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 Naivasha is a shallow freshwater lake in Kenya's southern Rift Valley. It is fringed by Acacia woodland. The lake is considered to be of recent geological origin, and is ringed by extinct or dormant volcanoes. Naivasha's water is supplied by the permanent Malewa and Gilgil Rivers that drain the Aberdare Mountains in central Kenya. Although the lake has no visible outlet, its water is fresh. It is thought that a combination of underground outflow and sedimentation of salts keeps the lake fresh, unlike other endorheic lakes in eastern Rift Valley. Papyrus Cyperus papyrus fringes much of the shore, with variable areas of submerged macrophytes such as Potamogeton spp., and floating rafts of the exotic Water Hyacinth Eichhornia crassipes. Lake Naivasha is a highly significant national freshwater resource in an otherwise water deficit area that supports a diverse waterbird community and many large mammals. Apart from the invaluable freshwater it also supports large and vitally important economic activities – mainly flower growing, fishing and geothermal power generation. The Lake and its surrounds are fragile with dynamic ecosystems and a yet uncertain water balance in a basin surrounded by intensively irrigated agricultural land and a fast growing township.

2 - Data & location

2.1 - Formal data

2.1.1 - Name and address of the compiler of this RIS

Responsible compiler

Institution/agency	National Museums of Kenya
Postal address	P.O. Box 40658, 00100, Nairobi. KENYA

National Ramsar Administrative Authority

Institution/agency	Kenya Wildlife Servce
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 Naivasha

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 ○ No ◉
(Update) B. Changes to Site area	No change to area
(Update) For secretariat only: This update is an extension	☐

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?	No

2.2 - Site location

2.2.1 - Defining the Site boundaries

b) Digital map/image
<2 file(s) uploaded>

Former maps	0

Boundaries description

Lake Naivasha Ramsar Site is enclosed in the region between the junction of Moi North Lake Road and Moi South Road and the Railway line in Nakuru County. It falls within the contour and riparian boundary1892.8m above sea level, which is the officially gazetted boundary of the Lake as per, The Kenya Gazette legal notice number 8 of 2012. The Lake covers an area of 30,000 ha but due to its fluctuating nature the surface area covered by lake water varies from time to time. It receives drainage from two perennial rivers, the Malewa, draining the Nyandarua (Aberdare) Mountains (drainage area: 1730 km2), and the Gilgil, draining the Rift Valley escarpment ridges from the North (drainage area: 420 km2). Ephemeral systems (Marmanet, Karati, Nyamithi and Kwamuya) drain hills and escarpments closer to the lake.

2.2.2 - General location

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

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): 30000

Area, in hectares (ha) as calculated from GIS boundaries: 30498.697

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Other scheme (provide name below)	Eastern Rift Valley
WWF Terrestrial Ecoregions	East African Halophytics
Freshwater Ecoregions of the World (FEOW)	Freshwater Ecoregions of the World (FEOW)

Other biogeographic regionalisation scheme

The Lake is representative of a natural or near natural freshwater lake in an otherwise arid area with no significant outlet in the Rift Valley region of Kenya. It is representative of the dispersal area for Red - knobbed Coot Fulica cristata and other waterbird species in Kenya's southern Rift Valley.

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	Lake Naivasha is a shallow endorheic freshwater lake (pH of 7.9 - 8.1) in the semi-arid zone in the Eastern Rift valley of Kenya, where most of the lakes are saline. Rivers draining the Lake include Malewa, Gilgil and Karati.The perennial Malewa and Gilgil originating from Nyandarua ranges account for nearly 90% of the Lake's inflow(Otiang'a-Owiti and Oswe 2007),while the seasonal Karati accounts for the remainder (Ayenew and Becht,2008). This site has three chemically distinct water bodies: a deeper fresh water Crater Lake, sodic Sonachi Lake and slightly alkaline Lake Oloidien, and infringing swamps all supporting unique habitats particularly the fringing papyrus swamp and associated freshwater biodiversity. River Malewa draining into Lake Naivasha has its catchment in the Aberdares escarpment to the east. This is a reliable Permanent River with a large volume of water. This river in combination with underground recharge and discharge play a major role in the biological and physical - chemical characteristics of a freshwater lake Naivasha. The river supports a lot of biodiversity and many ecological functions in the lake, which are very important locally and nationally. The depth has been decreasing over the years due to reduced precipitation, water diversion/abstraction and siltation. The lake was found to have a mean depth, volume and surface area of 4.68 m, 722 × 106 m3 and 154.17 × 106 m2, respectively (Maina CW,et al 2018). Considering water levels at 1,889 masl, it can be concluded from the 1983 and 2016 survey that the maximum water depth was reduced by 2, 0.6 and 1.75 m in the Main Lake (hippo point), Crescent Island Lake and Lake Oloiden, respectively (Maina CW,et al 2018).The sources of water for the lake include precipitation, river flow and underground seepage. The Site is an important source of water for irrigation, industry, and domestic use.
Other ecosystem services provided	The Lake is a source of livelihood supporting, recreation (tourism) and livestock watering and supports diverse and nationally important economic activities, such as cut - flower production, fishing and geothermal power generation.
Other reasons	The lake being a biodiversity hotspot has attracted various researchers and training institutions around Naivasha. These include Kenya Marine and Fisheries Research Institute (KEMFRI) that have a field research centre, Wildlife Research and Training Institute WRTI, Kenya Agriculture and Livestock Research Organization KALRO (previously known as the Kenya Agriculture Research Institute KARI. Naivasha hosts various educational institutions including. Elsamere, Dairy training Institute and WRTI.

