type="radio"/> Negative <input type="radio"/> Positive & Negative <input checked="" type="radio"/>
(Update) No information available	<input checked="" type="checkbox"/>
(Update) Changes resulting from causes operating within the existing boundaries?	<input type="checkbox"/>
(Update) Changes resulting from causes operating beyond the site's boundaries?	<input checked="" type="checkbox"/>
(Update) Changes consequent upon site boundary reduction alone (e.g., the exclusion of some wetland types formerly included within the site)?	<input type="checkbox"/>
(Update) Changes consequent upon site boundary increase alone (e.g., the inclusion of different wetland types in the site)?	<input type="checkbox"/>
(Update) Please describe any changes to the ecological character of the Ramsar Site, including in the application of the Criteria, since the previous RIS for the site.	
Flooding due to increased influent volumes of water as a result of increased rainfall during the period 2009-2013.	
(Update) Is the change in ecological character negative, human-induced AND a significant change (above the limit of acceptable change)	Yes <input checked="" type="radio"/>
(Update) Has an Article 3.2 report been submitted to the Secretariat?	Yes <input type="radio"/>

## 2.2 - Site location

### 2.2.1 - Defining the Site boundaries

b) Digital map/image  
<1 file(s) uploaded>

Former maps	0
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Boundaries description

Lake Bogoria is located within Kenya's Rift Valley at Longitude 36° 4' - 36° 7' E, Latitude 0° 10' - 0° 20'N in Baringo County, Kenya. It is situated about 120 km north of Nakuru city along the Nakuru - Marigat junction - Lobo road and 240 km north of Nairobi city. The Ramsar site includes the entire National Reserve with an area of (10,700 ha) with the lake covering an area 33 km<sup>2</sup> (3,300 ha) while the riparian and terrestrial habitats cover 74 km<sup>2</sup> (7,400 ha). The terrestrial component around the lake is an important buffer zone and an integral part of the lake. Due to rising lake levels in Kenya's Rift Valley, the area of the water body increased to about 46.9Km<sup>2</sup> in 2020 (GOK & UNDP 2021).

2.2.2 - General location

- a) In which large administrative region does the site lie?
- b) What is the nearest town or population centre?

2.2.3 - For wetlands on national boundaries only

- a) Does the wetland extend onto the territory of one or more other countries? Yes  No
- b) Is the site adjacent to another designated Ramsar Site on the territory of another Contracting Party? Yes  No

2.2.4 - Area of the Site

- Official area, in hectares (ha):
- Area, in hectares (ha) as calculated from GIS boundaries

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
WWF Terrestrial Ecoregions	Northern Acacia - Commiphora Bushlands and thickets

Other biogeographic regionalisation scheme

It is within the Gregorian Rift Valley. Beccaluva, Luigi; Bianchini, Gianluca; Wilson, Marjorie (2011).

### 3 - Why is the Site important?

#### 3.1 - Ramsar Criteria and their justification

Criterion 1: Representative, rare or unique natural or near-natural wetland types

Hydrological services provided	The marshes to the north of the Lake contribute to the hydrological functions of Lake Bogoria which is fed by Rivers Sandai-Waseges, Loboï and Emsos. The wetland is an alkaline soda lake, which is hydrologically dominated by hot springs and is the only alkaline lake that has minimal lake water fluctuations compared to other alkaline lakes in Kenya. The river system is a vital resource to the local community providing water for domestic and irrigated agriculture and a dry season grazing for the community. Other hydrological services provided by the wetland include ground water recharge and discharge and water purification.
Other ecosystem services provided	Lake Bogoria has cultural and spiritual significance to the local Endorois and Tugen community. The lake supports diverse flora and fauna including significant populations of the lesser flamingo ( <i>Phoenicopterus minor</i> ) hence is an important site for tourism, education and research.
Other reasons	The extremophiles found within Lake Bogoria hot springs are important in the field of biotechnology.

