KENYA WILDLIFE SERVICE

Nairobi National Park

Draft Management Plan, 2020-2030



Nairobi National Park
Management Plan, 2020-2030

Planning carried out by

NNP Managers
NNP Stakeholders
KWS Biodiversity Planning & Environmental Assessment Department

In accordance with the

KWS Protected Areas Planning Framework



Acknowledgements

This General Management Plan has been developed through a participatory planning process involving a cross section of NNP stakeholders, under the coordination of a Core Planning Team comprising representatives from NNP managers and KWS HQ planners.

The CPT is grateful to the KWS Board of Trustees, Director General and Senior Management for providing funding for the planning process and guidance on management and policy issues addressed by this plan. We are also grateful to The Nairobi Tented Camp, The Wildlife Foundation and Eng. Senator Peter Mositet who hosted planning consultative meetings in their premises. We also thank the NNP Transformation Task Force that developed the "*Nairobi National Park Experience Master Plan"* that forms the bulk of the Tourism Development and Management Programme contained in this management plan.

Finally, the planning process benefitted from contributions from many organisations and individuals as shown in Annex 2.

Approval Page

The Board of Trustees and the management of the Kenya Wildlife Service have approved the implementation of this management plan for Nairobi National Park.

Brig. (Rtd.) John Waweru
Director General

Executive Summary

This 10-year management plan for the Nairobi National Park (NNP) is not an entirely new plan. It is a rewritten plan that carries forward the existing policy direction for the ecological integrity of (NNP) and incorporates new content relating to visitor experience and public appreciation and understanding contained in the previous approved NNP Management Plan (2005-2010). The current review of the NNP Management Plan (2005-2010) provided an opportunity to build on a strong foundation of policy direction while aligning the plan with the KWS Protected Areas Planning Framework (PAPF)[1] and KWS Strategic Plan 2019-2024. In line with the PAPF and the Wildlife Conservation and Management Act, 2013, the NNP plan has been developed in a participatory manner, incorporating and building on ideas from a broad cross-section of NNP stakeholders.

The NNP plan is designed as a practical management tool supporting NNP management in carrying out their duties. In order to achieve this, the plan sets out strategic guidance on the goals (the purpose statements and subsidiary objectives) towards which management is working, and a series of prescriptions and management actions that need to be implemented in order to achieve these aims.

The plan builds on the previous NNP Management Plan 2005-2010 and the recently developed Nairobi National Park Experience Masterplan, where relevant aspects of these plans were adopted as appropriate.

The NNP plan structure is set out according to the PAPF specifications, and aims to ensure the plan can be easily understood by stakeholders and implemented by NNP management. At the heart of the plan are the ***zonation scheme*** and the plan's five ***management programmes***. These programmes are:

- ***Ecological Management Programme***
- ***Tourism Development and Management Programme***
- ***Community Partnership and Conservation Education Programme***
- ***Security Management Programme***
- ***Park Operations Management Programme***

NNP Purpose and Values

The Purpose of the Nairobi National Park is:

> To protect diverse critical habitats, especially highland dry forest, savannah and wetlands, and their associated species of conservation concern such as Rhinos and Lions for the benefit of present and future generations.

The development of the above Purpose Statement was based on the stakeholder identification of the NNP's "Exceptional Resource Values" (ERVs), which were divided into three categories: biodiversity, scenic, and social.

[1] The PAPF Manual is the management planning standard for KWS

NNP Exceptional Resource Values

Category	*Exceptional Resource Value*
Biodiversity	▸ Diverse Habitats (Highland dry forest and grassland habitats)
	▸ Rivers and dams
	▸ Rare, Threatened and Restricted Range Plants
	▸ Rhino sanctuary (black and white rhinos)
	▸ Important Bird Area (Largest number of bird species in any major city)
	▸ Masai Giraffe (*Giraffa camelopardalis tippelskirchi*)
	▸ Large carnivores
Scenic	▸ Picturesque gorges
	▸ Indigenous highland dry forest
Social	▸ Nature based tourism
	▸ First national park to be established in Kenya and only City park in the region
	▸ Wildlife rehabilitation and education facilities
	▸ Ivory burning site monument

Major issues of concern

The top twelve issues that this plan seeks to address are: habitat loss and fragmentation in the dispersal areas; decline in wildlife population; poaching, Human Wildlife Conflicts; alien and invasive species; pollution; mining and quarries; climate change; low park visitation; increased urbanization; settlement threats on the Sheep and Goats Ranch; and infrastructure development.

Proposed management options to address the major issues of concern at NNP and adjacent areas

In order to address the management issues facing the wildlife and its habitats in the NNP and its dispersal area, four management options have been considered. These options are the different ways of resolving most, if not all, of the environmental issues associated with the plan. The four management and policy options are:

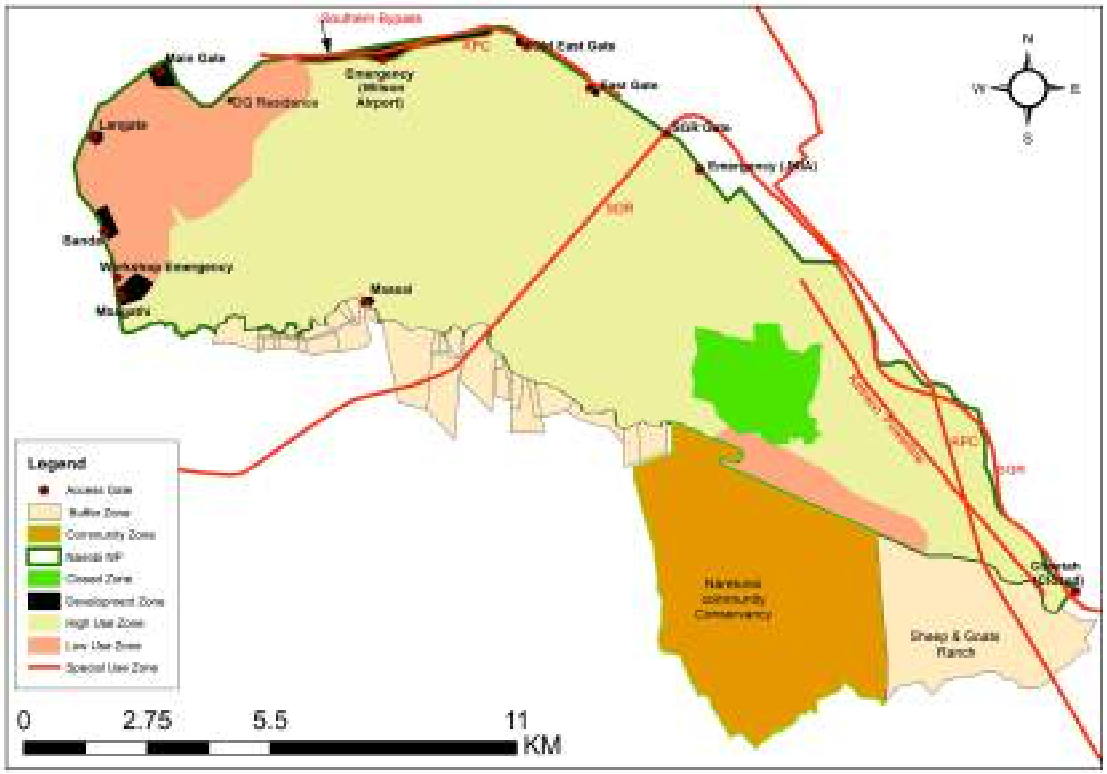
- Option 1- Maintaining the status quo;
- Option 2 - Habitat improvement through controlled burning, grass mowing and mineral supplementation;
- Option 3 – Enclosing the entire park with a predator proof fence; and
- Option 4 - Habitat improvement in the park coupled with progressively fencing willing land owners in the park's buffer zone

This management plan is based on Option 4. This option is preferred as it addresses most of the major management issues discussed in this plan.

NNP Zonation Scheme

The NNP and its ecosystem has been divided into seven zones: **Closed Zone (CZ)**, **High Use Zone** (HUZ), **Low Use Zone** (LUZ), **Development Zone** (DZ), **Special Use Zone** (SUZ), and the **Community Zone(CZ)**.

These seven zones have been developed to facilitate achievement of the park's management objectives as well as aspirations of the community in the park's buffer zone.



NNP Zoning

Ecological Management Programme

The Ecological Management Programme aims to ensure that "*The ecological components and processes of NNP and its dispersal area are understood, restored and conserved, and threats to the park's key ecological features are reduced*". In order to achieve this aim, the programme identifies 8 conservation targets that represent the most important ecological features in the park, their management needs, and the major threats to these features. This information then provides the foundation for developing the programme's objectives and management actions. The eight conservation targets identified for the NNP are:

1. Black Rhino
2. Migratory species
3. Large Carnivores
4. Masai Giraffe
5. Wooded grassland and open grassland
6. Open low shrubland
7. Highland dry Forest
8. River systems and wetlands

The identification and ranking of the threats to the NNP's conservation targets and their Key Ecological Attributes provides the basis for the development of the Ecological Management Programme's management objectives and actions. Objectives have been developed to ad-

dress the clusters of threats. Four objectives have been developed addressing threats to the NNP's threatened large mammals (covering conservation targets: black rhino, large carnivores, wildlife migratory species, and Masai giraffe); addressing crosscutting threats to the NNP's most important habitats (covering conservation targets: Wooded grassland and open grassland); and addressing threats to targets that rely on habitats beyond the NNP boundary for sustenance (covering conservation target: river systems and wetlands).

The top ten priority actions under the ecological management programme are:

1. Manage and enhance Black rhino population in accordance with the Black Rhino Action Plan 2017-2021;
2. Maintain rhino population below the determined ecological carrying capacity;
3. Enhance lion conservation and management; improve management of dispersing species; and minimise threats to the Masai Giraffe and its habitats;
4. Develop and implement a prescribed Fire Management Plan ;
5. Undertake mineral supplementation;
6. Design and implement a grass mowing pilot scheme to maintain short grass lawns;
7. Control invasive and alien plants;
8. Develop alternative water sources for wildlife inside the NNP;
9. Support establishment of Water Resource Users Associations(WRUAs) to control water use and pollution; and
10. Strengthen the capacity of the NNP research station

.

Tourism Development and Management Programme

The Tourism Development and Management Programme aims "t*o develop a distinctive and diverse nature-based tourism that offers visitors memorable experiences*". To achieve this aim, the programme sets out an ambitious strategy for enhancing visitor experience and thereby increasing visitation, as well as tourism revenues. The strategy focuses on providing new and innovative opportunities for private sector investment in the park, as well as activities that enhance visitor experience and satisfaction. The programme's objectives focus on developing tourism investment opportunities; improving tourism product to enhance visitor experience; marketing NNP locally and internationally; and improving tourism management. The priority management actions that will be implemented under this programme include:

1. Establish a Permanent Luxury Tented Camp
2. Develop the KWS Club House high-end restaurant (Orpul Place)
3. Design and establish adventure activity concessions
4. Facilitate alternative activities to traditional game-viewing
5. Develop the Visitor Service Centre and the Ivory burning memorial museum-Elephant graveyard
6. Improve Impala Viewpoint
7. Upgrade Mokoyiet picnic site and viewing point, Hippo Pools Picnic Site, nature trail and Cultural Centre, Kingfisher picnic site, and visitor facilities at park entry gates
8. Develop Dam site viewpoints (Nagolomon, Athi Basin, Hyena) and cultural tourism programmes with the local community
9. Modernise marketing methods
10. Nominate NNP to join the International Network of Sustainable Tourism Observatories (INSTO)

Community Partnership and Conservation Education Programme

The Community Partnership and Conservation Education Programme aims "t*o enhance the support and participation of NNP adjacent communities in wildlife conservation*". Key in achieving this aim is ensuring that NNP management and adjacent communities are able to

effectively communicate and collaborate with each other. This will be achieved through implementation of the management objectives that focus on: strengthening conservation education and awareness programme; promoting conservation-compatible community land uses and practises; reducing human-wildlife conflict; and improving opportunities for communities to benefit from the NNP. The key priority actions that will be implemented to achieve the programme's aims are:

1. Establish sponsored protected area tours for the local community;
2. Support establishment of community wildlife conservancies;
3. Support development of a Conservancy Livestock grazing plan;
4. Train community scouts in relevant skills;
5. Support wildlife related community enterprise projects;
6. Support formation of Water Resource Users Associations for management of the section of Mbagathi River in NNP;
7. Work with the County Governments of Kajiado and Machakos in maintaining wildlife dispersal areas;
8. Construct and maintain a wildlife fence to protect people and their property;
9. Create awareness on the wildlife compensation process among the local community; and
10. Work with other stakeholders to explore other legal Payment for Ecosystem Services (PES) mechanisms that can complement the wildlife conservation lease programme.

Security Management Programme

The NNP Security Management Programme aims to ensure that "*The NNP and adjacent wildlife dispersal areas are safe and secure for wildlife and visitors*". As such, this programme focuses on enhancing natural resource protection in NNP and its dispersal areas and improving collaboration with stakeholders in enhancing NNP security. The priority management actions under this programme are:

1. Minimise theft and vandalism of KWS assets
2. Equip existing patrol outposts
3. Intensify ground and aerial patrols
4. Expand the intelligence gathering network
5. Improve intelligence information gathering and analysis
6. Work with the local community in the dispersal area to control poaching
7. Work with other security agencies to enhance security in the park and its dispersal areas
8. Liaise with the local police to enhance security at tourist accommodation facilities

Park Operations Management Programme

The aim of this programme is to ensure that "*The NNP's operational systems and structures are effectively and efficiently supporting the achievement of the NNP purpose and the delivery of the NNP's management programmes"*. This is the broadest of the five management programmes, and the programme covers a variety of issues that are vital to the efficient and effective management of the NNP. The management objectives under this programme focus on strengthening and formalising institutional collaborations; improving performance and motivation of NNP staff; improving infrastructure, transport and communications to support PA management and tourism development; and providing resources required for effective park management. The priority actions under this programme are:

1. Develop and implement Memorandum of Agreements with buffer zone land owners to be fenced in, including Naretunoi Community Conservancy and Sheep and Goats Ranch

2. Establish a wildlife tourism forum for the buffer zone residents , Naretunoi Community Conservancy and Sheep and Goats Ranch
3. Establish an NNP management committee comprising all stakeholders with interest in the conservation of the NNP
4. Collaborate with County governments of Nairobi, Kajiado and Machakos in minimising threats to the ecological integrity of NNP
5. Deploy new staff to understaffed sections
6. Improve staff welfare
7. Upgrade, rehabilitate and maintain roads, tracks, firebreaks and trails
8. Construct, rehabilitate and maintain residential and Non residential buildings
9. Improve radio communication and telephone network coverage
10. Develop a NNP E-park portal

Plan Monitoring

The plan monitoring section provides a framework for monitoring the potential impacts, both positive and negative, that are anticipated from the implementation of each of the five management programmes' objectives. The framework also includes easily measurable indicators for monitoring positive and negative impacts, and potential sources of this information.

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Acronyms

ACC	African Conservation Centre
ATM	Automated Teller Machine
CAP	Conservation Action Planning
CBO	Community Based Organization
CZ	Closed Zone
CR	Critically Endangered
CWS	Community Wildlife Service
DZ	Development Zone
ECF	East Coast Fever
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ERVs	Exceptional Resource Values
ESIA	Environmental and Social Impact Assessment
FoNNaP	Friends of Nairobi National Park
GPS	Global Positioning System
HQ	Headquarters
HUZ	High Use Zone
HWC	Human-Wildlife Conflict
ICD	Inland Container Depot
IUCN	International Union For Conservation of Nature
JKIA	Jomo Kenyatta International Airport
KAPA	Karania Packers
KATO	Kenya Association of Tour Operators
KEAs	Key Ecological Attributes
KMC	Kenya Meat Commission
KTF	Kenya Tourism Federation
KURA	Kenya Urban Roads Authority
KWCA	Kenya Wildlife Conservancies Association
KWS	Kenya Wildlife Service
LUZ	Low Use Zone
MCF	Malignant Catarrh Fever
MoAL&F	Ministry of Agriculture, Livestock and Fisheries
NEMA	National Environment Management Authority
NGO	Non-Governmental Organization
NNP	Nairobi National Park
NT	Near Threatened
PA	Protected Area
PAPF	Protected Areas Planning Framework
SCA	Southern Conservation Area
SGR	Standard Gauge Railway
SSG	Species Specialist Group
SUZ	Special Use Zone
TNC	The Nature Conservancy
TWF	The Wildlife Foundation
VIP	Very Important Person
VU	Vulnerable
WCK	Wildlife Clubs of Kenya
WCMA	Wildlife Conservation and Management Act
WRUAs	Water Resource Users Associations

Plan Foundations

The Plan

This 10-year management plan for the Nairobi National Park (NNP) is not an entirely new plan. It is a rewritten plan that carries forward the existing policy direction for the ecological integrity of (NNP) and incorporates new content relating to visitor experience and public appreciation and understanding contained in the previous approved NNP Management Plan (2005-2010). The current review of the NNP Management Plan (2005-2010) provided an opportunity to build on a strong foundation of policy direction while aligning the plan with the KWS Protected Areas Planning Framework (PAPF) and KWS Strategic Plan 2019-2024. In line with the PAPF and the Wildlife Conservation and Management Act, 2013, the NNP plan has been developed in a participatory manner, incorporating and building on ideas from a broad cross-section of NNP stakeholders.

The NNP plan is designed as a practical management tool supporting NNP management in carrying out their duties. In order to achieve this, the plan sets out strategic guidance on the goals (the purpose statements and subsidiary objectives) towards which management is working, and a series of prescriptions and management actions that need to be implemented in order to achieve these aims.

The plan builds on the previous NNP Management Plan 2005-2010 and the recently developed Nairobi National Park Experience Masterplan, where relevant aspects of these plans were adopted as appropriate.

Plan functions

The Management Plan has been designed to fulfil the following specific functions:

- **Vision**: Set out a common understanding between stakeholders of the purpose of the NNP and its most important values, towards which all management action in the PA will be focused
- **What**: Establish clear management objectives that are agreed by the NNP's stakeholders and managers and that, if achieved, will ensure the PA purpose will be fulfilled and exceptional values conserved
- **How**: Provide clear and unambiguous guidance and a rationale for the specific management actions that PA Managers will need to implement over the 10-year timeframe of the plan to achieve the management objectives
- **Where**: Define a mechanism for PA zoning to enable different types and intensities of use in different parts of the NNP, thereby facilitating reconciliation of the NNP's sometimes competing conservation and development objectives
- **When**: Provide a balanced scorecard aligned with the corporate scorecard for the first five years of implementing the management plan, thereby establishing a crucial link between the plan's long-term management objectives and the annual operational planning and budgeting routinely carried out by PA Managers
- **Who**: Provide a practical framework enabling the collaboration of PA managers and other institutions and stakeholders in implementing the plan
- **Rules**: Set out clear and unambiguous prescriptions and regulations on what can and cannot occur in different parts of NNP in order to achieve the park's management objec-

tives and fulfil the NNP's purpose.

The Plan is NOT designed to:

- Provide a comprehensive reference source for the NNP, with detailed background information on the area's biodiversity, ecology, geology, soils, etc
- Set out a detailed inventory of issues or problems impacting the NNP, that are not directly addressed through the plan's management objectives and actions
- Provide detailed descriptions of the PAs management, administration, and national policies, unless they are relevant to the plan's management objectives and actions.

Plan structure

In order to fulfil the Plan's functions the NNP plan structure has been developed to be as simple as possible, and as such, easily understood by stakeholders and implemented by NNP management. The following points summarise the plan's main sections:

- **Plan Foundations**. This chapter introduces the planning process used to develop the plan, and describes the plan's functions, structure and stakeholder participation mechanisms. The chapter also provides an introduction to NNP, its location and exceptional resource values. It sets out the NNP's Purpose Statement, which explains why the NNP has been established as a protected area, and the major functions and roles the PA aims to fulfil. It also discusses the major issues of concern and management options that can be used to address these issues.

- **Zonation Scheme.** This section sets out areas of the NNP where different types of visitor use and tourism developments are permitted. The scheme contains prescriptions on the type of facilities and activities allowed in each zone.

- **The five management programmes.** The bulk of the plan is divided into five management programmes:

    - **Ecological Management Programme**
    - **Tourism Development and Management Programme**
    - **Community Partnership and Conservation Education Programme**
    - **Security Management Programme**
    - **Park Operations Management Programme**

  Each programme includes a programme purpose statement, which sets out the overall goal to which management under this programme is working towards, and a strategy describing the overall management approach pursued through the programme. Each programme also contains management objectives that set out the goals that NNP management aims to achieve, and a set of specific management actions to achieve these goals. In order to facilitate plan implementation, wherever possible the management programmes, or in some cases specific objectives therein, have been designed to align with NNP management section(s), and/or KWS HQ departments.

- The **plan monitoring** section provides a framework for monitoring the potential impacts, both positive and negative, that are anticipated from the implementation of each of the five management programmes' objectives. The framework also includes easily measurable indicators for monitoring positive and negative impacts, and potential sources of this information.

- The NNP management plan's **Balanced Score Card (Annex 1)** provides a link between the NNP management plan and the corporate strategic plan. The plan's management actions are aligned with the corporate strategic plan's six strategic objectives and the four corporate perspectives. This will ensure that resources to implement the management plan will be allocated.

Participation in planning

To ensure the management plan produced is both realistic and appropriate, and to build wider stakeholder understanding and support for implementation, the planning process involved a high degree of stakeholder participation in the development of the NNP management plan. Stakeholders participated through a multi-layered approach involving a variety of mechanisms designed to ensure that all stakeholders can meaningfully contribute to the plan's development. The three principal mechanisms used to enable this participation are: the Core Planning Team, Stakeholder Workshops, and Expert Working Groups.

Annex 2 gives a detailed list of stakeholders who participated in the NNP plan's development, and the specific events that they contributed to.

The Nairobi National Park

Area description

The name 'Nairobi' means 'a place of cool waters' in the Maa language spoken by the Maasai ethnic community who occupy Kajiado, Narok and Transmara Districts in Kenya. This area was an important dry season grazing area for wildlife and for the Masai people and their livestock too. The park is fenced along three sides, where it is adjacent to urban housing, industry, roads and airports; only the southern border, along the Mbagathi River, is partly open for animal dispersal.

Nairobi National Park (NNP) was gazetted in 1946 as Kenya's first National Park vide proclamation No. 48 of 16th December, 1946. The park covers 117 Km^2, which is delineated in boundary plan No. 204/1 (Figure 1).The Park is situated 10km south of Nairobi City centre. Administratively, the Park is in Nairobi County. It borders Kajiado and Machakos Counties to the south and Machakos to the east and south east. Features delineating the boundary of the Park are the Mbagathi River to the south and southeast and the Mombasa railway line to the north and east.

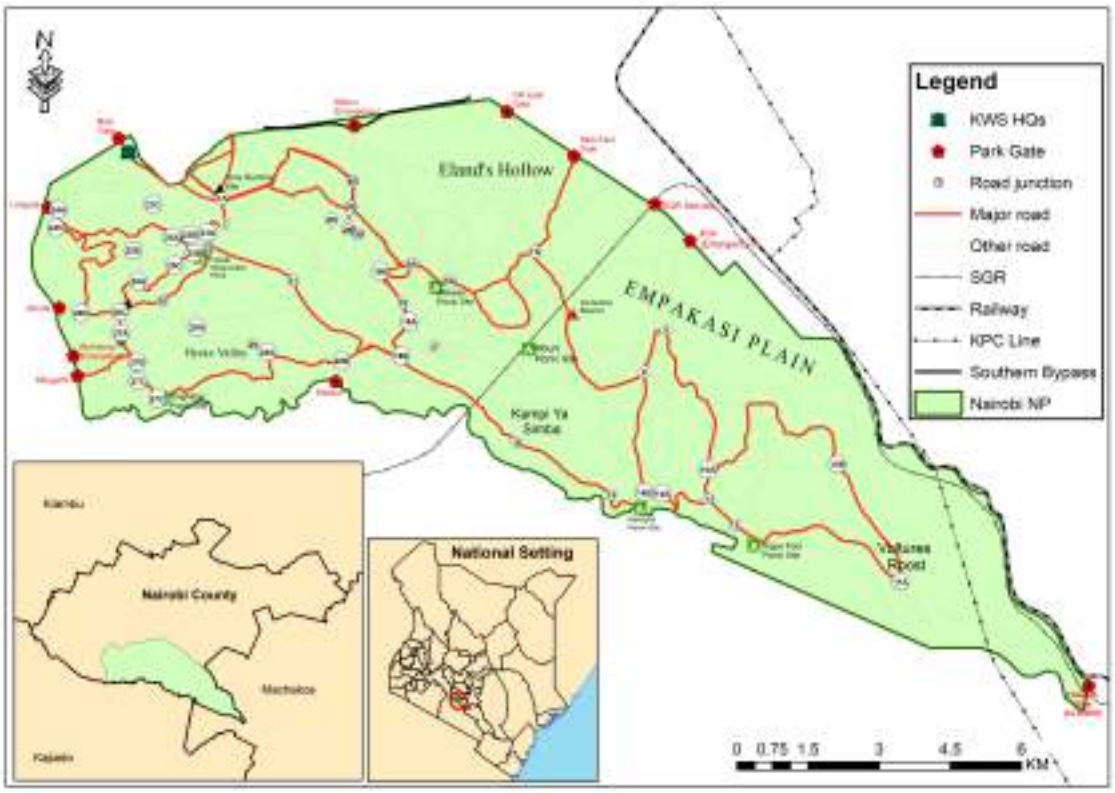


Figure 1. Nairobi National Park National and regional setting

NNP Purpose Statement

The role of the National Park system in Kenya is "*to protect and preserve representative natural areas of the nation's significance and to encourage public education, appreciation and enjoyment of this natural heritage to leave it unimpaired for future generations*[2]*".* NNP was therefore established to contribute to the fulfilment of this role.

The NNP Purpose Statement summarises the importance of the NNP, clarifies the reasons for its existence, and provides the overall goal that NNP managers are striving to achieve. The Purpose Statement is divided into a primary NNP Purpose followed by a series of supplementary purposes that expand on and complement the primary purpose. Both primary and supplementary purposes have been defined by NNP stakeholders.

The Purpose of the Nairobi National Park is:

To protect diverse critical habitats, especially highland dry forest, savannah and wetlands, and their associated species of conservation concern such as Rhinos and Lions for the benefit of present and future generations.

Subsidiary purpose statements

- *To promote scientific research*

[2] Hell's Gate National Park Management Plan, 1983

- *To promote stakeholder collaboration in conservation*
- *To promote tourism*

The development of the above Purpose Statement was based on the stakeholder identification of the NNP's "Exceptional Resource Values" (ERVs). These ERVs are discussed and elaborated in the following section.

NNP Exceptional Resource Values

The NNP ERVs describe the area's key natural resources and other features that provide outstanding benefits to local, national and international stakeholders and that are especially important for maintaining the area's unique qualities, characteristics and ecology. The following sections describe the NNP ERVs that have been prioritised by NNP stakeholders, their importance to the area and, where appropriate, relevant sections of the management plan that relate to the ERV in question. These sections have been set out according to the four categories of ERVs identified: Biodiversity, Scenic, and Social (Table 1).

Table 1. NNP Exceptional Resource Values

Category	*Exceptional Resource Value*
Biodiversity	▶ Diverse Habitats (Highland dry forest and grassland habitats)
	▶ Rivers and dams
	▶ Rare, Threatened and Restricted Range Plants
	▶ Rhino sanctuary (black and white rhinos)
	▶ Important Bird Area (Largest number of bird species in any major city)
	▶ Masai Giraffe (*Giraffa camelopardalis tippelskirchi*)
	▶ Large carnivores
Scenic	▶ Picturesque gorges
	▶ Indigenous highland dry forest
Social	▶ Nature based tourism
	▶ First national park to be established in Kenya and only City park in the region
	▶ Wildlife rehabilitation and education facilities
	▶ Ivory burning site monument

Biodiversity values

Diverse habitats

The national park is associated with a wide range of vegetation types or associations as shown in Figure 2. The main ones include; grassland, open dwarf tree grassland (*Acacia drepanolobium)*, open dwarf tree grassland (*Acacia mellifera*), forest glade, dense tall forest, open tall riverine woodland, scattered low-tall grassland, open low shrubland and riverine vegetation. The grasslands cover the largest area of the park (34 km^2), followed by open dwarf tree grassland (*Acacia drepanolobium*) and open low shrubland which cover nearly 25

km^2 and 18 km^2 respectively[3]. Ecologically, the park is intimately linked to the Kitengela and Athi-Kapiti plains, which adjoin it to the south, forming a single ecological unit.

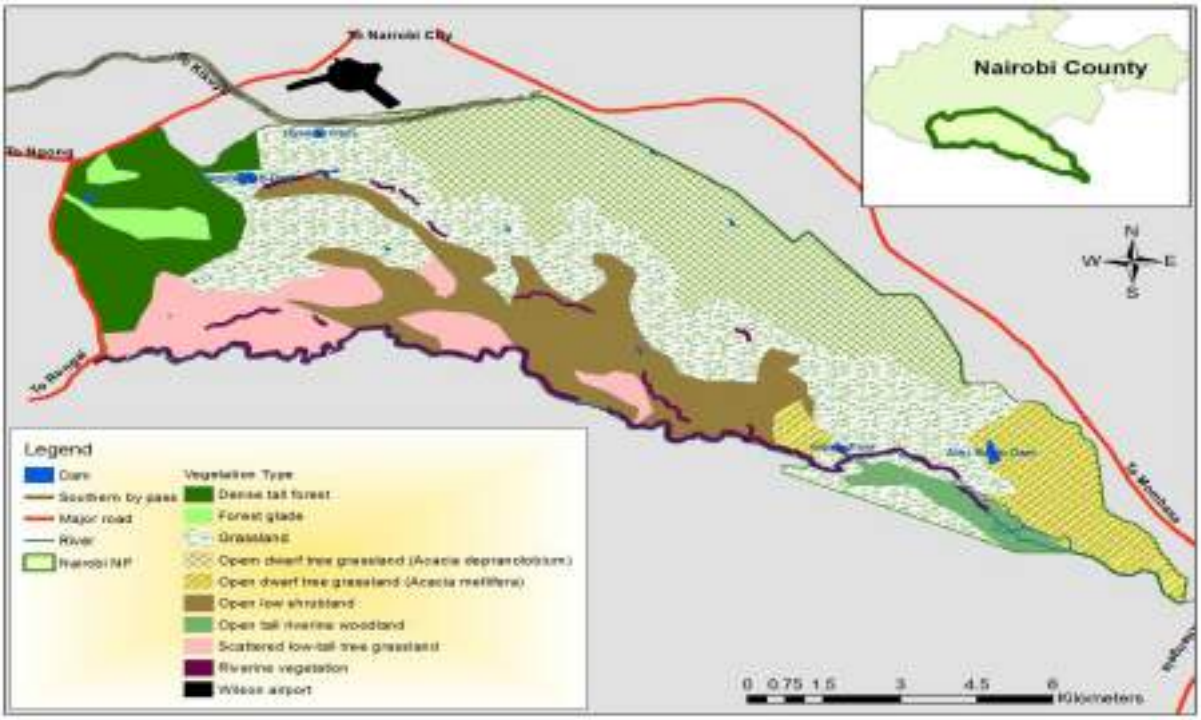


Figure 2. NNP Vegetation types[4]

Rivers and dams

The park has several rivers that flow through it. The main rivers are Mbagathi and Mokoyiet Rivers. There are also several dams that have been constructed in the park. The major dams are Nagolomon, Hyena and Athi basin dams (Figure 3). These rivers and dams support wetland habitats that in turn support diverse aquatic biodiversity.

[3] Habitat Planners, 2016. Proposed Standard Gauge Railway Project From Nairobi South Railway Station-Naivasha Industrial Park-Enoosupukia, Narok. Environmental and Social Impact Assessme2nt (ESIA) Study Volume I – Main Report

[4] Ibid

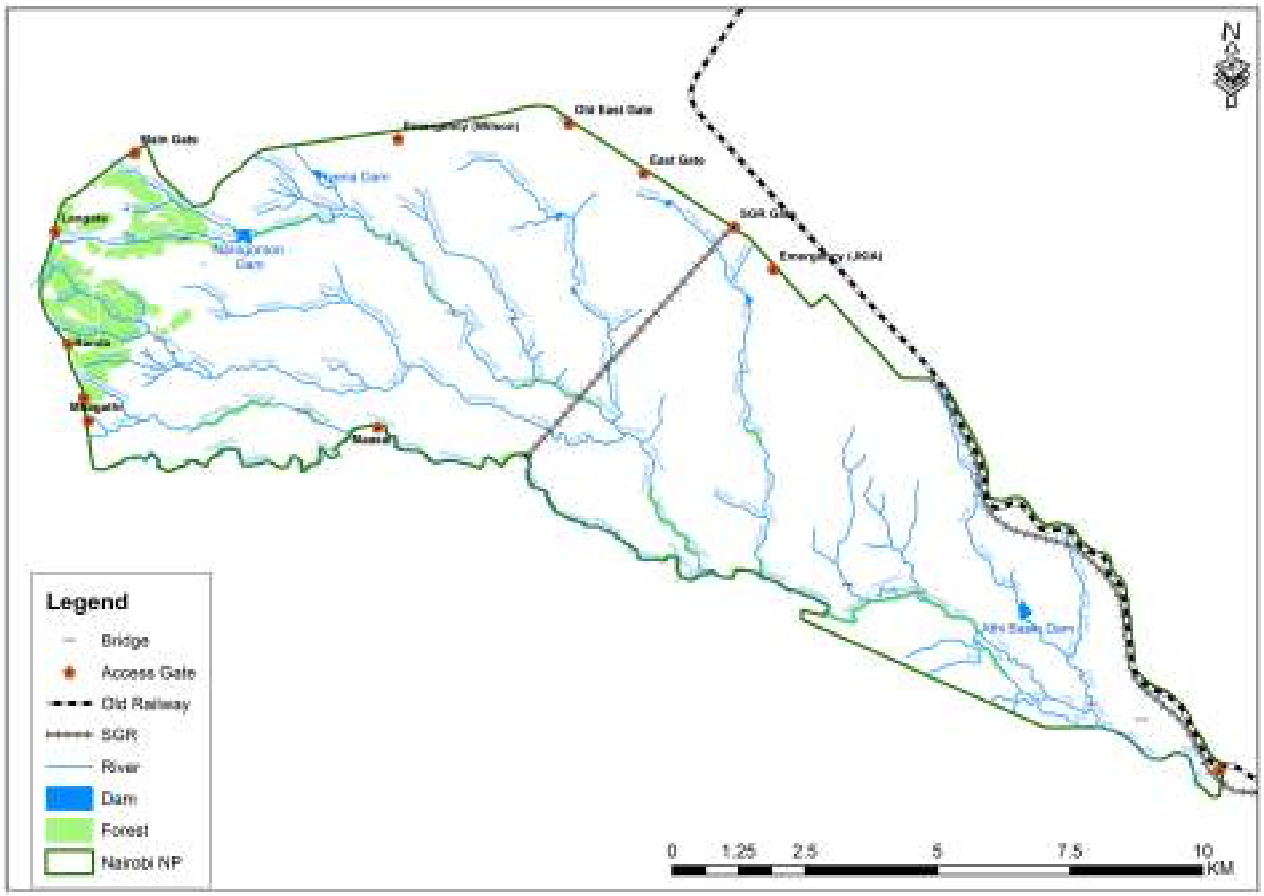


Figure 3. Rivers and dams in NNP

Rare, Threatened and Restricted Range Plants

The Park is divided into two major zones. The first is the dry forest on the high ground with species belonging predominantly to the Afromontane archipelago and the Acacia Woodland/Grassland which belongs to the Somalia/Masai regional center of endemism (throughout both phytochoria[5] are various Riverine/Rocky or Wetland habitats). The overriding importance of preserving the Park's integrity lies in the fact that most of the natural vegetation that occurred previously at this altitude range (1500m to 1800m) and at the boundary between the two phytochoria has by now either been converted or highly altered. However, few restricted range plants are actually present within NNP[6]. These limited range taxa are given in Annex 5. However this list is not exhaustive and it is important that a thorough survey of the plants be undertaken to update and extend the checklist.