☑ Criterion 2 : Rare species and threatened ecological communities

Optional text box to provide further information

The woodland within the Ramsar Site provides habitat for the globally threatened Grey‐crested Helmet‐shrike Prionops poliolophus (Red List: NT). Another globally threatened bird found in the site is the Basra Reed Warbler Acrocephalus griseldis (Red List: EN) a winter visitor and passage migrant whose exact status is unknown. There are regionally threatened species both as regular visitors and residents e.g. Great Crested Grebe Podiceps cristatus (critical), Maccoa Duck Oxyura maccoa (endangered), African Darter Anhinga rufa, Great Egret Casmerodius albus (CITES Appendix III), Saddle‐billed Stork Ephippiorhynchus senegalensis (CITES Appendix III), White‐backed Duck Thalassornis leuconotus, Baillon's Crake Porzana pusilla obscura and African Skimmer Rynchops flavirostris (all vulnerable). Poor fishing methods have damaged and thus reduced the extent of littoral macrophytes and diving birds such as the African Darter. Populations of Hippo Hippopotamus amphibious (vulnerable) (CITES App. II) are also present at the site.
The woodland within the riparian also supports the Masai Giraffe (Giraffa camelopardalis) listed by IUCN red list as endangered (CITES Appendix I)
i) Red‐knobbed coot Fulica cristata. The lake has been inhabited by thousands of the coot in the past, and it has been the most populous bird species. However due to decline in the extent of submerged plants (which are its source of food), there has been a marked decline in coot population.
(ii) African Fish Eagle Haliaeetus vocifer is another characteristic species of Lake Naivasha, but whose population has declined in the recent past due to habitat disturbance and lower transparency of the lake water. The lake acts as a reservoir for Fish Eagles for other areas.
(iii) Pied kingfisher Ceryle rudis. It is the only species of Kingfisher that fishes from the hover rather than always from a perch.
(iv) Grey‐crested helmet shrike (Prionops poliolophus). Globally threatened. Its habitat is almost exclusively the acacia woodland within the site.
(v) Lily trotter/African Jacana Actophilornis africanus. Population declined with the reduction of the water lily but it has successfully taken over the water hyacinth although the numbers are lower than previously.
(vi) African darter (Anhinga rufa). Regionally threatened. Severely reduced by gill‐netting in the lake, it survives in very small numbers.

(vii) Hippopotamus (Hippopotamus amphibius). Lake Naivasha contains a relatively isolated hippo population spread throughout the lake, swamp and Malewa River areas. Pressure on the hippo is increasing with developing agriculture, increasing human population and variable lake levels.
(viii) Masai giraffe (Giraffa Camelopardalis) The Lake Naivasha riparian woodland supports a small population of the Masai Giraffe listed by IUCN red list as endangered (CITES Appendix II).
(ix) The collapse of the macrophyte community in Lake Naivasha's littoral zone has largely been attributed to the int

☑ Criterion 3 : Biological diversity

Justification

The riparian, papyrus and littoral macrophyte zones of the site provide safe haven, foraging and breeding ground for many resident and migrant bird species. These include Little Grebe Tachybaptus ruficollis (LC) Red-knobbed Coot Fulica cristata (LC), African Spoonbill Platalea alba (LC), Grey-crested Helmetshrike Prionops poliolophus (NT), Basra Reed-warbler Acrocephalus griseldis (EN). The lake itself supports a diverse waterbird community, with more than 80 waterfowl species (over 400 total avian species) regularly recorded during censuses (National Water bird census for Kenya).
Other wildlife such as the Hippo Hippopotamus amphibius, Waterbuck Kobus defassa, Masai Giraffe Giraffa camelopardalis and Buffalo Syncerus caffer. The fish in the lake form an important food source for piscivorous birds.

☑ Criterion 4 : Support during critical life cycle stage or in adverse conditions

Optional text box to provide further information	Lake Naivasha is a stopover and a wintering ground for palearctic migrant birds. It has high avifauna diversity including globally important species such as Great Crested Grebe Podiceps cristatus (critical), Maccoa Duck Oxyura maccoa (endangered), African Darter Anhinga rufa, Great Egret Casmerodius albus, Saddle - billed Stork Ephippiorhynchus senegalensis, White - backed Duck Thalassornis leuconotus, Baillon's Crake Porzana pusilla obscura and African Skimmer Rynchops flavirostris (all vulnerable). The riparian, papyrus and littoral macrophyte zones of the site provide safe haven, foraging and breeding ground for many resident and migrant bird species, as well as other wildlife such as the Hippo Hippopotamus amphibius, Masai Giraffe Giraffa camelopardalis and Buffalo Syncerus caffer. In the past the site hosted over 20,000 water birds species, including 21,744 in 2001, although this number has since declined as per the most recent waterbird counts, to 11,551 (jan 2018), 11,075 (jul 2019) and 9,756 (jan 2020) respectively. Lake Naivasha is also an Important Bird Area IBA KE048 listed in 2001.
End year	2022
Optional text box to provide further information	The lake also is home to the largest population of hippopotamus with approximately 600-700 individuals counted. It also supports other wildlife species as Zebras, Wildbeeasts, Impals, Giraffes, and waterbucks. Crustaceans as the Lousiana red swamp cray fish and diverse fish species such as large mouth bass, red belly tilapia , rainbow trout, mosquito fish among others are also present.