Criterion 2 : Rare species and threatened ecological communities

Optional text box to provide further information	Lake Bogoria National Reserve host one of the few remaining pockets of the Greater Kudu ( <i>Tragelaphus strepsiceros</i> ) range in Africa. The species population has reduced due to habitat loss through overgrazing, increased settlement and habitat degradation. The lake is also a critical refuge for the Lesser Flamingo and other migratory bird species. It is an important dispersal range for the birds during extreme environmental conditions in other Rift Valley Lakes as it has high biomass of <i>Arthrospira fusiformis</i> capable of supporting high populations of the lesser flamingos.
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Criterion 4 : Support during critical life cycle stage or in adverse conditions

Optional text box to provide further information	During prolonged droughts and adverse environmental conditions, especially when lake levels are very low in other East Africa Rift Valley saline lakes, Lake Bogoria provides refuge to thousands and occasionally millions of lesser flamingos. On such occasions, it is the only lake with substantial water level and high biomass of <i>Arthrospira fusiformis</i> capable of supporting regional populations of the lesser flamingos. Unlike other soda lakes in the region, depth fluctuations are minimal and thus acts as a steady water reservoir and refuge site for the Lesser flamingos during extreme weather conditions, when other soda lakes are less preferred especially during flooding or dry periods. The lake is an important feeding ground for lesser flamingoes.
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Criterion 5 : >20,000 waterbirds

Overall waterbird numbers	22783
Start year	2016
End year	2022
Source of data:	The National Waterbirds Census for Kenya 2021

Optional text box to provide further information

Lake Bogoria supports high diversity of birds and is listed as an Important Bird Areas (IBA) with than 300 species of birds recorded. Previously, the lake supported an assemblage of about 1.5 million flamingos and other congregatory birds however due to the changes in hydrology of the lake, the number of waterbirds recorded has declined in the recent years. In January 2021, an estimate of 225,132 flamingoes were recorded during the National waterbird counts. The lake also supports Pied kingfisher with 703 and Long-tailed comorant (*Microcarbo africanus*) with 393 individuals counted in 2022

Criterion 6 : >1% waterbird population

Optional text box to provide further information

The population of waterbirds in Lake Bogoria was 227,836 (January 2021) which represents approximately 7% of the global population (as per IUCN Red list 2018 assessment). Waterbirds identified at this site include : Lesser flamingo (99412), Greater Flamingo (1263), Pied kingfisher (703) , Longtailed comorant (393) as per National Museums water fowls census 2022 report

Optional text box to provide further information

Lake Bogoria National Reserve hosts threatened mammal species including; Greater Kudu (*Tragelaphus strepsiceros*), Lion (*Panthera leo*) and Leopard (*Panthera pardus*). The common hippopotamus (*Hippopotamus amphibius*) listed by IUCN as vulnerable was recorded in the lake after the recent floods. Other wildlife found in the reserve include Impala (*Aepyceros melampus*), Grants Gazelle (*Gazelle grantii*), Zebra (*Equus burcheli*), Dikdik (*Rhynchotragus kirki*), Warthog (*Phacochoerus africanus*), Waterbuck (*Kobus ellipsiprymnus*), Hyena (*Crocuta crocuta*), Civet (*Civettictis civetta*) and White tailed Mongoose (*Ichneumia albicauda*).

### 3.2 - Plant species whose presence relates to the international importance of the site

During prolonged droughts and adverse environmental conditions, especially when lake levels are very low in other East Africa Rift Valley saline lakes, Lake Bogoria provides refuge to thousands and occasionally millions of lesser flamingos. On such occasions, it is the only lake with substantial water level and high biomass of *Arthrospira fusiformis* capable of supporting regional populations of the lesser flamingos. Unlike other soda lakes in the region, depth fluctuations are minimal and thus acts as a steady water reservoir and refuge site for the Lesser flamingos during extreme weather conditions, when other soda lakes are less preferred especially during flooding or dry periods.

*Arthrospira fusiformis* (Voronichin) Komárek & J.W.G.Lund, 1990 in GBIF Secretariat (2023). GBIF Backbone Taxonomy. Checklist dataset <https://doi.org/10.15468/39omei> accessed via GBIF.org on 2024-01-16.