Rich wildlife species

The park has over 100 mammal species, over a dozen different reptiles, and over 400 permanent and migratory bird species find a place for themselves in the protected area. African buffalo and baboons, the Eastern black rhinoceros, the southern white rhino, common zebra, Grant's gazelle, Thomson's gazelle, the Masai giraffe, elands, impala, ostriches, jackals, warthogs and waterbucks all roam in the park. It is home to more than 45 lions among other large carnivores such as leopards, cheetah, and hyena. Hippopotamuses inhabit areas along the Mbagathi River and crocodiles are found in the dams.

[5] A phytochorion is geographic area with relatively uniform composition of plant species
[6] Luke Q, 2017. Plants of Conservation Interest of Nairobi National Park. www.researchgate.net/publication/312173075

Important Bird and Biodiversity Areas (IBA)[7]

Nairobi National Park is listed as an IBA in danger[8] by Birdlife International. It is an important roosting site for *Falco naumanni* flocks on passage (up to 5,000 have been recorded), although numbers have markedly declined in recent years. The substantial area of undisturbed grassland is of great importance for species such as the restricted-range *Euplectes jacksoni*, which regularly breeds here after good rains. The avifauna is diverse, with a remarkable 516 species recorded, including 27 of Kenya's 94 Somali–Masai biome species (23 of which are regular), and 25 of Kenya's 67 African Highland biome species. The globally threatened *Crex crex* is a scarce visitor from the Palaearctic, and the Near Threatened *Balaeniceps rex* and *Acrocephalus griseldis* have both been recorded once. *Ardeola idae* is a regular non-breeding visitor (May–October) in small numbers, and *Parus fringillinus* is fairly common in riverine *Acacia* woodland. Regionally threatened species include *Struthio camelus* (common); *Anhinga rufa* (scarce visitor); *Casmerodius albus* (regular visitor to dams and ponds); *Ephippiorhynchus senegalensis* (resident in small numbers); *Hieraaetus ayresii* (scarce resident in the forest); *Stephanoaetus coronatus* (at least one pair nests in the forest); *Polemaetus bellicosus* (several pairs have home ranges that include the park); *Podica senegalensis* (resident in small numbers on thickly-fringed sections of the rivers); and *Buphagus africanus* (moderately common)[9]. The bird species that triggered the park's designation as an IBA are given in Table 2.

Table 2. IBA trigger species[10]

Species	Current IUCN Red List Category
Grey Crowned Crane *Balearica regulorum*	EN
Kori Bustard *Ardeotis kori*	NT
Madagascar Pond-heron *Ardeola idae*	EN
Secretarybird *Sagittarius serpentarius*	VU
White-backed Vulture *Gyps africanus*	CR
Rüppell's Vulture *Gyps rueppelli*	CR
Lappet-faced Vulture *Torgos tracheliotos*	EN
Martial Eagle *Polemaetus bellicosus*	VU
Greater Spotted Eagle *Clanga clanga*	VU

Rhino sanctuary

The park is a rhino sanctuary hosting both black rhino *Diceros bicornis* (CR) and southern white rhinos *Ceratothrium simum* (NT). As a part of biological metapopulation management, some of the surplus rhinos in NNP sanctuary have been removed to stock other areas with suitable habitats.

Masai Giraffe (*Giraffa camelopardalis tippelskirchi*)

The Masai Giraffe is listed by IUCN as Endangered due to an estimated decline of 49-51% over three generations (30 years). They are obligate browsers that occur in areas of *Vachellia* (*Acacia*) savanna in southern Kenya and North and Central Tanzania. Although associated with *Vachellia* (*Acacia)*, Masai Giraffes take a wide variety of browse, generally taking common browse species in proportion to their abundance in the environment. The most

[7] IBAs are sites of international significance for the conservation of the world's birds and other wildlife. These sites are also all Key Biodiversity Areas (KBAs), sites that contribute significantly to the global persistence of biodiversity.
[8] Important Bird and Biodiversity Areas in Danger are sites that have been identified as being those under very high pressure in recent years and in need of immediate action.
[9] BirdLife International (2020) Important Bird Areas factsheet: Nairobi National Park. Downloaded from http://www.birdlife.org on 09/03/202
[10] BirdLife International (2020) Important Bird Areas factsheet: Nairobi National Park. Downloaded from http://www.birdlife.org on 09/03/2020.

important contemporary threats to the Masai Giraffe are land use change and poaching. Masai Giraffes are poached for meat and products such as hide, bones and tail hairs. Their numbers in Kenya declined from approximately 32,000 to 12,000, a 63% reduction, from 1977 to 2015[11]. There were 99 Masai Giraffes in NNP in 2019[12].

Large carnivores

Nairobi National Park is home to several large carnivores including lions *Panthera leo* (VU), cheetahs *Acinonyx jubatus (VU)*, leopards *Panthera pardus (VU)*, and both spotted and striped hyenas. Some of these species (e.g. lion) are of particular conservation value as their numbers have declined nationally yet they are of economic value as they are key tourist attractions. However, at NNP the lion population has been increasing. Twenty years ago (1996/ 1997), thirty three (33) individual lions were known to be present in NNP, with three adult males. In 2003 the population dropped to 22 individuals and by the beginning of 2004 the population dropped further to 16. In 2011 the estimated lion population was 40 individuals, probably due to immigration of lions from areas adjacent to the park as human settlements and associated anthropogenic activities increased. By early 2016, the NNP lion population was about 36 adult lions. This rose to 42 in 2017. The population estimate of lions in NNP in 2019 was 45 with 4 to 7 cubs[13].

Scenic values

Indigenous highland dry forest

The park has a scenic highland dry forest that is largely undisturbed. This forest has been zoned as a Low Use Zone to not only give visitors a sense of solitude, but also provide them with an opportunity to enjoy the forest scenery.

Picturesque gorges

The park is gently undulating with the highest point being to the northwest at an altitude of 1790m above sea level. Along Mbagathi River, there are deep rocky valleys and breath taking gorges covered by scrub and long grass. These include Mbagathi, Mokoyiet and Leopard gorges.

Socioeconomic values

Nature based tourism

The park is a key tourist destination in the country receiving over 120,000 visitors annually in the last seven years. It is also a major revenue earner for KWS with more than Ksh. 400million accruing from visitation in 2018 (Table 3).

Table 3. Visitor and revenue statistics (2012-2018)

Year	Citizen	Resident	Non-resident	Total visitors	Revenue
2012	93137	16785	37574	147496	205,469,190.00
2013	90370	17209	42412	149991	216,103.136.00

[11] Bolger, D., Ogutu, J., Strauss, M., Lee, D., Muneza, A., Fennessy, J. & Brown, D. 2019. *Giraffa camelopardalis ssp. tippelskirchi.* The IUCN Red List of Threatened Species 2019: e.T88421036A88421121. http://dx.doi.org/10.2305/IUCN.UK.2019-1.RLTS.T88421036A88421121.en. Downloaded on 19 October 2019.
[12] NNP Research Section
[13] Ibid

Year	Citizen	Resident	Non-resident	Total visitors	Revenue
2014	74404	15504	37470	127378	250,680,162.00
2015	76399	15721	36968	129088	279.778,790.00
2016	85032	16850	51639	153521	324,456,224.00
2017	91287	17690	58644	167621	321.885,169.00
2018	102576	18941	74981	196498	429,672,423.00

First national park to be established in Kenya and the only City Park in the region

Nairobi National Park, founded in 1946, was the first Park to be gazetted in Kenya and indeed in East Africa. It is among the major metropolitan National Parks in the world in a capital City.

Wildlife rehabilitation and education facilities

Integrated with the park are animal rehabilitation and education facilities that are the Nairobi Animal Orphanage and Nairobi Safari Walk that offer visitors close encounters with captive wildlife. These attractions augment NNP's mission and provide opportunities for people not going into the park to observe similar animals and ecosystems they would see throughout NNP. These ancillary features provide an added opportunity for nature interpretation and environmental education.

Although the Animal Orphanage and Safari Walk are managed as a separate entity with oversight conducted by the Captive Wildlife Management Department, the missions of each of these establishments is overlapping: to provide a pleasant and memorable learning experience that motivates environmental stewardship and builds financial and cultural support for the protection of Kenya's natural heritage. Thousands of children visit these park features every year.

The Education Office is involved in educating visiting school groups as well as outreach programmes to communities and individuals outside of the park. The Animal Orphanage has had so many visitors that 12 acres of the protected area are being developed to expand the size and number of captive animal enclosures.

Although these visitors are not spending their time in the interior of the park with free roaming wildlife, their attendance plays an important role in shaping the positive attitude Kenyan youth and families have towards parks and animals. These activities are also used as a strategic introduction that intends to increase park visits by Nairobi residents in the future[14].

The park also hosts the most successful orphan elephant rescue and rehabilitation program in the world which is operated by the Sheldrick Wildlife Trust, an NGO.

Ivory burning site monument

This is one of the most important landmarks in the annals of conservation in the country. It was here that the second Kenyan President, His Excellency Daniel Arap Moi, made a dramatic statement to poachers by setting fire to 11 tonnes of ivory in 1989. The event demonstrated Kenya's resolve to tackle elephant poaching which had decimated local elephant populations. The ivory burning is credited with playing a significant role in turning the tide against poaching in Kenya[15.]

[14] Feyers, S., 2015. Nairobi National Park Situation Analysis 2015
[15] www.lonelyplanet.com

Major issues of concern

The northern eastern and western parts of the park are completely developed and to minimise human wildlife conflict, these boundaries have been fenced. The park borders permanent industries (Tanneries, steel works, cement plants, chemical factories), residential and commercial developments while to the north and west it borders residential areas. To the south of the park residential areas are progressively closing the former wildlife corridors and migratory routes such that the park is increasingly becoming an ecological island.

The urban growth is fuelled by commoditization of land where group ranches have been dissolved and subdivided and land use conversion from pastoralism to residential use has taken place, thus impacting wildlife migration. The decrease of space for wildlife and livestock has led to increased land use conflicts, which has created an incentive to sell, leading to greater difficulties for the pastoralists who hope to keep their property intact.

However, despite the challenges faced by the park and its wildlife, the park provides a place for recreation, education, research, employment, and provision of ecosystem services that supply fresh air, clean water, and open space for Nairobi residents.

Pressures surrounding the park have increased with rise in human population in the park-adjacent areas. Land-use changes are degrading the water quality and quantity in the rivers that flow through the park. Wildlife populations are also declining with the increase in land use conversion outside the park and declining habitat quality in the park. Mining and quarrying, noise pollution, transportation, and other development activities occurring on the NNP border are having indirect but substantial impacts on the park's ecosystems and wildlife.

Raw sewage, garbage, and construction materials from illegal dumping and poor waste management practices are polluting the water that flows into the watershed through tributaries. Invasive species are overtaking indigenous flora communities in many areas throughout the park and nutrient runoff from roadways around the park is leading to eutrophication of the dams. Both of these impacts are degrading the unique habitats within the park, making them unsuitable for wildlife species currently present[16].

These conditions and the growing problems within the park are not suitable for conservation. The ecological resilience of the park is unknown and continued pressures will only worsen the decline of wildlife habitats and populations within the protected area. Wildlife is imprinted with the biological need to roam, migrate, and seek food and shelter. There is not sufficient room for many large species to move away from pollution or adapt to new environments created by these pressures and a changing climate[17].

The top twelve issues that this plan seeks to address are: *habitat loss and fragmentation in the dispersal areas; decline in wildlife population; poaching, Human Wildlife Conflicts, alien and invasive species; pollution; mining and quarries; climate change; low park visitation; increased urbanization; settlement threats on the Sheep and Goats Ranch; and infrastructure development.*

Issue 1: habitat loss and fragmentation in the dispersal areas

Given the expanding population and urbanization, there have been significant and increasing pressures in the dispersal area, which is not protected but very important to the health of the

[16] Feyers, S., 2015. Nairobi National Park Situation Analysis 2015
[17] ibid

park. More challenging than wildlife conflicts, which are addressed through compensation programs and lease programs, is the permanent sale of land to non-residents. These people do not have a stake in the community, thus they ward off their land to any use, even if it is leaving it vacant. Moreover, unplanned subdivisions, floriculture, pollution, and expanding urban centres have led to growing traffic and settlements in these communities (Figure 4). The sales of land and subsequent fencing have transformed the landscape to the extent that seasonal migration and dispersion has been severely degraded. Wildlife movement is significantly obstructed by the fences, thus the migration patterns and seasonal movements are also changing (Figure 5). While some animals stay in the park, occasionally they find themselves trapped outside, and sometimes they pass through, but generally fewer animals are migrating any distance. Roadways have further increased the barriers for animals, preventing them from either leaving or returning to the park. As a result, NNP is regarded as a closed ecosystem by many because of these circumstances. However, there are still pockets of critical wildlife areas that are being considered for protection as conservancies even though it is unlikely that connectivity to the park will be regained[18].

Notably, proximity to Nairobi City has accelerated land sales and fragmentation. The area is very attractive to those seeking relatively cheap residential plots, for instance in the case of former Kitengela, Kisaju, and Embolioi ranches. The high re-sale value of real property in this area has highly encouraged land speculation.

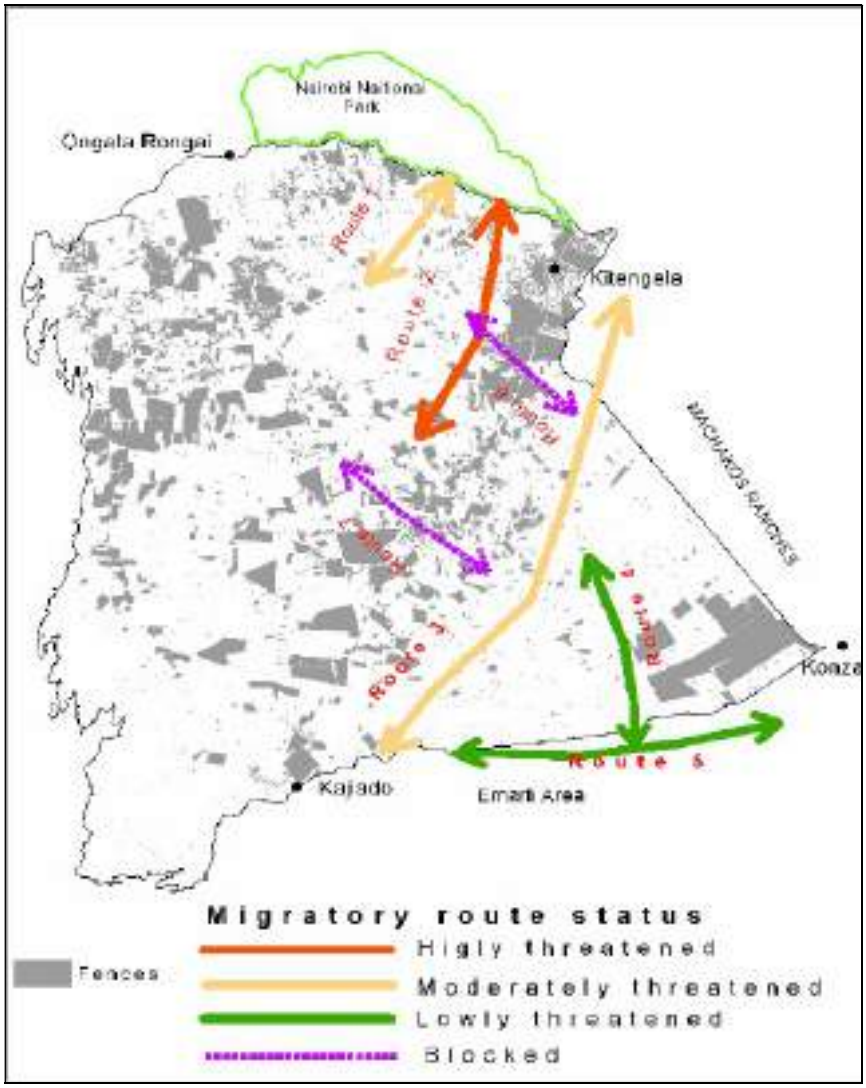


Figure 4. Status of wildlife migratory routes in NNP's dispersal area

[18] Feyers, S., 2015. Nairobi National Park Situation Analysis 2015



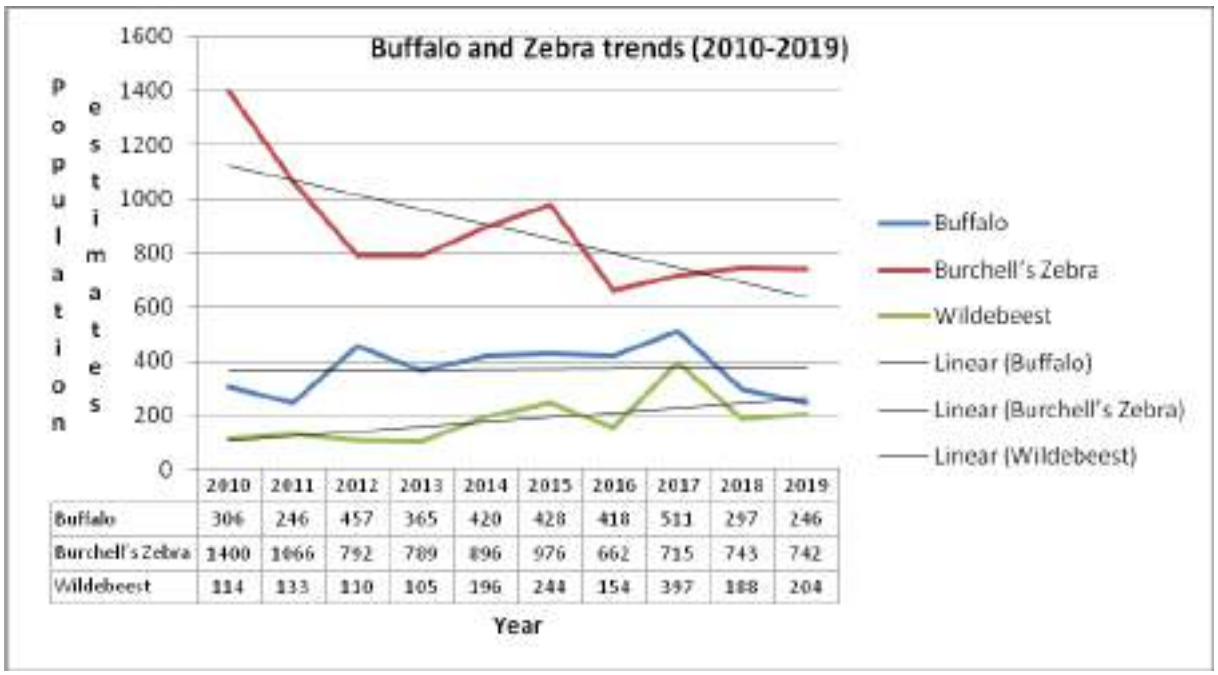
Figure 5. Fences in NNP's dispersal areas-2015

Issue 2: Decline in wildlife population

The park's wildlife population has experienced significant decline for some species over the last three decades. A wildebeest migration that had 30,000 animals in the 1960s has completely collapsed with a mere 200 currently using the park. Warthog, waterbuck, hartebeest, and gazelle populations have declined by 70%, down to one-third of what they were just forty years ago. And as seen in Figures 6, 7 and 8, many species populations are still declining.

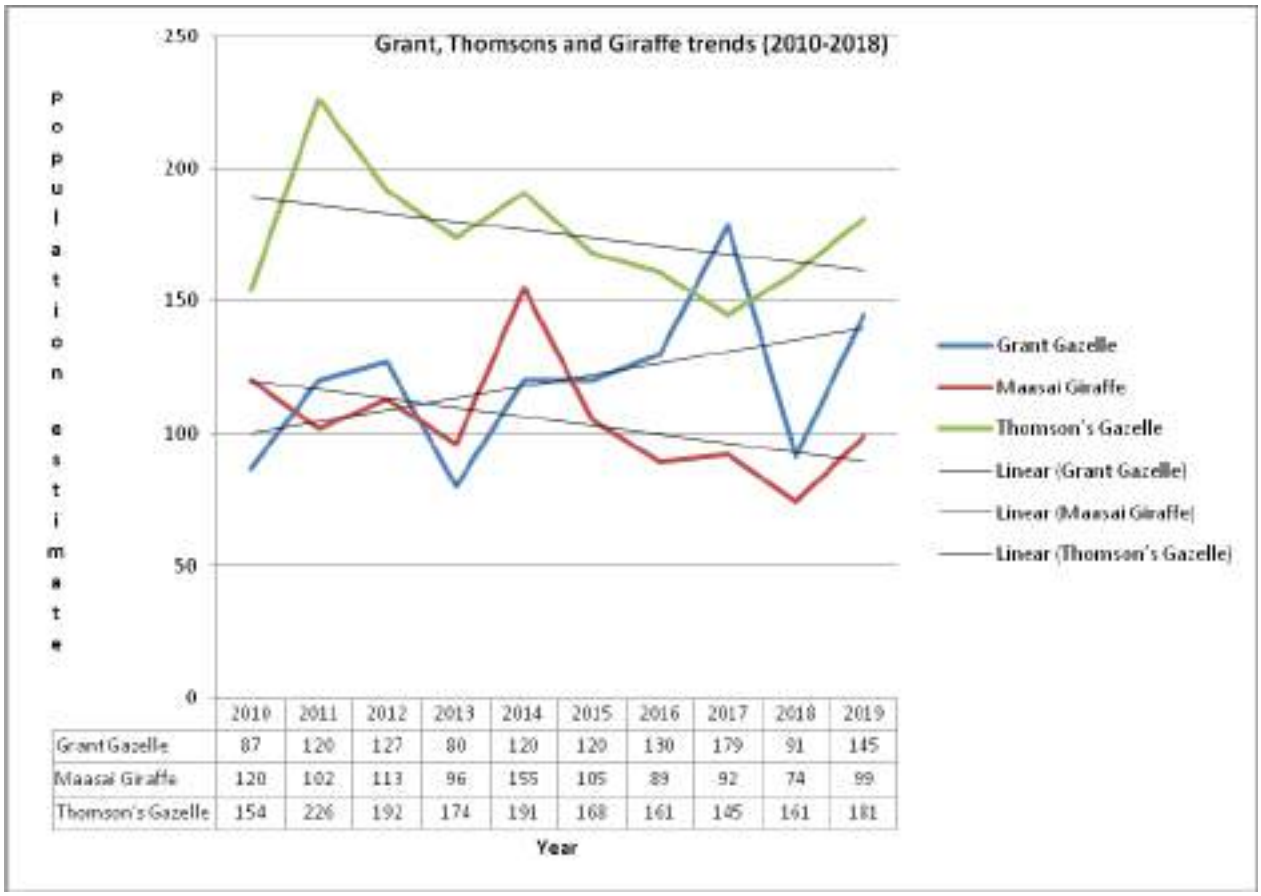
It is estimated that 70-80 percent of the park's animals roam outside of the protected area boundaries. The southern dispersal areas are still crucial to most of the migratory animals. But now those corridors linking the park to the greater plains have been obstructed by development, urban sprawl and subdivision, or totally blocked by fences. Most wildlife is no longer able to disperse into or out of the park, causing immeasurable but substantial changes across the entire trophic system. This range compression is decreasing animals' abilities to cope with climate variation and increasing competition and conflict[19].

[19] Feyers, S., 2015. Nairobi National Park Situation Analysis 2015



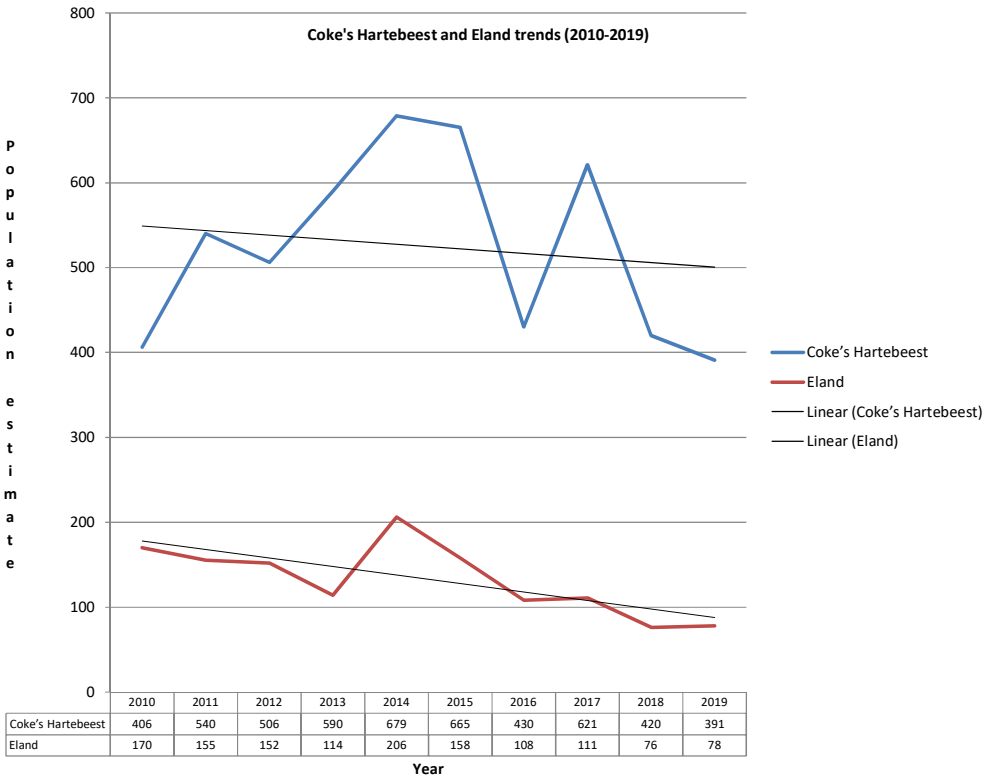
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Buffalo	306	246	457	365	420	428	418	511	297	246
Burchell's Zebra	1400	1066	792	789	896	976	662	715	743	742
Wildebeest	114	133	110	105	196	244	154	397	188	204

Figure 6. Wildlife Population Trends (buffalo, burchell's zebra and wildebeest) in Nairobi National Park (2010-2019)



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Grant Gazelle	87	120	127	80	120	120	130	179	91	145
Maasai Giraffe	120	102	113	96	155	105	89	92	74	99
Thomson's Gazelle	154	226	192	174	191	168	161	145	161	181

Figure 7. Wildlife Population Trends (Grant's gazelle, Masai giraffe, and Thomson's gazelle) in Nairobi National Park (2010-2019)



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Coke's Hartebeest	406	540	506	590	679	665	430	621	420	391
Eland	170	155	152	114	206	158	108	111	76	78

Figure 8. Wildlife Population Trends (Coke's hartebeest, Eland) Nairobi National Park (2010-2019)[20]

The decline in wildlife population may be attributed to:

- Land use change in some areas of the Kitengela area from semi-nomadic pastoralism to industrial/commercial uses like flower farming, quarrying, and small settlements;
- Increase in human population and rising poverty levels in the Athi-Kapiti ecosystem;
- Increase in land sales and sub-division of group ranches into private parcels;
- Increase in small fences along the traditional zebra and wildebeest migratory routes;
- Subsistence and commercial poaching;
- Occurrence of droughts;
- Disease outbreak e.g. rinderpest, which in 1996/97, reduced the buffalo population by almost half; and
- Habitat change

Issue 3: Wildlife Poaching

Nairobi National Park has not historically experienced many poaching issues. However, in the past several years – presumed to be an outcome of human settlement encroachment around the park and areas in the dispersal area – there have been increasing incidents of poaching in the dispersal area. Because the park is so small in size and the open space of the dispersal area is getting smaller, wildlife and people are closer together thus incidents are on the rise.

[20] NNP wildlife population database

Proximity of the park to residential areas and illegal settlements (slums) makes wildlife vulnerable to poaching. Incidences of subsistence and commercial poaching have become a common occurrence. The park's infrastructure, such as fences is being vandalized and illegal tapping of electric power from the fence has been recorded.

Snaring occurs along Mbagathi River, the dispersal area and the Machakos ranches. The affected wildlife species include Giraffe, Impala, Thomson's gazelle, Grants gazelle, zebra, and Coke's hartebeest.

The current rhino population in the park is beyond the park's ecological carrying capacity. Their home ranges have expanded beyond the southern boundary of the park and poaching has been recorded in these areas in the past. This calls for increased rhino surveillance in the dispersal areas.

There is a population of both white and black rhino that usually go outside the park, and the Rhino rangers always conduct rhino drives. Sometimes the rhinos go as far as Old Kitengela. This presents a security risk in terms of rhino protection (Figure 9).

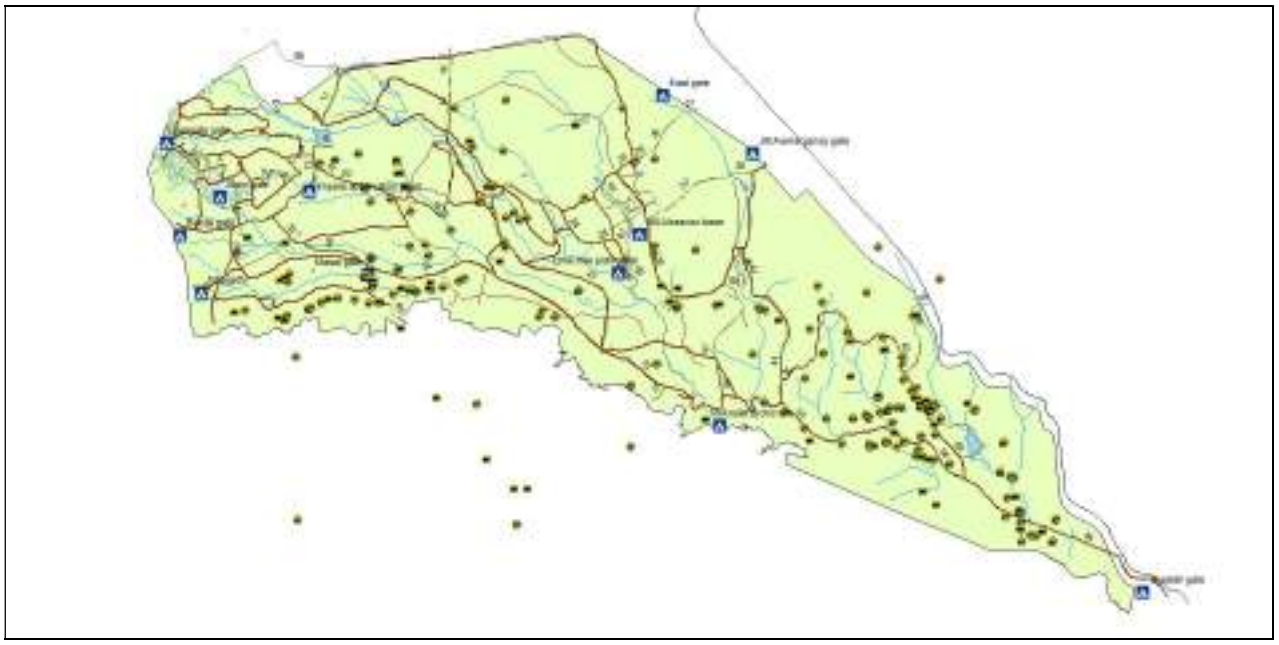


Figure 9. Rhino distribution in NNP and adjacent areas. NB: Some rhinos have home ranges that extend outside the park boundary

Issue 4: Human-Wildlife Conflicts

Despite the increased human settlement and land fragmentation through fencing in the dispersal area, wildlife still roam outside the park throughout the dispersal area. But because of the changes in land-tenure and the reduction of contiguous land area these animals have less space to roam (Figure 10), forcing the pastoralists to graze livestock in smaller areas with heavier concentrations of wildlife. This increases potential conflict.

Human-wildlife conflicts are manifested in the following forms: crop raiding, destruction of farm infrastructure, livestock predation, human deaths and injury, threats to human safety as well as disease transmission (wildlife to livestock and livestock to wildlife) and fuel-wood poaching from the Park.