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

Phylum	Scientific name	Criterion 2	Criterion 3	Criterion 4	IUCN Red List	CITES Appendix I	Other status	Justification
Plantae								
TRACHEOPHYTA / LILIOPSIDA	*Eichhornia crassipes*	☐	☑	☐		☐		Alien and invasive
TRACHEOPHYTA / LILIOPSIDA	*Pistia stratiotes*	☐	☐	☐	LC	☐		
TRACHEOPHYTA / LILIOPSIDA	*Wolffia arrhiza*	☐	☑	☐	LC	☐		

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								
Others																	
CHORDATA / MAMMALIA	*Giraffa camelopardalis camelopardalis*	☑	☑	☐	☐	☐	☐	☐	☐				EN	☐	☐	Globally endangered	Globally endangered
CHORDATA / MAMMALIA	*Hippopotamus amphibius*	☑	☑	☐	☐	☑	☐	☐	☐				VU	☐	☐	Globally vulnerable	the site provides safe haven, foraging and breeding ground
CHORDATA / MAMMALIA	*Kobus ellipsiprymnus*	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		
CHORDATA / MAMMALIA	*Syncerus caffer*	☐	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	Globally near threatened	the site provides safe haven, foraging and breeding ground
Fish, Mollusc and Crustacea																	
CHORDATA / ACTINOPTERYGII	*Cyprinus carpio*	☐	☐	☐	☐	☑	☐	☐	☐				VU	☐	☐		
CHORDATA / ACTINOPTERYGII	*Gambusia affinis*	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		
CHORDATA / ACTINOPTERYGII	*Micropterus salmoides*	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		
CHORDATA / ACTINOPTERYGII	*Oncorhynchus mykiss*	☐	☐	☐	☐	☑	☐	☐	☐					☐	☐		
CHORDATA / ACTINOPTERYGII	*Oreochromis leucostictus*	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		
CHORDATA / ACTINOPTERYGII	*Poecilia reticulata*	☐	☐	☐	☐	☑	☐	☐	☐					☐	☐		
ARTHROPODA / MALACOSTRACA	*Procambarus clarkii*	☐	☐	☐	☐	☑	☐	☐	☐				LC	☐	☐		
CHORDATA / ACTINOPTERYGII	*Tilapia busumana*	☐	☐	☐	☐	☑	☐	☐	☐				VU	☐	☐		
Birds																	
CHORDATA / AVES	*Acrocephalus griseldis*	☑	☐	☐	☐	☑	☐	☐	☐				EN	☐	☑		
CHORDATA / AVES	*Amaurornis flavirostra*	☑	☑	☐	☐	☑	☐	☐	☐					☐	☐	regionally threatened species	Lake Naivasha is a stopover and a wintering
CHORDATA / AVES	*Anhinga rufa*	☑	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	regionally threatened species	Lake Naivasha is a stopover and a wintering ground
CHORDATA / AVES	*Ardea alba*	☑	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	regionally threatened species	Lake Naivasha is a stopover and a wintering ground
CHORDATA / AVES	*Ephippiorhynchus senegalensis*	☑	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	regionally threatened species	Lake Naivasha is a stopover and a wintering ground
CHORDATA / AVES	*Oxyura maccoa*	☑	☑	☐	☐	☑	☐	☐	☐				EN	☐	☐	regionally threatened species	Lake Naivasha is a stopover and a wintering ground
CHORDATA / AVES	*Podiceps cristatus*	☑	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	regionally threatened species	Lake Naivasha is a stopover and a wintering ground
CHORDATA / AVES	*Prionops poliolophus*	☐	☐	☐	☐	☑	☐	☐	☐				NT	☐	☐		
CHORDATA / AVES	*Rynchops flavirostris*	☑	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	regionally threatened species	Lake Naivasha is a stopover and a wintering
CHORDATA / AVES	*Thalassornis leuconotus*	☑	☑	☐	☐	☑	☐	☐	☐				LC	☐	☐	regionally threatened species	Lake Naivasha is a stopover and a wintering ground

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
Riparian woodland	☑	Riparian fringe is dominated by Acacia xanthophloea, undergrowth has shrubs and herbaceous plants (Hypoestes sp.,Psiadia punctulata,)	The woodland supports a small population of Masai Giraffe Giraffa camelopardalis (Red List: EN), Hippo Hippopotamus amphibious (Red List :VU), and other herbivores and provided a breeding and nesting place for various bird species The woodland withi
Littoral zone	☑	This zone is dominated by cyperus papyrus,and different species of sedges, emergent and submerged macrophytes, however the macrophytes communities have been on decline	The papyrus fringe supports globally threatened Basra Reed Warbler Acrocephalus griseldis (Red List: EN) a winter visitor and passage migrant whose exact status is unknown. Zone The papyrus fringe supports globally threatened Basra Reed Warbler
Open waters	☑	This zone is characterised by shallow fresh water with a mean depth of 4.68m at lake level 1889masl and supports a variety of bird and fish species.The zone is often occupied by free floating macrophytes (Eichornia crassipes and Cyperus papyrus)	This zone supports regionally threatened species both as regular visitors and residents e.g. Great Crested Grebe Podiceps cristatus (critical),