### 3.3 - Animal species whose presence relates to the international importance of the site

Phylum	Scientific name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence 1)	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
		2	4	6	9	3	5	7	8								
<b>Others</b>																	
CHORDATA / MAMMALIA	<i>Hippopotamus amphibius</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3	2021		VU	<input type="checkbox"/>	<input type="checkbox"/>		
CHORDATA / MAMMALIA	<i>Panthera leo</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				VU	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
CHORDATA / MAMMALIA	<i>Panthera pardus</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				VU	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
<b>Birds</b>																	
CHORDATA / AVES	<i>Ceryle rudis</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	703	2022		LC	<input type="checkbox"/>	<input type="checkbox"/>		
CHORDATA / AVES	<i>Microcarbo africanus</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	393	2022		LC	<input type="checkbox"/>	<input type="checkbox"/>		
CHORDATA / AVES	<i>Phoeniconaias minor</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	225132	2021	11.3	NT	<input type="checkbox"/>	<input type="checkbox"/>	Change in the ecological character of the lake where increased water levels hence flooding was witnessed after 2010 affecting waterbird populations as well as tourism attractions as geysers disappering and submerged tourism infrastructures.	Despite that Lake Bogoria provides refuge to hundreds of thousands and occasionally millions of lesser flamingos, the flooding phenomenon witnessed after 2010 caused a drastic to total dissapperance of this species in this lake.
CHORDATA / AVES	<i>Phoenicopterus roseus</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1263	2022	1	LC	<input type="checkbox"/>	<input type="checkbox"/>	Similar to the lesser flamingos, flooding of lake caused reduced population numbers of the greater flamingo population numbers when compared to previous years.	Flooding of the lake impacted on the greater flamingo numbers .

1) Percentage of the total biogeographic population at the site

### 3.4 - Ecological communities whose presence relates to the international importance of the site

Name of ecological community	Community qualifies under Criterion 2?	Description	Justification
Arthrospira fusiformis	<input checked="" type="checkbox"/>	Cyanobacteria endemic to Lake Bogoria which profides food for lesser flamingos	It provides an important feeding ground for the lesser flamingos
The greater Kudu	<input checked="" type="checkbox"/>	Species in Northern Kenya	Population status is unknown but decreasing in the country

## 4 - What is the Site like? (Ecological character description)

### 4.1 - Ecological character

Lake Bogoria is an alkaline soda lake, hydrologically dominated by hot springs which contain highly specialized microbial communities. The lake is a critical refuge for the lesser flamingo (*Phoeniconaias minor*) with a population of over 200,000 birds supported by a high concentration of cyanobacteria (*Arthrospira fusiformis*). Other micro-organisms including extremophiles also inhabit the lake. It has high biodiversity values with more than 300 water-bird species recorded. The lake is, thus, an important stop-over point for a wide range of the migratory bird species, further it is a critical revenue base in terms of tourism and has socio-economic and cultural significance to the local communities. Other bird species of global conservation concern recorded at Lake Bogoria include Pallid Harrier (*Circus macrourus*), Ostrich (*Struthio camelus*) and Lesser Kestrel (*Falco naumanni*) while regionally threatened species include Great crested grebe (*Podiceps cristatus*) and African Darter (*Anhinga rufa*) occurring in the swamp north of the lake, Maccoa Duck (*Oxyura maccoa*), White-backed duck (*Thalassornis leuconotus*), White-headed vulture (*Trigonoceps occipitalis*) and Martial Eagle (*Polemaetus bellicosus*). The riparian ecosystem comprises a narrow shoreline fringe dominated by *Sporobolus spicatus* and *Cyperus laevigatus*. The terrestrial vegetation around Lake Bogoria is mainly thorny bushland, dominated by *Balanites* and *Commiphora* spp., with patches of riverine woodland containing *Ficus capensis*, *Acacia xanthophloea*, *Acacia tortilis* and *Salvadora persica* woodlands. The latter is a critical habitat for the Greater Kudu (*Tragelaphus strepsiceros*) and other mammalian species. The recent rise in water levels led to an increase in coverage in the lake by 24.32% between 2010 and 2020 (GOK, 2021) and this impacted negatively on the rich biodiversity and important habitats for wildlife. The floods also submerged the hot springs and suppressed most of the geysers thus affecting the habitats and their touristic value.