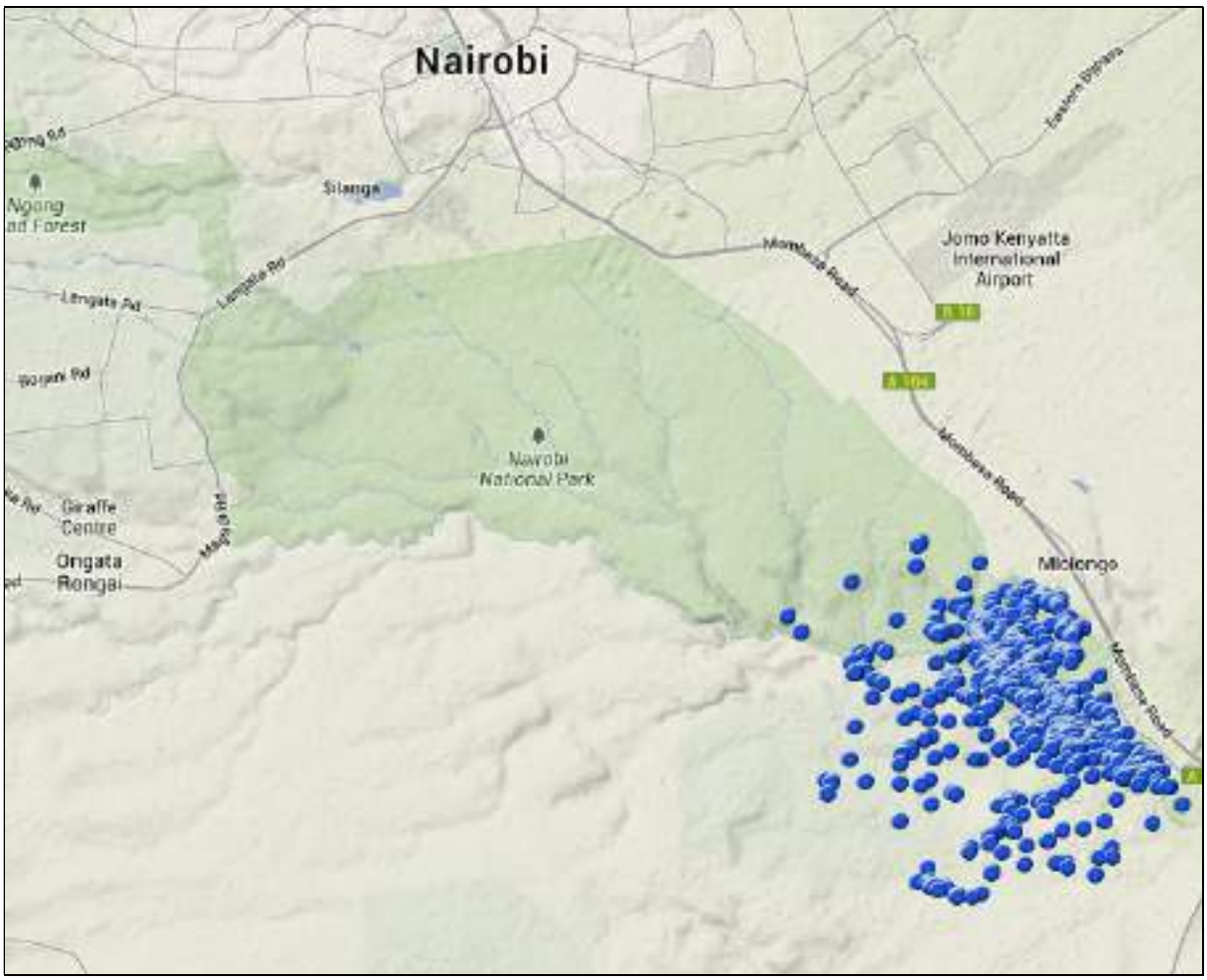


Figure 10. Collared lion movement in the south western part of the park. The lions roam from the park to settled areas

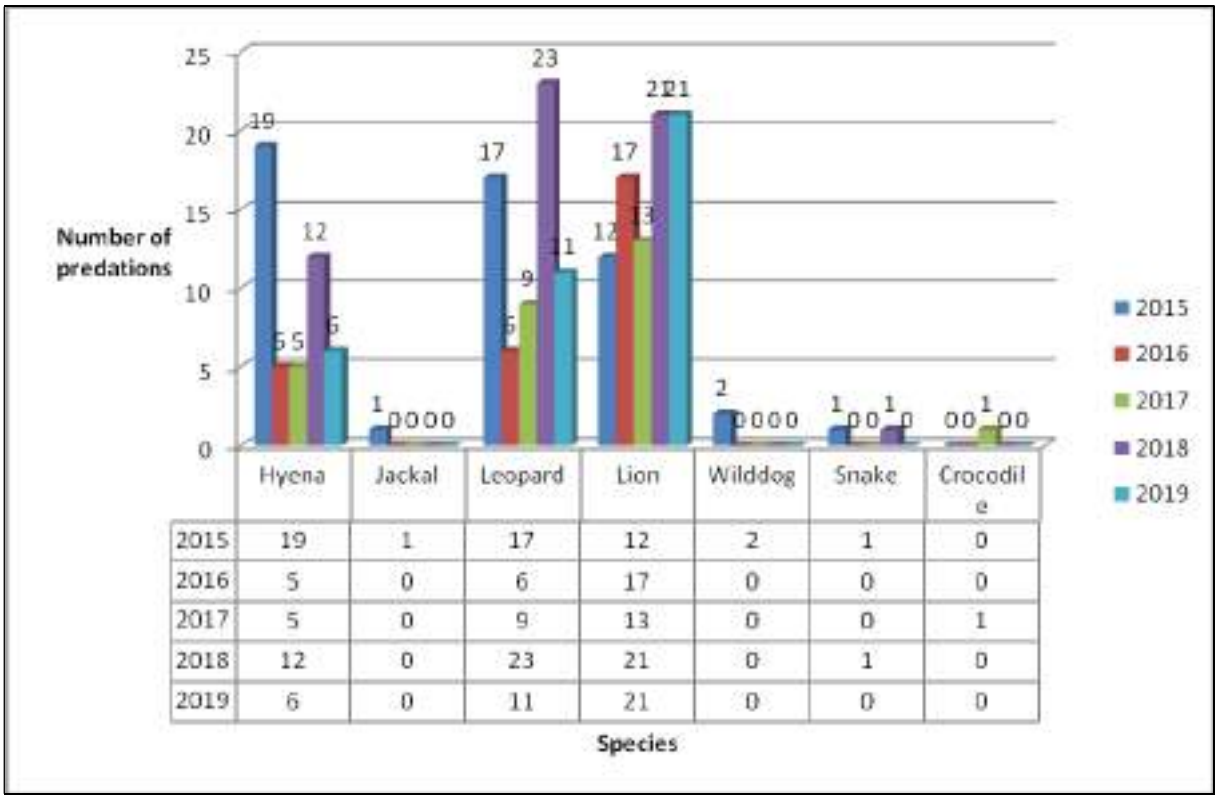
Crop raiding and destruction of fences - Crop farming is becoming an economic activity in the dispersal area. Land under cultivation is relatively small. However, this is increasing due to change in lifestyles of the local community from semi-nomadic pastoralists to sedentary subsistence mixed farming. To keep wildlife and livestock away from the cultivated farms, the farmers fence these small plots. During the seasonal wildlife dispersal these fences are damaged and crops raided thus creating tension.

Livestock predation- Predation of livestock by lion and other predators (leopards, hyenas, cheetahs, jackals and crocodiles) has been a common wet season occurrence in the dispersal area, when there is scarcity of prey in the park (Figures 11, 12, 13, and 14). Predation has been occasioned by an increase in predator home range during this period.

A study of movement of collared lions in Nairobi National Park in 2016 revealed that there are three prides and at least one coalition of sub-adult males in the park, with a very high lion density: 24 lions/km^2. Home ranges of the collared lions varied between 15.67 km^2 and 154.19 km^2. Three out of the four collared lions leave regularly the park towards the buffer zone, and two of them have important part of their home range outside the protected area (approximately 45%). Lions are the main predators of livestock in the surroundings of Nairobi National Park (43.8% of all reported predation events), with attacks occurring all-year-round (i.e.: no seasonal differences). Three of the four collared lions included in the study exited the

park at least once every three weeks, and two of those lions spent more than a day outside NNP, roaming in the livestock ranging area, with lions living the park on a weekly basis[21].

In Nairobi National Park, home range sizes were estimated to be 26 km^2. In areas where livestock is readily available, lions may incorporate domestic animals into their diet. In Nairobi National Park livestock comprise 15% of the lions' diet[22]. However, not all lions exhibit the same stock-raiding behaviour. While some lions frequently kill livestock (habitual stock-raiders), others may never, or rarely ever do so (no-problem lions), and others may only do so in the lean season (seasonal stock raiders). Some community members retaliate by killing the predators, particularly the lions. The new sensitivity programs attempting to reduce the physical and social conflicts are showing success. The installations of lion lights have a measurable reduction in predatory nuisances[23].



	Hyena	Jackal	Leopard	Lion	Wilddog	Snake	Crocodile
2015	19	1	17	12	2	1	0
2016	5	0	6	17	0	0	0
2017	5	0	9	13	0	0	1
2018	12	0	23	21	0	1	0
2019	6	0	11	21	0	0	0

Figure 11. Number of livestock reported killed by predators (2015-2019)

[21] Gatta M., 2016. Population structure, home ranges and movement of Nairobi National Park lions (*Panthera leo melanochaita*) in relation to livestock depredation. https://www.researchgate.net/publication/309672843
[22] Ibid
[23] Feyers, S., 2015. Nairobi National Park Situation Analysis 2015

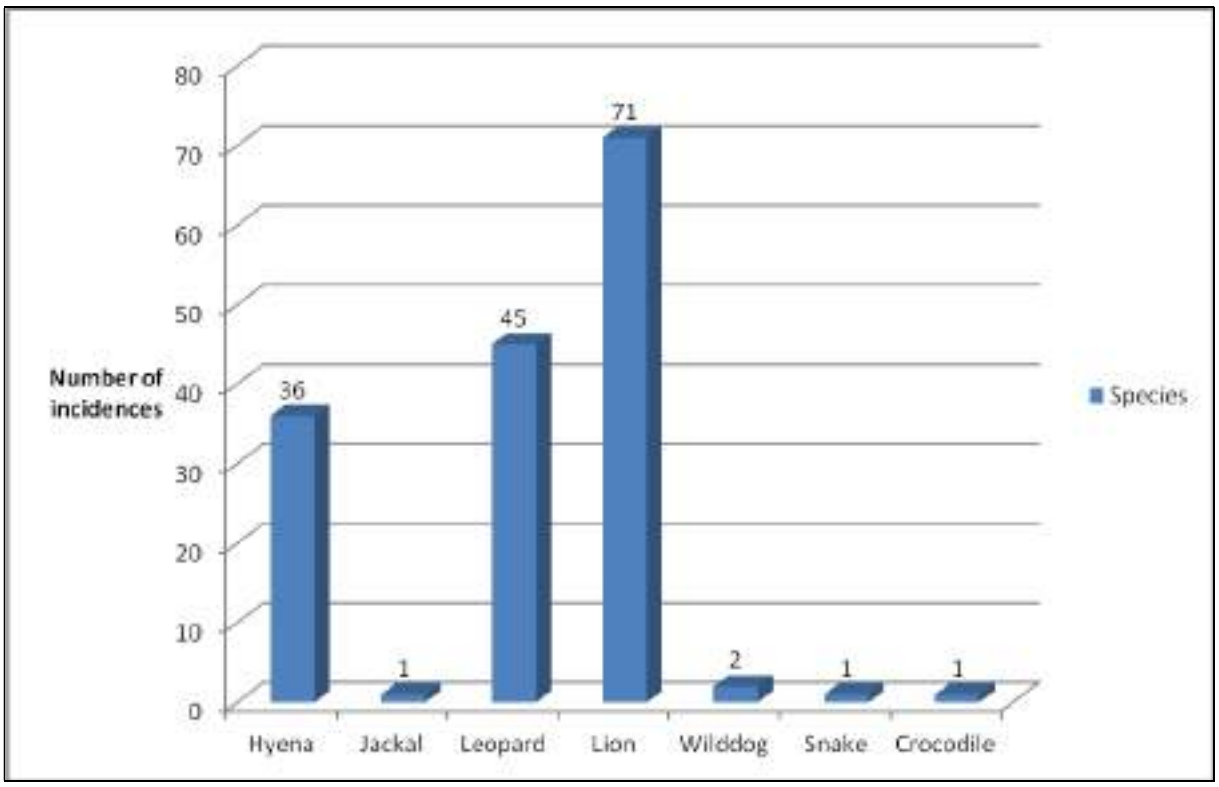
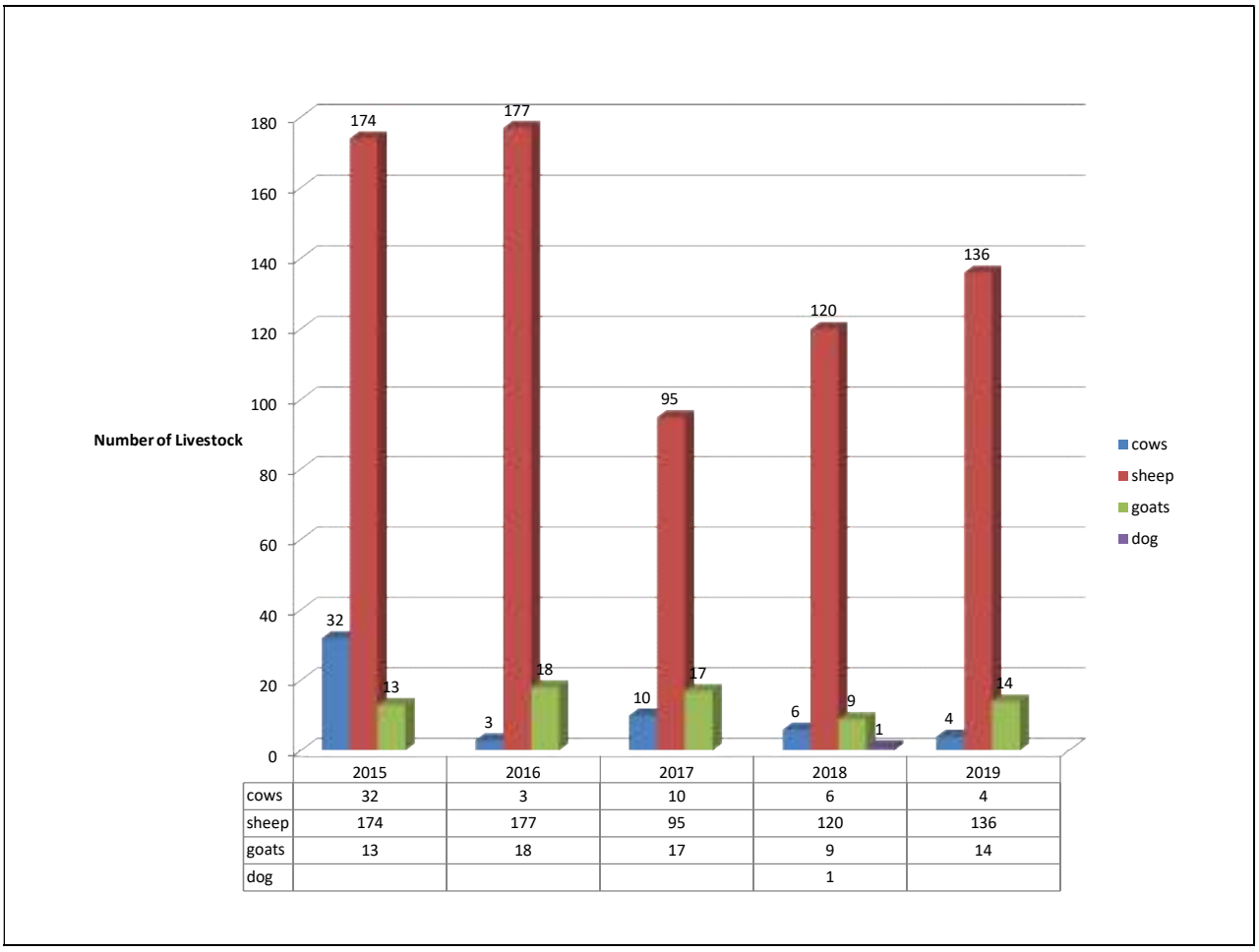


Figure 12. Predation incidences (2015-19)



	2015	2016	2017	2018	2019
cows	32	3	10	6	4
sheep	174	177	95	120	136
goats	13	18	17	9	14
dog				1	

Figure 13. Livestock predation since 2015 by various predators

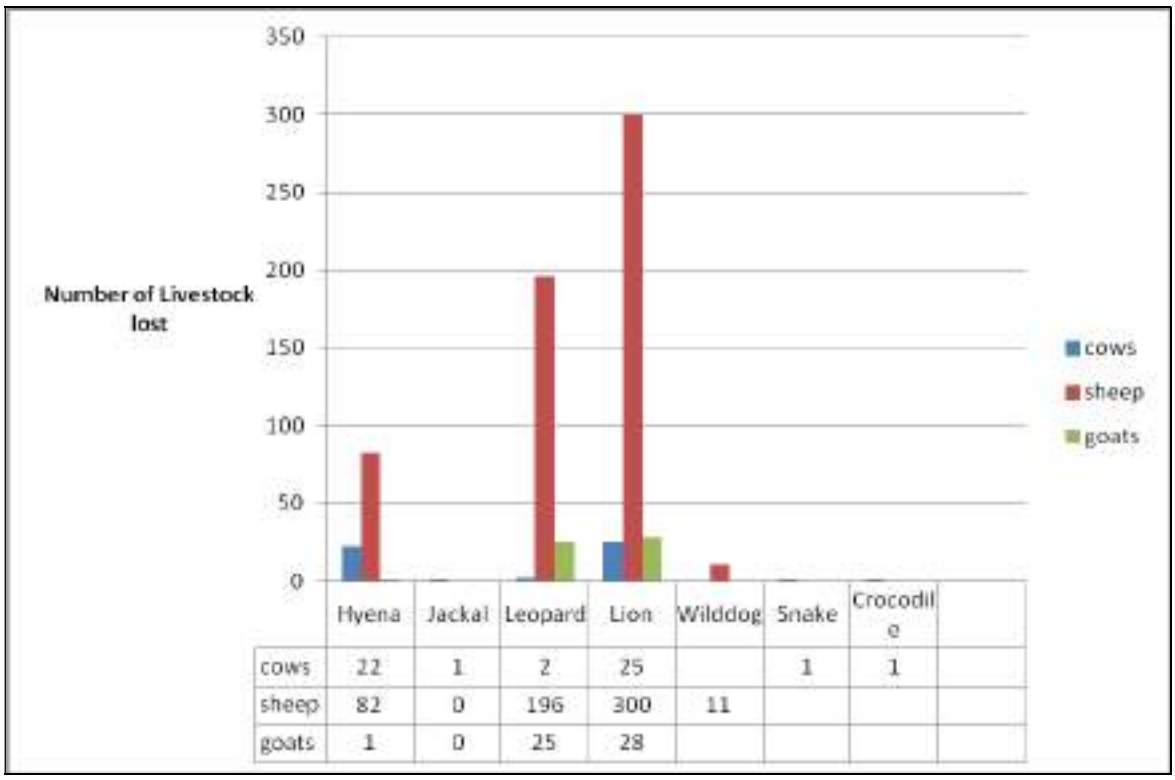


Figure 14. Livestock predation through different predators since 2015

Wildlife caused human deaths and injury - Between 2015 and 2019, fifty one (51) cases of wildlife threats to human life were reported to KWS. Out of these there were four (4) deaths and two injuries. The species involved included rhinos, hyenas, hippopotamus, buffaloes and lions (Tables 4 and 5).

Table 4. Wildlife caused human deaths 2015-2019

Year	*Month*	*Species*	*Conflict type*	*Area*
2015	*July*	*hyena*	*human death*	*Nkaimurunya*
2016	*June*	*hyena*	*human death*	*Kandisi*
2016	*November*	*buffalo*	*human death*	*Kasoito*
2019	*December*	*lion*	*human death*	*Tuala*

Table 5. Wildlife caused human injuries 2015-2019

Year	*Month*	*Species*	*Conflict type*	*Area*
2017	*December*	*hippo*	*human injury*	*Embakasi (Kasoito)*
2019	*November*	*buffalo*	*human injury*	*Emakoko*

Competition for pasture– Migrating wildlife, particularly the wildebeest and zebra, which are bulk feeders provide stiff competition to livestock during the wet season forcing the herding community to move their animals to other areas.

Disease transmission. The migrating wildlife are hosts of disease carrying ticks which transmit diseases such as East Coast Fever (ECF). The wildebeests are also carriers of Malignant Catarrh Fever (MCF) which is transmitted to cattle. Farmers also incur huge losses through extra animal husbandry and replacement of the livestock that succumb to disease.

Land use: The NNP ecosystem can only be effectively viable if the traditional wildlife migration routes are maintained. However, there has been recent rapid land adjudication, subdivisions and increased settlements without coherent land-use controls. This has thus reduced the wildlife dispersal area. The plan recognizes the speed at which these developments are taking place and calls for implementation of Kajiado County Physical Planning (Land Subdivision and Amalgamation) Regulations 2018 to control land use in the dispersal area.

Issue 5: Alien and invasive species

Invasive species can reduce forage resources for animals and cause changes in habitat structure by reducing the regenerative capacity of indigenous species. Several alien plant species have been identified in the park and some are invasive.

The species that pose a serious threat include the *Lantana camara*, which is dispersed by birds and baboons; it is found within the forested areas and along the riverine vegetation. *Parthenium hysterophorus* is also a hazardous weed which is spreading fast in the park and adjacent areas. The alien species found in the park include *Eucalyptus sp*. which is found next to the animal orphanage and opposite the Wildlife Clubs of Kenya, and Kei apple and the *Opuntia sp*. at the Kingfisher area.

The spread of invasive species has been human-aided by increased vehicle presence, the maintenance of roads within the park, and the construction of new infrastructure within and adjacent to the park which creates disturbances in which these species thrive. In highly disturbed areas more than five invasive species can be found, with little or no indigenous vegetation present[24]. They are slowly overtaking the native flora community that the herbivores depend on. As Nairobi National Park is a dry-season refuge, the plant communities in this park are vital to the survival of grazing animals. This replacement is degrading wildlife habitat and forage; neither wildlife nor livestock consume the plant species that are overtaking major parts of the park, creating a major setback for this already constrained ecological community.

Alien and invasive plant species are given in table 6.

Table 6. Alien and invasive plant species in Nairobi National Park

Plant species	Occurrence	Status
Eucalyptus Spp.	Former Somali Camp, next to mini-orphanage, and opposite the Wildlife Clubs of Kenya	Non invasive/Alien
Opuntia spp (Opuntia exaltata,Opuntia ficus indica, Opuntia monocanthas)	Former Somali Camp	Invasive/alien
Lantana camara	In the forests and wooded grasslands	Invasive/alien
Dovyalis caffra (Kei apple)	Former Somali Camp	Non invasive
Thorn cactus	Near the central workshop	Invasive
Parthenium hysteropholus	Along the roads and river valleys	Invasive /alien
Solanum incanum	In degrade rangelands	Invasive
Datura Stramonium	Along the roads and disturbed areas	Invasive
Ricinus communis	Along river valleys	Invasive
Caesalpina decapetala	Forest edges and along roads	Invasive/alien
Tagetes minuta	Farms and disturbed areas	Invasive/alien
Byophylum delagoence	Rocky outcrops/open forests/grassy remnant vegetation	Invasive/alien
Cereus peruvianus	widespread	Invasive/alien

[24] Feyers, S., 2015. Nairobi National Park Situation Analysis 2015

Issue 6: Pollution

Water pollution. All the sewage and waste from the growing and un planned suburban town of Ongata Rongai eventually drains into Mbagathi River, a major source of water for the wildlife, as there is no urban sewage drainage system for this town.

Effluents from Carnivore Restaurant, the Langata Army Barracks, and Southlands Estates, pollute Hyena dam, while that from Karen residential area and neighbouring learning institutions pollute the Nagolomon Dam and South Kisembe streams. Occasionally effluent from Mlolongo finds its way into Athi basin dam, especially during the wet season

Air pollution. Air pollution in the park is caused by leather tannery, which led to closure of Cheetah Gate in 2009 because of air conditions that caused worker-health problems and wildlife aversion of the area. Small particles of dust from Bamburi and Portland cement factories also pollute the park environment. These particles settle on vegetation affecting primary productivity and reducing the aesthetic appeal of the park. Dust on forage is also not attractive to wild herbivores.

Solid waste pollution. Solid waste from Ongata Rongai pollutes the park through garbage, mainly plastics that find its way into Mbagathi River. Solid waste along the edges of the park is also degrading aesthetics and tourism quality.

Noise pollution. Sources of intense noise from landing and taking off aircrafts at Wilson and Jomo Kenyatta International Airport, vehicles on the southern bypass, Mombasa highway, Standard Gauge Railway (SGR), cement factories and entertainment centres like Carnivore cause disturbance to the park wildlife.

Issue 7: Mining and Quarries

Quarrying has been adopted as a major land use form in the dispersal areas. The people who mine and sell the stones usually lease quarries from landowners. To extract the stones, explosives which produce a lot of noise are used. This noise, combined with the increasing population of people and the damage to grazing land at the quarries has led to wildlife avoiding these areas. Further, as a result of the quarries there is heavy truck movement which has imposed new roads and less environmentally sensitive land use activities. In addition, some of the abandoned quarries are filled with water attracting hippos, thus escalating human wildlife conflicts. The water also attracts other wildlife make the wildlife vulnerable to bush meat poaching.

Issue 8: Climate change

With the rise in global climate change, different regions around the world are experiencing changes in their weather patterns. While there is no accurate forecast of the weather conditions in the next decade, some preliminary studies point to a rainfall increase in certain regions of Kenya. As a result, the grassland and shrublands of the park are growing taller, which alters the seasonal succession dynamics of the park. This in turn affects wildlife browsing behaviour, and diminishes the tourism quality of the park. Further, due to the increase in human population density in the park adjacent areas, many homeowners use septic systems, but the increase in rainfall in recent years causes these systems to fill up more quickly, thus resulting in septic failures. Given that Nairobi National Park is a central point in the regional watershed, any waste water that is not connected to the sewerage system flows into or collect at the park. Moreover, industrial and solid waste that is not appropri-

ately disposed also moves into the park. As a result, there has been siltation of water bodies within the park, which has further affected the fish in the wetlands. If the area gets wetter, there will be need for high construction and maintenance costs to cover water processing, pollution control, and dam management in the park. On the other hand, if the park becomes drier, there will be an increase in eutrophication, the spread of invasives, and the risks to wildlife[25]. This justifies the need to maintain wildlife dispersal areas to enhance their resilience to climate change

Issue 9: Park Visitation

Tourism Management. Even though visitors are an important part of park management, some of their activities have harmful impacts; for instance, off-road driving and littering. Some also harass or feed the animals, thus interfering with their natural behaviour.

Improvement of Visitor numbers. There is need to determine the optimum number of visitors with the aim of developing appropriate targets. While resident and non-resident visitor numbers have stagnated, the citizen visitor numbers are steadily increasing.

Loss of the aesthetic value of the Park: The aesthetic appeal of the park has declined due to the development of residential houses, industries and slums in the north and north-eastern side of the park.

Meeting visitor expectations: Visitors have varying expectations during their trip to the park. A majority of the large herbivores (Wildebeests, Zebras, Elands and Coke's Hartebeests) and predators (lions, cheetahs) occasionally migrate to the dispersal area eroding visitor experience in the park. Kenyan citizens are the main visitor category at 61% on average, thus there is an opportunity to appeal to this group by focusing on citizen needs and expectations. Further, varied visitor experience in the park (i.e. a variety of visitor activities) may alleviate narrow expectations.

Issue 10: Increased urbanization

Urbanization is the most prevalent and serious threat to conservation efforts across Kenya and the world. With urbanization, all demographics demonstrate that people choose to reinforce the separation between themselves and the natural environment as much as possible. In the NNP, urbanization has resulted in the real estate problems in the southern dispersal area, the northern problems originating from highway development, the east park problems arising from industrial pollution, in addition to the problems of sewage and solid waste from large commercial areas. Moreover, as societies urbanize they do not actively take into account their overall impact on the environment[26].

Issue 11: Settlement on the Sheep and Goat Ranch

The Sheep and Goats Ranch is situated on the southern region of the Nairobi National Park; it is approximately 2912 acres. Currently registered as L.R. no. 10029/11, it was originally land ref. no. 10029, with a previous area of about 8,912 acres. The land was registered in 1951 to the Kenya Meat Commission (KMC) for a 99-year term, but KMC surrendered it back to the government on 31st December 1970. It was then reserved to the Ministry of Agriculture and Livestock Development as a livestock holding ground. In 1982 the government subdivided the land to create L.R. No. 10029/1 of 6000 acres and 10029/11 of about 2912 acres, which was

[25] Feyers, S., 2015. Nairobi National Park Situation Analysis 2015

[26] ibid

reserved for the Ministry of Agriculture and Livestock Development for purposes of sheep and goat rearing; it is known as the Sheep and Goats Ranch. This ranch is a critical dispersal area for NNP, thus there should be efforts to ensure that it remains available for wildlife dispersal. .

Issue 12: Infrastructure development

There are a number of infrastructure developments that have been established inside or at the periphery of the park. These developments are outlined in the following sections:

Roads (Southern bypass and Internal Container Depot roads). The Southern bypass road passes through the park, and it has cut off a section of the park that borders Wilson Airport. The impacts of this road include noise and air pollution from traffic plying the road.

Pipelines (Old and new pipelines). There are oil pipelines that pass through the park. They have also obtained way leaves to facilitate pipeline maintenance.

Nairobi Animal orphanage. The proposed expansion of the animal orphanage seeks to increase space for individual or groups of animals, improve on enclosure sizes and designs, enrich the landscape, redesign cages layout, and upgrade the entrance gate with staff offices for efficient and effective service delivery. The existing facility is approximately 2.36ha and it will be extended inside the national park by an additional 4.70 hectares, bringing the area under the orphanage to about 7.06 hectares.

The Nairobi Safari Walk and Animal Orphanage management plan is being developed separately. In this plan, KWS aims to take a proactive step to promote rehabilitation of releasable animals in preparation for their return to the wild. This is a deliberate effort to reduce the captive animals to representative numbers only.

Over head power pylons. Power pylons have also been constructed in the park.

Underground power cable. An underground power cable has also been installed along the northern and eastern park boundary.

Standard Gauge Railway. Six kilometres viaduct to hold the SGR has been constructed across the park. There is need to plant trees along it to blend with the environment and minimise visual intrusion.

The SGR ESIA identified the following negative impacts on the park environment:-

- Disturbance of park environment during the installation of about T-frame pillars along the 7.2 km long corridor. Each pillar will involve an excavation area of 4X4 m.
- Noise and vibration during the construction and operation stages.
- Risk of introduction of invasive species during construction and operation stages.
- Negative visual impact on park tourism.
- Solid waste disposal during the construction phase and also by train passengers during the operation stage.

Proposed management options to address the major issues of concern at NNP and adjacent areas

In order to address the management issues facing the wildlife and its habitats in the NNP and its dispersal area, four management options have been considered. These options are the different ways of resolving most, if not all, of the environmental issues associated with the plan. The major goals of the management plan are to: *enhance ecological integrity; enhance visitor experience; improve community relations; improve wildlife security; and enhance PA management effectiveness.* Reasonable options are not only those that are realistic, but also ecologically and economically feasible for KWS to implement.

The "status quo" option and other management options were analyzed for their suitability in addressing the management plan goals and objectives. This was accomplished through identifying the advantages, disadvantages and key requirements for implementing each option. These management options were discussed during the stakeholder planning workshops.

The major issues addressed by these options include: *reversing wildlife population decline, averting habitat degradation in the park, minimising human-wildlife conflicts, enhancing visitor experience, enhancing wildlife security, enhancing revenue generation from the park, and land use development control in the NNP's buffer zone*. The four management and policy options are: Option 1- maintaining the status quo; Option 2 - Habitat improvement through controlled burning, grass mowing and salt supplementation; Option 3 – enclosing the entire park with a predator proof fence; and Option 4 - Habitat improvement in the park coupled with progressively fencing the willing land owners in the park's buffer zone and establishing a viable conservancy in the Naretunoi area and Sheep and Goats Ranch.

Option I: Maintaining the status quo

This option is regarded as the continuation of existing management approaches to conservation and development in the Park. Since this option does not require making major decisions regarding future land use patterns in the park and its ecosystem, it is the easiest to implement as it does not require major investments. Under this option, park managers would continue managing the park as an open system. No actions will be taken to improve the wildlife habitat. Projects aiming at securing the southern wildlife dispersal areas will continue but their sustainability will not be certain as land subdivision and sale will continue with no control.

The pros of this option are:

- Implementation is affordable for KWS and it does not introduce new, costly and controversial projects.
- Community members who are participating in the lease program will continue to benefit and their socio-economic status will be enhanced.

The cons of this option include:

Conservation:

- Wildlife population in the park and surrounding area will continue to decline

- Wildlife poaching for bushmeat in adjacent areas will continue
- Snaring of wildlife from the park will continue
- With extensive human development along the southern boundary continuing unabated and the area having been zoned as an agricultural area, the open system might not succeed.

Tourism

- Tourism will seriously decline because visitors and tour operators will be dissatisfied because of paucity of wildlife, particularly the lions.
- The revenue potential for the NNP will not be realized due to low visitation.

Park-community relations

- Predation of livestock by lions and other predators, particularly during the wet season will continue.
- Destruction of crops and fences by wildlife from the park will continue.
- Threats to human life, human death and injuries caused by wildlife from the park will continue.
- Park-community relations will deteriorate due to wildlife related losses.

Figure 15 shows the option 1 scenario.

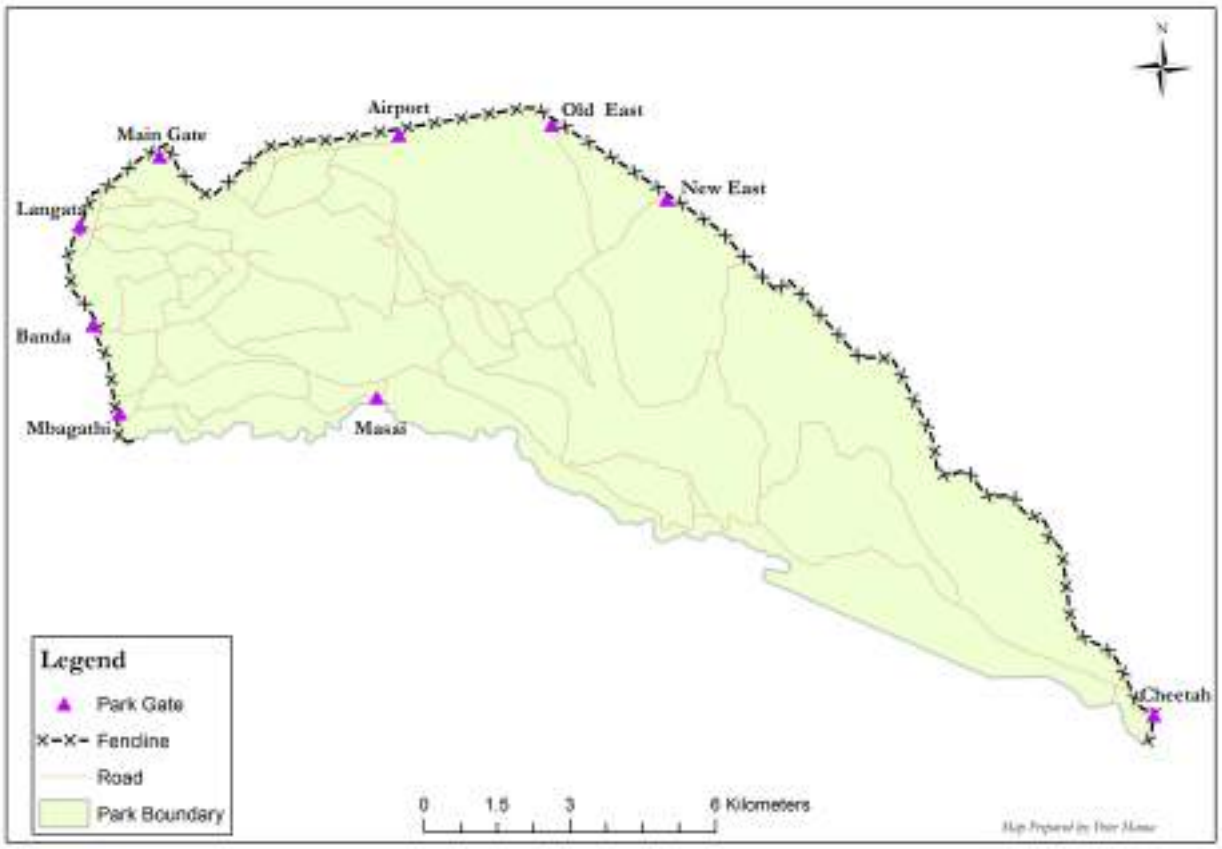


Figure 15. Option I-Leaving the entire southern park boundary unfenced

Option 2: Habitat improvement through controlled burning, grass mowing and salt supplementation

It has been noted that wildlife grazers move out of the park in search of short grass and salt licks that are available in the community areas. In the past KWS had adopted the use of controlled burning and mowing as tools for habitat management in Nairobi National Park but this was stopped in 2007. Since then the grasslands have been overrun by dwarf shrubs and the grass is tall and unpalatable to most grazers. Option 2 seeks to improve the wildlife habitat through prescribed burning, mowing and salt supplementation (Figures 16 and 17) to retain wildlife in the park as well as enhance wildlife viewing experience for visitors. The southern park boundary will also not be fenced.