Optional text box to provide further information

The littoral zone is inhabited by macrophytes that provide suitable habitats for fish feeding and breeding, and mulch for invertebrates. The dominant floating species are Cyperus papyrus, Pistia stratiotes, Wolffia arrhiza and Nymphaea (water lilies). Submerged plants include Potamogeton schweinfurthii, P. pectinatus, P. octandrus, Najas pectinata, N. caerulea, Ultricularia reflexa, and U. gibba. The areas of submerged macrophytes vary considerably.
Water lilies have so far disappeared in the lake and this was caused by crayfish and coypu, both introduced. Salvinia was a major ecological problem in the 1970s when it covered most of the lake, but biological control by use of Cyrtobagus salviniae effectively reduced the weed to insignificant levels by the early 1990's. Water hyacinth was noted on the lake in 1988, but the conditions on the lake are not conducive to its rapid spread. Two host specific biological control agents, Neochetina bruchii and N. eichhornia, have been introduced and been effective in controlling the weed. An accidental introduction of the African sharp tooth catfish, (first reported in 2011) is a great concern. Its impact to the lake's littoral zone and the littoral macrophytes is not documented. The density of crayfish within the littoral zone has since crashed. This is partly attributed to the presence of the catfish and also to the targeted fishing by the Chinese since 2015.
The papyrus is considered the most important plant of Lake Naivasha. It occurs in the shallow water of the lake edge and on land where sub‐surface soil is saturated. It almost completely surrounds the lake, forms floating islands on the lake and can be found up to 5 kms up the Malewa River. It acts as an efficient silt and nutrient filter and is capable of recycling excess nutrients. It also supplies large amounts of fixed nitrogen. It forms an important habitat for fish and wildlife such as birds, hippo and buffalo. The amount of papyrus in the lake has varied tremendously as a consequence of fluctuating water levels, fires, and, in some cases, human encroachment. At present, the amount of papyrus has greatly decreased along most parts of the shoreline as the lake recedes from the year 2019/2020 rise. Papyrus stumps have remained stuck in the exposed muddy riparian areas ending up being grazed by wildlife/ livestock or being destroyed by other human activities.
One hundred and forty-three (143) phytoplankton taxa are recorded on the lake. The main zooplankton genera are Cladocera, Copepoda and Rotifera. Twenty-eight taxa of invertebrates have been recorded associated with macrophyte beds. Micronecta scutellaris is an important component of the diet of fish. The present fish population is made up of introductions by man: the large‐mouth bass (Micropterus salmoides), introduced 1927, 1951 and 1956, Tilapia zillii and Oreochromis leucostictus (1956), Gambusia, Poecilia and Lebistes, and occasionally rainbow trout (Onchorhynchus mykiss) and Barbus amphigramma from the Malewa River. The Louisiana red swamp crayfish (Procambarus clarkii) was introduced in 1970 as food for the bass. Other accidental introductions have since occurred with Common carp Cyprinus carpio introduced in 1997, Mirror carp Cyprinus carpio specularis 1997 and African sharp tooth catfish Clarius gariepinus 2011 being among recent occurrences. The fish are a source of food for numerous piscivorous birds such as the fish eagles and cormorants, and also support an important fishery.
The Naivasha Thorn, or Yellow Fever Tree (Acacia xanthophloea) is the dominant terrestrial tree species and forms the woodland around the lake. It is an important habitat for birds and other wildlife such as the hippopotamus, waterbuck, buffalo and giraffe.

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

4.1 - Ecological character

There is a misconception of the current degraded state of Lake Naivasha by scientist with time-limited studies (e.g. Ngari et al., 2008; Ballot et al., 2010), they tend to relate it to recent anthropogenic activities, mostly over-abstraction by the horticultural industry, that the lake's ecosystem has experienced, since 1929, but this is an underestimation. Naivasha has experienced over 80 years of ecological change initiated by deliberate introduction and accidental arrival of alien species (Gherardi et. al.,2011). The fish community in Naivasha is totally exotic, with the only endemic species (Aplocheilichthys antinorii, a small tooth carp) last recorded in 1962, alleged to have been driven to extinction by Micropterus salmoides (large-mouthed bass) first introduced in 1929. The Lake's commercial fishery started in 1959, based on the bass and two tilapias (Oreochromis leucostictus and Tilapia zillii), (Muchiri et al 1995), however the fishery industry has had mixed fortunes due to overfishing and water level fluctuation. Procambarus clarkii, another species deliberately introduced in 1970 and exploited for international market until mid-late 1980s, but currently for local market since the catches have been inconsistent and much lower (Harper et al.,1990)
The ecosystem impact of P. clarkii was very dramatic, through its complete eradication of floating-leaved and submerged plants by the late 1970s. Plant beds recovered in the late 1980s, after the population of P. clarkii crashed because of predation from M. salmoides (Hickley et al., 2004). A cycle of plant recovery when P. clarkii declined, followed by buildup density of submerged plants beds and finally plant decline again as they were consumed, seemed to have been established by the early 1990s (Harper, 1992; Gouder de Beauregard et al., 1998). However, occurrence of another exotic species Eichhornia crassipes (water hyacinth) built a dense littoral mat which provided a permanent physical refuge for P. clarkii. to remain high and to subsist on detritus produced from the hyacinth mat which it fed on at night al., 2002b; Smart et al., 2002).
Thereafter and until early 2011, both submerged plants and P. clarkii have been absent as a result of the domination of C. carpio, while E. crassipes and C. eichhorniae populations fluctuated since then in a 'classic' predator-prey cycle (D. Harper, unpublished data). In March 2011, there were about 5 km2 of water lilies and submerged plant beds. These had dominated the former native species (Gouder de Beauregard et al., 1998) floating water lily Nymphaea nouchalii var caerulea, and submerged Potamogeton schweinfurthii, P. pectinatus and Naias horrida, together with the roots of Salvania molesta, had reappeared, present among ubiquitous, floating E. crassipes Utricularia sp. extensively associated with the roots of Salvinia molesta (D. Harper, personal observations). The E.crassipes mat protected the crayfish from predation, enabling the crayfish population to remain high, so high that the fishermen could use a bucket to scoop the fish. However, the introduction of Cytobagus eichhorniae (hyacinth weevil) to control the water hyacinth led to the decline of the crayfish, since the individual plants reduced by the weevil could no longer provide a hideout for them. The subsequent accidental introduction of the African sharp tooth catfish (first recorded in 2011 and now dominant in the littoral zone), and the targeted commercial fishing of the P. clarkii by the Chinese from late 2015 has resulted in the collapse of the P. clarkii population in the lake.
The lake now has between two and three alien species dominant –Keystone species – at each of the first three levels of its food web (producer, consumer and top predator). In this regard it is one of the best examples of an alien ecosystem in the world (L. Douglas-Hamilton, unpublished report,2005), Carp (top predator); crayfish (Omnivore) sustained upon detritus, derived largely from Ei