### 4.2 - What wetland type(s) are in the site?

#### Inland wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
Saline, brackish or alkaline water > Lakes >> Q: Permanent saline/brackish/alkaline lakes	Lake Bogoria	1	10700	Rare

#### Other non-wetland habitat

Other non-wetland habitats within the site	Area (ha) if known
Savanna grasslands, Rocky slopes,	

(ECD) Habitat connectivity

### 4.3 - Biological components

#### 4.3.1 - Plant species

##### Invasive alien plant species

Phylum	Scientific name	Impacts	Changes at RIS update
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Lantana camara</i>	Actual (minor impacts)	No change
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Pereskopsis diguetii</i>	Actual (major impacts)	No change
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Prosopis juliflora</i>	Actual (major impacts)	No change
TRACHEOPHYTA/MAGNOLIOPSIDA	<i>Solanum villosum</i>	Actual (minor impacts)	No change

##### Optional text box to provide further information

*Prosopis juliflora* is widespread around Lake Bogoria ecosystem and has displaced the native plant species, and negatively impacted the local community livelihoods.

#### 4.3.2 - Animal species

##### Other noteworthy animal species

Phylum	Scientific name	Pop. size	Period of pop. est.	% occurrence	Position in range /endemism/other
CHORDATA/MAMMALIA	<i>Acinonyx jubatus</i>				
CHORDATA/MAMMALIA	<i>Aepyceros melampus</i>				
CHORDATA/AVES	<i>Anas capensis</i>				
CHORDATA/AVES	<i>Aquila verreauxii</i>				
CHORDATA/AVES	<i>Calidris temminckii</i>				
CHORDATA/MAMMALIA	<i>Civettictis civetta</i>				
CHORDATA/MAMMALIA	<i>Crocuta crocuta</i>				
CHORDATA/MAMMALIA	<i>Equus quagga</i>				
CHORDATA/MAMMALIA	<i>Ichneumia albicauda</i>				
CHORDATA/MAMMALIA	<i>Kobus ellipsiprymnus defassa</i>				
CHORDATA/AVES	<i>Limosa limosa</i>				
CHORDATA/MAMMALIA	<i>Madoqua kirkii</i>				
CHORDATA/MAMMALIA	<i>Nanger granti</i>				
CHORDATA/AVES	<i>Neophron percnopterus</i>				
CHORDATA/AVES	<i>Netta erythrophthalma</i>				
CHORDATA/MAMMALIA	<i>Phacochoerus africanus</i>				
CHORDATA/AVES	<i>Podiceps nigricollis</i>				
CHORDATA/AVES	<i>Rhinopomastus aterrimus</i>				
CHORDATA/AVES	<i>Rostratula benghalensis</i>				
CHORDATA/MAMMALIA	<i>Tragelaphus strepsiceros</i>				
CHORDATA/AVES	<i>Vanellus senegallus</i>				
CHORDATA/AVES	<i>Vanellus tectus</i>				

Optional text box to provide further information

Not Applicable

#### 4.4 - Physical components

##### 4.4.1 - Climate

Climatic region	Subregion
B: Dry climate	BWh: Subtropical desert (Low-latitude desert)

The unpredictable climatic changes has affected the lake's hydrology and subsequently impacting on biodiversity and community livelihoods.

##### 4.4.2 - Geomorphic setting

a) Minimum elevation above sea level (in metres)

a) Maximum elevation above sea level (in metres)

- Entire river basin
- Upper part of river basin
- Middle part of river basin
- Lower part of river basin
- More than one river basin

Not in river basin

Coastal

Please name the river basin or basins. If the site lies in a sub-basin, please also name the larger river basin. For a coastal/marine site, please name the sea or ocean.