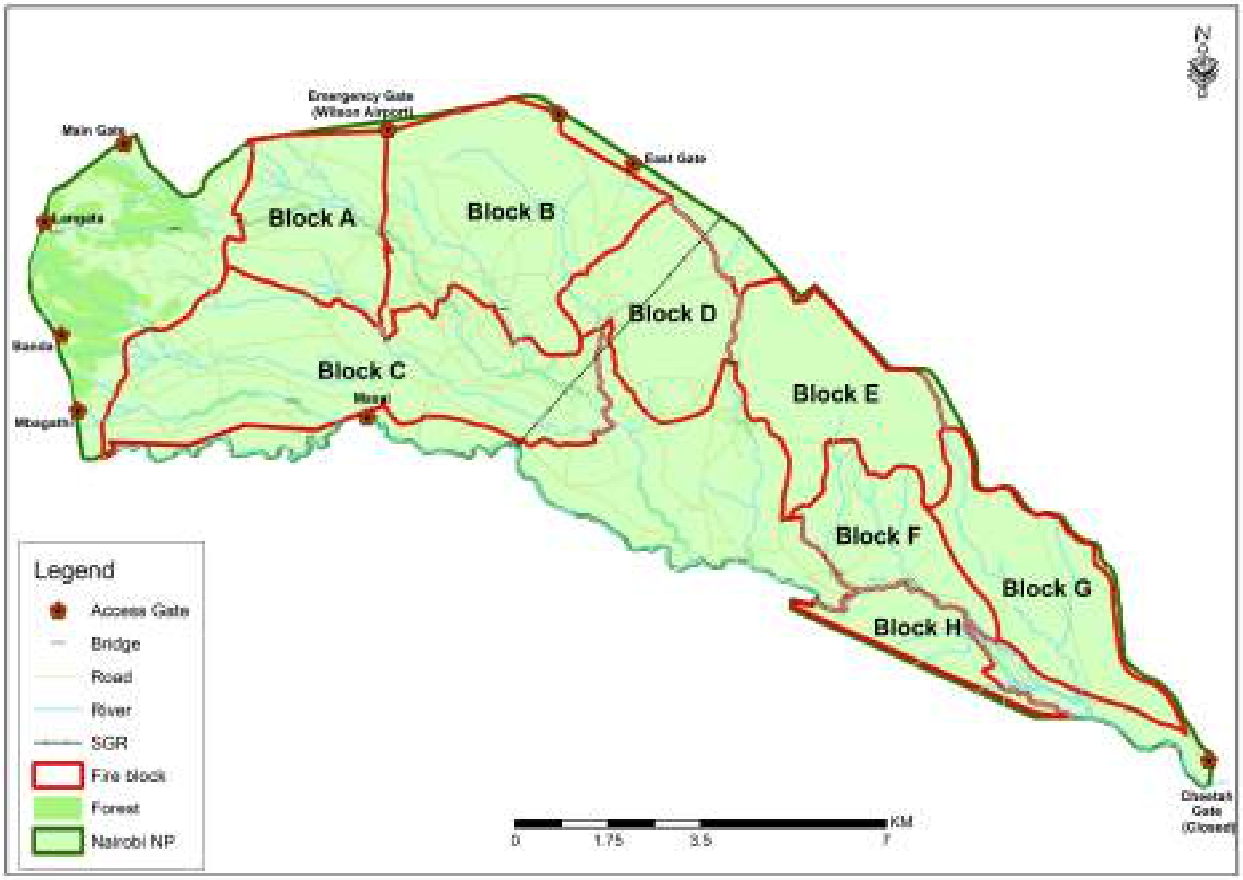


Figure 16. Prescribed fire burning blocks

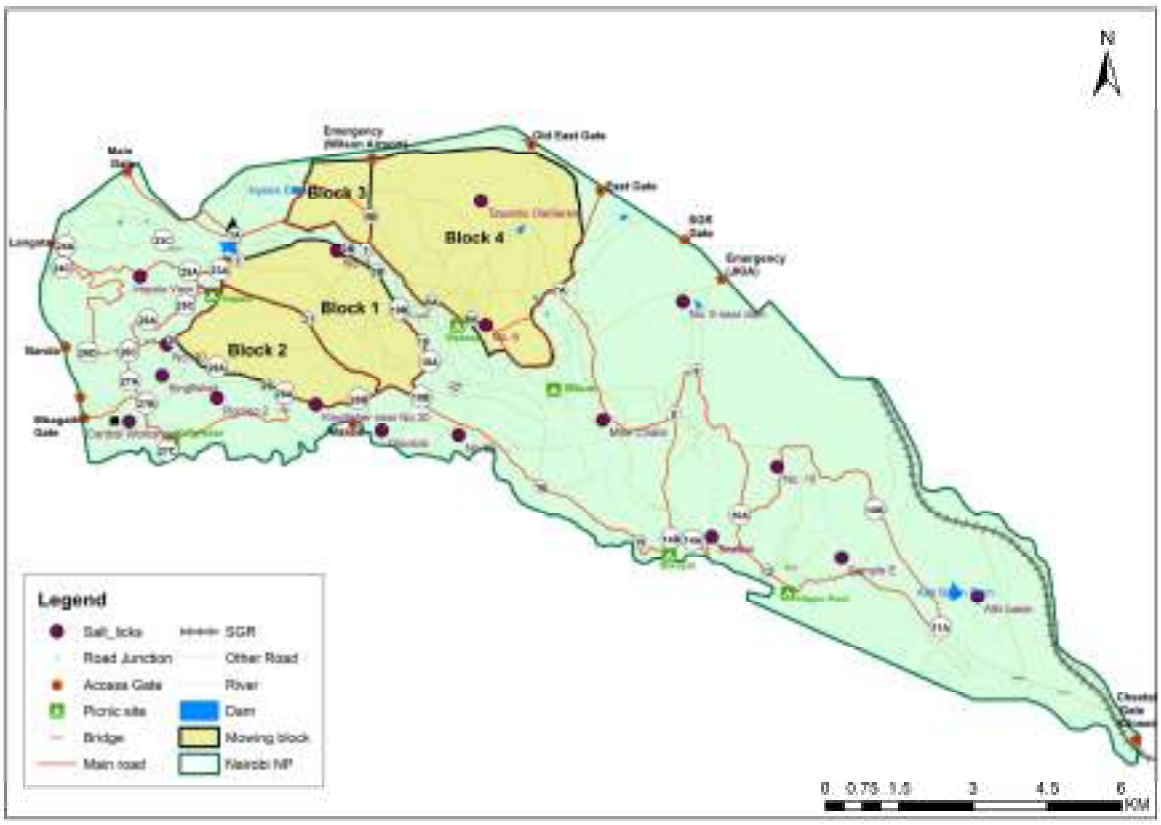


Figure 17. Mowing blocks and salt licks

The pros of this option are:

- The nutritional value of vegetation for browsing and grazing animals will be improved.
- An out-of-season flush of growth will be maintained. This is useful in areas where shortages of high quality vegetation are experienced early in the dry season due to high growth rates.
- Fuel loads will be reduced and thus the intensity and frequency of accidental fires will be minimal.
- Bush encroachment will be controlled and grasslands will be maintained in a sub-climax phase.
- Animals will be redistributed to sub-optimal areas
- The abundance and distribution of ecto-parasites will be controlled, thus reducing wildlife diseases and enhancing animal health.

The cons of this option include

- Some biodiversity will be killed when prescribed fire is applied
- Some fire resistant shrubs may proliferate
- There is the risk of wildlife diseases spreading through salt licks
- Dangerous wildlife will still move out of the park and endanger human life
- Livestock predation will continue in the buffer and community zones

Option 3: Fencing along the southern park boundary

This option calls for fencing the unfenced southern park boundary, thereby enclosing the park (Figure 18). It recommends fencing to be effected during the height of the dry season

when most of the park's wildlife is in the park. Once the park is fenced, an active wildlife and habitat management strategy will be adopted. This will be aimed at ensuring that the wildlife populations are maintained slightly below the habitat carrying capacity to avert habitat degradation.

This option is different from option 1 and 2 in that it acknowledges that based on the current land use patterns and trends the Kitengela dispersal areas have changed from a pastoralist area to residential use. Land fragmentation and subsequent settlement of people in the dispersal area will progressively continue until the Park is completely surrounded by residential houses and other incompatible uses. Acknowledging that KWS is the custodian of Kenya's wildlife, it is its cardinal duty to keep animals inside the area it manages. As such, the southern boundary of the park will be fenced to save the remaining wildlife populations and it will be maintained as a closed system (Figure 18).

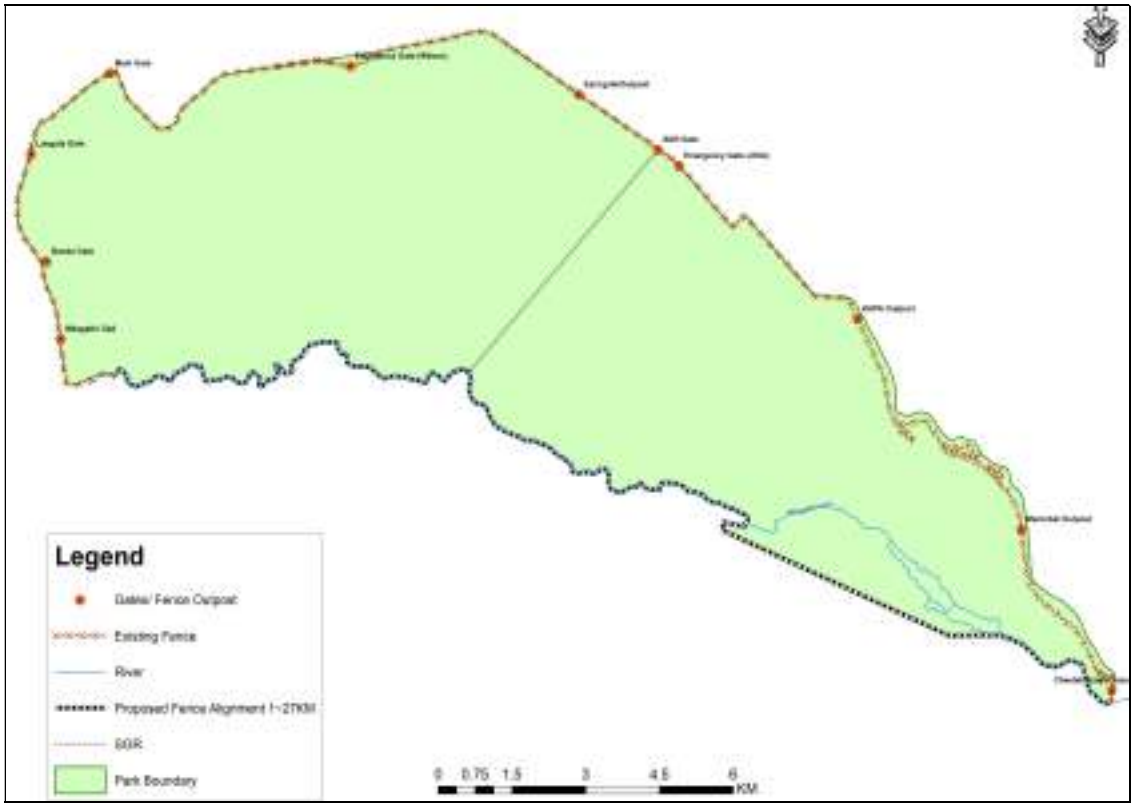


Figure 18. Option 3- Fencing along the park boundary

The pros of this option are:

Conservation

- Protection of wildlife species, and especially that of the rhino whose home range extends to the Kitengela area, will be enhanced.
- Poaching, snaring and environmental degradation (especially along the Mbagathi river valley) will be reduced.
- Fencing will allow restocking of the park in a controlled manner, while ensuring that the animals reintroduced do not move out of the park.

Tourism

- The Park will draw visitors, as it will have an adequate and representative selection of animals visible throughout the year.

Park-Community relations

- Fencing will minimize human-wildlife conflicts especially human deaths and injury, and livestock predation.
- The security of endangered species like rhinos, lions, and cheetahs will be enhanced and the cost of security patrols will be reduced.
- Threats to human life, deaths and injury caused by wild animals will be reduced.
- Fencing will minimize crop destruction by dispersing herbivores.
- Fencing will reduce mixing of wildlife and livestock, decreasing the risk of disease transmission.
- Bush meat poaching will reduce.

The cons of fencing the park include:

- Since the fence cannot be aligned with the park boundary as most of the boundary is at the middle of Mbagathi River, park land that will be fenced out will be encroached(Figure 19).
- Enclosed wildlife will not be able to access water from Mbagathi River, particularly during the dry season when water is scarce in the park.
- Members of the local community who are currently benefiting from the land lease program will lose a source of income since the lease program will no longer be justifiable.
- Fencing might deny local communities and their livestock access to water, creating tense community-park relations.
- The fence will separate park wildlife from wildlife that is resident in the park-adjacent areas, thus decreasing genetic diversity
- Confined herbivores might overpopulate the park leading to vegetation degradation and starvation.
- A fence with smooth wire is prone to vandalism and can even provide poachers with material for snares.
- There is potential for inbreeding in fenced conservation areas, but the wildlife populations that will be enclosed are high such that inbreeding might be rare in this case.
- Fences can be expensive to construct and difficult to maintain.



Figure 19. Fenced out and encroached section of NNP in the south western section of the park

The implementation requirements for this option include:

- Adequate water reservoirs will have to be constructed in the park to ensure that adequate water is available for wildlife both in the wet and dry season. This will require desilting all the dams.
- As recommended under option 2, a habitat improvement programme involving mowing, prescribed burning and salt supplementation will have to be implemented before the closure of the park. This measure is expected to increase the wildlife carrying capacity of the park.
- The fence will have to be constructed during the dry season when most of the park wildlife is back in the park.
- An Environmental Impact Assessment (EIA) will have to be conducted before the fencing project is implemented.
- The park neighbours will have to be sensitized on the benefits of the fence.

Option 4: Habitat improvement in the park coupled with progressively fencing willing land owners in the park's buffer zone

Option 4 is a mix of option 2 and 3 (Figure 20) and proposes integrated land use management in the parks buffer zone[27] and wildlife dispersal areas to achieve the park's management objectives i.e. maintaining ecological integrity, enhancing visitor experience, enhancing community benefits from wildlife, minimising Human Wildlife Conflicts and improving wildlife security.

According to Section 4 of WCMA, 2013, one of the guiding principles of wildlife conservation and management to be applied in Kenya is using the "ecosystem approach". In addition, The National Wildlife Strategy calls for park management to secure dispersal areas adjacent to the park to curb wildlife habitat loss and fragmentation. It further prescribes that innovative schemes and incentives shall be applied in securing identified critical wildlife dispersal areas for sustainable conservation and management. One of the key strategies prescribed by the KWS Strategic Plan 2019-2024 for "*reversing and stabilizing the declining trend across wildlife populations and habitats"* is "*winning more space for wildlife*". Thus, option 4 is well aligned with the WCMA, 2013, the National Wildlife Strategy as well as the KWS Strategic Plan 2019-2024.

Option 4 acknowledges that KWS has no jurisdiction on land and land use outside the park and hence it is imperative that it first concentrates its efforts in the conservation and protection of biodiversity within the park boundary. However, it can influence the course of land owner's decisions to favour wildlife. Towards this end, this option proposes negotiations with land owners in the park's buffer zone with an aim of managing these separate but interconnected units together with the NNP as a single ecological unit.

Under this option, wildlife habitat in the Park will be improved through measures outlined under Option 2, and the dispersal area will be managed in accordance with legal agreements entered between KWS buffer zone land owners, Naretunoi Conservancy owners and the Ministry of Agriculture, Livestock and Fisheries as regards Sheep and Goats Ranch. This option proposes fencing the southern park boundary, but since the park boundary is at the

[27] A buffer zone is an area peripheral to a protected area, where restrictions on resource use and special development measures are undertaken in order to enhance the conservation value of the protected area.

centre of Mbagathi River, river frontage land owners with significant land parcels will be fenced in. This is expected to ensure that dangerous wildlife cannot access high density residential areas around Tuala and Ole Kasasi. Properties that have wildlife crossing points will either be fenced in or out depending on the decision of the land owner. It also proposes to fence in Naretunoi Community Conservancy and the Sheep and Goats Ranch, and encourage development of viable tourism ventures in the conservancy and ranch. A park entry gate will also be provided to serve visitors accessing the park from the conservancy and Sheep and Goats Ranch. In areas that land owners do not want to be fenced in, the fence will follow the park boundary.

This management plan is based on Option 4. This option is preferred as it addresses most of the major management issues discussed in this plan.

The fencing will be done in four phases as follows:

- Phase I-From Pasha's land to Masai Gate
- Phase II- From Masai Gate to Emakoko Lodge
- Phase III- From Naretunoi Community Conservancy to Sheep and Goats Ranch
- Phase IV- Sheep and Goats Ranch

Phase I-From Pasha's land to Masai Gate

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This area has large parcels of land that are used by the park's rhinos and other wildlife. There are four key wildlife crossing points. These are Pasha Farm, Osirua farm, Dr. David Western farm and Silole Sanctuary. Buffaloes and lions access the high density residential areas at Tuala, Nazarene University and Ole Kasasi endangering people's lives.

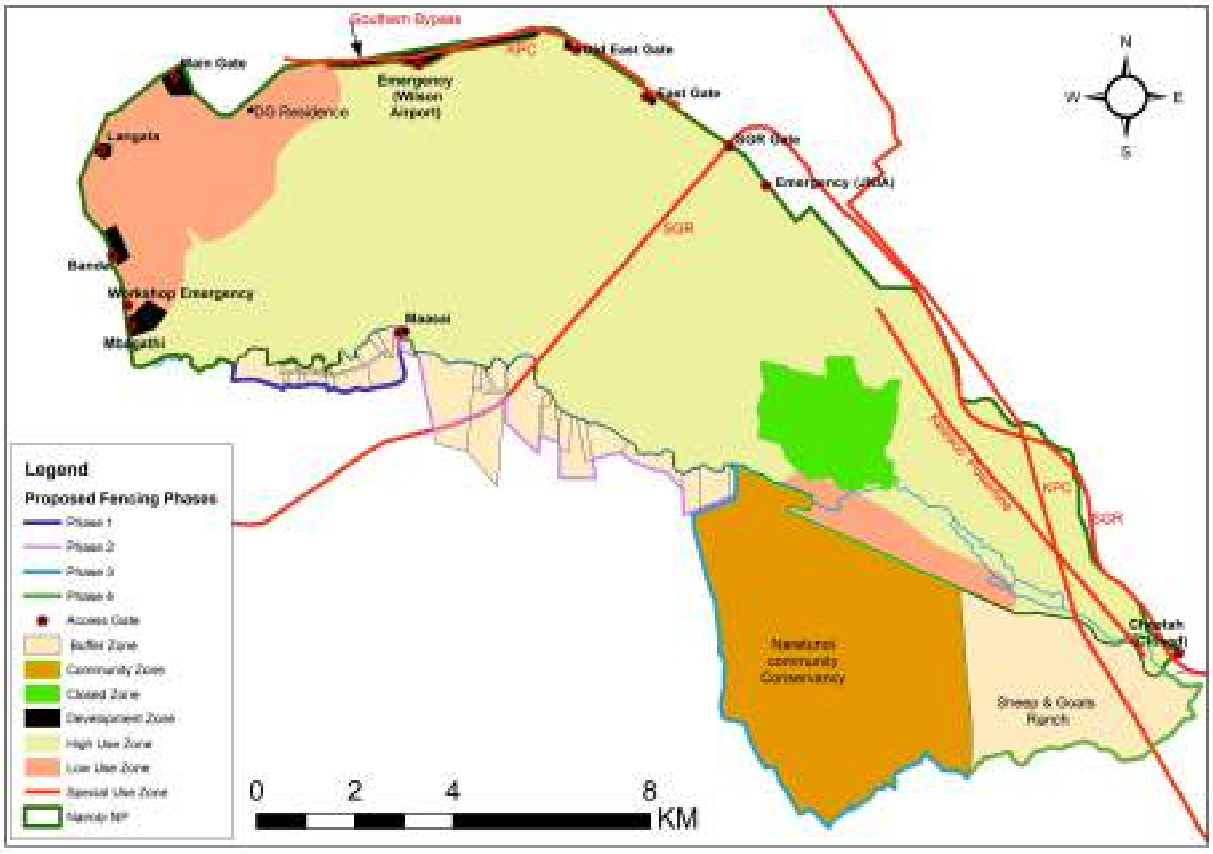


Figure 20. Proposed fencing phases

Phase II- From Masai Gate to Emakoko Lodge

The phase II fencing section has two crossing points; at the SGR bridge and the land parcel bordering Emakoko Lodge to the west. There are resident rhinos in one of the large farms (Wachira Farm) in this section. To enhance rhino security and enhance safety of residents, willing land owners will be fenced in. However, before fencing this section, an assessment of the status of wildlife corridors and dispersal areas in this section will be conducted.

Phase III- From Naretunoi Community Conservancy to Sheep and Goats Ranch

The Naretunoi Community Conservancy was registered by the Ministry of Labour, Social Security and Services, Athi River Sub County, as a Community Based Organization (CBO) on 8th June 2016. The Conservancy is also registered with KWS and the Kenya Wildlife Conservancies Association (KWCA). However, the conservancy, which is supported by The Wildlife Foundation (an NGO), is an amalgamation of land parcels that are not contiguous and cover 1789 acres. The members of the conservancy by 28th April 2018 were twenty one (21).

The community benefits from the conservancy through the lease programme, employment of 20 members by The Wildlife Foundation Center, and eight community conservancy scouts have been sponsored for paramilitary training at the KWS Law Enforcement Academy. Funds for the lease programme accrue from the visitor accommodation facilities at the Wildlife Foundation Center, which is a private asset in the conservancy. The geographic extent of the conservancy will be determined and the conservancy fenced to minimise human wildlife conflicts with conservancy neighbours.

It is important that conservancies in the NNP's dispersal areas are established in accordance with the Wildlife Conservation and Management Act, 2013. The Wildlife Act envisages consolidation of contiguous land parcels to form conservancies. KWS will engage the community in wildlife conservation using the mechanisms provided under Section 39 and 40 of WCMA, 2013 (Wildlife Conservancies and Community Wildlife Associations) in this phase.

Phase IV- Sheep and Goats Ranch

Next to the conservancy is the Sheep and Goats Ranch which is a critical wildlife dispersal area for the park. KWS should engage the Ministry Agriculture, Livestock and Fisheries (MoAL& F) in exploring whether the Sheep and Goats Ranch can be fenced in and managed as a conservancy that integrates livestock production, wildlife conservation and tourism. However, there are ownership disputes that have persisted for many years that need to be resolved first. If this becomes a protracted process, KWS can fence along its boundary with Sheep and Goats Ranch.

The pros of this option are:

Conservation

- Human wildlife conflicts will be reduced as wildlife will be confined in areas where it is tolerated.
- Wildlife threat to human life will be reduced as dangerous animals such as buffaloes, rhinos and lions will not be roaming in high density residential areas endangering human life.
- Park wildlife will interact with the Naretunoi Conservancy's wildlife enhancing genetic diversity.
- The conservancy and buffer zone will provide additional space for wildlife.
- The buffer zone will minimise impacts of human activities on the park.

Tourism

- Visitor satisfaction will be enhanced as the likelihood of viewing preferred wildlife would be high when the animals are contained in the park by a fence.

Park-community relations

- Livestock predation and other human-wildlife conflicts will decrease in areas where wildlife is not tolerated.
- Expenditure on human-wildlife conflict resolution activities and compensation claims will be reduced.
- The community will continue to benefit from the lease program, employment and other innovative approaches that will be initiated with an aim of conserving wildlife in the dispersal area.
- Encroachment on park land will be averted as the park will be fenced in.

The cons of this option are:

- The Park-land owners negotiations might take a long time to bear fruit due to the heterogeneity of the land owners. There are differences in terms of ethnicity, land holding, and socio-economic status, all of which have a bearing on the needs, values and aspirations of the different community strata.
- Fencing is an expensive undertaking which will take time to implement.
- Different community groups have laid claim to the Sheep and Goats Ranch and it might take a long time to resolve the land ownership disputes that exist.

To implement this option, the following is required:

- Community goodwill and trust that their land will not be taken by government.
- A long term guaranteed co-operation and commitment by landowners within the buffer and community zones not to further sub-divide or sell their land within the dispersal area.
- Adequate long-term funding must be guaranteed from the onset by the Wildlife Conservation Lease Programme for all co-operating Maasai pastoralists to maintain Naretunoi Community Conservancy.
- Only willing land owners will be fenced in.

NNP Zonation Scheme

Introduction

The NNP and its ecosystem has been divided into seven zones: **Closed Zone (CZ)**, **High Use Zone** (HUZ), **Low Use Zone** (LUZ), **Development Zone** (DZ), **Special Use Zone** (SUZ), **Buffer Zone (BZ)** and the **Community Zone(CZ)**.

These seven zones have been developed to facilitate achievement of the park's management objectives as well as aspirations of the community in the park's buffer zone.

Table 7 summarises the zone purpose, zone descriptions, and zone prescriptions while figure 21 shows NNP zoning.

Table 7. NNP Zone types

Zone type	Zone purpose	Zone description	Zone prescriptions
1. Closed Zone	▶ To protect critical rhino breeding areas. ▶ To provide an area for scientific research	▶ This zone is a critical breeding and foraging area for the black rhino in the park. ▶ The zone is located in the rhino valley section of the park	▶ The zone will not contain any major physical development except interpretive facilities ▶ Access to this zone for research will require authorisation by the park warden
2. High Use Zone	▶ To provide a system of viewing tracks throughout the area. ▶ To provide interpretive wayside exhibits at selected viewpoints and sites. ▶ To provide sites where visitors will be allowed to leave their vehicles and walk.	▶ This zone comprises the open grasslands and grassland-bushland. ▶ The zone contains the prime wildlife habitat in the Park and is thus also the prime viewing zone. ▶ It will not contain any major physical development except viewing tracks and interpretive facilities	▶ No driving will be permitted that occurs off the defined viewing roads ▶ Visitor facilities such as washrooms will be upgraded ▶ Interpretive facilities will be of unobtrusive design and will blend as close as possible with the natural environment, ▶ Wildlife viewing platforms will be installed ▶ Campsites and picnic sites will be provided
3. Low Use Zone	▶ This zone is for the provision of large tracts of relatively undisturbed land for scientific study and wilderness experience. The perpetuation of ecosystems with minimal human interference is the key consideration. ▶ To provide an area where visitors wishing to leave the more developed areas of the Park can do so. ▶ To offer an area for visitors seeking solitude and quietness.	▶ The low use zone covers the forested part of the park. ▶ This zone covers portions of the Park that are not currently utilized to any appreciable extent by tourists due to lower viewing potential. ▶ This zone is characterised by a very low density of viewing roads. ▶ It gives the discerning naturalist an opportunity to enjoy the scenic forest ▶ The Nairobi Tented Camp is located here	▶ New roads will not be constructed in this zone. ▶ Off-road driving will not be condoned. ▶ Trails and non-permanent campsites or eco-friendly facilities may be allowed. ▶ Activities include viewing of scenery and forest wildlife, and walking. ▶ Prescribed burning is not allowed and firebreaks will be maintained to prevent wildfires

Zone type	Zone purpose	Zone description	Zone prescriptions
4. Development Zone	▶ To provide areas for the development of KWS HQ and NNP administration infrastructure, as well as education and tourism facilities.	▶ The Development Zone includes areas that have been set aside for the development of park and KWS HQ administration infrastructure, as well as tourism and education facilities. ▶ These include the following sites: ▶ The KWS HQ and NNP Park HQ offices and Junior Staff quarters; ▶ Nairobi Safari Walk and Animal Orphanage; ▶ KWS Club House and Director General's residence; ▶ Central Workshop and NNP staff residential area; ▶ Elephant orphanage; ▶ Banda Gate KWS HQ senior staff quarters; ▶ Hippo Pools Outpost; ▶ All gates - NNP Junior staff quarters; ▶ Visitor Service Center; ▶ Education center; ▶ Camping Site and Picnic Sites; ▶ Road side parking areas; and ▶ The park section cut off by southern by-pass at Wilson Airport to meet the International Civil Aviation requirements that require at least 570 meters clearance from the North-South runway of any airport.	▶ EIA should be conducted on all infrastructure projects ▶ Park headquarters, park residential houses, Director General's house, ranger outposts, entrance gates and other infrastructure such as water supply will be in this zone. ▶ Access will be mainly restricted to persons authorized by the Park Warden.
5. Special Use Zone	▶ The purpose of this zone is to provide areas where public infrastructure can be installed	▶ This includes those areas of the park which are used for non-park purposes ▶ These include way leaves for power lines, oil pipeline, roads, and SGR	▶ Permits for installation of such public infrastructure will be issued by KWS with conditions specifying how the infrastructure will be maintained with minimal impact to the environment. ▶ Close relationships will be maintained between KWS and the project proponent to ensure that Environmental Management Plans are implemented at all stages of project execution. ▶ New special use permits or Memorandum of Agreements will be limited to essential special uses for which there are no other viable alternatives.

Zone type	Zone purpose	Zone description	Zone prescriptions
			▶ An Environmental Impact Assessment will be required for any new special use proposal
6. Buffer Zone	▶ The purpose of this zone is to buffer the park from impacts of human activities e.g. pollution, visual intrusion, destruction of the riparian vegetation, soil erosion, and HWC. ▶ To promote eco-tourism.	▶ This includes the Mbagathi River frontage land parcels ▶ Tourism facilities such as Emakoko Lodge, Masai Lodge and Oloolo Lodge are located in this zone ▶ The zone also includes the government owned Sheep and Goats Ranch	▶ Land use and land subdivision will strictly be guided by the Kajiado County Physical Planning (Land Subdivision and amalgamation) regulations 2018. ▶ The minimum permitted land subdivision size is 4 Ha within 5km from the park boundary. ▶ Land use in this zone is low density residential use and eco-tourism. ▶ Cultural and educational tourism will be encouraged. ▶ Memorandum of Agreements on wildlife conservation and management in this zone will be drawn between KWS and land owners
7. Community Zone	▶ To provide an area where local communities can participate in wildlife conservation and derive tangible benefits from conservation. ▶ To promote conservation education and awareness. ▶ To integrate livestock production and wildlife conservation	▶ The zone includes Naretunoi Community conservancy and other settled areas within five kilometres from the park whose residents interact positively or negatively with the park's wildlife.	▶ Integrated land use (Livestock and tourism) will be promoted in this zone. ▶ Eco-tourism is encouraged within 5km from NNP boundary. ▶ Cultural tourism will be encouraged. ▶ Memorandum of Agreements on wildlife conservation and management in this zone will be drawn between KWS and Naretunoi Community Conservancy

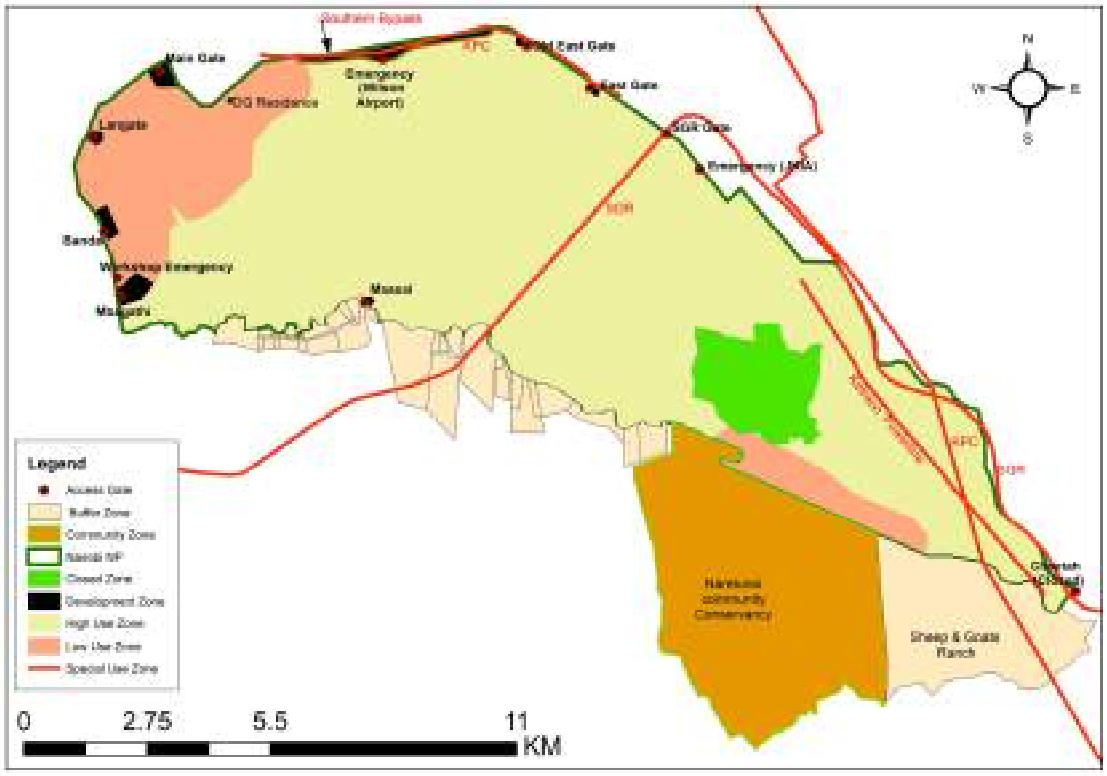


Figure 21. NNP Zoning

Ecological Management Programme

Programme Purpose and Strategy

The purpose of the Ecological Management Programme is to ensure that:

> The ecological components and processes of NNP and its dispersal area are understood, restored and conserved, and threats to the park's key ecological features are reduced

Over the past twenty years, the ecology of the NNP has altered considerably, with wildlife numbers for most species significantly declining, mainly due to land habitat degradation in the park's dispersal areas. Changes in the park's vegetation have also occurred as a result of the decline in wildlife numbers, with grasslands being gradually encroached upon by more shrubs and herbaceous plants. The grass is also tall and overgrown in many parts due to lack of grazing pressure and stoppage of prescribed burning and mowing that used to be carried out to keep the grass short and palatable for wildlife. Poaching has also contributed to the observed decline in wildlife numbers. Other threats to the ecology of the NNP and its dispersal area (such as pollution, habitat fragmentation outside the park, and invasive species) are escalating, mainly as a result of increasing human settlement in the park's dispersal area. Migrations of wildebeests to the Athi-Kapiti plains where they used to breed has completely collapsed due to intensifying land uses and blockage of migratory corridors by residential use along Athi River-Namanga road. The NNP Ecological Management Programme aims to address the threats that are impacting on the most important ecological features and values of the NNP, and provide a guiding framework for the long-term ecological monitoring of the area.

The following paragraphs set out the ***guiding principles*** that are designed to guide NNP managers and stakeholders in the implementation of the Ecological Management Programme and the achievement of the Programme Purpose.

Guiding Principles

In implementing the NNP's Ecological Management Programme, NNP Management and stakeholders should strive to ensure that:

NNP habitats and wildlife are restored

The major reduction of the NNP's browsing and grazing species caused by several factors including poaching and wildlife not finding their way back from the dispersal area, coupled with lack of active habitat management measures have led to significant changes in the ecology of the NNP today compared to 20 years ago. There has been a proliferation of invasive species, some of which e.g. *Parthenium hysteropholus* has over run some of the popular wildlife grazing areas. Hence, the Ecological Management Programme will aim to restore the park's natural wildlife species composition, with particular attention to those species whose populations are severely degraded and those that are listed by IUCN as threatened, through habitat improvement and restoring populations of suppressed species.

Habitat connectivity with surrounding areas is maintained

NNP is the dry season refuge for wildlife from the greater Athi-Kapiti Ecosystem. However this ecosystem has been truncated by human settlement in the last 30 years to an extent that only a small fraction of the dispersal area is now accessible to wildlife. Many wildlife grazers in NNP depend not only on the conservation of suitable habitat within the park, but also on habitat connectivity with surrounding areas. During the wet season, NNP's wildlife grazers and browsers disperse to adjacent open areas south of the park where they are followed by carnivores. According to the KWS Strategic Plan 2019-2024, KWS will *"Secure wildlife corridors and dispersal areas* to "*win more space for wildlife*". As such, as part of efforts to re-establish and conserve natural population dynamics and processes, management activities under this programme will aim to perpetuate the unrestricted dispersal of animals into areas outside of the NNP's buffer zone and community zone.

Fire is effectively managed and monitored

Fire plays a critical role in the management of the NNP, with both positive and negative impacts. Properly prescribed fire can have beneficial effects by reducing bush encroachment. If timed correctly, it can improve the browsing and grazing conditions for many species. However, unprescribed fires or wildfires, can counteract the benefit of a prescribed fire management regime, and make the results of a controlled burning programme difficult to assess. As such, NNP Management will aim to minimise the negative impacts of wildfires and promote the use of prescribed fires for ecological management purposes.