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
Fresh water > Flowing water >> L: Permanent inland deltas				
Fresh water > Flowing water >> M: Permanent rivers/ streams/ creeks		2		
Fresh water > Lakes and pools >> O: Permanent freshwater lakes		1		Unique
Saline, brackish or alkaline water > Lakes >> Q: Permanent saline/ brackish/ alkaline lakes		3		
Fresh water > Lakes and pools >> Tp: Permanent freshwater marshes/ pools		4		
Fresh water > Marshes on inorganic soils >> Ts: Seasonal/ intermittent freshwater marshes/ pools on inorganic soils				
Fresh water > Marshes on inorganic soils >> W: Shrub-dominated wetlands				

(ECD) Habitat connectivity	Lake Naivasha is well endowed with biodiversity and is one of the important biodiversity hotspots in Kenya, with several hundred species of plants and animals. The natural vegetation around the Lake is dominated by the 'yellow fever tree' Acacia xanthophl

4.3 - Biological components

4.3.1 - Plant species

Other noteworthy plant species

Phylum	Scientific name	Position in range / endemism / other
TRACHEOPHYTA/LILIOPSIDA	*Cyperus papyrus*	This the most important plant in the lake ecosystem
TRACHEOPHYTA/MAGNOLIOPSIDA	*Nymphaea nouchali caerulea*	used to be a characteristic floating plant on the lake but due to grazing pressure, it has been reduced
TRACHEOPHYTA/MAGNOLIOPSIDA	*Vachellia xanthophloea*	forms an important habitat for the African fish eagle and the grey - crested helmet - shrike and giraffe

Optional text box to provide further information

(i) Papyrus (Cyperus papyrus). This is the most important plant in the lake ecosystem. It dominates the plant - water ecotone and maintains the ecological character of the lake, through nutrient and silt filtration, and is also an important wildlife habitat.
(ii) Naivasha thorn (Acacia xanthophloea). This yellow - barked tree is the most characteristic feature of the Naivasha area in and around the Site. It also forms an important habitat for the African fish eagle and the grey - crested helmet - shrike and giraffe among other wildlife.

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/AVES	*Actophilornis africanus*				Population declined with the reduction of the water lily but it has successfully taken over the water hyacinth
CHORDATA/AVES	*Ceryle rudis*				It is the only species of Kingfisher that fishes from the hover rather than always from a perch
CHORDATA/AVES	*Fulica cristata*				Due to decline in the extent of submerged plants (which are its source of food), there has been a marked decline in coot population
CHORDATA/AVES	*Haliaeetus vocifer*				population has declined in the recent past due to habitat disturbance and lower transparency of the lake water

Optional text box to provide further information

(i) Red - knobbed coot Fulica cristata. The lake has been inhabited by thousands of the coot in the past, and it has been the most populous bird species. However due to decline in the extent of submerged plants (which are its source of food), there has been a marked decline in coot population.
(ii) African Fish Eagle Haliaeetus vocifer is another characteristic species of Lake Naivasha, but whose population has declined in the recent past due to habitat disturbance and lower transparency of the lake water. The lake acts as a reservoir for Fish Eagles for other areas.
(iii) Pied kingfisher Ceryle rudis. It is the only species of Kingfisher that fishes from the hover rather than always from a perch.
(iv) Grey - crested helmet shrike (Prionops poliolophus). Globally threatened. Its habitat is almost exclusively the acacia woodland within the site.
(v) Lily trotter/African Jacana Actophilornis africanus. Population declined with the reduction of the water lily but it has successfully taken over the water hyacinth although the numbers are lower than previously.
(vi) African darter (Anhinga rufa). Regionally threatened. Severely reduced by gill - netting in the lake, it survives in very small numbers.

(vii) Hippopotamus (Hippopotamus amphibius). Lake Naivasha contains a relatively isolated hippo population spread throughout the lake, swamp and Malewa River areas. Pressure on the hippo is increasing with developing agriculture, increasing human population and variable lake levels.
(viii) Masai giraffe The Lake Naivasha riparian woodland supports a small population of the Masai Giraffe (Giraffa camelopardalis) listed by IUCN red list as endangered (CITES Appendix 1).
(ix) The collapse of the macrophyte community in Lake Naivasha's littoral zone has largely been attributed to the introduction of the Red Louisiana Crayfish (Procambarus clarkii), introduced in Lake Naivasha in 1950s for commercial fishing targeting the export market.