Sandai-waseges river basin

#### 4.4.3 - Soil

Mineral

(Update) Changes at RIS update No change  Increase  Decrease  Unknown

No available information

Are soil types subject to change as a result of changing hydrological conditions (e.g., increased salinity or acidification)? Yes  No

Please provide further information on the soil (optional)

Lake Bogoria basin has three major soil types; clay soil, clay loam and silt loam. Soil texture is not variable and most soils are categorized as loamy with exceptions of clay loams restricted to riverine areas. The riverine soils are complex with varied textures depending on the drainage conditions and are composed of eroded volcanic sediments and alluvial deposits. They consist of diverse types of granulomites, conglomerates, silts and gravels. The soils around the lake have high a pH ranging from 6.8 to 9.0, with high sodium bicarbonate levels ranging from 0.5 to 9.92 meq/l-1. The salinity and sodicity are attributed to the parent rock material. Highly alkaline soils are found along the shoreline fringes, but those close to permanent water sources have intermediate values, while soils in the ridges and scarps have the lowest pH values. Soil nutrient availability indices are high indicating high fertility levels with mean phosphorous concentrations of 80 ppm in the riverine soils. Ka

#### 4.4.4 - Water regime

Water permanence

Presence?	Changes at RIS update
Usually permanent water present	increase

Source of water that maintains character of the site

Presence?	Predominant water source	Changes at RIS update
Water inputs from surface water	<input checked="" type="checkbox"/>	increase
Water inputs from groundwater	<input type="checkbox"/>	increase
Water inputs from precipitation	<input type="checkbox"/>	increase

Water destination

Presence?	Changes at RIS update
Unknown	No change
Feeds groundwater	No change

Stability of water regime

Presence?	Changes at RIS update
Water levels largely stable	increase

Please add any comments on the water regime and its determinants (if relevant). Use this box to explain sites with complex hydrology:

Lake Bogoria has a trellis drainage pattern with rivers flowing northwards along fault lines. The lake is majorly fed by River Sandai-Waseges which flows northwards towards Lake Baringo but deviates to the south at Sandai to drain into Lake Bogoria. The river flow is seasonal and occasionally dries up between January and March. River Lobo that also drains into Lake Baringo diverts its course in the wet season to drain into Lake Bogoria due to clogging of its channel by sediments. In the south River Emsos and a few perennial springs discharge fresh water into the lake. A number of dry wadis characterized by flash floods bring in water during the wet season. The lake's water balance is maintained by evaporation, rainfall, surface flow, underground hot springs and geysers, with minimal lake level fluctuations. However, despite the minimal fluctuations in lake levels, it should be noted that the lake is located in a semi-arid area with temperatures reaching as high as 39.0 C, rainfall of 500 mm per annum and annual evaporation of 2,300 mm. Arrays of hot alkaline springs and fumaroles along the shoreline and within the lake floor discharge enormous volumes of water that effectively counter-balance evaporative losses. The lake does not have a record of drying out and it is the most permanent of the alkaline lakes found in the Rift Valley.

(ECD) Connectivity of surface waters and groundwater

The water that emanate from the hot springs and geysers is believed to originate from the higher elevation areas of Nakuru, Elementaita and Eburu, flowing through underground hydrological systems in contact with underlying hot lava. Temperatures as high

(ECD) Stratification and mixing regime

The lake has a meromictic regime a condition in which a lake does not mix completely

#### 4.4.5 - Sediment regime

Significant erosion of sediments occurs on the site

(Update) Changes at RIS update No change  Increase  Decrease  Unknown

Significant accretion or deposition of sediments occurs on the site

(Update) Changes at RIS update No change  Increase  Decrease  Unknown

Significant transportation of sediments occurs on or through the site

(Update) Changes at RIS update No change  Increase  Decrease  Unknown

Sediment regime is highly variable, either seasonally or inter-annually

(Update) Changes at RIS update No change  Increase  Decrease  Unknown

Sediment regime unknown

Please provide further information on sediment (optional):

Land-use changes, deforestation, over-grazing and poor agricultural practices in the catchment have resulted in increased soil erosion, run-off and siltation of the feeder rivers and the lake. There is evidence of serious sedimentation leading to rivers changing their courses in the region.