The NNP has sufficient supply of clean water

A variety of habitats and wildlife species in the NNP are dependent on water supplied by the rivers flowing into the NNP, especially the park's riverine vegetation, dams and swamps. However, human population in the catchment areas of these rivers (Mbagathi, Mokoyiet) has increased rapidly in recent years, and as a result, water pollution has also increased. Water abstraction has also reduced the amount of water that reaches the park, particularly during the dry season. As such, management actions under this programme will seek to maintain and enhance water storage in the park, rain water harvesting, and working with water catchment residents and water regulatory authorities to ensure that NNP's wildlife receives sufficient clean water.

Ecological trends and threats in NNP are monitored and understood

Given the high and increasing human pressures the NNP is facing, the monitoring of trends in the status of the most important features of the NNP's ecology, and the major threats impacting, or with the potential to seriously impact, on these features is a high priority during the lifespan of this management plan. In addition, ecological monitoring will be designed and implemented in such a way as to provide a firm foundation for adaptive management and for measuring management effectiveness.

Targeting ecological management action

The PAPF prescribes the use of the ***Nature Conservancy's (TNC) Conservation Action Planning (CAP)*** process as a foundation for designing the PA plan's Ecological Management Programme. The rationale underlying this is that, with limited human and financial

resources available to PA managers, it is impractical to attempt to manage and monitor every single aspect of the complex ecology of a protected area. The CAP methodology provides a tried and tested mechanism for targeting ecological management, by identifying and developing an accurate definition and understanding of the PA's most important ecological features and their management needs, and the major threats to these features. In line with the PAPF, this programme also uses a simplified form of the CAP framework to target ecological management in NNP.

The PAPF identifies three main stages in applying the CAP methodology: the selection of ***conservation targets***; the identification and ranking of ***threats*** to the conservation targets; and the development of ***management objectives and actions*** to address these threats as well as to enhance the conservation targets. These key stages and their application in the NNP planning process are elaborated in the following sections.

Conservation targets

The first step of the CAP process is the definition of a small number (usually about eight) of **conservation targets** which represent and encapsulate the unique biodiversity contained within the protected area, as well as any ecological features that may require specific management actions (such as particularly endangered species or habitats). A comprehensive ecological definition and understanding of each of these targets is then achieved through the further identification of the "***key ecological attributes*****"** (KEAs), which are the ecological parameters upon which long-term survival of each conservation target depends. Common examples of KEAs include: essential habitat requirements of a particular species; keystone species for a specific habitat; and ecological connectivity requirements. The eight NNP conservation targets, the rationale behind their selection, important subsidiary targets (i.e. other ecosystem components that share KEAs and threats with the conservation target concerned), and KEAs for each target are set out in Table 8.

Threats to conservation targets

The comprehensive definition of conservation targets and their KEAs enables the identification of the "***threats*****"** to these targets and attributes, and the subsequent prioritisation of these threats according to their significance. The PAPF defines a threat as any factor, resulting either directly or indirectly from human activities, which has the potential to destroy, degrade or impair a conservation target during the 10-year lifespan of the PA plan. Table 9 shows the priority threats impacting or likely to impact on the NNP conservation targets and their KEAs.

Table 8. NNP conservation targets

	Conservation target	Rationale for selection	Important subsidiary targets	Key ecological attributes
Species	**Black rhino**	▸ Classified as critically endangered by the IUCN. ▸ NNP population is used to restock other rhino sanctuaries. ▸ Threatened by poaching ▸ Some rhino home ranges have expanded outside the park	▸ White rhino	▸ Habitat size and quality (water and forage) ▸ Population size, recruitment and structure ▸ Genetic diversity and variability
	Migratory species	▸ Disperse or use resources across different ecological systems including those outside the park. ▸ These species help ensure attention to linkages, connectivity, ecotones and environmental gradients. ▸ Justify conservation of the truncated NNP ecosystem ▸ Migratory species populations are in steep decline ▸ Directly attributed to increasing human population densities as well as land subdivision, settlements, fencing, roads and other infrastructure. routes and These processes fragment the landscape and obstruct migratory therefore access to wet season grazing and breeding areas	▸ Common zebra ▸ Wildebeest ▸ Grant's gazelle ▸ Thomson's Gazelle ▸ Large carnivores	▸ Population size of key migratory species ▸ Habitat connectivity ▸ Habitat size (grassland) ▸ Pasture quality and quantity
	Large Carnivores	▸ Play an ecologically and economically essential role in the NNP. ▸ Many species (e.g. lion, cheetah) declining nationally. ▸ Wild dogs are classified as endangered by IUC ▸ Grouped together as they face common threats including human-wildlife conflict and reduction of dispersal areas.	▸ Cheetah ▸ Leopard ▸ Spotted hyena ▸ Striped Hyena ▸ Wild dog	▸ Age/sex structure and ratio ▸ Population size ▸ Prey species availability ▸ Habitat availability and connectivity ▸ Genetic variability
	Masai Giraffe	▸ Declining population due to habitat loss and poaching for bush meat ▸ Classified as endangered by IUCN	▸ Coke's hartebeest ▸ Impala ▸ Dik dik ▸ Thomson and Grant gazelle ▸ Eland	▸ Population size and structure ▸ Habitat size and quality ▸ Availability of dispersal areas ▸ Genetic variability

	Conservation target	Rationale for selection	Important subsidiary targets	Key ecological attributes
Habitats	**Wooded grassland and open grassland**	▸ it is habitat for browsers such as Masai Giraffe and Black Rhino ▸ Habitat for diverse grazers ▸ Characterised by extensive plains of tall to medium grass and Acacia sp ▸ Supports diverse wildlife grazers ▸ This is the focal wildlife viewing area ▸ Threatened by bush encroachment ▸ Maintained through prescribed burning	▸ Masai Giraffe ▸ Black Rhinos ▸ Coke's hartebeest ▸ White rhino ▸ Buffalo ▸ Wildebeest, Burchell's Zebra ▸ Eland ▸ Impala ▸ Thomson's Gazelles ▸ Grant's Gazelles	▸ Habitat size and quality ▸ Vegetation structure and composition ▸ Population size of grazers ▸ Extent of grassland
	Open low shrubland	▸ Characterised by scattered shrubs less than 6m high Grasses and herbs with a few scattered trees cover the ground. ▸ The common herbaceous vegetation that dominates this vegetation community includes *Eragrostis superba* and *Themeda triandr*a ▸ Habitat for Masai Giraffe, Black Rhino and White rhino ▸ Habitat for other grazers ▸ Wildlife viewing area	▸ Masai Giraffe ▸ Black Rhino ▸ White Rhino ▸ Diverse grazers ▸ Large carnivores	▸ Vegetation structure ▸ Floristic composition ▸ Extent of the habitat
Systems	**Highland Dry forest**	▸ It is characterized by a closed canopy and occurs in areas over 1700m in altitude. ▸ *Croton megalocarpus* and *Olea africana* dominate this community. ▸ Least developed zone in the park ▸ Contains rare tree species	▸ Forest primates ▸ Indigenous tree species	▸ Forest size ▸ Floristic composition ▸ Vegetation structure
	River Systems and wetlands	▸ Characterised by riverine vegetation comprising tall trees in some areas e.g. *Acacia xanthophloea* at hippo pools area ▸ Source of water for both wildlife and livestock during the dry season ▸ Heavily polluted by sewage and solid waste from Ongata Rongai town ▸ Habitat for diverse wildlife including hippos, crocodile and birds	▸ Dams ▸ Rivers and streams ▸ Riverine vegetation ▸ Hippopotamus ▸ Crocodiles ▸ Amphibians	▸ Status of associated catchments ▸ Sustained and adequate water flow ▸ Water quality ▸ Water quantity ▸ Diversity of aquatic life forms ▸ Composition and extent of riparian habitat

Table 9. Threats to NNP Conservation Targets

TARGETS / THREATS	Black Rhino	Migratory species	Large Carnivores	Masai Giraffe	Wooded grassland and open grassland	Open low shrubland	Highland dry Forest	River systems and wetlands
Trophy Poaching	Low							
Bush meat Poaching		Very High		Very High				
Illegal livestock Grazing	Low	Low	Low	Low	Low	Low		Low
Wild fires	Low	Low	Low	Low	High	High	Medium	Low
Invasive/alien species					Low	Low	Medium	High
Inbreeding	High	Low	High	High				
Ecto-parasites	Low	Low	Low	Low				
Wildlife diseases	High	Low	High	Low				
Land conversion from grazing to residential use	Medium	Very High	Very High	Very High				High
Fencing	Medium	Very High	Very High	Very High				
Potential retaliatory killing due to livestock predation	Low	High	Very high	Low				
Bush encroachment					High	Medium		High(dams)
Tourism infrastructure develop-ment					Low	Low	Low	Low
Visitor impacts	Low		Low	Low	Low	Low	Low	Low
Destruction of catchment areas								Very High
Conversion of riparian habitat to agriculture								Very High
Abstraction of water for irrigation and domestic uses	High	High	Low	High				Very High
Farms	High	High	High	High				Medium
Mining	Low	Medium	Low	Low				Medium
National infrastructure develop-ment	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Low
Water pollution	Low	Low	Low	Low				Very High
Climate Change	Medium	Medium	Medium	Medium	Low	Low	Low	High
Inter specific competition	Medium	Medium	Medium	Medium				

Ecological management objectives and actions

The identification and ranking of the threats to the NNP's conservation targets and their KEAs provides the basis for the development of the Ecological Management Programme's management objectives and actions. Objectives have been developed to address the clusters of threats shown in Table 8. Four objectives have been developed addressing threats to the NNP's threatened large mammals (covering conservation targets: black rhino, large carnivores, wildlife migratory species, and masai giraffe); addressing crosscutting threats to the NNP's most important habitats (covering conservation targets: Wooded grassland and open grassland); and addressing threats to targets that rely on habitats beyond the NNP boundary for sustenance (covering conservation target: river systems and wetlands).

The four objectives developed for the NNP Ecological Management Programme are:

MO 1. Conservation status of the NNP's threatened large mammals and landscape species enhanced
MO 2. Important NNP habitats managed and improved
MO 3. Wildlife dispersal areas and river systems in the greater NNP landscape protected, in collaboration with other stakeholders
MO 4. Ecological monitoring and research information dissemination is enhanced

These management objectives and their subsidiary management actions are described in detail in the sections below. Under each management objective there is a brief description of the relevant management issues and opportunities, which provides the specific context and justification for the management actions.

Objective 1: Conservation status of the NNP's threatened large mammals and lands cape species enhanced

The desired future state of the NNP is one where the four conservation target species selected for the Park are effectively managed and monitored, so as to ensure their long-term survival in the Park, and that of the co-occurring species and habitats. In order to achieve this desired state, a series of management actions have been developed, each relating to one of the species-level conservation targets selected for the NNP: Black rhinos, large carnivores, migratory species, and Masai giraffe. These management actions are elaborated in the following sections.

Action 1.1: Manage and enhance Black rhino population in accordance with the Black Rhino Action Plan 2017-2021

In order to capitalise on recent successes that have seen rhino populations increasing, KWS and its partners are implementing the Kenya Black Rhino "*Diceros bicornis michaeli"* Action Plan (2017-2021). The overall goal of this action plan is "*To achieve a meta-population of 830 black rhinos by the end of 2021; a net growth of at least 5% per annum maintained in at least six established populations; and positive net growth achieved in all recovering populations*. This is to be achieved through an emphasis on biological monitoring and management, protection and law enforcement and community engagement.

The management activities that will be implemented under the biological monitoring and management component include:

- Regularly ear-notch rhinos as a means of ensuring all animals can be reliably identified
- Management of fenced rhino areas to achieve optimum growth and to maintain meta-population genetic diversity.
- Update Ecological Carrying Capacity for rhino and competing browsers
- Develop and implement metapopulation translocation plan based on stocking levels, set percentage, harvesting, reproductive performance and level of inbreeding
- Manage densities of competing browsers to recommended levels in fenced areas.
- Undertake genetic profiling of rhino -population
- Carry out strategic translocation of known individuals to improve breeding performance /genetic
- Rhino disease and health-related mortalities kept to less than 0.5% per annum
- Diagnose and treat sick and injured rhinos in a timely manner.
- Investigate disease outbreaks, and implement control mechanisms in a timely manner.
- Establish and maintain a trained and dedicated rhino monitoring team in all rhino areas.

Under this action, the NNP will strive to implement the activities outlined above. Some of these activities are elaborated in action 1.2, 1.3 and 1.4 of this programme.

Action 1.2: Maintain rhino population below the determined ecological carrying capacity

Nairobi National Park's rhino population is classified under the IUCN/SSG African Rhino Specialist Group ranking as a Key population category 'B' (population between 51 and 100). The carrying capacity for the Park has been established as 59 and any surplus animals above the management level of 45 animals may be removed for purposes of restocking other rhino sanctuaries.

Currently the park has 89 black rhinos and 16 Southern White Rhinos. With the increase in rhino population beyond the carrying capacity, the home ranges of some the black rhinos have expanded outside the park where they may be more vulnerable to poaching. Rhinos have also been lost through territorial fights.

Continuous monitoring of the rhino population will be undertaken in order to maintain records of births, mortality, mating, and identities of breeding animals and parenthood of calves, among others, which are critical for the biological management of the species. Other management measures will be undertaken as stipulated in the Black Rhino Action Plan 2017-2021(see Action 1.1 above). This will include updating Ecological Carrying Capacity for rhino and competing browsers and managing densities of competing browsers.

Action 1.3: Carry out new rhino reintroductions as appropriate

Dependent on the identified population targets (Action 1.2 above), and the ongoing monitoring of rhino population growth rates and health, additional reintroductions to the NNP may be necessary in order to enhance genetic diversity, and achieve the national targets for rhino population growth. As such, if appropriate during the 10-year timeframe of this management plan, requests will be made for the additional reintroduction of rhinos to the NNP. In particular, an additional 20 white rhinos will be introduced to the park to enhance visitor experience and reduce time spent searching for charismatic wildlife. However, during translocations pre and post translocation surveys will be conducted in line with the translocation protocols.

Action 1.4: Carry out routine monitoring of rhino population dynamics and habitat suitability in the rhino park

The rhino populations of both species (black and white rhinos) are highly susceptible to a number of potential impacts (such as poaching, disease, or intra-specific competition) that could easily undermine the success of the entire NNP Rhino programme. The monitoring of both Black and White rhino populations is therefore essential for informing NNP managers on the overall status and trends in the rhino populations, and as the basis for the implementation of the management actions under this objective. Intensive monitoring and surveillance is particularly important in the NNP considering that some rhinos have home ranges that extend outside the park.

The Rhino Action Plan highlights the importance of collecting information on each population's status and performance in terms of population dynamics, as well as reproductive health and condition, in order to improve their biological management. As such, information will be regularly collected, collated and disseminated on both the Black and White rhino population sizes, recruitment rates and age/sex structures. And to aid this, rhinos will be ear notched for easy identification. The habitat suitability of park will also be regularly assessed and monitored to ensure it is not degraded as the populations increase over time. Further, in line with the Black Rhino Action Plan, rhino diseases will be diagnosed and sick animals treated in a

timely manner. In addition, disease surveillance and timely interventions will be made during disease outbreaks.

Action 1.5: Enhance lion conservation and management

At approximately 38 lions per 100Km^2 NNP has a higher lion density than the average density of lions in East Africa: 16.2 lions per 100 km^2. There are three prides of lions and at least one male coalition of nomadic sub-adults in Nairobi National Park and the current population of lions is estimated at 45. Some of the lions have therefore expanded their territories to include the park's buffer zone[28].

The two major prey species for lions in Nairobi National Park are wildebeest and zebra. The population trend of wildebeest in particular has declined (in park presence counts) over the years. These species have been moving outside the Park during the wet season where they are followed by lions, leading to livestock predation and threat to human life and even human death (Figure 22 shows lion crossing points)[29]. To address lion conservation and management issues the following management measures will be implemented:

- Capture and translocate problem lions and sub adults to other parks.
- Install a predator proof fence in high density residential areas adjacent to the park thereby restricting the access to supplementary food for lions (i.e.: livestock).
- Collar and monitor lion movement and drive them back if they are a threat to human life and livestock.
- Contraception of female lions.
- Encourage communities to improve livestock husbandry e.g. construction of lion proof bomas and installation of lion lights.
- Implement the wildlife compensation scheme.
- Maintain regular KWS presence within the migration/dispersal areas for monitoring public relations and intervention.
- Conduct research to assess the genetic viability of existing lion population.

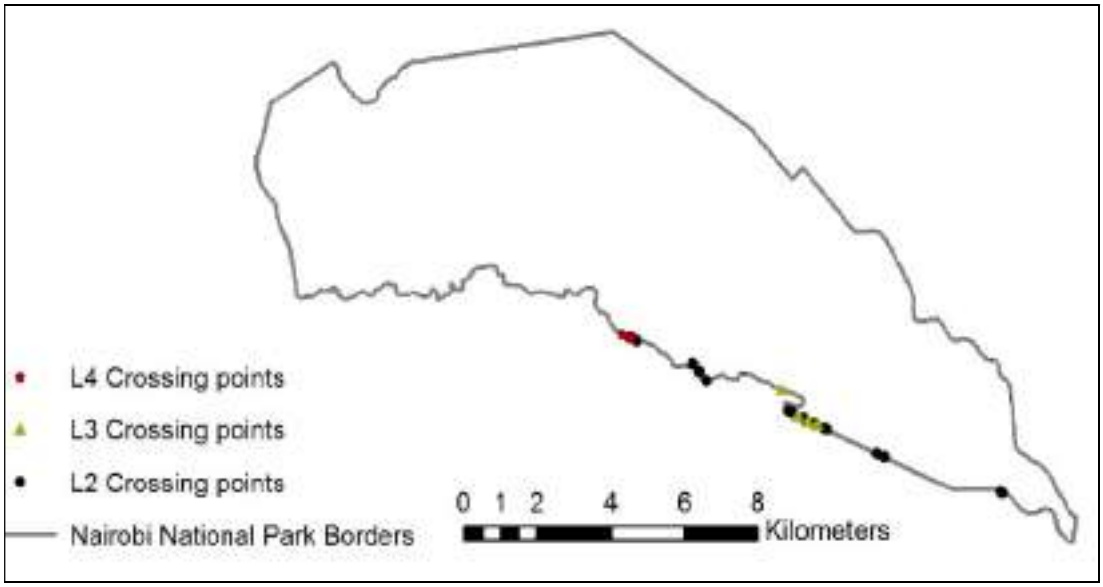


Figure 22. Crossing points of collared lions who left the park between 12th February to 22 March 2016

[28] NNP Research Section
[29] Gatta M., 2016. Population structure, home ranges and movement of Nairobi National Park lions (*Panthera leo melanochaita)* in relation to livestock depredation. https://www.researchgate.net/publication/309672843

Action 1.6: Improve management of dispersing species

With increased land fragmentation through fencing and residential use in the Kitengela area in the last 20 years, migratory routes have progressively been curtailed. However, some wildlife dispersal still occurs in the south eastern part of the park, in Machakos County. In order to reverse the observed declining population of dispersing species, the following are some of the intervention measures:

1. The large swathe of former dispersal area near the Park, from Rongai to Maasai Lodge, is not accessible to wildlife having largely been blocked by residential use, fencing, and by natural impediments such as cliffs along Mbagathi River. KWS will work with river frontage property owners to establish a wildlife buffer zone dedicated to ecotourism and conservation.

2. The south eastern section of the park is continuous with the former Sheep and Goats Ranch, which is a critical dispersal area for wildlife as it is not settled and is free from fences. This section therefore needs to be left open for free movement of wildlife to and from the Park and the rest of the migration/dispersal lands beyond.

3. The dispersal area should be managed as one unit to include these migrants. If they are fenced out, they are likely to be poached to extinction. KWS should enhance security, initiate, and support the community in the creation of viable community conservancies in the remaining dispersal area.

Figure 23 shows Movement of NNP wildebeest south of Namanga road has been cut off.

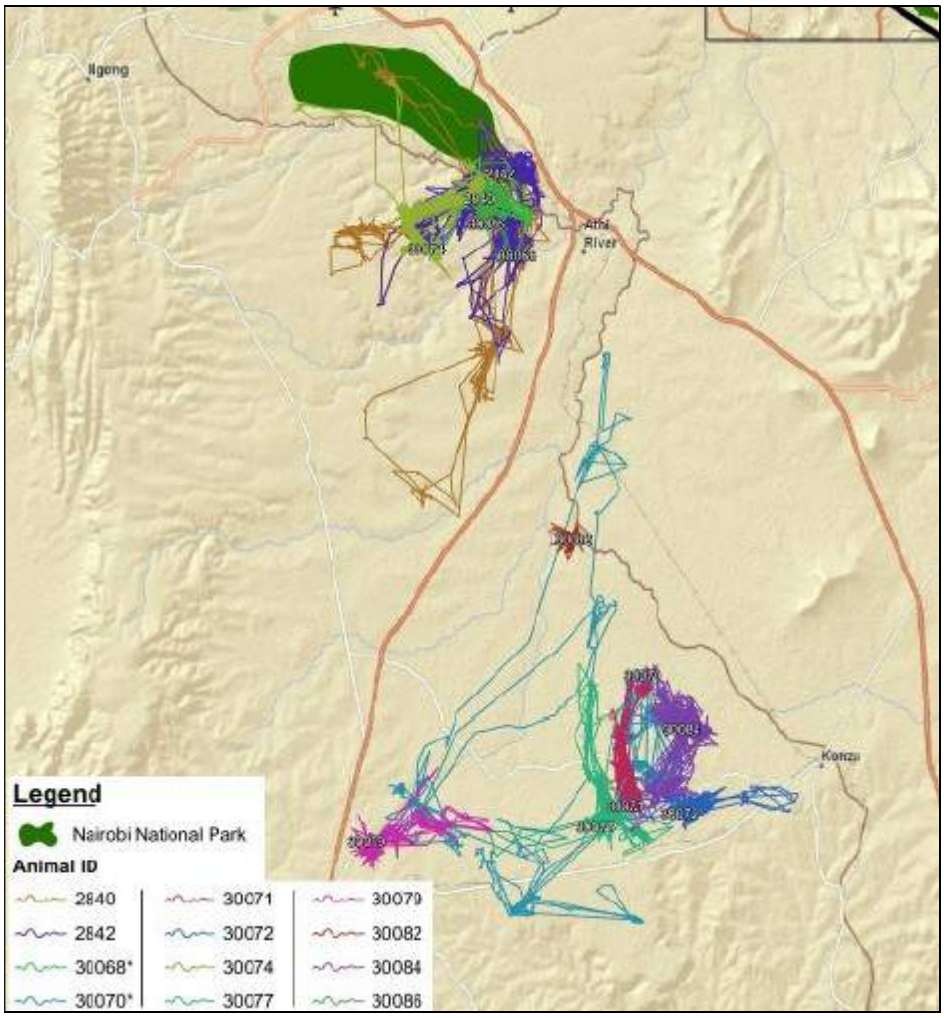


Figure 23. Movement of collared wildebeest in the greater NNP ecosystem, 2011. *Source, KWS*

Action 1.7: Minimise threats to the Masai Giraffe and its habitats

As mentioned elsewhere in this document, the Masai Giraffe is listed by IUCN as Endangered due to an estimated decline of 49-51% over three generations (30 years). They occupy areas of *Vachellia* (*Acacia*) savannah in the NNP but their range also extends outside the park, in community land to the south of the park. The most important threats to the Masai Giraffe are habitat loss and poaching. Masai Giraffes are poached for meat, particularly in the dispersal area. Power lines are also a threat to giraffes. Hence under this action, wildlife security will be boosted to prevent poaching incidents. In addition, an environmental audit of existing electricity infrastructure in the park and its dispersal areas will be conducted and mitigation measures implemented to ensure safety of giraffes. The health status of giraffes will be monitored through disease surveillance and prompt clinical interventions implemented when disease outbreaks occur.

Action 1.8: Enhance conservation of habitats for Masai Giraffe

The *National Recovery and Action Plan for Giraffe (Giraffa camelopardalis) in Kenya (2018-2022)* proposes mobilization of the community to establish conservancies in critical giraffe range areas. Hence, under this management action, NNP management will identify and secure giraffe habitats outside NNP through encouraging and facilitating the development of

conservancies targeting giraffe conservation. An assessment of giraffe habitat in the NNP dispersal area will also be conducted.

Action 1.9: Undertake translocations for introduction, re-introduction and genetic augmentation of wildlife populations

Some animal species e.g. black and white colobus monkey, aardvark, and wild dogs used to be found in the Park in the 1950s and 1960s, but they are now locally extinct. In order to diversify wildlife species, reintroduction of some of these animals will be considered.

In addition, most wildlife species are declining in number resulting in prey scarcity particularly during the wet season when the migrants move out of the park. To partly address this problem, the declining wildlife species will be restocked at appropriate levels. However, before any reintroduction and restocking is carried out, thorough pre-release monitoring will be carried out which will determine the habitat suitability. Assessments will be done to determine other suitable species for introduction and or reintroduction/restocking.

Action 1.10: Manage wildlife diseases

Decline in wildlife populations in the park is partly attributed to wildlife diseases such as rinderpest. This disease contributed to a massive decline in the buffalo population in the mid 1990s. The KWS Veterinary Unit will constantly conduct disease surveillance and monitoring and institute necessary control measures when diseases are detected.

Objective 2: Wildlife habitats managed and improved

Wildlife numbers in the NNP have reduced over the last thirty years, mainly as a result of poaching pressure and constriction of dispersal areas. This dramatic decline in wildlife numbers using the park, especially the large reduction in the buffalo, wildebeest and Kongoni population, combined with lack of active habitat management, has resulted in significant changes in the NNP's vegetation. Most notably the park's grasslands are being gradually encroached upon by more woody species and tall grass that is not palatable to many species. These changes have not only impacted the habitat diversity in the NNP and the ability of grazing species to recolonise the area, but have also effectively restricted game viewing by tourists as most of the grazers move out of the park in search of shorter, nutritious grass outside the park.

Alien and invasive species on the other hand, pauses a threat of reducing forage resources for animals, hence causing changes in habitat structure by reducing the regenerative capacity of indigenous species. Several alien plant species have been identified in the ecosystem and some are invasive. The species that pose a serious threat is *Lantana camara* which is dispersed by birds and baboons, and is found within the forested areas and along the riverine vegetation. Other alien species found in the park include Eucalyptus sp. which is found next to the animal orphanage and opposite the Wildlife Clubs of Kenya, as well as the Kei apple and the Opuntia sp. at the Kingfisher area. *Parthenium hysterophorus* is also another alien invasive species that is spread fast both within and outside the park.

The desired future state that this objective aims to achieve is one where the management of key habitats within the NNP is improved, to re-establish the park's natural vegetation composition and dynamics, support the restoration of the park's natural wildlife species composi-

tion, and improve tourism game viewing in the park. To achieve this future desired state, ten management actions have been developed. These are elaborated in the following sections.

Action 2.1: Develop and implement a prescribed Fire Management Plan

Evidence suggests that grasslands and swamps in NNP are being encroached by shrubs. It has been suggested that a lack of a comprehensive fire management programme and bush suppression measures are the main reason behind the observed changes in NNP vegetation. Although a fire management programme has been implemented in NNP in the past, documentation of the rotational burning programme is lacking.

Since its establishment in 1946, the grasslands of NNP have been managed using prescribed burning. This burning programme was carried out on an annual basis in the 1950s and early 1960s, but was not consistent after the late 1960s. Experimental burns were carried out in the Park in 1978, 1988/1989 and 1991. The programme continued in the early 2000s but stopped in 2007 and the park has not been burnt since.

Under this management action, prescribed burning will be re-introduced. A prescribed fire management will be developed to guide the burning programme. Towards this, the eight fire burning blocks (Figure 24) will be used and 10% of each block will be burnt after every five years. The burning blocks are separated by road circuits which are also firebreaks meant to prevent fire from spreading from one block to another. Late burning, at the end of the dry season, will be carried out.

Pre-burning and post-burning data on invertebrates, small mammals, birds, large mammals, reptiles, amphibians and vegetation data will be collected from the block to be burnt. Monitoring after burning will continue after 3 months, 6 months, one year, 3 years and 5 years. In addition, one block adjacent to the one being burnt will be left un-burnt to act as a benchmark when monitoring impacts of burning.

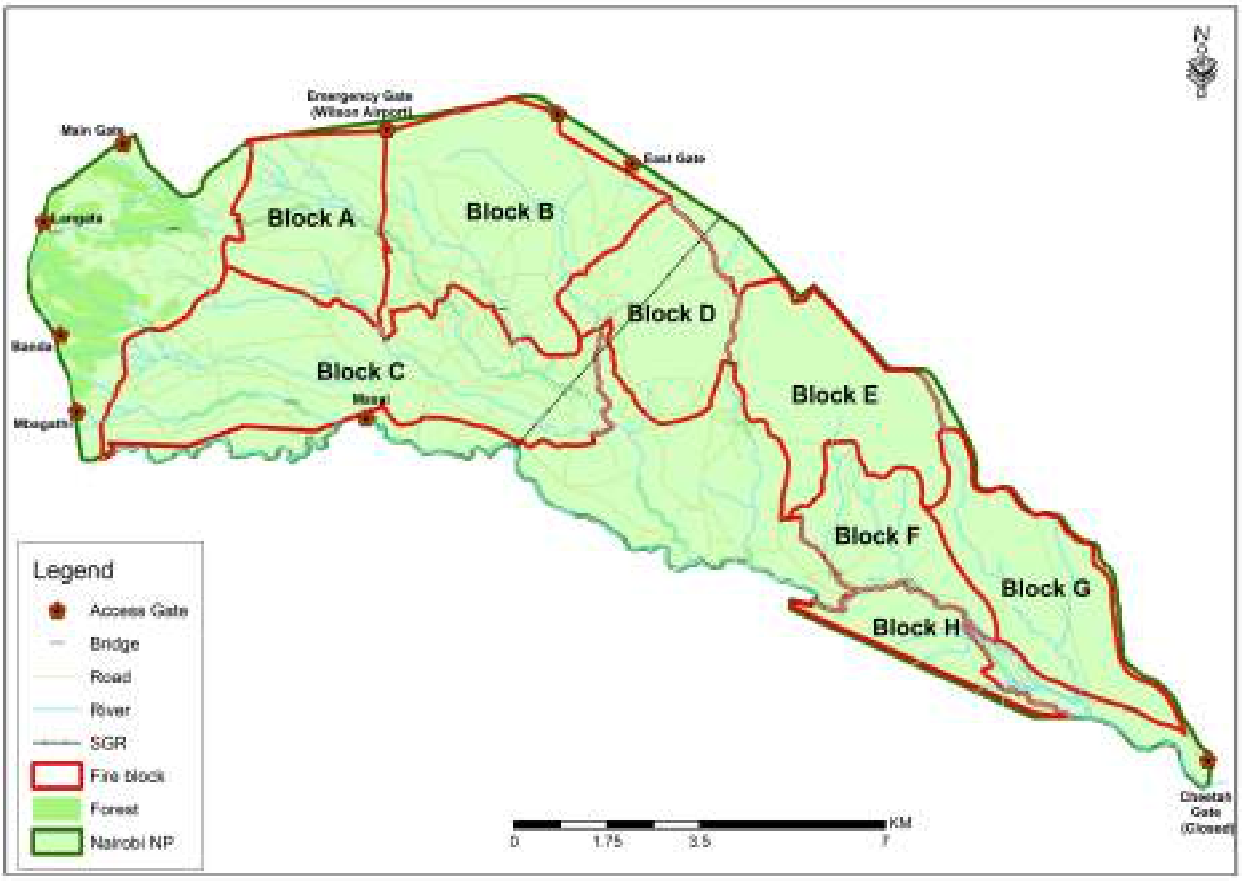


Figure 24. Prescribed fire burning blocks

Action 2.2: Prevent and control wild fires

The Park experiences occasional wild fires that can be devastating to the wildlife habitat if not controlled in time. The fires are almost entirely man-made occurring at the height of the dry season when accumulated litter is high. The common cause of these fires are either careless visitors who discard burning cigarette butts in the open grasslands, or fires that are set by people outside the Park but spread into the Park due to their negligence.

In order to effectively address the problem of wildfire, the Park's viewing circuits will be graded every year so they can serve as effective firebreaks. The boundary fence track will be cleared and upgraded to firebreak standard to prevent fires that might emanate from outside the Park.

During this planning period, capacity for fire fighting will be improved through purchase of necessary equipment and training of staff. Community awareness and capacity building in fire management will be undertaken. Visitor education on fire handling will also be enhanced.

Action 2.3: Undertake mineral supplementation

The park is mineral-salt deficient, and animals periodically move outside the park in search of natural saltlicks in the Kitengela plains. As such, there is a need for mineral salt supplementation at already identified strategic saltlicks to improve the distribution of wildlife around the tourist circuits.

However, renewing provision of mineral supplements will need to be weighed against its negative impacts:

- A high concentration of wildlife at the salt lick resulting in trampling and overgrazing,
- Some wildlife diseases can be spread through close contact or saliva from large concentrations of animals,
- Salt will affect the soil in the immediate surrounding area and may kill existing vegetation around the lick.

Artificial mineral salt licks will be created for two purposes: to attract more wild herbivores, and especially the dispersing ones to the Park; and to provide wildlife with essential minerals. At least 17 salt licks will be created to spread the animals evenly throughout the Park and mitigate the problem of habitat degradation.

Action 2.4: Design and implement a grass mowing pilot scheme to maintain short grass lawns

This action focuses on mowing to re-establish short grass lawns for grazers that prefer short grass. Maintaining short grass will not only support the re-establishment of wildlife, but will also help improve game viewing in the NNP. In addition, mowing helps to reduce impacts of unprescribed fires. As such, potential areas that were formerly mowed and currently have been encroached by short herbaceous plants will be identified and mowed on a pilot basis. These areas will be situated away from the main areas of tourism use. If successful, additional priority areas will then be selected for rolling out the mowing scheme, adapted according to the lessons learnt from the pilot plots. However, due to high costs associated with mowing, this action will be implemented when prescribed fire is not possible e.g. during the wet season, and it will be focused on identified small patches along the wildlife viewing circuits and saltlicks.

Figure 25 shows the location of salt licks and mowing blocks.