4.4 - Physical components

4.4.1 - Climate

Climatic region	Subregion
B: Dry climate	BSh: Subtropical steppe (Low-latitude dry)

The Lake occurs within the arid and semi arid climate, with mean maximum temperatures of 26.5oC., and mean minimum temperatures of 16.4oC. per annum. Average rainfall is 600mm per annum. The Climate is influenced by ITCZ with two distinct wet seasons. However, with the prevailing climate change phenomenon, like other Kenyan Rift Valley Lakes, the lake has experienced rising water levels leading to frequent flooding with population being displaced.

4.4.2 - Geomorphic setting

a) Minimum elevation above sea level (in metres): 1890

a) Maximum elevation above sea level (in metres): 1892

- [ ] Entire river basin
- [ ] Upper part of river basin
- [ ] Middle part of river basin
- [ ] Lower part of river basin
- [x] 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.

Lake Naivasha's water is supplied by the permanent Malewa River basin and Gilgil River basin that drain the Aberdare Mountains forest in central Kenya. Although the lake has no visible outlet, its water is fresh. It is thought that a combination of underground outflow and sedimentation of salts keeps the lake fresh, unlike other endorheic lakes in the eastern Rift Valley.

4.4.3 - Soil

- [x] 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)

The wetland soils are mainly sediments of a former large lake and are influenced by the volcanic origins of the basin rocks and soils. It has been observed that the deposited silt and mud is rich in debris from vegetation and animal material, which show a slow process of sedimentation. The sediment load in the rivers determines the rate of sedimentation. The soils are basically volcanic. The upper Pleistocene Gamblian sediments of the Naivasha area are indicative of a larger lake and a wet episode in the history of the region when Lakes Nakuru, Elmenteita and Naivasha were joined as one lake. The shallow closed basin is dominated by Tertiary and Quaternary pyroclastic and lacustrine deposits. Mixed basalt/trachyte lava flows, pyroclastic, ash and pumice cover the volcanic plain. Obsidian and pumice are abundant in the area around the lake. Sandy clays and clay loams eroding from the wider catchment enter the lake basin from the River Malewa.

4.4.4 - Water regime

Water permanence

Presence?	Changes at RIS update
Usually permanent water present	
Usually seasonal, ephemeral or intermittent water present	

Source of water that maintains character of the site

Presence?	Predominant water source	Changes at RIS update
Water inputs from precipitation	☐	No change
Water inputs from surface water	☑	No change
Water inputs from groundwater	☐	No change

Water destination

Presence?	Changes at RIS update
Feeds groundwater	No change

Stability of water regime

Presence?	Changes at RIS update
Water levels fluctuating (including tidal)	No change

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

The lake level fluctuates considerably and it was only a stagnant pool in the 1880's. The lake was found to have a mean depth, volume and surface area of 4.68 m, 722 × 106 m3 and 154.17 × 106 m2, respectively. Considering water levels at 1,889 masl, it can be concluded from the 1983 and 2016 survey that the maximum water depth was reduced by 2, 0.6 and 1.75 m in the Main Lake (hippo point), Crescent Island Lake and Lake Oloiden, respectively (Maina CW,et al 2018).. The water of the Naivasha basin is a solution of predominantly sodium carbonate and bicarbonate. Several factors combine to keep the lakes' water fresh. These include a large percentage of the water being supplied from dilute rivers and rainfall, loss of water and solutes via groundwater seepage, and exchanges with near and offshore sediments and sedimentation of particles to remove solutes. Basic physical - chemical parameters are presented below (main lake):

(ECD) Connectivity of surface waters and of groundwater	Lake Naivasha largely receives surface recharge although there also exists some level of underground recharge. The Lake is fed by two perennial rivers; Malewa and Gilgil as well as a seasonal river Karati. In addition, the lake is fed by inputs via groun
(ECD) Stratification and mixing regime	Lake Naivasha is a shallow lake that experiences a lot of mixing within the water column although the Crescent Island (the deepest point) often experiences some level of stratification in the morning with some level of mixing in the afternoon as the lake

4.4.5 - Sediment regime

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):

Erosion and sediment deposition rate in the lake varies depending on the seasons of the year. The lake receives much of the silt from the catchment in rainy seasons. The lake depth has been decreasing over the years partly due to siltation. Considering water levels at 1,889 masl, it can be concluded from the 1983 and 2016 survey that the maximum water depth was reduced by 2, 0.6 and 1.75 m in the Main Lake (hippo point), Crescent Island Lake and Lake Oloiden, respectively (Maina CW,et al 2018).

(ECD) Light - reaching wetland	35.75cm to 84.46cm Secchi depth
(ECD) Water temperature	21.75 – 23 .24˚C

4.4.6 - Water pH

Alkaline (pH>7.4) ☑

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

Unknown ☐

Please provide further information on pH (optional):

The lake's pH range is relative and falls largely between 7.4 - 8.9 and may vary from time depending on the seasons of the year, precipitation regimes and the dilution episodes that are derived from surface recharge from catchment streams.