(ECD) Water turbidity and colour

(ECD) Light - reaching wetland

(ECD) Water temperature

#### 4.4.6 - Water pH

Circumneutral (pH: 5.5-7.4 )

(Update) Changes at RIS update No change  Increase  Decrease  Unknown

Alkaline (pH>7.4)

(Update) Changes at RIS update No change  Increase  Decrease  Unknown

Unknown

#### 4.4.7 - Water salinity

Euhaline/Eusaline (30-40 g/l)

(Update) Changes at RIS update No change  Increase  Decrease  Unknown

Hyperhaline/Hypersaline (>40 g/l)

(Update) Changes at RIS update No change  Increase  Decrease  Unknown

Unknown

Please provide further information on salinity (optional):

Lake Bogoria is hypersaline lake with a pH range of 9.8 - 10.6, electrical conductivity of 35 - 80 mS/cm and alkalinity of 480 - 800 m eq/l.

#### 4.4.8 - Dissolved or suspended nutrients in water

Mesotrophic

(Update) Changes at RIS update No change  Increase  Decrease  Unknown

Unknown

(ECD) Water conductivity

#### 4.4.9 - Features of the surrounding area which may affect the Site

Please describe whether, and if so how, the landscape and ecological characteristics in the area surrounding the Ramsar Site differ from the i) broadly similar  ii) significantly different  site itself:

- Surrounding area has greater urbanisation or development
- Surrounding area has higher human population density
- Surrounding area has more intensive agricultural use
- Surrounding area has significantly different land cover or habitat types

Please describe other ways in which the surrounding area is different:

Lake Bogoria has a catchment area of 1200 km<sup>2</sup>, its upper catchment around Subukia have a high agricultural potential with intense cultivation and high human population densities. The montane forests around Subukia, Ol Arabel, Mchongoi and Marmanet areas forms the catchment for Sandai-Waseges River. There are riverine forests along its rivers courses, seasonal water flow channels and freshwater springs. The nearby urban areas such as Marigat and Mogotio are expanding and have relatively high population densities.

### 4.5 - Ecosystem services

#### 4.5.1 - Ecosystem services/benefits

Provisioning Services

Ecosystem service	Examples	Importance/Extent/Significance
Wetland non-food products	Reeds and fibre	Medium
Genetic materials	Medicinal products	Medium

Regulating Services

Ecosystem service	Examples	Importance/Extent/Significance
Maintenance of hydrological regimes	Groundwater recharge and discharge	High
Erosion protection	Soil, sediment and nutrient retention	Medium
Climate regulation	Local climate regulation/buffering of change	High

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Picnics, outings, touring	High
Spiritual and inspirational	Cultural heritage (historical and archaeological)	High
Scientific and educational	Educational activities and opportunities	High
Scientific and educational	Important knowledge systems, importance for research (scientific reference area or site)	High

Supporting Services

Ecosystem service	Examples	Importance/Extent/Significance
Biodiversity	Supports a variety of all life forms including plants, animals and microorganisms, the genes they contain, and the ecosystems of which they form a part	High
Nutrient cycling	Storage, recycling, processing and acquisition of nutrients	High

Optional text box to provide further information

The lake has cultural and spiritual significance to the local Endorois and Tugen communities who have been the custodians of the lake for centuries and depend on it for their livelihoods.

Extremophiles are important in the field of biotechnology. For example, two thermophile species *Thermus aquaticus* and *Thermococcus litoralis* are used as sources of enzyme DNA polymerase, for the polymerase chain reaction (PCR) in DNA fingerprinting. As thermophiles have become increasingly important in biotechnological research, the number of bio-prospecting groups searching for useful organic compounds in nature has dramatically increased.

Within the site:

Outside the site:

Have studies or assessments been made of the economic valuation of ecosystem services provided by this Ramsar Site? Yes  No  Unknown

4.5.2 - Social and cultural values

- i) the site provides a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland
- ii) the site has exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland
- iii) the ecological character of the wetland depends on its interaction with local communities or indigenous peoples
- iv) relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland

Description if applicable

Endorois and Tugen community considers the site as central to their religious and traditional practices. It is used as a historical prayer site, for circumcision rituals and other cultural ceremonies. The community has continued to protect Lake Bogoria as a cultural site.