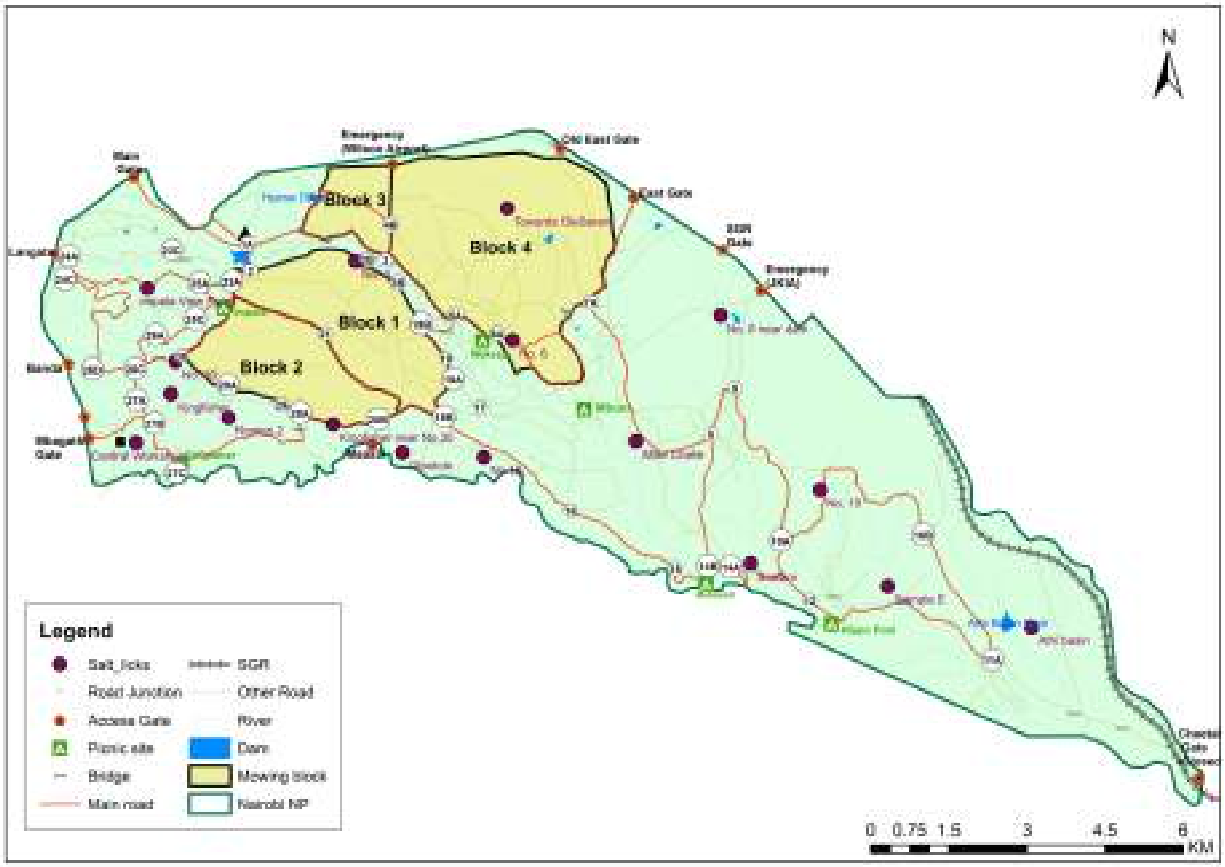


Figure 25. Salt licks and identified mowing blocks

Action 2.5: Rehabilitate and restore degraded habitats

The alien eucalyptus trees that stand opposite the Wildlife Clubs of Kenya (WCK) and near the headquarters will be removed as part of the program of eliminating alien species from the Park. Once this starts, suitable indigenous trees, and preferably those already growing in the vicinity of the two sites, will be planted.

Degraded areas in the park will also be identified and they will be a focus for the national tree growing campaign. Some of the sites that are being rehabilitated include the Cheetah Gate area.

Action 2.6: Control invasive and alien plants

Invasive and alien species can reduce forage resources for animals and cause changes in habitat structure by reducing regenerative capacity of indigenous species. Climate change and habitat disturbance have resulted in the invasion of the park by unpalatable plant species that are not part of the food spectrum of wildlife. Restoration of the habitat requires a consistent invasive species control and management program. Several alien plant species have been identified in the park but not all are invasive e.g. Eucalyptus *spp.* Most of the Kei apple and eucalyptus though alien, were planted by park management in the early 1950s and some (at the former Somali camp) were planted by the Somalis who dwelt in the park from 1900 to 1967. Other alien species include *Parthenium hysteropholus*, Cactus (*Opuntia sp.*) and *Lantana camara,* the latter being dispersed by birds.

Attempts have been made to remove alien species from the Park but total eradication has not been achieved. All the alien plants, apart from the Kei apple planted as a hedge along the Park boundary, will be manually eradicated from the Park. Opuntia species will be eliminated using biological control as it is being done in Tsavo East National Park. All sites where invasive or alien species will be removed will be restored using indigenous species occurring around each site.

Action 2.7: Establish a buffer zone on the southern park boundary

Residential houses, industries and slums have been developed outside the fence on the northern and north eastern side of the Park, thereby leading to loss of its aesthetic appeal. To avert similar development along the unfenced southern Park boundary, Park management will endeavour to closely work with other stakeholders to create a buffer zone where land use is supportive of Park goals. The area has been zoned by Kajiado County government as low density residential area and eco-tourism zone. Therefore, KWS will work with the land owners and the Kajiado County Government to ensure that the zoning regulations that prescribe a minimum permitted subdivision of 4ha is adhered to.

Action 2.8: Carry out NNP land use/cover change study

In the past the NNP's dispersal area has suffered heavily from encroachment, which has had far-reaching impacts on the area's ecology. Many browsing and grazing species have been drastically reduced in numbers, which has resulted in significant changes in the vegetation structure, especially in the park. However, although these changes are widely acknowledged, scientific investigation and documentation of the actual changes in NNP ecosystem land use and land cover is needed as a basis for current wildlife management both inside and outside the park, but this has not been undertaken. As such, a land use/land cover change analysis will be carried out to establish the specific changes that have occurred. This information will provide a scientific basis for establishment of viable conservancies in the park's dispersal area.

Action 2.9: Implement the Standard Gauge Railway (SGR) Environmental Management Plan

The aim of the SGR Environmental Management Plan (EMP) is to detail the actions required to effectively implement the mitigation measures identified and recommended in the Environmental and Social Impact Assessment (ESIA) study for the SGR. These actions are expected to minimize negative impacts and enhance positive impacts associated with the operations of the SGR.

The EMP actions present the commitments made by Kenya Railways Corporation for addressing the impacts of the project. This is a living document that will be updated and amended as new information (e.g. environmental data), policies, authority guidelines and technologies develop.

The EMP identifies management actions that need to be implemented in various phases of the SGR project. However, since the project design and construction phases have been completed and we are currently at the operational phase, the focus of this management

action will be the implementation of the EMP for the operational phase (Annex 6).This is the phase during which the SGR will be operated and it is anticipated to last for 150-200 years[30].

Action 2.10: Mitigate impacts of climate change

To mitigate impacts of climate change, KWS has embarked on a nationwide tree planting campaign in its parks to restore degraded areas. This is part of the national tree planting campaign. At the NNP, degraded areas that need restoration have been identified and tree planting has started. In addition, a green line will be established and maintained along the northern and eastern park boundary to buffer the park from human activities. Sites where invasive and alien species will be removed will also be restored. Tree growing will be a continuous process until all the degraded areas have been restored. Emphasis will be given to tree husbandry to ensure that the planted trees survive to maturity.

Objective 3: Quantity and quality of water supplied to the NNP maintained in collaboration with responsible agencies

Wetland habitats and wildlife species in the NNP are dependent on water supplied by rivers and streams that flow into the NNP from the Ngong Hills. Of particular importance are the riverine vegetation along Mbagathi River and permanent swamps and dams in the Park, which provide important dry season habitats for many wildlife species.

Many of the threats to the conservation of NNP and its associated habitats are located well beyond the boundaries of NNP. Despite the fact that addressing these threats is beyond KWS's immediate mandate, if left unattended to, they are likely to have severe and far-reaching impacts on the NNP ecology and wildlife populations.

This objective has been developed to ensure that the quantity and quality of water in key rivers supplying the NNP are maintained, so as to ensure the continued conservation of key habitats and wildlife species within the NNP. Although the area of focus for this objective is outside the immediate jurisdiction of KWS, the potential impacts of reduced water supply and water pollution on NNP's ecology and wildlife populations are considered too serious and far-reaching to be left unaddressed by the Ecological Management Programme. As the issues impacting on the supply of water to the NNP are located outside of KWS' immediate mandate, actions under this objective will involve establishing or strengthening collaborations and supporting the work of key stakeholders in the area, such as the Water Resource Authority and NEMA. The management actions that have been developed to ensure that the quantity and quality of water supplied to the NNP is improved are elaborated in the following sections.

Action 3.1: Establish and maintain water monitoring stations on rivers leading to the NNP

The monitoring of the flow rates, water level and quality of water in rivers flowing into the NNP, specifically Mbagathi and Mokoyiet rivers, is essential for determining the intensity of the threat to the area's conservation, and for assessing the effectiveness of the management

[30] Habitat Planners, 2016. Proposed Standard Gauge Railway Project From Nairobi South Railway Station-Naivasha Industrial Park-Enoosupukia, Narok. Environmental and Social Impact Assessme2nt (ESIA) Study Volume I – Main Report

actions developed under this objective. Although some information is already collected on the flow and pattern of the key rivers flowing into the NNP, this monitoring needs to be expanded to include an analysis of water quality. As such, under this management action, water monitoring stations will be established along the two major rivers. These stations will be capable of monitoring water flow and pattern, and the collection and simple analysis of water quality samples. The long-term ecological monitoring of these aspects will then continue in line with the specifications in the Ecological Monitoring Plan. If significant increases in chemical pollution in these rivers are recorded, potential sources will be identified and the information provided to the relevant water resource management authorities and NEMA for appropriate action.

Action 3.2: Support establishment of WRUAs to control water use and pollution

Increased water use has reduced the amount of river water reaching the NNP, and has the additional potential to impact on the area's conservation values. However, the Water Act (2002) recognises the positive role that communities can play in the management of water resources, provided they are given proper organisation and support. The Act provides for the formation of Water Resource Users Associations (WRUAs), made up of water users along a river's course. The functions of the WRUAs include protection of the water catchments, addressing environmental problems in the watershed, and resolving water use conflicts. NNP management will work closely with the Water Resource Authority in creating awareness on the impacts of poor water management in the water catchment area. In addition, in order to improve the sustainable use and management of Mbagathi River water, support will be provided for the formation of WRUAs by co-funding meetings organised during the community mobilisation stage.

Further, sewage and waste from the growing suburban towns and institutions within the ecosystem are flowing into water systems that are important for wildlife. To address this problem, therefore, NNP will work with the buffer zone residents association in cleaning Mbagathi River and in initiating environmental awareness activities targeting the main sources of pollution.

Action 3.3: Support the preparation of an integrated water management plan for rivers feeding into the NNP

All the rivers and streams entering the NNP are threatened by the degradation of the water catchment area, inefficient water use and pollution from urban effluent. In response to these issues, support will be provided to the Water Resources Authority and the Water Resource Users Associations (WRUA) in the preparation of integrated water resource management plans for priority rivers flowing into the NNP. These plans will analyse water resource uses and management issues in each river's watershed, and develop relevant management actions to be implemented by the WRUAs. KWS will provide support to the planning process by attending and facilitating community planning meetings, and by providing other logistical and technical assistance as may be requested by the water management authority and/or the WRUAs.

Action 3.4: Develop alternative water sources for wildlife inside the NNP

Artificial water bodies that capture water that currently flows through the NNP will not only provide an alternative and more secure source of water for wildlife species during the dry season, but, if appropriately located, could also encourage the dispersal of wildlife from its current concentrations around the three main dams-Nagolomon, hyena and Athi.

Mbagathi River and the many streams that drain into it are the main source of water for wildlife in the Park. However, most of these streams dry up during the dry season leading to water shortage. To counter the shortage, 15 watering points were constructed some time back to provide water to the animals throughout the year. The water points are along the seasonal streams that flow through the park draining into the Mbagathi River and provide micro habitats for water birds. Out of these, only 3 are currently serving the animals as shown in the table 10 below, and the rest are completely filled up with silt and overgrown vegetation.

Table 10. Status of Watering Points in the Park and action needed

No.	Water point	Type	Status	Management Action
1	Embakasi	Dam	Seasonal	Desilting Not Required
2	Hyena	Dam	Permanent	Desilting Not Required
3	Eland Hollow	Dam	Seasonal	Desilting Required
4	Athi basin	Dam	Permanent	Desilting Not Required
5	Karen C. Primary	Dam	Seasonal	Desilting Required
6	Olmanyi	Dam	Seasonal	Desilting Required
7	Impala Point	Dam	Seasonal	Desilting Required
8	Nagolomon	Dam	Permanent	Desilting Required
9	Kingfisher	Dam	Seasonal	Desilting Required
10	Ruai	Dam	Seasonal	Desilting Required
11	No.2	Water pan	Seasonal	Desilting Required
12	No. 6A	Water pan	Seasonal	Desilting Required
13	No. 24A	Water pan	Seasonal	Desilting Required
14	Banda	Water Pan	Seasonal	Desilting Required
15	No.26D	Water Pan	Seasonal	Desilting Required

Under this management action, artificial water source sites in the NNP that have been silted and overgrown over the years will be identified and desilted. Additional potential sites will be selected for construction of water pans. The construction will capitalise on the natural features of the area wherever possible, in order to minimise habitat disturbance and construction costs. EIAs will then be undertaken for the proposed sites, addressing not only issues relating to construction, but also potential ecological impacts downstream, and any likely impacts on wildlife distribution.

To monitor the biological resources within the dams, and document the changes and impact of the watering points to the animal abundance and distribution, a monitoring program covering all the dams will be established. This will address the physical and chemical composition of the water, as well as the temporal and spatial variations of wildlife resources utilizing the dams. The information gathered will also be used to assess the change in tourism perception towards the park as regards animal abundance and visitor satisfaction.

Objective 4: Ecological monitoring and research information dissemination is strengthened

Many research projects have been carried in NNP and a long-term wildlife monitoring programme has been in place for more than forty years. While research and monitoring findings can play a key role in guiding management action at NNP, there has been inadequate dissemination of research information to NNP managers and planners; hence science driven management has been minimal.

This objective has therefore been designed to streamline wildlife related research and dissemination of research outputs among stakeholders. The management actions that will be implemented to achieve this objective are elaborated in the following sections.

Action 4.1: Establish an ecological monitoring programme

A key component of the Ecological Management Programme is the NNP Ecological Monitoring Plan. An additional benefit of the TNC CAP methodology is that the threats and KEAs identified through the process also provide a comprehensive framework for monitoring the overall status of the conservation targets, and therefore a surrogate measure of the health of the entire NNP ecosystem. The use of the threats and KEAs also ensures that there is a direct link between the components of the ecosystem that are being monitored and this programme's management objectives and actions. As such, the Ecological Monitoring Plan provides a basis for both monitoring overall ecosystem health and assessing the effectiveness of, and recommending adaptations to, the management actions under this programme.

Therefore, under this management action, a comprehensive ecological monitoring plan will be developed by the NNP Research Section early in the lifespan of this management plan. The NNP Research Section will be responsible for ensuring that monitoring activities are included in annual work plans, and will work together with KWS HQ to ensure appropriate budgets are approved to cover the stipulated activities.

Action 4.2: Strengthen the capacity of the NNP research section

The ability of the NNP Research section's scientists to take a lead role in implementing many of the management actions set out in this programme is currently severely undermined by a variety of factors. The first deficiency that needs to be addressed is the current human resource shortfalls in the NNP research Section. In this regard, NNP management will liaise with KWS HQ to deploy scientists in line with the station's optimum staffing levels. The deployment of adequate staff will be complemented by the provision of equipment required to meet specified ecological research needs. This will involve liaison with KWS HQ for procurement of office and field equipment (GPS, camera, computers, an automatic weather station, and a reliable research vehicle) to support essential operations.

Action 4.3: Improve the management, accessibility and dissemination of NNP ecological information

Several of the management actions listed in this programme, and as a result of the implementation of the NNP Ecological Monitoring Plan, will generate a significant amount of ecological information. In addition, a considerable amount of data is collected, or can be collected, by field staff in other departments, including the CWS, rangers and the tourism officers. If this information is to be used effectively, it needs to be managed, stored and synthesised effectively and efficiently, and the outputs disseminated to all relevant NNP and KWS officers in a form that is easy to digest and understand. Unless this is achieved, much of the ecological information is likely to be unused, wasting both time and resources of the officers collecting and those analysing the data.

This action therefore provides for the establishment of a NNP ecological monitoring database designed to store information generated through the implementation of the programme and the NNP Ecological Monitoring Plan. The database will be developed to be as far as possible compatible with existing rhino database, so that data can be easily transferred between them. At the same time, efforts will also be made to ensure that the new database is integrated with other NNP databases, such as tourism, security and CWS. The design of the new database will be complemented by the development of a reporting framework and communication protocols aimed at ensuring that database outputs are regularly available in a simple and transparent form for both researchers and other park managers.

Action 4.4: Develop closed system management guidelines

Wildlife movement in and out of the park has been significantly affected by the proliferation of human settlement outside the southern part of the park that is currently not fenced. There is a need to develop guidelines for the management of the park as a closed system, and to enclose the southern part of the park without compromising the park's ecological integrity. Fencing must be accompanied by restocking and destocking activities for identified species. In addition to wildlife population management interventions, the closed system requires the use of technology for intensive monitoring, including wildlife collaring. Hence, under this management action detailed guidelines will be developed for habitat and species management in the park and its buffer zone.

Action 4.5: Conduct management oriented research

Targeted research and monitoring will aim at providing timely scientific and technical information on ecological and sociological issues for management of the park's ecosystem. Research and monitoring programmes will be implemented in collaboration with other learning and research institutions.

The following research will be prioritized:

Assessment of the importance of dispersal areas and wildlife corridors outside the NNP

A comparative predator-prey study in and outside the Park: Predators follow the migratory species outside the park during the wet season. As a result, the predators expand their home range outside the park resulting in human-wildlife conflict. The study will include analysis of wildlife population dynamics and movement patterns within Nairobi National park ecosystem.

Habitat utilization studies: Studies on habitat utilization in the park for migratory species and their preferred plant food are needed. These studies will provide useful information that will be used in habitat management programs.

The populations of migratory species have been declining: Studies will be conducted to identify the causes of population decline.

Population structure of wild ungulates: These studies will provide information on species population health status, recruitment, mortality rates, sex ratios, and their seasonal change. .

Rhino related studies: The following studies will be undertaken to improve the management of Rhinos and thereby meet the overall objectives of improving their reproductive performance and population in the ecosystem.

(a) Impact of fires on rhino preferred food plants: Studies on the impact of fire on the major rhino food plants will be undertaken, with a view of re-designing the fire management program. Though studies on the nutritional quality of rhino food plants were done in 1994, there is need to undertake a detailed analysis of the rhino food quality and quantity.

(b) Rhino home range sizes: Studies on rhino home range sizes within the park were done in 1988. Since that time, many changes have occurred inside the park and there is need to carry out another rhino home range studies. The objective of the study will be to determine whether the rhino home ranges have changed since then and identify reasons for the changes. Other

crucial studies will include the Rhino time-activity budget, which is critical in management interventions like translocation.

Action 4.6: Carry out ongoing ecological monitoring

Game census: Records of animal census data for the Park are available on a monthly basis from mid 1960 to1976 and bi-monthly from 1989 to present. Data for the period between 1976 and 1989 is lacking. ***Ground counts*** will be undertaken bi-monthly inside the Park and quarterly in the dispersal area, and a***erial count*** will be conducted once in every five years in the ecosystem. This will aim at providing more accurate information on the wildlife distribution and population numbers.

Plant vegetation diversity assessment. Carrying out vegetation diversity assessment will help determine species distribution, abundance and frequency. This is done through reconnaissance survey of the area using line transect and quadrat sampling methods to identify sites for sampling. Plotting of the study area should be done randomly with 10 x 10 m plots for trees and 5 x 5 m for shrubs[31]. KWS will carry out the surveys bi-annually during the dry and wet seasons.

Water pollution monitoring: The Park is surrounded by industries and institutions, which drain their effluents into the park. Pollution levels within the park's wetlands need to be constantly monitored. To curb pollution of the rivers flowing through the Park, known polluters will be advised to prepare and implement waste management systems to reduce the amount of pollution. The park management, through the National Environmental Management Authority (NEMA), will use EMCA, 1999 to mitigate pollution.

Monitoring of climatic conditions: The Park has automatic rain gauges at East gate, Cheetah gate, Masai Gate and Langata Gate. However, these are not functional. The park, through the Meteorological department, will acquire appropriate precipitation gauges for monitoring of the climatic conditions.

Measuring changes in ecosystems such as protected areas requires identifying the impacts of climatic changes to these areas. Due to changing weather patterns, the park has experienced increased rainfall over the years. This could eventually lead to water pollution from overflow of the residential sewers near the park. Water pollution management is one of the ways that can be used to control the flow of waste into water bodies in the park. This can be done through conducting water quality tests as well as using stress indicators to assess the resilience of plant and animal life to the effluent[32]. Water quality and stress indicator tests will be carried out quarterly to ensure impacts are mitigated

Wildlife Disease surveillance and control: To control wildlife diseases, continuous collection and sample analysis will be done to monitor diseases. An effective wildlife treatment programme will be instituted to curb spread of diseases.

Develop appropriate GIS and databases to manage the information to support management decisions.

Ornithological surveys: Conduct ornithological surveys.

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[31] Uddin, M. (2015). Plant diversity assessment in Khadimnagar National Park, Sylhet. 10.13140/RG.2.2.11459.91682.

[32] Changzuo W., Feng Z., Peng H. & Qiao W. (2014). Integrated Monitoring and Assessment Framework of Regional Ecosystem under the Global Climate Change Background

NNP Ecological Monitoring Plan

In addition to the programme's management objectives and actions, the other key component of the Ecological Management Programme is the NNP Ecological Monitoring Plan. An additional benefit of the TNC CAP methodology (described above) is that the threats and the KEAs identified through the process also provide a comprehensive framework for monitoring the overall status of the conservation targets, and therefore a surrogate measure of the health of the entire NNP and its dispersal area. The use of the threats and KEAs also ensures that there is a direct link between the components of the ecosystem that are being monitored and this programme's management objectives and actions. As such, the Ecological Monitoring Plan provides a basis for both monitoring overall ecosystem health and assessing the effectiveness of, and recommending adaptations to, the management actions under this programme.

The framework for the development of the NNP Ecological Monitoring Plan is set out in Table 11. As shown in this table, the plan framework is set out by conservation target. The indicators of change provide easily measurable attributes for assessing the status and trends of the KEAs or threats to each conservation target. The indicators selected also provide an early warning of any serious threats that may develop during the lifespan of this plan, which may potentially require the development of new management actions. The framework also outlines the data collection methodology, which sets out how, when, where and who will collect the data for the indicators. This framework provides the outline for the development of a comprehensive NNP Ecological Monitoring Plan, which will be elaborated and developed by the NNP Research Section early in the lifespan of this management plan. The NNP Research Section will be responsible for ensuring that monitoring activities are included in annual work plans, and will work together with KWS HQ to ensure appropriate budgets are approved to cover the activities stipulated.

Table 11. Framework for e development of the NNP Ecological Monitoring Plan

KEA/Threat	Indicator of change	Method of measurement	Collection frequency	Data source	Responsibility	Data currently collected?
Conservation Target 1: Black Rhino						
KEA: Available habitat and quality **Threat**: Insufficient habitat	Quantity and quality of preferred forage species; Population size verses carrying capacity	Transects to establish forage quantity and lab forage quality analysis	Bi-annual	Monitoring reports	NNP – RS/ collaborative institutions	No data is available
KEA: Population size, recruitment and structure	Number of individuals (age & sex)	Individual IDs	Daily	ID reports	NNP - RS	Baseline data is available
KEA: Genetic diversity and variability **Threat**: Inbreeding	No. of individuals with similar or different genotypes; Quantitative characteristics of the population (phenotype)	Genetic analysis and mapping; Population performance	Every 3 years	Genetic analysis reports	NNP – RS/Forensic lab	Samples for analysis available
Threat: Disease	% of disease outbreaks investigated	Confirmed diagnoses	continuous	Veterinary services department disease surveillance reports	KWS vet department/ collaborative institutions	Baseline reports available
Conservation Target 2: Migratory Species						
KEA: Available habitat and quality	Extent of suitable grasslands; quantity and quality of preferred forage species	Mapping of habitat through satellite image analysis; lab forage quality analysis; transects & quadrants to establish forage quantity, rainfall to relate to primary productivity	Bi-annual; Daily (rainfall data)	Monitoring and mapping/land cover changes report	NNP – RS/ consultant	Baseline reports available
KEA: Population size, recruitment and structure	No. of individuals (age and sex); body condition	Ground counts	Bi-monthly	Ground count reports	NNP - RS	baseline data is available
KEA: Migration routes/ dispersal areas **Threat**: Settlement in key areas	Length and width of migratory routes; size of dispersal area	Collaring; mapping of available habitat through satellite images	3 years	Wildebeest movement patterns reports; land cover changes	NNP – RS	Baseline data available

KEA/Threat	*Indicator of change*	*Method of measurement*	*Collection frequency*	*Data source*	*Responsibil-ity*	*Data currently collected?*
				report		
Threat: Bush-meat poaching	No. of individual lost due to poaching	Recovered bushmeat	Daily	patrol reports	NNP – RS/security	Baseline data available
Conservation Target 3: Large Carnivores						
KEA: Population size and structure of key species	Population and age-sex struc-ture	Ground counts; species collaring and tracking	Bi-monthly ground counts; daily	Ground count reports; Species move-ment reports	NNP – RS	Baseline data available
KEA: Genetic diversity	Genetic Diversity	DNA testing	Ad hoc	KWS Forensic lab	NNP-RS and Lab Manager	Partially
KEA: Habitat size and quality, and connectivity Threat: Land use changes	Disturbance/Fragmentation of corridors and dispersal areas	Analysis of satellite imagery, change detection	Every Three Years	Land Use/Cover change maps	NNP-RS	No
Threat: Human-wildlife conflicts	Number of reported Incidents	Reports (CWS)	Ongoing	CWS	NNP-RS	Data available
KEA: Prey spe-cies availability	Population and age-sex struc-ture	Ground counts	Bi-monthly ground counts	NNP Ground count reports	NNP-RS	Data available
Threat: Poaching	Carcasses Number of arrest	Patrols, aerial survey, security reports	Daily,	NNP security and conser-vancy security	NNP Security	Good data already col-lected.
Threat: Disease	% of disease outbreaks inves-tigated	Confirmed diagnoses	continuous	KWS Vet	KWS vet and NNP-RS	Some data already col-lected
Conservation Target 4: Masai Giraffe						
KEA: Population size, recruitment and structure	Numbers, recruitment rates, age structure, sex structure, Mortality	Ground counts	Bi-monthly	NNP Ground count reports	NNP-RS	Data available
Threat: Poaching	Carcasses Number of arrest	Patrols, aerial survey, security reports	Daily,	NNP security and conser-vancy security	NNP Security	Good data already col-lected.
KEA: Habitat size	Plant species composition	Transects and quadrants	annually	Vegetation	NNP-RS	No

KEA/Threat	Indicator of change	Method of measurement	Collection frequency	Data source	Responsibil-ity	Data currently collected?
and quality	Changes Habitat change	Comparison studies		monitoring reports		
KEA: Genetic diversity Threat: Inbreed-ing	Genetic Diversity	DNA testing	Ad hoc	KWS Forensic lab	KWS Vet lab	No
Conservation Target 5: Wooded grassland and open grasslands						
KEA: Population of key grazing species	Number of individuals of differ-ent sex and age classes of key grazing species	Ground counts	Bi-monthly	Ground counts reports	NNP-RS	Baseline data available for all species
Threat: Bush-meat poaching	Number of arrests made and snares removed	Analysis of occurrence book; removal	Monthly	Reports on arrests and snares	NNP – RS/security	Baseline data available
KEA: Extent of grassland	Area under grassland	Analysis of satellite images	Every 5 years	Land cover changes report	NNP – RS/ consultant	Data available
KEA: Vegetation structure and composition	Number of species and vegeta-tion cover	Sampling transects to assess vegetation composition & structure	Seasonal (wet and dry) after every 3 years	Reports on floral structure	NNP - RS	Data available for NNP
Threat: Invasive species	Invasive species distribution and area covered	Sampling transects to assess invasive species composition & structure	After every 3 years	Monitoring reports	NNP – RS	Baseline data available at NNP
Threat: Livestock incursion	Number of livestock in PA	Daily surveillance	Daily	Livestock incursion re-ports	NNP – RS/security	Baseline data is available
Conservation Target 6: Open low shrubland						
KEA: Population of key browsing species	Number of individuals of differ-ent sex and age classes of key browsing species	Ground counts	Bi-monthly	Ground counts reports	NNP-RS	Baseline data available for all species
KEA: Extent of bushland	Area under bushland	Analysis of satellite images	Every 5 years	Land cover changes report	NNP – RS	Baseline data available
KEA: Vegetation structure and composition	Number of species and vegeta-tion cover	Sampling transects to assess vegetation composition & structure	Seasonal (wet and dry) after every 3 years	Reports on floral structure	NNP - RS	Data available
Conservation Target 7: Highland dry Forest						

KEA/Threat	*Indicator of change*	*Method of measurement*	*Collection frequency*	*Data source*	*Responsibil-ity*	*Data currently collected?*
KEA: Forest size	Area under forest; extent of destructive practices	Analysis of satellite images and	Every 5 years	Land cover changes report	NNP – RS	data is avail-able
KEA: Floral composition	Number of species	Sampling transects to assess floristic composition	Seasonal (wet and dry) after every 3 years	Reports on floristic compo-sition	NNP – RS	Baseline data is available (Na-tional Museums of Kenya)
KEA: Floral structure	Vegetation cover	Sampling transects to assess floral structure	Seasonal (wet and dry) after every 3 years	Reports on floral structure	NNP – RS	Baseline data is available
Conservation Target 8: River systems and wetlands						
KEA: Catchments forest size **Threat**: Habitat conversion	Area under forest catchments	Analysis of satellite images and	Every 5 years	Land cover changes report	NNP-RS	No data is available
KEA: River regime (flow and pattern) **Threat**: Water abstraction	Level of water in key rivers	Installing and taking reading from water flow meters	Daily	Water flow monitoring reports	NNP - RS/Water Resources Authority	Data available
KEA: Water quality **Threat**: Chemical pollution	Amounts of dissolved chemi-cals in water	Direct measurements and laboratory analysis of chemi-cals in water samples	Seasonal (wet and dry)	Water quality analysis reports	NNP -RS	Baseline data is available
KEA: Riparian habitat **Threat**: Habitat conversion	Area under riparian habitats	Analysis of satellite images	Every 5 years	Land cover changes report	NNP - RS	No data is available

Tourism Development & Management Programme

Programme Purpose and Strategy

The purpose of the Tourism Development and Management Programme is:

> To develop a distinctive and diverse nature-based tourism that offers visitors memorable experiences

The NNP today attracts low visitor numbers, has limited tourism infrastructure and facilities, relatively low densities of wildlife and, because of bush encroachment and long grass, much of the area is unsuitable for traditional game viewing. During the wet season most of the wildlife are known to move to the southern community lands where there is short grass, thus degrading the wildlife viewing experience in the park. The park undoubtedly has significant tourism potential, as demonstrated during the early 1990s when it was the most popular park destination in the country.

Through the NNP experience master plan, the NNP is set to be significantly transformed through development and rehabilitation of visitor and management infrastructure, and re-stocking the park's depleted wildlife populations. Active habitat management, through improvement of pastures, is also expected to ensure that wildlife will be concentrated in the park. These infrastructure and habitat improvements will set the stage for increased visitation over the next ten years, provided visitor satisfaction can be maintained and enhanced.

This programme sets out a series of management objectives and actions that the NNP management will implement over the next 10 years, aimed at realising the area's full tourism potential. It is based on a proactive and innovative visitor experience master plan designed to overcome the obstacles that are presently holding back tourism development, by leveraging the area's unique location in a heavily populated city and largely untapped tourism potential.

The following paragraphs set out the ***strategic principles*** that will guide NNP Management in the implementation of the Tourism Development and Management Programme and the achievement of this Programme Purpose.

Guiding Principles

In implementing the NNP's Tourism Development and Management Programme, NNP Management will strive to ensure that:

The tourism product is diversified to enhance visitor experience

One of the strategic objectives of the KWS Strategic Plan 2019-2024 is ***"enhance financial sustainability"*** through increasing visitation to parks and developing new products, while enhancing existing ones. As such, in line with this strategic objective, a guiding principle under this programme is to diversify the tourism product to increase park visitation without compromising the park's ecological integrity. Diverse tourism products will not only ensure that visitor experience is enhanced, but they will keep visitors from the roads, thus minimizing congestion. In addition, visitors participating in these activities would spend more time and cash in the park further generating more income.

Ensure visitor awareness, appreciation, understanding and enjoyment through interpretation of the natural and cultural attributes of NNP

NNP lacks an elaborate interpretation programme. The need for one and the demand by visitors for information necessitates a robust interpretation programme to diversify and enhance visitor experience. Park interpretation is an integral part of any Park operation. It facilitates an important flow of understanding between the administrator of the Park and the visitor. As such, under this programme, a guiding principle will be ensuring visitor awareness, appreciation, understanding and enjoyment through park interpretation. This is in line with Strategic Objective "*C1: Enhance internal business processes and service delivery*", of the KWS Strategic plan 2019-2024 which seeks to enhance interactions with customers by using multiple channels, including revamping the KWS website, developing mobile apps, using social media and other media forms, as well as developing products and services that respond to or anticipate customer needs.

Tourism in the buffer zone developed as a major positive force in support of the NNP's conservation and management

Experience elsewhere has shown that tourism investments both inside and outside a protected area can positively reinforce park management activities, by establishing a continual presence in areas which law enforcement patrols can only occasionally reach. For these reasons, the promotion of tourism development in the park's buffer zone such that it strongly supports the NNP's conservation and management is a key aspect of the tourism strategy set out in this programme.

Tourism is developed appropriately

To develop the capacity of tourism to support the long-term conservation of the park and contribute to national economic development, while continuing to ensure a top-quality visitor experience, there is need to promote a high quality and environmentally friendly tourism product. As such, under this programme, any proposed major developments will be subjected to thorough environmental impact assessment before work commences, according to the Environmental Management and Coordination Act (1999) regulations, and subject to licensing by the National Environment Management Authority (NEMA).

The NNP offers attractive investment opportunities

The NNP's tourism product is currently largely based on wildlife viewing, and it will be necessary for KWS to adopt an affirmative and innovative approach in order to develop the NNP tourism product to meet visitor expectations. This will involve two complementary strategies: developing distinctive visitor activities, and providing investors with innovative tourism investment opportunities.

A wide range of recreational activities are permitted in KWS national parks, and the NNP can therefore support the development of a diversity of distinctive visitor activities. As such, the programme's tourism strategy aims to enable and support the development of a wide variety of distinctive visitor activities in the NNP. Visitor activities that capitalise on the proximity to the city and JKIA will also be an important aspect of developing a unique NNP tourism product. For this reason, a major feature of the tourism development strategy set out in this management plan is the development and promotion of tourist packages.

These strategic principles are intended to guide the implementation of the Programme's four management objectives that, when taken together, achieve the Programme Purpose. These four objectives are:

MO 1. The NNP tourism investment opportunities developed
MO 2. NNP tourism product improved to enhance visitor experience
MO 3. NNP is marketed locally and internationally
MO 4. NNP tourism management improved

The following sections describe these management objectives and the management actions needed to achieve them. Under each management objective there is a brief description of the relevant management issues and opportunities, which provides the specific context and justification for the management actions.

Management Objectives and Actions

Objective 1: The NNP tourism investment opportunities developed

There has been a general increase in the number of visitors to NNP, both non-resident and citizens, in the last seven years (Table 12). Similarly, there has been a steady increase in revenue over the same period as depicted in the table and graphs below. The increase in visitor numbers necessitates investment in visitor facilities and activities to meet their accommodation and recreation needs.

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Table 12. NNP visitation and revenue 2012-2018

Year	Citizen	Resident	Non-resident	Total visitors	Revenue(Ksh)
2012	93137	16785	37574	147496	205,469,190.00
2013	90370	17209	42412	149991	216,103.136.00
2014	74404	15504	37470	127378	250,680,162.00
2015	76399	15721	36968	129088	279.778,790.00
2016	85032	16850	51639	153521	324,456,224.00
2017	91287	17690	58644	167621	321.885,169.00
2018	102576	18941	74981	196498	429,672,423.00

Objective 1 aims to expand and diversify the NNP's offering of visitor facilities and activities and their supportive infrastructure, in order to attract an increased number of visitors to the park (Figure 26). Two of the key issues that need to be addressed in order to achieve this objective are the development of a conducive environment that fosters private sector interest and investment in new activities and facilities in the NNP, and the establishment of management systems necessary to support the implementation and operation of these activities and facilities. This will involve communication and collaboration with the tourism industry to ensure that KWS is providing appropriate support for their initiatives.