4.4.7 - Water salinity

Fresh (<0.5 g/l) ☑

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

Unknown ☐

(ECD) Dissolved gases in water

DO 7.84 - 8.66mg/l

4.4.8 - Dissolved or suspended nutrients in water

Eutrophic ☑

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

Unknown ☐

Please provide further information on dissolved or suspended nutrients (optional):

The water of the Naivasha basin is a solution of predominantly sodium carbonate and bicarbonate.
Total phosphorus in the lake water appears to have increased slightly to around 100ug 1-1 since the early 1980s.
A long - term trend of nutrient enrichment is likely. The inflowing Rivers Malewa and Gilgil contribute the main part of the external nutrient supply, but sewage effluent from the Naivasha sewage treatment works contributes a significant input as well.

(ECD) Water conductivity	200- 350(µScm- ¹)

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 site itself: i) broadly similar ○ ii) significantly different ◉

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:

(a) Within the Ramsar site:
The Lake and its surrounds are fragile with dynamic ecosystems and a yet uncertain water balance in a basin surrounded by intensively irrigated agricultural land and a fast growing township. Much of the land in the Ramsar Site is in private ownership and has been converted into irrigated farmlands, particularly for cut flower and vegetable production for the export market. It is unusual that such intensive farming is carried out within a Ramsar Site, utilizing the lake's fresh water for irrigation. Water is mainly pumped directly from the lake although borehole water is also used. Increasing human pressures resulting from increased tourism, fisheries and related infrastructure, are a major threat to Lake Naivasha. In the last decade the area has seen an extraordinary explosion of horticulture and floriculture for the European export markets. The increased water demand by the above-mentioned investments and the rising population around the Lake has increased pressure on the lake's resources and increased pollution footprint for both point and nonpoint source. Intensified cultivation, encroachment on riparian land and removal of fringing swamps, has reduced the lake's natural water filter function, causing increased amounts of sediments and nutrients to the lake.
(b) In the surrounding area:
Agriculture and water off - take in the catchments has intensified greatly. In addition there has been rapid increase in build up structures for housing, tourism and general transport infrastructure. There has been intensive land subdivision around the general landscape. Based on observations in recent years, water extraction in the catchments may now exceed replenishment, although no adequate water budget is available. Deforestation in the catchments of the two rivers draining to Lake Naivasha has intensified in recent years. This has significantly reduced the water flow to the Lake. Livestock production is not a major issue of concern in the ca

4.5 - Ecosystem services

4.5.1 - Ecosystem services/benefits

Provisioning Services

Ecosystem service	Examples	Importance/Extent/Significance
Food for humans	Sustenance for humans (e.g., fish, molluscs, grains)	High
Fresh water	Drinking water for humans and/or livestock	Medium
Fresh water	Water for irrigated agriculture	Medium
Fresh water	Water for energy production (hydro-electricity)	Medium

Regulating Services

Ecosystem service	Examples	Importance/Extent/Significance
Maintenance of hydrological regimes	Groundwater recharge and discharge	High
Maintenance of hydrological regimes	Storage and delivery of water as part of water supply systems for agriculture and industry	High
Erosion protection	Soil, sediment and nutrient retention	Medium
Pollution control and detoxification	Water purification/waste treatment or dilution	Medium
Climate regulation	Regulation of greenhouse gases, temperature, precipitation and other climactic processes	Medium

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Recreational hunting and fishing	Medium
Recreation and tourism	Picnics, outings, touring	Medium
Recreation and tourism	Nature observation and nature-based tourism	Medium
Scientific and educational	Educational activities and opportunities	Medium
Scientific and educational	Important knowledge systems, importance for research (scientific reference area or site)	Medium
Scientific and educational	Major scientific study site	Medium

Supporting Services

Ecosystem service	Examples	Importance/Extent/Significance
Biodiversity	Supports a variety of all life forms including plants, animals and microorganizms, the genes they contain, and the ecosystems of which they form a part	Medium

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 ☐

<no data available>

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
Public land (unspecified)	☑	☐

Private ownership

Category	Within the Ramsar Site	In the surrounding area
Other types of private/individual owner(s)	☐	☑

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

The lake and the adjoining riparian land is state owned, and is under the custody of the National Land Commission , co-managed by the various government agencies, and the local community that own land contiguous to the riparian area in form of Lake Naivasha riparian Association, Lake Naivasha Water Resource User Association among other civil society and NGO groups. All land in the Ramsar Site above the 1892.8 m asl (6210 ft) contour is in private ownership. Much of it has been converted into irrigated farmlands, particularly for cut flower and vegetable production for the export market, however it is slowly being overtaken by the hospitality sector. Much of the land along the western and Northwestern side is under ranching and private wildlife conservation.

5.1.2 - Management authority

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

Postal address: PO Box 1011, Naivasha, 20117, Kenya

E-mail address: kijabe@net2000ke.com

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
Housing and urban areas	High impact	High impact	☑	No change	☑	No change
Tourism and recreation areas	Medium impact	Medium impact	☑	No change	☑	No change

Water regulation

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Drainage	High impact	High impact	☐	No change	☑	No change
Water abstraction	Medium impact	Medium impact	☑	No change	☑	No change

Agriculture and aquaculture

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Annual and perennial non-timber crops	Medium impact	Medium impact	☑	No change	☑	No change
Livestock farming and ranching	Low impact	Low impact	☑	No change	☑	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	Low impact	☐	No change	☑	No change

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	☐	No change	☑	No change
Utility and service lines (e.g., pipelines)	Low impact	Low impact	☑	No change	☑	No change