4.6 - Ecological processes

<no data available>

## 5 - How is the Site managed? (Conservation and management)

### 5.1 - Land tenure and responsibilities (Managers)

#### 5.1.1 - Land tenure/ownership

Public ownership

Category	Within the Ramsar Site	In the surrounding area
Local authority, municipality, (sub)district, etc.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Other

Category	Within the Ramsar Site	In the surrounding area
Commoners/customary rights	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Provide further information on the land tenure / ownership regime (optional):

The area around the Ramsar site is a mix of community trust land and communal land ownership.

#### 5.1.2 - Management authority

Please list the local office / offices of any agency or organization responsible for managing the site:

County Government of Baringo.

Provide the name and/or title of the person or people with responsibility for the wetland:

The Governor of Baringo County

Postal address:

P.O Box 53 - 30400, Kabarnet, Kenya.

E-mail address:

info@baringo.go.ke

### 5.2 - Ecological character threats and responses (Management)

#### 5.2.1 - Factors (actual or likely) adversely affecting the Site's ecological character

Human settlements (non agricultural)

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Tourism and recreation areas	Low impact	High impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

Water regulation

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Water abstraction	High impact	High impact	<input type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

Agriculture and aquaculture

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Livestock farming and ranching	Medium impact	High impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

Energy production and mining

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Renewable energy	Low impact	High impact	<input checked="" type="checkbox"/>	increase	<input type="checkbox"/>	increase

Transportation and service corridors

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Roads and railroads	Low impact	Low impact	<input checked="" type="checkbox"/>	increase	<input checked="" type="checkbox"/>	increase
Utility and service lines (e.g., pipelines)	Low impact	Low impact	<input checked="" type="checkbox"/>	increase	<input checked="" type="checkbox"/>	increase

Biological resource use

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Hunting and collecting terrestrial animals	Medium impact	High impact	<input checked="" type="checkbox"/>	increase	<input checked="" type="checkbox"/>	increase
Gathering terrestrial plants	High impact	High impact	<input checked="" type="checkbox"/>	increase	<input checked="" type="checkbox"/>	increase

Human intrusions and disturbance

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Recreational and tourism activities	Low impact	Low impact	<input type="checkbox"/>	No change	<input checked="" type="checkbox"/>	increase

Natural system modifications

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Vegetation clearance/land conversion	Medium impact	High impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Unspecified/others	Low impact	Low impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

Invasive and other problematic species and genes

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Invasive non-native/alien species	High impact	High impact	<input checked="" type="checkbox"/>	increase	<input checked="" type="checkbox"/>	increase

Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Agricultural and forestry effluents	Medium impact	Medium impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	increase
Excess heat, sound, light	Medium impact	Medium impact	<input checked="" type="checkbox"/>	No change	<input type="checkbox"/>	No change

Geological events

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Avalanches/landslides	Medium impact	Medium impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change

Climate change and severe weather

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Droughts	High impact	High impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Temperature extremes	High impact	High impact	<input checked="" type="checkbox"/>	No change	<input checked="" type="checkbox"/>	No change
Storms and flooding	High impact	High impact	<input checked="" type="checkbox"/>	increase	<input checked="" type="checkbox"/>	increase

Please describe any other threats (optional):

The recent floods in the lake have resulted in habitat loss and modification. The flamingoes which is an important species in the site have been affected by being trapped by the submerged Prosopis bushes as they attempt to either land or take off.

### 5.2.2 - Legal conservation status

Global legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
World Heritage site	Lake Bogoria National Reserve	<a href="https://whc.unesco.org/en/list/1060">https://whc.unesco.org/en/list/1060</a>	whole

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
National Reserve	Lake Bogoria National Reserve		whole

Non-statutory designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Important Bird Area	Lake Bogoria National Reserve	<a href="http://datazone.birdlife.org/site/factsheet/lake-bogoria-national-reserve-iba-kenya">http://datazone.birdlife.org/site/factsheet/lake-bogoria-national-reserve-iba-kenya</a>	whole

### 5.2.3 - IUCN protected areas categories (2008)

- Ia Strict Nature Reserve
- Ib Wilderness Area: protected area managed mainly for wilderness protection
- II National Park: protected area managed mainly for ecosystem protection and recreation
- III Natural Monument: protected area managed mainly for conservation of specific natural features
- IV Habitat/Species Management Area: protected area managed mainly for conservation through management intervention
- V Protected Landscape/Seascape: protected area managed mainly for landscape/seascape conservation and recreation