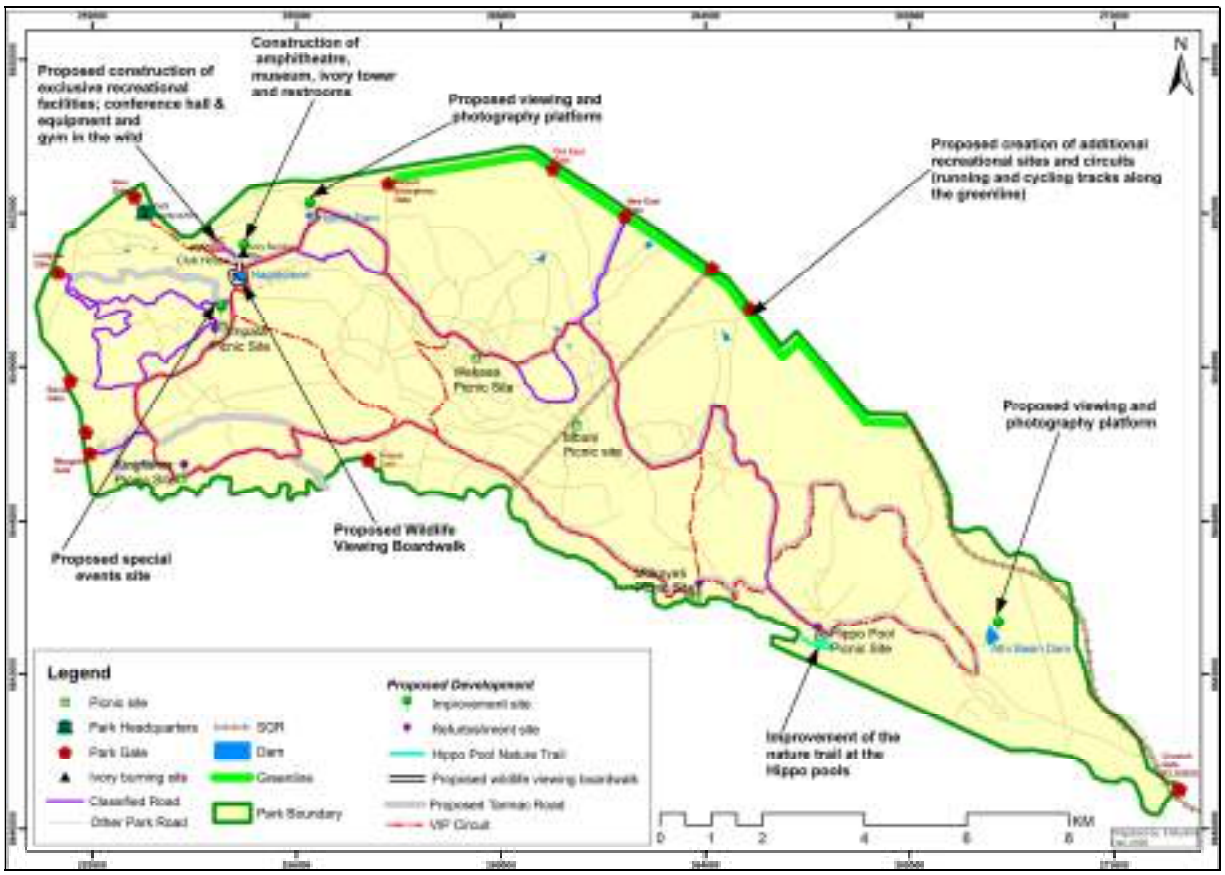


Figure 26. Proposed tourism developments

KWS recognises the interdependence of conservation and tourism; tourism provides the economic justification for conservation. This objective seeks to improve the tourists' experience in NNP, in partnership with the private sector by developing suitable accommodation facilities and new adventure activities.

While developing tourism activities in the parks, KWS' primary concern and mandate remain the protection of biodiversity and natural habitats to ensure their sustainability. Thus, rigorous procedures will be undertaken to identify sites for development, selection of suitable investors, nature of development, and eventual management of the facilities.

The overall objectives of private sector investment within NNP are:

- To optimise KWS's net revenue from tourism and wildlife to establish a secure financial base for the organisation's conservation and wildlife management mandate
- To encourage the development of environmentally sensitive tourism, minimising adverse environmental impact, wildlife harassment, and threats to biodiversity.

Investors will be required to submit business plan/proposals in line with procurement guidelines provided. At the end of the 4-month selection process, successful bidders will sign a commercial lease for the property and pay quarterly fixed ground rent to Kenya Wildlife Service. They will recoup their investment by charging the clients for services such as accommodation, meals, drinks, game drives, and any other services offered. KWS expects investors to use their extensive marketing network and established brands to promote visitation to NNP.

The management actions that have been developed to facilitate private sector investment in visitor activities and facilities in NNP are elaborated in the following sections.

Action 1.1: Establish a Permanent Luxury Tented Camp

There are no hotels or lodges inside the park but some exist at its peripheries. These include Masai Lodge, Emakoko and Oloolo lodges, and Park Place Hotel. However, there is a small camp, Nairobi Tented Camp (NTC), which has been operating in the park for the last 10 years continuously at the same site with minimal environmental footprint. Initially this was initially a temporary tented camp but it is now an 18 bed permanent luxury tented camp. There is a need to upgrade this site to reflect its current status of a permanent luxury tented camp. Hence, the site will be re-advertised and the selected developer will be expected to adhere to high environmental management standards[33] and should leave minimal footprint upon decommissioning.

Action 1.2: Develop the KWS Club House into a High-end restaurant (Orpul Place)

The Club House is located on 3.4 acres that have been fenced to keep out wildlife. The Club House used to be the KWS Chief Executive Officer's house. It is currently used for corporate events and social functions. KWS proposes that the facility is operated by an investor who will redesign the premise to make the best use of the space including a high end boutique hotel with conference/board room, events grounds, and VIP lounge for VIP guests.

Action 1.3: Establish a canopy walk

One of the potential new activities that could be established at in the park is a canopy walk, especially if operated in collaboration with one of the tourist facilities. However, any development of any new adventure activity in the park needs to be regulated by clear guidelines, and the roles, responsibilities and liabilities of KWS and any private sector investors need to be clearly established from the outset. Thereafter, the development and operation of the canopy walk will be procured in line with the Public Procurement and Disposal Act.

Action 1.4: Facilitate alternative activities to traditional game-viewing

As discussed above, there is significant scope for the development of a wide variety of new and innovative visitor activities in the NNP and this forms the main thrust of this management objective. As part of efforts to diversify the experiences offered to visitors the existing and ongoing visitor activities will be revamped and new ones established. One of the potential new activities that will be introduced will be night game drives.

Action 1.5: Designate and establish new campsites

Special campsites provide opportunities for camping in a safe and exclusive location within a PA, a concept that appeals to many high-end mobile safari operators. With tourism already at high levels in many PAs, such opportunities are becoming increasingly difficult to find in Kenya, and the demand for this type of product is likely to increase during the lifespan of this plan. Under this management action, new public campsites and new special campsites will be established.

[33] The same standards maintained by NTC at the moment

Objective 2: NNP tourism product improved to enhance visitor experience

Nature-based tourism is becoming an increasingly sophisticated market, with a growing number of visitors favouring access to a diversity of complementary visitor experiences in a single destination. As such, a proactive approach to promoting tourism investment in the park over the lifespan of this management plan will be essential.

One way of reducing game drive encounters is to provide alternative attractions and activities that encourage visitors and driver/guides to get off the roads. An increased variety of visitor attractions, activities and amenities will also improve the overall quality of the tourism product, by providing high quality and appealing alternative attractions to wildlife viewing.

The park has a variety of natural and historical attractions e.g. gorge, wetlands and, ivory burning site that can be developed into tourism sinks. In addition visitor activities that can enhance tourism experience such as short walks and nature trails remain untapped**.** As such, this objective has been developed to bring about the desired future state where visitors to the NNP are enjoying a wide diversity of visitor attractions, activities and amenities in the park, and thereby benefiting from reduced vehicle encounters during game drives.

In order to achieve this objective, a number of management actions have been developed. These management actions are elaborated below.

Action 2.1: Remodel the NNP Main Gate

The gate remodelling will involve rehabilitation of the roof, visitors' rest rooms and waste management programs as well as door leaf.

The proposed activities and facilities will include:

- Reconfiguring the internal space for mixed-use.
- Interior layout plan for shopping/merchandise area.
- Creation of information area and materials.
- Park ticketing area.
- Mpesa/ATM booths.
- Coffee and snacks vending machines.
- Executive conference room for 20 pax.
- Visitor lounge and restrooms.
- Park management office space.
- Rehabilitation of the entire structure – plumbing, wiring, drainage, landscaping, roofing, replacement of external decks.
- Traffic management and visitor flow plan.
- New parking areas.

Action 2.2: Develop the Visitor Service Centre

Visitor orientation and the provision of sufficient information about the Park are inadequate to ensure well informed Park users and to disperse visitors to various attractions in the park. A visitor centre will be established for the following reasons: to assist visitors to understand and appreciate the principal environmental and cultural values of the Park opportunities; to expand a sense of responsibility among visitors on the need for maintaining the integrity of the Park through provision of information and illustrative exhibits; provide a common orientation to all Park users; effectively communicate important regulations and management messages through a variety of personal and technical media; and to provide appreciation and under-

standing of the NNP environment to all users irrespective of their physical capabilities, financial resources or cultural background. The visitor centre will essentially be a communication facility. It will be a public building where visitors will congregate to be briefed on the Park, its regulations, its special features, its role in the Park system, and how they can best enjoy and understand the dynamics of NNP. It will also serve as a depository for park information. It will be the first stop of tour vans and buses entering the Park.

The visitor centre will feature reconfiguring the internal space of Ranger's restaurant for mixed use to include an interior layout plan for shopping/merchandise area - gifts and necessities, information area, ticketing area, Mpesa booth, vending machines, rest rooms, coffee bar and visitor lounge. The visitors will walk through these facilities. It will also have new parking areas, traffic management and visitor flow-through as well as landscaping and signage. Figure 27 shows an artistic impression of the proposed visitor service centre.



Figure 27. Impression of the proposed visitor service centre

Action 2.3: Develop the Ivory burning memorial museum-Elephant graveyard

The ivory burning memorial is a solemn and historic site that Kenya has used as an icon to send a strong message to the world about its commitment to the conservation of endangered species as well as the fight against illegal international wildlife trade (Figure 28).

The proposed activities and facilities are:

- Connect to Nagolomon dam and Club House with landscaping elements.
- Ivory monument.
- second ivory burn site.
- Gift shop and merchandise
- Landscaped deck seating.
- Outdoor event site to celebrate themed events and performances, photo and art exhibition/gallery.
- Commemoration platform.
- Themed Restrooms.
- Several Digital signages.

- Waste disposal – the recycling story. Partner with taka taka solutions.
- Lighting.
- Bus park.
- Car park.
- Helipad.



Figure 28. Impression of the Ivory burning memorial

Action 2.4: Improve Simba Viewpoint (Impala Viewpoint)

Located next to Impala Observation point at the edge of the forest to the west of the park, this site offers excellent views of the plains and the associated wildlife (Figure 29). It is a premier event site with recreation amenities for families and corporations. It occupies the highest point with the best view of the Park and the city skyline. Current amenities are a shed, two benches, two sets of waste sorting bins and two pit latrines. Complete renovation and upgrading to meet changing visitor requirements is necessary.

Proposed activities and facilities are:

- Targeted at corporate and social groups
- Landscaped to allow setting up of marquee tents
- Booking in advance for a premium fee
- Restrooms
- A cooking area where hotels/event organisers can set up a bar and buffet.
- Raised wooden deck on the edge of the cliff overlooking the savannah vista
- Water storage tank
- Permanent water piping from nearest source (clubhouse or banda gate)
- The eatery, including “nyama choma” barbeque corner.
- Photo opportunity area
- Themed signage.



Figure 29. Impression of the Impala Viewpoint

Action 2.5: Upgrade Mokoyiet picnic site and viewing point

Mokoyiet picnic site and viewpoint overlooks the Mbagathi River and Kitengela plains (Figure 30). It offers an excellent view of the gorge and riverine vegetation. It has three resting sheds with three benches each, two sets of waste sorting bins, and two pit latrines. Located in the southern part of the park, this site has a breath-taking view of the gorge. However, the facilities at the site are dilapidated and the site requires total redevelopment. There is an opportunity to operate a portable container shop for small food items. Wood cladding should be used to camouflage the container. A suspended bridge can also be constructed over the gorge for which visitors can be charged.

Proposed activities and facilities are:

- Swinging bridge
- Themed restrooms
- Resting benches
- Garbage management
- Themed signages



Figure 30. Proposed development at Mokoyiet picnic site

Action 2.6: Upgrade and expand Hippo Pools Picnic Site, nature trail and Cultural Centre

The Hippo Pools trail starts at the Hippo pools picnic site and ends at the Hippo pools bridge which provides access across Mbagathi River to the Community Curio Centre**.** The picnic site has ample vehicle parking space for visitors. Amenities are currently a grass thatched resting shed, five benches (two located in the open), four flush toilets and two sets of waste sorting bins. The site is popular with visitors and thus requires complete renovations and additional amenities. On the other hand, the nature trail is currently overgrown with vegetation and needs clearing for safe use.

Hippo pools nature trail is an essential link between the park and the local communities. It not only encourages a deeper connection between the visitors and the local communities but also promotes environmental protection, cultural conservation, social responsibility, and the enhancement of livelihoods.

The improvement of facilities at the Hippo pools nature trail will go beyond the park to the community and will include the construction of curio stalls and an amphitheatre to enable visitors to receive authentic cultural experiences and learn more about wildlife and cultural conservation.

Proposed activities and facilities include:

- A boardwalk along the banks of the river
- Shade for curio sellers
- Rehabilitation of bridge
- Water storage – 10,000 litres
- Themed modular restrooms
- Landscaping
- Gazebos
- Waste disposal
- Themed Signage

Action 2.7: Upgrade Kingfisher Picnic Site

Located in the South western part of the park the picnic site has *acacia* trees, which enhance its aesthetic value and provide shade; it is popular with domestic visitors (Figure 31). Two latrines are required to cater for visitors during special functions. The current facilities are poorly constructed and maintained.

Proposed activities and facilities include:

- Divided into two separate areas
- Two Kitchen sheds
- Themed upgraded restrooms
- Resting benches
- Five gazebos



Figure 31. Impression of development at Kingfisher Camping Site

Action 2.8: Develop Dam site viewpoints (Nagolomon, Athi Basin, Hyena)

Currently, no visitor facilities have been developed at the three major dams in the park. To enhance visitor experience, the following facilities will be provided at each of the dams (Figure 32).

Proposed activities and facilities

- Nagolomon dam – a boardwalk on the wetland, a raised platform that circles the front side along the forest, with seats
- Photo opportunity
- Viewing deck
- Parking area

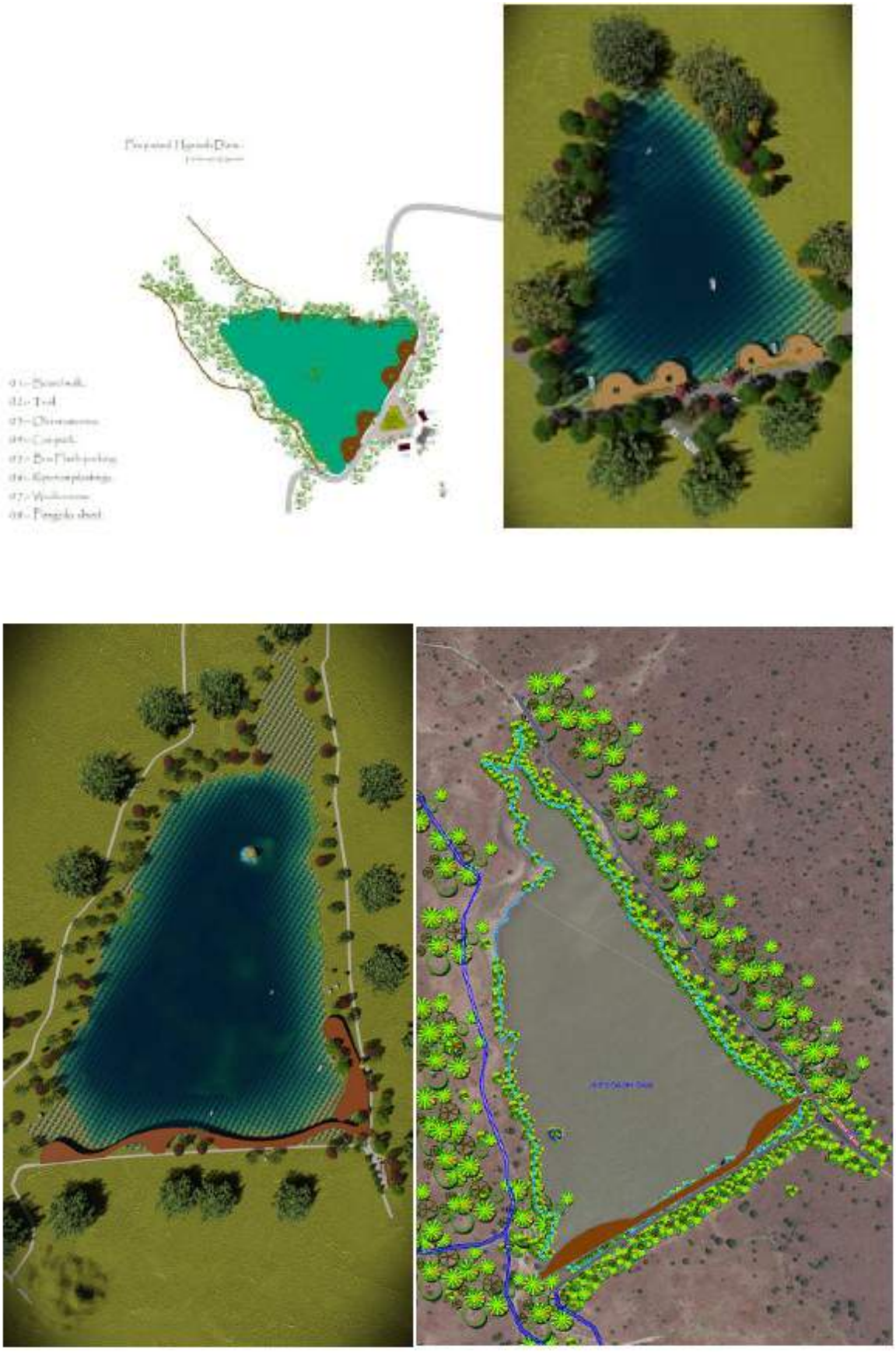


Figure 32. Impression of development at Athi basin dam

Action 2.9: Upgrade Signage and interpretation

The existing directional signage is less informative as it lacks interpretive information. To facilitate visitor movement and add interest to the NNP's resource values, the signposts will be re-constructed, and where appropriate, information on distance to destination and other relevant interpretive information will be included. Themed signages will be erected at strategic locations for information and visitor guiding. The signages will be attractive, easy to maintain, simple, and contemporary.

Action 2.10: Upgrade visitor facilities at park entry gates

A major challenge facing the NNP is having to host many visitors when it lacks enough and standard washrooms and sanitation facilities. This is a headache to the management, which has to bear with confusion and unhappy visitors, but also constraints on visitor experience as many people are put off by the lack of standard washrooms. The foremost action under this management action is the development of modern sanitation and washroom facilities at all the gates.

In addition, at the gates (East Gate, Langata Gate, and Maasai gate) emphasis will also be on seamless customer service and comfort.

Proposed activities and facilities at the entry gates include:

- Rehabilitation and upgrade of existing gates
- Rehabilitation and upgrade of existing restrooms
- Landscaping
- Themed signage – at the gate and approach areas, e.g. highways and junctions
- Visitor service centre
- Engage KURA about access into Langata Road

Proposed improvements at the entry into the KWS HQ compound include:

- Entry and exit areas
- Pedestrian walkway
- Sentry and security checks
- Lighting and attractive branding

Action 2.11: Develop cultural tourism programmes with the local community

There is great potential for cultural tourism which needs to be opened in conjunction with local communities at Naretunoi Community Conservancy by developing cultural tourism packages and linking them with reserve visits so that they are marketed together. The community can be assisted in developing and operating the Hippo Point Curio but also in establishing an authentic Masai Cultural Manyatta that educate visitors on the Masai culture. In addition, the community can be encouraged to initiate an annual cultural event that will be commemorated annually in the Naretunoi Community Conservancy.

Objective 3: NNP is marketed locally and internationally

Action 3.1: Modernise marketing methods

Even when marketing is done, the destination tends to rely mostly on traditional marketing tools like brochures, which are exceedingly overtaken by technology and consumer trends. There is therefore need to modernize the marketing activities by developing a modern website with information on location, geography, wildlife and scenery attractions, among others. This will be complemented by modern marketing tools like social media, which can update potential visitors and general readers on regular activities like sightings of animals, and important functions among others.

Action 3.2: Re-introduce a tour bus and additional VIP tour vehicle

Sponsored park tours for the residents of Nairobi are an effective tool to increase awareness on natural resources found in NNP. There are Nairobi residents who would like to enjoy the park's resources but they cannot do so as they cannot afford to hire vehicles to take them to the park. In an effort to increase conservation awareness and bring about positive community attitudes towards wildlife conservation among the residents, KWS will re-introduce a tour bus at subsidized rates. The aim of this action will be to generate interest and appreciation of the park among the local community and as a result, win public support for wildlife conservation. Further, there are members of the local community and tourists who can afford to hire the VIP tour vehicle. It has been noted that the demand for this service is high and thus there is need to invest in an additional VIP tour vehicle. Hence, under this management action, an additional VIP tour vehicle will be procured.

Action 3.3: Organize marketing events

It is important to organize marketing events that draw many customers while also giving publicity to the park. For instance, in 2021 the park will be 75 years old and this will be an opportune time to celebrate 75 years of its existence. Such a commemorative event can attract interest from many participants and enhance chances of success. It will also help if it is tied to a humanitarian cause where part of the proceeds goes towards supporting communities that are supportive of the park.

Action 3.4: Prepare and disseminate marketing materials e.g. brochures, maps, guide book, stickers and merchandise

Marketing is constrained by lack of tangible materials that the park management can use to attract potential visitors and also ones that can be used by tourism partners like tour operators who refer to materials in their offices when discussing safari options with clients. Having marketing materials disseminated in the industry will greatly increase the park's publicity and most likely lead to increased visitation.

Moreover, if visitation and use of the entire NNP is to be encouraged, an updated tourist map covering the park and adjacent areas of interest needs to be produced and disseminated. Further, to help improve the overall NNP visitor experience, an updated high-quality guidebook will need to be created for NNP. This guidebook will provide visitors with information on the area's attractions and natural history.

Action 3.5: Promote the NNP through the mass media and organising and participating in both local and international exhibitions

The mass media (radio, television and the press) plays an important role in conveying conservation education messages to the community. Special radio and TV programmes on NNP's values and attractions will therefore be designed and aired. Efforts will also be made to prepare articles on the NNP and publish them in the local dailies. It is expected that this strategy will increase the variety of audiences that are educated on conservation issues in NNP, and further enhance appreciation of the area.

In addition, NNP will participate in local as well as international events such as the World Environment Day, World Wetlands Day, Nairobi Trade Fair, and mall activations, among others. During these events, the public will be enlightened on the unique NNP's natural resources, and issues and challenges facing their conservation.

Action 3.7: Improve park interpretation

Interpretation involves providing information to visitors to enhance their level of expectation and satisfaction. Interpretation of the park will be done using the following: interpretive displays; nature trail and trail side signs; trail leaflets and maps. These displays will be placed at the following points Hippo Pools Nature Trail. In addition, ranger guided or volunteer guided services will be provided where necessary.

Action 3.8: Work with JKIA and other relevant stakeholders to develop a day package for visitors in transit and other stakeholders

NNP has not tapped the transit visitor tourism market that is available at JKIA. Under this management action, KWS will work with tour operators to tap into this market. Towards this, there will be need to ensure that the visitor gets to the park, have a game drive and return to JKIA in the shortest time possible. As such, there will be need to open a gate and access road from Namanga road to the south-eastern part of the park which is ideal for wildlife viewing. Access from the southern direction helps the visitors to avoid traffic jams along Mombasa road.

Further, to market NNP among visitors from JKIA to the city, marketing billboards will be installed at JKIA and along Mombasa-City road.

Action 3.9: Sell Park branded merchandise

Kifaru shop is an up-market gift shop situated at the Nairobi National Park main gate and was established in 1998. The shop stocks KWS branded merchandise that is of interest to tourists, such as caps, t-shirts, maps, brochures and souvenirs. The shop will also be stocked with NNP branded merchandise to cater for customers who would like to have souvenirs from NNP.

Action 3.10: Nominate NNP to join the United Nations World Tourism Organization (UNWTO) International Network of Sustainable Tourism Observatories (INSTO)

The Ministry of Tourism and Wildlife, Jaramogi Oginga Odinga University of Science and Technology (JOOUST) and KWS are working with United Nations World Tourism Organization (UNWTO) to have NNP join the International Network of Sustainable Tourism Observatories (INSTO). INSTO strives to support and connect destinations that are committed to regular monitoring of the economic, environmental and social impacts of tourism, to unlock the power of evidence-based decision making at destination level, fostering sustainable tourism practices locally and globally. As a first step towards joining INSTO, a stakeholders' workshop bringing together key government and non government agencies in the tourism sector was held in Nairobi in October 2019. The workshop discussed and agreed that the vision of the proposed NNP observatory is to *"Nurture a dynamic network of partners that strive together towards creating a healthy NNP for tourists and the host communities, leaving it as a resilient destination for future generations"*[34]. The specific objectives to be achieved by the proposed observatory are: to conserve Nairobi National Park while adapting to new pressures and solving problems that are already in existence; to gather data to make an inclusive, evidence-based approach indispensable for sustainable and resilient tourism development; and to foster responsible tourism management.

The nine INSTO mandatory areas to be monitored are:

1. Tourism Seasonality
2. Employment
3. Destination Economic Benefits
4. Governance
5. Local Satisfaction with Tourism
6. Energy Management
7. Water Management
8. Waste Water (Sewage) Management
9. Solid Waste Management

In addition the NNP observatory will also monitor

10. Biodiversity – flora and fauna, land degradation
11. Park Encroachment – by excisions, infrastructure (roads and railways)

Monitoring will be done through five thematic working groups namely: Biodiversity, Park Planning, Environment, Human Ecology, and Tourism and Economics. The groups will be headed by qualified University Professors from our local Universities on an ad hoc basis. Their responsibility will be to gather all the relevant monitoring issues within a specific thematic area. The thematic working groups will meet on a quarterly basis. A Secretariat for the observatory led by the Centre Director will be established within NNP with the main responsibility of coordinating thematic working groups. The director's work will be to manage the centre generally and in particular to compile all the monitoring reports from thematic working groups for onward submission to UNWTO. The director will also report and discuss thematic working group reports with the NNP Observatory local working group/committee before they are submitted to UNWTO. The Centre Director will also convene annual stakeholders' meetings and quarterly meetings for the thematic working groups.

[34] Report Of The First Stakeholders Workshop For The Admission Of Nairobi National Park Into The UNWTO-International Network Of Sustainable Tourism Observatories (INSTO), held on 15th October, 2019 at Nairobi National Park Safari Walk Conference Hall.

Objective 4: NNP tourism management improved

Through the actions implemented under the previous three objectives, it is anticipated that visitor numbers, tourism infrastructure, and visitor activities in the NNP will greatly increase and diversify during the 10-year lifespan of this plan. If the NNP Management is to meet KWS' obligations to tourism investors and operators, and ensure that the quality of the overall NNP visitor experience is maintained and tourism investment encouraged, the anticipated increases in the scale and complexity of tourism in the area need to be complemented by strengthening and enhancing of NNP tourism management capacity and systems. Without appropriate and concomitant improvements in the management of tourism in the NNP, the long-term and sustained achievement of this programme's management objectives will be seriously undermined.

Objective 4 therefore focuses on ensuring that tourism management in the NNP is strengthened, and that NNP managers have the capacity and supportive administration systems to meet their obligations to tourism industry partners and to bring about the achievement of this programme's management objectives. The management actions that have been developed under this objective are outlined in the following sections.

Action 4.1: Strengthen NNP tourism human resource capacity

The implementation of the management actions set out in this programme will require dedicated human resources at the NNP who will take responsibility for ensuring their implementation. The scope of work set out in this management programme is significant, and if the management objectives are to be achieved, the recruitment or reassignment of additional staff to the NNP tourism department needs immediate attention. Once in place, NNP tourism department staff will periodically assess human resource needs as the implementation of the Tourism Development and Management Programme rolls out, and tourism use and activities in the NNP increase.

Action 4.2: Hold regular meetings with NNP tourism investors and operators

Tourism investors and operators are major stakeholders in the NNP, and their concerns and advice need to be regularly sought and considered in order to realise the Park's tourism potential, and to successfully implement a large number of the management actions contained in this programme. This group of stakeholders is also best placed to advise NNP management on the key issues that may be impacting current tourism activities and operations in the NNP, or that may be discouraging the development of new activities and investments. As such, an NNP Tourism Management Committee will be established to improve communication and collaboration between NNP managers and private sector investors. This committee will consist of members from the NNP Management and representatives from tourism industry stakeholders that will be operating in the NNP, such as KATO and KTF.

Action 4.3: Create more environmental awareness during visitor briefings on infringement of park rules

To minimize pollution in the park, NNP management will create more environmental awareness during visitor briefings. In particular, they will be made aware of the government's ban on the use of plastic bottles, straws and related products within all protected areas that was gazetted on 5th June 2019. Visitors will be requested to leave all banned plastic products at the entry gates. In addition, litter bins will be provided at strategic locations and visitors sensitized on their importance and use.

Several accidents that are attributable to over- speeding have occurred in the park in the past. Speed warning signs will be improved and new ones installed where necessary. Patrols will also be intensified to curb this problem.

Visitors have been observed crowding animals or feeding them. These actions stress the animals and lead to change in animal behaviour that can eventually be dangerous to visitors. Information will be provided to visitors in pamphlets and on signposts warning them on these potentially dangerous actions. Conservation education campaigns will be conducted, targeting tour drivers and tourists. Support from tour drivers will also be sought to help discourage visitors from feeding animals.

Community Partnership & Conservation Education Programme

Programme Purpose and Strategy

The purpose of the Community Partnership and Conservation Education Programme is:

> To enhance the support and participation of NNP adjacent communities in wildlife conservation

The key strategic principles, which will guide the implementation of the Community Partnership and Conservation Education Programme over the next 10 years and the achievement of the programme purpose, are set out below.

Guiding Principles

In implementing the NNP's Community Partnership and Conservation Education Programme, NNP Management will strive to ensure that:

Communities can express their concerns, ideas and opinions

Effective communication between PA-managers and local communities is essential to enable both parties to raise common problems and work towards achieving shared goals. Without such two-way communication, it will be difficult to ensure community support for conservation, as minor issues are more likely to escalate into serious problems, and NNP management activities may not be optimally targeted towards community needs. As such, activities under this programme will aim to further develop and strengthen NNP management communication and collaboration mechanisms with local communities.

The NNP is having a positive impact on the lives of adjacent communities

NNP-adjacent communities bear the costs of wildlife conservation through tolerating human-wildlife conflicts. If these costs are not offset, community support necessary for the continued survival of the NNP will not be sustainable. As such, activities under this programme will aim to mitigate the costs of wildlife conservation incurred by the adjacent communities, and increase the direct benefits communities receive from the NNP.

Communities and other stakeholders are aware of the NNP's values and importance

One of the core functions of KWS is to provide wildlife education and raise awareness of protected area values in order to improve support for wildlife conservation. As such, activities under this programme will improve the scope, content and structure of NNP conservation education programmes, and focus partnership activities in community areas where support for conservation is poor, or where there are critical conservation issues that need to be addressed.

Communities have the capacity to manage land and natural resources sustainably

Increasing pressures on land and other natural resources outside the NNP threaten to undermine both the ecology of the NNP, and the long-term sustainability of community livelihoods. As such, activities under this programme will aim to mitigate the negative impacts of unsustainable natural resource use on PA biodiversity and community wellbeing, by improving the capacity of communities to sustainably manage land and natural resource uses.

There is collaboration between Park managers and other stakeholders in strengthening Community Based Natural Resource Management

Many of the threats to the ecology and natural resources on some of the NNP conservation targets stem from outside the park. The scale and intensity of these impacts particularly water pollution and land use conversion, is increasing and, although outside the direct mandate of KWS, these issues cannot be left unaddressed. As such, and in line with Objective 3 of the KWS Strategic Plan 2019-2024 "*strengthen relationships with stakeholders and partners*", activities under this programme will pursue partnerships and collaborations with other institutions and organisations to address issues of mutual concern outside NNP.

These strategic principles are intended to guide the development and implementation of the four management objectives that have been identified by stakeholders to achieve the Programme Purpose. These objectives are:

MO 1. Conservation education and awareness programme strengthened
MO 2. Conservation-compatible community land uses and practises promoted
MO 3. Human-wildlife conflict reduced
MO 4. Opportunities for communities to benefit from the NNP improved

The following sections describe these management objectives and provide an outline of the management actions needed to achieve them.

Management Objectives and Actions

Objective 1: Conservation education and awareness programme strengthened

To win more space for wildlife, the KWS Strategic Plan 2019-2024, prescribes "*strengthening engagement with community conservancies, conservation education and awareness, extension services and capacity building".* In the NNP, the majority of educational and awareness-raising activities make use of the well-equipped Nairobi Education Centre, the Animal Orphanage and the Nairobi Safari Walk to disseminate conservation information. Currently, conservation education awareness programme is involved in the following activities:

- Giving environmental lectures and video shows to visitors at the Nairobi Education Centre
- Providing guided tours and talks to organised educational groups visiting the NNP

- Awareness-raising activities through barazas, public talks and wildlife video shows at local schools

Under this objective, the above activities will be enhanced through implementation of the following actions.

Action 1.1: Create awareness on NNP's values among organised school groups

The overall number of students visiting the NNP is high. However, there is no strategy to engage these school groups and create awareness on the values of the NNP. As such, under this management action, NNP management will develop a clear strategy on how the diverse student groups can be educated on the parks resources and values. In this regard the park will use the services of volunteers, interns, and students on attachment to give open air conservation talks to organised school groups.

Action 1.2: Prepare educational materials targeting different age groups

There is a constant need to keep educational materials up-to-date to reflect the changing circumstances in the NNP, interests of the visitors, and the resources and media available. This is especially important as the numbers and variety of students visiting the NNP is always increasing.

In order to create awareness on the NNP's biodiversity and gain support for the NNP from the local and national public, under this management action, the education programme will be revamped and deliberately re-designed to target different age groups. Educational materials will be prepared and disseminated for understanding by different age groups.

Action 1.3: Establish sponsored protected area tours for Kenyans

Sponsored park tours for Kenyans are an effective tool to increase awareness on natural resources found in a protected area. Most Kenyans, because of poverty or lack of means, do not appreciate conservation, as they are unable to visit the parks and hence are not familiar with the biodiversity therein. In an effort to increase conservation awareness and bring about positive community attitudes towards wildlife conservation, KWS will initiate sponsored tours for organised groups. The aim of this action will be to generate interest and appreciation of the park among the Kenyans and as a result, win public support for wildlife conservation in the NNP.

Action 1.4: Support WCK's education activities

The Wildlife Clubs of Kenya (WCK) is an organisation that works closely with KWS in educating school children on the importance of wildlife conservation. WCK's activities include trips to parks, a regular Club magazine, annual art and essay competitions, visits from the Mobile Education Unit, and many more.

In order to create a generation of Kenyans who want to preserve wildlife for its own sake and not exclusively for economic benefits, positive, wildlife-related experiences such as park visits are a top priority. Reinforcement through training of teachers and integration with school curricula are essential, as are materials and projects which lend depth to experiential learning.