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	☑	No change	☑	No change
Logging and wood harvesting	Low impact	High impact	☑	No change	☑	No change
Fishing and harvesting aquatic resources	High impact	High impact	☑	No change	☐	No change

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	Medium impact	High impact	☑	No change	☑	No change

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	☑	No change	☑	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	Medium impact	High impact	☑	No change	☑	No change
Problematic native species	High impact	High impact	☑	No change	☑	No change
Introduced genetic material	High impact	High impact	☑	No change	☑	No change

Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Household sewage, urban waste water	High impact	High impact	☑	No change	☑	No change
Agricultural and forestry effluents	High impact	High impact	☑	No change	☑	No change
Garbage and solid waste	High impact	High impact	☑	No change	☑	No change

Climate change and severe weather

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Habitat shifting and alteration	Medium impact	High impact	☑	No change	☑	No change
Droughts	Medium impact	Medium impact	☐	No change	☑	No change
Temperature extremes	Medium impact	Low impact	☐	No change	☑	No change
Storms and flooding	Medium impact	Medium impact	☑	No change	☑	No change

Please describe any other threats (optional):

Erosion and siltation in the surrounding and within the site

5.2.2 - Legal conservation status

Global legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Other global designation	It is an Important Bird/ Biodiversity Area. Lake Naivasha		whole

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Catchment protection order (Lake Naivasha catchment protection order number 8 of 2012)	Lake Naivasha		whole

Non-statutory designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Important Bird Area	Lake Naivasha		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
Improvement of water quality	Partially implemented
Re-vegetation	Partially implemented
Soil management	Partially implemented
Land conversion controls	Partially implemented
Faunal corridors/passage	Partially implemented
Habitat manipulation/enhancement	Partially implemented
Hydrology management/restoration	Partially implemented

Species

Measures	Status
Control of invasive alien plants	Partially implemented

Human Activities

Measures	Status
Livestock management/exclusion (excluding fisheries)	Partially implemented
Harvest controls/poaching enforcement	Partially implemented
Management of water abstraction/takes	Implemented
Regulation/management of wastes	Partially implemented
Fisheries management/regulation	Partially implemented
Communication, education, and participation and awareness activities	Implemented
Research	Implemented

Other:

Human wildlife conflicts exist within the Ramsar site, with Human - Hippo conflict being the most common. Management interventions are being implemented

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:

Elsamere Education and conservation centre and the Wildlife Research and Training Institute (WRIT).
The Elsamere Education and Conservation Centre sponsors visits by school children to learn about the lake and its catchment and conservation in general. The centre also organizes training workshops for teachers from all over the catchment on various topics that include the lake's ecology and conservation issues. The Center in collaboration with other stakeholders organizes field days for schools to mark World Wetlands Day, Environment Day and Water Day annually, and make school visits to promote the formation of environment clubs. There are several youth conservation groups in the area and the Lake Naivasha Riparian Association (LNRA) is working with them to promote education and awareness and enhance their effectiveness in conservation in their areas. There is a need to develop and implement a more comprehensive strategy to promote conservation education and awareness, considering

URL of site-related webpage (if relevant): https://elsaconservationtrust.org https://wrti.go.ke

5.2.6 - Planning for restoration

Is there a site-specific restoration plan? Yes, there is a plan

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
Plant community	Implemented
Plant species	Implemented

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

Ballot, A., Kotut, K., Novelo, E., & Krienitz, L. (2009). Changes of phytoplankton communities in Lakes Naivasha and Oloidien, examples of degradation and salinization of lakes in the Kenyan Rift Valley. Hydrobiologia, 632, 359-363.
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de Beauregardº, G., North, R., Adams, C., Obade, P., & Kamau, M. (2013, April). Distribution and abundance of the Louisiana red swamp crayfish Procambarus clarkii Girard at Lake Naivasha, Kenya between. In Lake Naivasha, Kenya: Papers submitted by participants at the conference “Science and the Sustainable Management of Shallow Tropical Waters” held at Kenya Wildlife Services Training Institute, Naivasha, Kenya, 11–16 April 1999, together with those from additional studies on the lake (Vol. 168, p. 143). Springer Science & Business Media.
George E Otiang'a-Owiti & Ignatius Abiya Oswe (2007) Human impact on lake ecosystems: the case of Lake Naivasha, Kenya, African Journal of Aquatic Science, 32:1, 79-88, DOI: 10.2989/AJAS.2007.32.1.11.148
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Ngari, A. W. (2008). A study of supply chain management practices at the University of Nairobi (Doctoral dissertation, University of Nairobi).
Smart, A. C., Harper, D. M., Malaisse, F., Schmitz, S., Coley, S., & De Beauregard, A. C. G. (2002). Feeding of the exotic Louisiana red swamp crayfish, Procambarus clarkii (Crustacea, Decapoda), in an Afri

6.1.2 - Additional reports and documents

i. taxonomic lists of plant and animal species occurring in the site (see section 4.3)
<3 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
<1 file(s) uploaded>

6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:


Lake Naivasha (*Martha Mutiso, marthanzisa@gmail.com, 16-09-2013*)


Lake Naivasha (*Martha Mutiso, marthanzisa@gmail.com, 01-12-2023*)


Lake Naivasha (*Martha Mutiso, marthanzisa@gmail.com, 16-09-2013*)

6.1.4 - Designation letter and related data

Designation letter
<1 file(s) uploaded>

Date of Designation: 1995-04-10