VI Managed Resource Protected Area: protected area managed mainly  for the sustainable use of natural ecosystems

### 5.2.4 - Key conservation measures

#### Legal protection

Measures	Status
Legal protection	Implemented

#### Habitat

Measures	Status
Catchment management initiatives/controls	Partially implemented
Faunal corridors/passage	Partially implemented

#### Species

Measures	Status
Control of invasive alien plants	Proposed
Threatened/rare species management programmes	Partially implemented

#### Human Activities

Measures	Status
Communication, education, and participation and awareness activities	Implemented
Research	Partially implemented
Livestock management/exclusion (excluding fisheries)	Partially implemented
Management of water abstraction/takes	Partially implemented
Regulation/management of recreational activities	Implemented

#### Other:

Baringo County Government has developed a Policy on Benefit Sharing with the local communities as a motivation to conserve the Lake.

### 5.2.5 - Management planning

Is there a site-specific management plan for the site? Yes

Has a management effectiveness assessment been undertaken for the site? Yes  No

If the site is a formal transboundary site as indicated in section Data and location > Site location, are there shared management planning processes with another Contracting Party? Yes  No

Please indicate if a Ramsar centre, other educational or visitor facility, or an educational or visitor programme is associated with the site:

Lake Bogoria National Reserve has an education center located at Lobo gate to promote environmental awareness to school groups, local communities and visitors. However, this center needs upgrading with modern audiovisual equipment and awareness materials. The Reserve management in collaboration with partners such as Wildlife Clubs of Kenya (WCK) conducts a school environmental education program to neighboring schools. The management has further designated observation points, picnic sites and campsites within the reserve.

### 5.2.6 - Planning for restoration

Is there a site-specific restoration plan? No, but restoration is needed

#### Further information

Not yet prepared, but once developed the restoration plan will cover the whole Ramsar site and catchment areas.

### 5.2.7 - Monitoring implemented or proposed

Monitoring	Status
Water quality	Implemented
Birds	Implemented
Animal community	Implemented
Animal species (please specify)	Implemented
Water regime monitoring	Implemented

Waterfowl counts are conducted in the site twice in a year as part of the National waterfowl Census programme. Wildlife Monitoring is conducted periodically within the reserve and adjacent Community Wildlife Conservancies.

## 6 - Additional material

### 6.1 - Additional reports and documents

#### 6.1.1 - Bibliographical references

Beccaluva, Luigi; Bianchini, Gianluca; Wilson, Marjorie (2011). *Volcanism and Evolution of the African Lithosphere*. Geological Society of America. ISBN 978-0-8137-2478-

*Arthrospira fusiformis* (Voronichin) Komárek & J.W.G.Lund, 1990 in GBIF Secretariat (2023). GBIF Backbone Taxonomy. Checklist dataset <https://doi.org/10.15468/39omei> accessed via GBIF.org on 2024-01-16.

#### 6.1.2 - Additional reports and documents

i. taxonomic lists of plant and animal species occurring in the site (see section 4.3)

<2 file(s) uploaded>

ii. a detailed Ecological Character Description (ECD) (in a national format)

<no file available>

iii. a description of the site in a national or regional wetland inventory

<no file available>

iv. relevant Article 3.2 reports

<no file available>

v. site management plan

<1 file(s) uploaded>

vi. other published literature

<2 file(s) uploaded>

#### 6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:



Calm lake overlooking the hills in the horizon ( *Martha Nzisa*, [marthanzisa@gmail.com](mailto:marthanzisa@gmail.com), 28-01-2017 )



Vegetation submerged in the water indicating rise in water levels ( *Martha Nzisa*, [marthanzisa@gmail.com](mailto:marthanzisa@gmail.com), 05-01-2018 )



Flamingos in the lake ( *Martha Nzisa*, [marthanzisa@gmail.com](mailto:marthanzisa@gmail.com), 07-01-2011 )

#### 6.1.4 - Designation letter and related data

Designation letter

<1 file(s) uploaded>

Date of Designation