To strengthen the relationship between the NNP management and the WCK office, KWS through this action will support WCK's wildlife education activities such as organising conservation rallies, seminars and workshops for teachers and students. In addition, KWS will collaborate with WCK in organising park visits for community members and school groups.

Action 1.5: Enhance the community outreach programme

Outreach programmes will be developed to target specific groups. They will target groups at Kitengela triangle, institutions (schools and hotels) within Nairobi City, and slums around the park. These programmes will be aimed at educating the community on the role of wildlife in Kenya's economy, the importance of wildlife, dangers of polluting the environment, the need to live in a clean environment, and various wildlife species and their importance. Video shows, posters, and educational tours will be used to expose these special groups to the importance of the park.

In addition, special programs to highlight specific park issues will be developed. These programs will aim to educate the public on human-wildlife conflicts, invasive species, bush-meat, and special species. The KWS website, as well as the print and electronic media will be used to relay the information.

Awareness campaigns about specific issues concerning the park will be undertaken. Such issues include pollution by industries and institutions, bush meat trade, encroachment and solid waste disposal.

Objective 2: Conservation-compatible land uses and practises in the buffer and community zones promoted

The vast majority of NNP-adjacent communities to the south eastern part of the park are pastoralists who directly depend on livestock for their livelihoods. The population of these communities has rapidly grown over recent years, and the corresponding increases in the intensity and scope of their livelihood activities is increasingly constricting NNP's wildlife dispersal areas.

The NNP Ecological Management Programme uses a logical and iterative methodology for prioritising the key ecological features that NNP management will focus on (the NNP "***conservation targets***", examples of which can be seen in Table 13 below), and for identifying and ranking the threats to these targets. As shown in the table below, many of the threats identified result from community activities in areas outside the NNP, but nevertheless significantly impact on the NNP's wildlife populations.

Table 13. Community-based activities impacting on NNP conservation targets

Conservation Target	Community-based threats	Ranking
River systems and wetlands	Abstraction of water for irrigation and domestic uses	**Very High**
	Conversion of riparian habitat to agriculture	**Very High**
	Water pollution	**Very High**
Migratory species and Masai Giraffe	Fencing	**Very High**
	Quarrying	**Medium**
	Land conversion from grazing to residential use	**Very High**
	Poaching	**Very High**
Wooded grass-land and open grassland	Wild fires (mainly started by adjacent communities)	**High**
	Illegal livestock grazing	**Low**
Large Carnivores	Potential retaliatory killing due to livestock predation	**Very High**

Many of the threats listed above are already, or have the serious potential to, impact on the ecology and biodiversity of the NNP. Although KWS may not have the mandate or the resources to deal with all these issues, the other major partners in the NNP, Kajiado and Machakos County Governments, do have a broader mandate with regard to these issues, and there is also the possibility for the NNP management to establish collaborations with other relevant institutions and thereby leverage additional resources and expertise.

The desired future state is one where land uses that are both sustainable and compatible with conservation are practised in community areas adjacent to the NNP. The actions that have been designed to achieve this state are elaborated in the following sections.

Action 2.1: Support establishment of community wildlife conservancies

In order to preserve the remaining wildlife dispersal areas, tap the tourism potential, mitigate impacts of livestock incursion in NNP and Human Wildlife Conflict, the NNP management supported Naretunoi Community Conservancy (Figure 33) formation process by conducting a feasibility study for the conservancy in 2016. Based on the recommendations of this study, the conservancy was registered by both KWS and Kenya Wildlife Conservancies Association (KWCA).

Thus to ensure that the conservancy is functional and achieves the objectives for which it was established (wildlife tourism and livestock production), KWS will collaborate with the Conservancy in establishing cultural tourism products, capacity building for its Conservancy Board in conservancy administration and governance, and paramilitary training for community scouts. In addition, the conservancy will be assisted in developing a comprehensive Conservancy Management Plan[35] as required by the Wildlife Conservation and Management Act, 2013.

The Conservancy Concept will be the mechanism that KWS will use to engage the community in community conservation as well as to address human wildlife conflict issues in the Conservancy and beyond. Land owners south of Naretunoi Community Conservancy who decide to consolidate their land parcels to form viable conservancies will be encouraged to do so in accordance with the provisions of the WCMA, 2013.

[35] The Conservancy has Management Plan that needs to meet the requirements of the WCMA. 2013

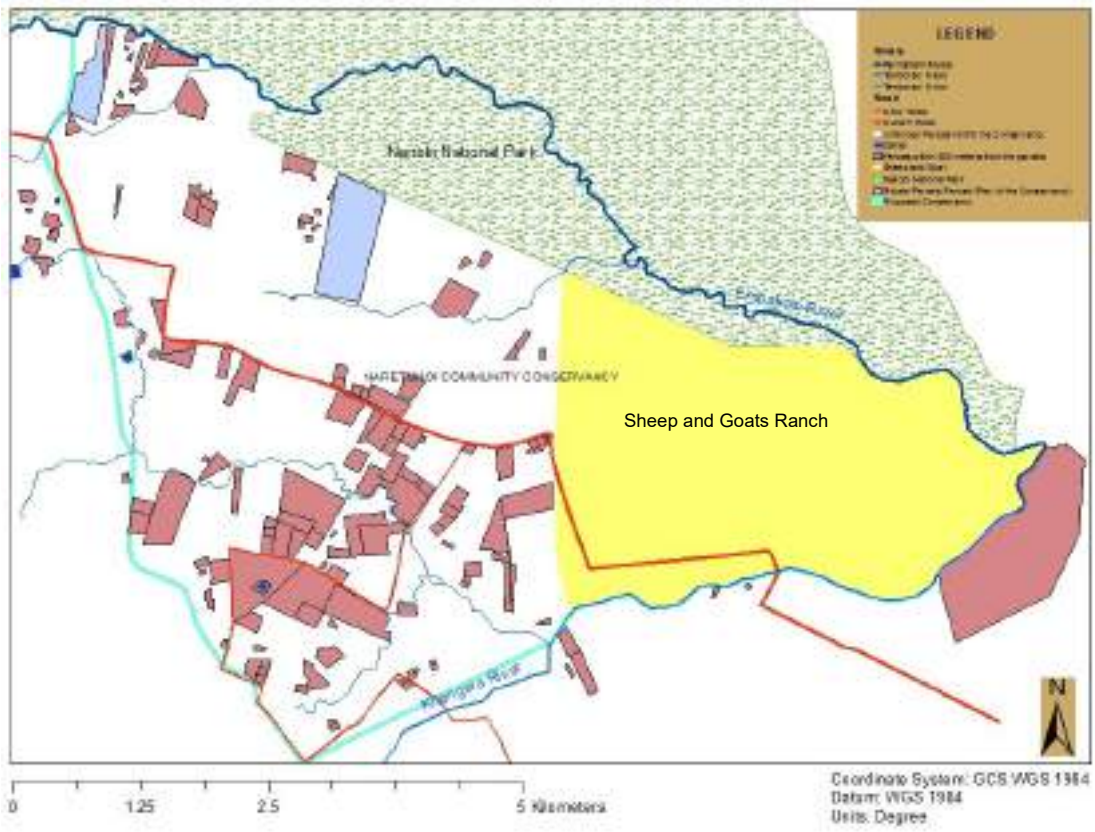


Figure 33. Naretunoi Community Conservancy[36]

NB:

1. Fences within 500m from unfenced conservancy parcels are shaded **brown**;
2. Private parcels are shaded **blue**
3. Unfenced parcels in the conservancy are shaded **white**

Action 2.2: Support development of a conservancy livestock grazing plan

According to the Naretunoi Community Conservancy Management Plan[37], the conservancy lacks a coordinated livestock grazing plan. Therefore livestock grazing pastures are subject to 'the tragedy of the commons'[38] despite the fact that the land is under private ownership. Lack of a coordinated grazing plan leads to overgrazing and degradation of livestock pastures. Thus, under this management action, NNP management will support the conservancy in developing a livestock grazing plan. Towards this, a livestock and wildlife census will be carried out in the conservancy to determine the number and species of animals in the conservancy. To determine the number of livestock, each conservancy member will be required to disclose the number and type of livestock they own. Wildlife counts will be carried out through road counts. Once the number of animals grazing in the conservancy has been determined, the conservancy's livestock carrying capacity will be set and implemented through livestock grazing bylaws agreed by all conservancy members. Monthly livestock census will also be carried out to ensure that conservancy members adhere to the set livestock stocking limits.

[36] Bitok, E et al. 2016. An Assessment Report for Proposed Naretunoi Community Conservancy in Machakos County –Mavoko Municipality
[37] Naretunoi Community Conservancy Management Plan, 2019
[38] Hardin, G. 1968. The Tragedy of the Commons. Http:/www.jstor.org/stable/1724745

Action 2.3: Train community scouts in relevant skills

Local communities living near the park are responsible for some level of poaching both along the park boundary and outside the Park. This poaching is mainly for subsistence purposes. However, there are cases of rising commercial bush meat trade for the Nairobi market. To minimise poaching outside the park, KWS will support conservancies by giving their scouts paramilitary training as well as incorporating them in the wildlife intelligence gathering network.

Action 2.4: Support wildlife related community enterprise projects

One way of winning support for conservation in dispersal areas is by supporting the establishment of conservation related income generating projects. There are sites in the Naretunoi Community Conservancy where tourism enterprises such as cultural villages and home stays can be established and promoted.

The NNP management will collaborate with other interested stakeholders and partners in the process of establishing tourist activities (i.e. cultural manyattas and curios). However, before the enterprise development projects take off, Environmental and Social Impact Assessment (EIA) studies will be carried out.

Action 2.5: Support formation of Water Resource Users Associations for management of the section of Mbagathi River in NNP

Mbagathi River enters the park when it is extremely polluted by plastics and sewage from Ongata Rongai. There is need for stakeholders along the southern park boundary to come together to improve the water quality of the river to make it safe for livestock and wildlife. Hence, under this management action, KWS will support formation of a Water Resource Users Association comprising of KWS, buffer zone residents, Naretunoi Community Conservancy and the Sheep and Goats Ranch. The functions of the WRUAs include addressing water pollution and resolving water use conflicts. KWS will support formation of the associations, in particular by co-funding meetings that will be organised during the community mobilisation stage. This action will be implemented in conjunction with Action 3.2 of the Ecological Management Programme, which has been developed to achieve the same aims.

Action 2.6: Work with the County Governments of Kajiado and Machakos in maintaining wildlife dispersal areas

The County Government of Kajiado has zoned the dispersal area as an agricultural area as well as an eco-tourism zone. The Sheep and Goats Ranch and part of Naretunoi Conservancy are in Machakos County thus the county government regulates land use and land subdivision in this area. As such, KWS will work with the two county governments to ensure that areas set aside as conservancies are not fragmented and that the Sheep and Goats Ranch continues to be a valued dispersal area for wildlife.

Objective 3: Human-wildlife conflict reduced

Human-wildlife conflict (HWC) around the NNP, particularly south of the park, is a serious issue, and takes on a variety of forms relating to the different land-uses practised in the area. The conflicts can be categorised into the following main types of conflict: human injury or loss of life and livestock attacks/predation.

Livestock attacks and predation by wildlife are the most frequently reported HWC in the pastoral areas to the south east of the Park. Sheep and cattle are the most commonly affected livestock, and most attacks are carried out by carnivores (commonly lions, leopards, and hyenas). Communities in these areas have also raised the problem of disease transmission from wildlife to cattle given that wildebeests have recently been calving at the Sheet and Goats Ranch. Diseases that are transmitted to livestock include East Coast Fever and Foot-and-Mouth Disease.

Attacks on humans by a variety of wildlife also occur around the NNP. The main perpetrators include lions, buffaloes and hippo. Although attacks by wildlife occur in all areas surrounding the NNP, they mainly occur in the unfenced southern part of the park.

The future desired state at the NNP is where human-wildlife conflict (HWC) around the NNP, in particular livestock attacks/predation and human injury or loss of life, are minimised in order to improve NNP-community relations. The actions that have been designed to achieve this objective are elaborated below.

Action 3.1: Construct and maintain a wildlife fence to protect people and their property

As mentioned elsewhere, only the southern border of the NNP is not fenced as a method of reducing HWC. The north eastern and western borders are fenced as they border heavily settled areas. In the past, the southern border was largely open and wildlife could move freely but in recent times this dispersal area has been sold and subdivided into small plots that are in turn fenced, thus restricting wildlife movement. In order to reduce the impact of wildlife threat to human life as well as livestock predation, a predator proof fence will be constructed to separate residential areas from wildlife. Land owners whose land uses are compatible with conservation, and are willing to be fenced together with the park, will be fenced in.

Consultations with land owners south of the park is in progress to determine the best fence alignment. In addition, a GIS mapping exercise is being conducted to generate information that will inform the fence alignment upstream of the Naretunoi Community Conservancy. For the fence to be successful, continuous maintenance of the fence will be important to prevent damage causing animals invading neighbouring areas where land use is incompatible with wildlife conservation. The other options available to KWS include shooting animals that are a threat to people and their property like the lion that has killed a person and a buffaloes that threaten people daily around Tuala area. However, shooting of animals such as lions has in the past[39] attracted significant media attention and public condemnation denting KWS' image. Other options[40] that have been suggested by the community are given in table 14.

Table 14. Suggested measures to solve the human-lion conflict in NNP by the people living in the livestock ranging area

Measures to be taken to resolve human-lion conflicts in NNP	Number of times mentioned
Flashlight	24
Compensation	21
Keep lions in park	11
Prompt response by KWS	7
Stop construction in NNP	6
Proper fencing of bomas	4
Cooperation between community and	3

[39] For instance the shooting of the lion named "Mohawk" in 2016

[40] Gatta M., 2016. Population structure, home ranges and movement of Nairobi National Park lions *(Panthera leo melanochaita*) in relation to livestock depredation. https://www.researchgate.net/publication/309672843

Measures to be taken to resolve human-lion conflicts in NNP	Number of times mentioned
KWS	
Keep prey in park	2
Herding	2
Watch cattle at night	2
KWS patrol at night the community land	2
Translocation of problem animals	2
KWS monitor lions	2
Reduce lion numbers in NNP	1
Monitor collared lions and bring them back to NNP	1
Train people from the community and let them monitor lions	1
Feed lions if hungry	1

Action 3.2: Maintain the human-wildlife conflict database and identify HWC hotspots

A well organised database can be a valuable source of information to support planning and decision making. A significant amount of HWC data is available at the NNP, but it is not organised and stored in a format that can facilitate quick analysis to discern nature, extent, spatial distribution and trends of the conflicts. The data is stored in flat databases (Ms excel) limiting analysis and linkage with other databases. To correct this and facilitate monitoring of HWC cases, a computerised HWC relational database will be designed and implemented and, to ensure that the database is functional, NNP Community staff will be trained on aspects of database maintenance. In addition, to ensure that KWS acts promptly to HWC cases, HWC hotspots will be identified through a participatory process involving thorough analysis of HWC data, and extensive consultations with the affected local communities. The identification of HWC hotspots will inform the selection of priority areas for constructing wildlife barriers (Action 3.1), the establishment of HWC communication facilities (Action 3.3), and the establishment of HWC outposts (Action 3.4).

Action 3.3: Establish an effective communication network to facilitate prompt reporting of human-wildlife conflict incidents

One reason for the poor relations between local communities and NNP management is undue delay in responding to human-wildlife conflicts incidents. This could be due to lack of an effective communication mechanism to enable the affected community to report problem animal incidents in time. Therefore, to ensure that incidents are reported to NNP management rapidly, the communities living in areas prone to HWC, such as the conservancies will be provided with telecommunication radios that are linked to the KWS radio communication network. Also, the NNP Community Partnership & Conservation Education Programme will establish a HWC mobile telephone hotline to further boost the mechanisms of reporting HWC incidents.

Action 3.4: Establish problem animal control (PAC) outposts

Certain areas, due to their location on wildlife migratory routes, experience very frequent HWCs (especially from lions and buffaloes), warranting constant attention. A good example of this is the Empakasi area and Tuala, where most lion and buffalo are a threat to human life. Whereas the problem of lions and buffaloes wandering into residential areas around Tuala will be addressed by installing a predator proof fence, it might take longer to address

livestock predation issues at Empakasi area. As such, under this management action, a PAC outpost will be established in this area as we await the eventual fencing of the conservancy.

Action 3.5: Provide problem animal control equipment to the community scouts

A variety of wildlife species use the Naretunoi Conservancy. Grant's and Thomson's gazelles, wildebeests, lions and zebras are the most common wildlife that cause conflicts in the conservancy. Conflicts include livestock predation, destruction of crops, transmission of diseases, and competition for pastures. Lion, hyena, leopard, cheetah and Jackal are ranked in that order as the most common predators while wildebeest, zebra and buffalo as the common competitors for pasture, water, and source of diseases as well as crop destruction[41].

To partly address the above problems, community scouts from Naretunoi Conservancy will be well equipped to address HWC cases in the conservancy and beyond. These scouts will be trained on use of thunder flashes to scare wildlife such as buffaloes and installation of lion lights to scare lions.

Action 3.6: Identify and recommend gazettement of honorary wardens

The Wildlife Act provides for the appointment of honorary wardens to further strengthen wildlife conservation and management, especially outside the protected area network. Such a warden exercises the same powers as a KWS warden and therefore can be used to carry out problem animal management activities. In order to further boost HWC response measures in the NNP's dispersal areas, NNP management will identify from among the local community, persons of integrity who have a passion for conservation and recommend them to the KWS Director General for gazettement as honorary wardens.

Action 3.7: Create awareness on the wildlife compensation process among the local community

The Community Wildlife Conservation Committee facilitates the processing of compensation claims; however, the process is lengthy and requires a number of reports from different authorities (e.g. police, Ministry of Health and local administration) before it can be approved. There is need to create awareness on the compensation process among the local community so that the community is able to follow the laid out compensation protocol leading to successful awards.

Action 3.8: Train the local community on construction of predator proof Bomas

As mentioned under Action 3.5 above, lion, hyena, leopard, cheetah and Jackal are ranked in that order as the most common predators. Livestock predation at times leads to retaliatory attacks on predators.

To minimize livestock predation, effort will be made to prevent predators from attacking livestock especially at night. Thus, KWS will support construction of predator proof Bomas which have proven effective in protecting livestock in other ecosystems e.g. Amboseli and Mara ecosystems. Members of the Naretunoi Community Conservancy will be trained in construction of predator proof Bomas. Towards this, KWS will construct a few model predator

[41] Bitok, E et al. 2016. An Assessment Report for Proposed Naretunoi Community Conservancy in Machakos County –Mavoko Municipality

proof Bomas in the home range of NNP predators to demonstrate the effectiveness of these Bomas. Once trained, community members will be expected to construct such Bomas.

In addition, several lions have been collared to monitor their movement. Thus in case collared lions wander close to human settlements, rangers can be deployed to pre-empt interaction or conflict with humans and livestock.

Objective 4: Opportunities for local communities to benefit from the NNP enhanced

The desired future state of the NNP is one where NNP-adjacent communities, and particularly those that are tolerating wildlife, are benefiting directly from support given through KWS' social responsibility projects or income-generating conservation projects. Currently, the community is receiving minimal benefits from wildlife conservation. To ensure that the community is benefitting from wildlife the following actions will be implemented.

Action 4.1: Support social projects identified by communities

Assisting communities by funding community projects not only helps KWS to fulfil its corporate social responsibility, but also increases community support for local conservation initiatives. KWS has in the past supported projects such as cattle dips and construction of classrooms in the NNP's wildlife dispersal area. Through this action, the community, through their conservancy will work with KWS in identifying and implementing community social projects in the conservancy.

Action 4.2: Support communities in identification and exploitation of ecotourism opportunities

Involving local communities in tourism development can provide a means to gain community support for conservation outside the protected areas. Aside from direct employment, tourism also offers opportunities for development of enterprises that supply inputs to the tourism trade. Income can also be earned through leasing access to land if the custodianship of the land is bestowed on the community. This action will seek to assist communities in identifying and mapping all potential ecotourism opportunities in the conservancy. This information will be used by KWS and local stakeholders to raise the interest of tour operators on the tourism opportunities in the conservancy.

Action 4.3: Provide employment opportunities to the local community

One of the most practical ways of giving direct benefits to communities neighbouring the park is to provide them with employment opportunities. Hence, under this management action, NNP will affirmatively give priority to local communities when new employment opportunities that require unskilled labour arise, e.g., maintenance of fences, roads, buildings or compounds, so that as large a number of people as possible from the local community benefit from employment opportunities in the park.

Action 4.4: Work with other stakeholders to explore other legal Payment for Ecosystem Services(PES) mechanisms that can complement the wildlife conservation lease programme

In the year 2000, the Maasai community in the NNP dispersal area with the help of Kenya Wildlife Service and Friends of Nairobi National Park (FONNAP) established a Wildlife Conservation Lease Progamme to *"ensure long term ecological viability of Nairobi National park by maintaining seasonal dispersal areas and migration corridor on adjacent privately owned lands and demonstrating the use of wildlife conservation leases as a conservation tool outside protected areas".* In return, the households under the lease program were paid an annual fee of Ksh. 300 per acre in three instalments. However, funds for the lease programme petered out in 2012 and the project closed. By the time the project closed, over 60,000 acres were under the lease programme[42]. The programme was later revived by The Wildlife Foundation (TWF), an NGO, which currently has about 2000 acres under lease in Naretunoi Community Conservancy and pays land owners Ksh. 500 per acre annually to keep their land unfenced and available to wildlife.

To ensure that the Naretunoi Community Conservancy remains a key dispersal area for NNP wildlife, KWS will work with other stakeholders to explore other legal and sustainable PES models that can be adopted to complement the TWF sponsored lease programme. These could include conservation easements provided under Section 65 of the Wildlife Conservation and Management Act, 2013.

Action 4.5: Support communities in preparation of proposals to seek donor funding

It is vital that sustainability of KWS-funded community projects is ensured, otherwise there is a likelihood of establishing community structures that cease to be of use when KWS funding is no longer available(as evidenced by the abandoned cattle dip). A very effective way of mobilising funds to support maintenance of community projects is through the development of project proposals targeting identified donor funds. The NNP Community Partnership & Conservation Education Programme will assist the communities in preparing and marketing funding proposals to potential donor agencies with an aim of generating funds for maintaining the projects.

[42] Matiko D (2014) Wildlife Conservation Leases are Considerable Conservation Options outside Protected Areas: The Kitengela - Nairobi National Park Wildlife Conservation Lease Program. J Ecosys Ecograph 4:146. doi:10.4172/2157-7625.1000146

Security Management Programme

Programme Purpose and Strategy

The purpose of the Security Management Programme is to ensure that:

> The NNP and adjacent wildlife dispersal areas are safe and secure for wildlife and visitors

The NNP Management has minimised poaching in the park but in the adjacent dispersal areas poaching, and particularly for bush meat, is a major threat to wildlife that disperse outside the park. In addition, due to the presence of rhinos in the park and the threat posed by poaching for rhino horn, wildlife security remains an issue of paramount importance; a situation that is unlikely to change during the 10-year lifespan of this plan. As such, efficient, effective and intensive security operations are particularly important given that threatened species such as rhinos, lions and giraffes have home ranges that extend outside the park.

The following paragraphs set out the ***strategic principles*** that will guide NNP Management in the implementation of the Security Programme and the achievement of the Programme Purpose.

Guiding Principles

In implementing the NNP's Security Programme, NNP Management will strive to ensure that:

Operational effectiveness is improved

One of the major threats to the park's wildlife is bush meat poaching. Whereas wildlife has adequate security when it is in the park, it becomes vulnerable to poaching when it disperses to community areas to the south of the park. Therefore, under this programme measures will be put in place to enhance wildlife intelligence gathering in the dispersal area to prevent poaching incidents. Towards this, the NNP ranger force will be strengthened, and capacity for management and analysis of intelligence information enhanced.

Collaboration with key stakeholders is strengthened

Communication and collaboration with key stakeholders in enhancing wildlife and visitor security in the park's buffer zone is essential to improve security responses, strengthen the deterrent against illegal activities in the area, and improve the overall effectiveness of security operations. Under this programme therefore, mechanisms will be put in place to ensure that KWS and the buffer zone stakeholders, including tourism investors, conservancies, buffer zone residents and local police are collaborating to enhance wildlife and visitor security in the area.

These strategic principles are intended to guide the implementation of the Security Programme's two management objectives that, when taken together, achieve the Programme Purpose. These two objectives are:

MO 1. Natural resource protection in NNP and its dispersal areas enhanced

MO 2. Collaboration with stakeholders in enhancing NNP security improved

Objective 1: Natural resource protection in NNP and its dispersal areas enhanced

Wildlife security, and specifically security of rhinos, will remain a very important management issue in the NNP and its buffer zone. Security measures, and especially proactive ones, need to be implemented to maintain and also boost wildlife security in the NNP and its dispersal area

The major security problems within the NNP ecosystem include snaring wild animals for bush meat, threat to the rhino population, illegal livestock grazing during the dry spells and fuel wood collection.

The future desired state this objective aims to achieve is one where security operations have been revamped to effectively address challenges posed by livestock incursion, bush meat poaching and vandalism in the NNP, as well as in adjacent areas. Towards this, four management actions relating to minimising theft and vandalism of KWS assets, developing an NNP security database, establishing and equipping existing and new patrol outposts, and carrying out intense ground and aerial patrols have been developed. These actions are elaborated in the following sections.

Action 1.1: Minimise theft and vandalism of KWS assets

The park's infrastructures such as fences have been reported vandalized and illegal tapping of electric power from the fence has also been recorded. Reports of theft have also been reported at the club house, offices and central workshop. Vandalism of vehicles have also have been reported at rangers parking.

To address these security issues, patrols will be conducted along the fences, particularly at night when vandalism of fence wires mostly occurs. Night patrols will also be intensified at all KWS installations to prevent theft cases. Security priority will be given to: the park’s yard, offices, all gates, picnic sites, loss of revenue, fire arms and ammunition, trophies and all residential areas. Security will also be provided to the Elephant Orphanage which is located within the park.

Action 1.2: Establish an NNP security database and identify security hotspots

A security database is essential in order to monitor and evaluate the effectiveness of the overall security strategy at the NNP, and to inform timely changes to the strategy if appropriate. Information from the database can be used to support planning of security operations and patrols, and help identify the optimal location of new security outposts. Thus, a comprehensive security database for the NNP will be developed through this action. Key elements of this database will be details on patrols carried out per month (such as patrol route, observations made, and action taken in case of observed illegal activity), details on arrested individuals and action taken, and intelligence information on wildlife-related criminal activities. The database will be linked to a Geographic Information System (GIS) to facilitate display and output of information in the form of maps. This will enable the identification of areas where security issues are most pressing, and the revision of NNP security operations and location of new outposts.

Action 1.3: Equip existing patrol outposts

NNP has existing ranger outposts both inside and outside the park. Each outpost has been assigned a patrol sector. To enhance the performance of these outposts, each outpost will be optimally staffed and provided with basic equipment such as binoculars, GPS, night goggles and where necessary, a vehicle, to facilitate ground patrols. The positioning of new outposts outside the park will take into account the HWC hotspots and outpost needs will thus be identified. Accommodation for rangers will be provided at all outposts.

Action 1.4: Intensify ground and aerial patrols

The main protected area offences within the NNP are illegal livestock grazing and bush meat poaching. Although significant advances have been made in securing the NNP to curb these offences, intensifying security patrols in the NNP and its dispersal area is paramount during the implementation period of this plan.

In order to combat illegal activities through deterrence, aerial and ground patrols will be intensified within the NNP and its dispersal area. In addition, to further facilitate the patrols, an efficient patrol road network will be designed and constructed.

Objective 2: Collaboration with stakeholders in enhancing NNP security improved

An effective wildlife security system should be complemented by a wildlife intelligence system that collects security related information, analyses it, and advises the wildlife authority on steps to be taken to counter various wildlife issues. Many wildlife-related crimes such as poaching for bush meat and rhino horn can be effectively prevented using reliable intelligence information. Such a security system requires collaboration with citizens and other security agencies in collection and analysis of wildlife intelligence as well as in execution of security operations.

The future desired state this objective aims to achieve is one where intelligence information is effectively gathered and is contributing to the enhanced effectiveness of NNP security operations. The actions that have been designed to achieve this objective are elaborated in the following sections.

Action 2.1: Expand the intelligence gathering network

Much has been done to counter wildlife threats in and outside the park. Intelligence operations (i.e. information gathering, surveillance and planning) have been put in place to preempt imminent threats by providing prior intelligence on the perpetrators. The anti-poaching security teams based in Nairobi National Park, Ngong and Kajiado have also been fully utilized. They have been used to act on specific information, as well as to mount routine patrols, ambushes and roadblocks. In the process the teams have made several successful arrests inside the park.

During the lifespan of this plan, the intelligence gathering network will be expanded and resourced to gather actionable information.

Action 2.2: Improve intelligence information gathering and analysis

It is important that intelligence information is analyzed, collated and verified before it is passed on to the Anti-poaching Unit for action. Pre-emptive security intervention measures usually require deployment of substantial resources, both human and equipment, hence the importance of the reliability of the information that is prompting action. The quality of security information will be enhanced through use of Global Positioning System (GPS), Geographic Information Systems (GIS) and security databases. The information will guide security operations within the greater NNP. Further, training of security personnel will be conducted to make them more effective in collection, management and the use of information.

Action 2.3: Work with the local community in the dispersal area to control poaching

Bush meat poaching is the main challenge being experienced due to a ready market. Most poaching is done at night in some parts of Kajiado, Ewaso Kedong, Emali, Sultan, Machakos ranch and even some areas of Kiserian. Reports of illegal trophy trade have been received in areas such as Mlolongo, Kitengela, Athi River, Salama, Emali, Makindu, Matuu, Mutomo and Kitui. The trophies mainly reported are skins of leopards, cheetah, python and elephant tusks.

To curb poaching, KWS will work closely with local communities in gathering and sharing information that can pre-empt poaching cases. Specifically, KWS will work with community scouts and honorary wardens in creating awareness on the importance of protecting and conserving wildlife for posterity.

Action 2.4: Work with other security agencies to enhance security in the park and its dispersal areas

KWS has been collaborating with other security agencies to enhance general security in the park and adjacent areas. Local police are deployed in the park to augment KWS security capacity in the park. Multiagency collaboration in boosting the park security will be supported during the implementation of this plan. KWS will work with security agencies operating in the buffer zone, such as the local administration in tackling wildlife crimes outside the park.

Action 2.5: Liaise with the local police to enhance security at tourist accommodation facilities

KWS is mandated to provide a safe environment for wildlife in the protected areas, but the security of tourist facilities and tourists falls under the ambit of the Kenya Police Service. It is therefore essential that NNP management liaise with the police to ensure that law and order is maintained at the tourist facilities, especially given that the existing and proposed facilities will be employing staff in future as tourism grows. Through this action therefore, NNP management will liaise with the police to ensure that police officers are deployed at the tourist facilities, and they provide security when events are held in the park.

Park Operations Management Programme

Programme Purpose and Strategy

The purpose of the Park Operations Management Programme is to ensure that:

> The NNP's operational systems and structures are effectively and efficiently supporting the achievement of the NNP purpose, and the delivery of the NNP's management programmes

As discussed elsewhere in this management plan, the NNP faces an increasingly complex array of management challenges and issues, originating from both within and outside the park's boundaries. Many of these threats, such as those resulting from human settlement and fencing in the dispersal area and pollution from surrounding urban areas, are likely to intensify during the 10-year duration of this plan. Targeted and complementary management responses will be vital if all these management issues are to be adequately addressed. However, delivering these management responses requires strengthening collaboration with other stakeholders as most of the threat sources are outside KWS jurisdiction. If the NNP Management is to be successful in the implementation of this management plan, it will also be essential to strengthen Park operations to enable the effective and efficient delivery of the plan's management actions, by establishing a conducive working environment and supportive management systems and structures. In particular, the effort spearheaded through this management plan to manage the NNP together with the privately owned buffer zone and Naretunoi Community Conservancy, will require the establishment of effective collaboration mechanisms between KWS, buffer zone land owners, Sheep and Goats Ranch, and the Naretunoi Community Conservancy, as well as the expansion and strengthening of Park operations to fully encompass all four geographic components making up the truncated Nairobi National Park Ecosystem. The Park Operations Management Programme provides the means for strengthening the NNP's management systems, structures and human resources to support the implementation of the four other management programmes, and the overall achievement of the NNP's Purpose Statement.

The following paragraphs set out the ***strategic principles*** that will guide NNP Management in the implementation of the Park Operations Programme and the achievement of the Programme Purpose. Wherever appropriate, guidance has been drawn from the KWS Strategic Plan 2019 – 2024

Guiding Principles

In implementing the NNP's Park Operations Management Programme, NNP Management will strive to ensure:

Good communications and access

Good communications and access throughout the park and its ecosystem remain essential to support the effective management of the park and enable NNP management to respond rapidly to specific issues as they arise (most notably issues relating to security, tourism and HWC). As such, this programme will emphasise the continuing improvement of communication systems in support of management activities as well as cooperation between NNP Management and other stakeholders, such as tourism industry partners and conservancies. In addition, improvements in infrastructure across the area will be planned and targeted to provide maximum support for the effective management of the NNP, and to support tourism development in the park and beyond.

Sufficient and well-allocated management resources

Underpinning every management action designed to achieve each of the management objectives outlined in this management plan, and thus achieves the desired future condition of the NNP, is the NNP staff that will be responsible for implementing them. These staff not only requires conducive working conditions and facilities, but also the necessary equipment and training to carry out their duties. The scope of work set out in the plan's four programmes is an ambitious undertaking, and will require increases in both the levels and capacity of human resources available in the NNP, and in the financial resources required to support the implementation of the management actions set out in this plan. As such, this programme will aim to ensure that NNP human resources are of sufficient number and efficiently allocated in order to implement this plan's management actions, and that the financial resources and administrative and tourism infrastructure required to deliver the plan's management actions are made available, through expeditious development of the appropriate budgets and their submission to KWS Headquarters as appropriate.

These strategic principles are intended to guide the implementation of the Programme's four management objectives that, when taken together, achieve the Programme Purpose. These four objectives are:

MO 1. Institutional collaborations formalised and strengthened
MO 2. Performance and motivation of NNP staff improved
MO 3. Infrastructure, transport and communications to support PA management and tourism development improved
MO 4. Resource requirements for effective management provided

The following sections describe these management objectives and provide an outline of the management actions needed to achieve them. Under each management objective there is a brief description of the relevant management issues and opportunities, which provides the specific context and justification for the management actions.

Objective 1: Institutional collaborations formalized and strengthened

The desired future state at NNP is one where stakeholders' collaborations and partnership in conservation and management of wildlife in the park and adjacent areas are strengthened. If park management objectives are to be successfully achieved, there are a variety of institutions with which NNP management needs to either establish or strengthen relations and collaborations; they include the local administration, county governments of Machakos and Kajiado, Naretunoi Community Conservancy, Sheep and Goats Ranch, Buffer zone residents, The Wildlife Foundation, FONNAP, and Sheldrick Trust, among others

The partnerships are expected to among other things; secure a minimum viable conservation area for the NNP conservation targets, raise essential funds to support conservation efforts at the NNP, gain support for conservation and ensure constructive relations with key institutions impacting on the management and conservation of NNP.

The management actions that have been designed to achieve this objective are set out in the following sections.

Action 1.1: Develop a stakeholder engagement plan for the community conservancy and buffer zone land owners

Given the need to develop and sustain viable wildlife dispersal areas for NNP, there is a need to develop a clear stakeholder engagement plan for the land owners in the dispersal area. A stakeholder engagement plan seeks to emphasize the aspects of environmental and social performance with a view of actively developing and sustaining relationships with communities and other stakeholders affected by the plan. This is in compliance with the Wildlife Conservation and Management Act, 2013 that prescribes an ecosystem approach as well as participatory planning for protected areas. The International Finance Corporation (IFC) good practice handbook (2007) of doing better business through effective consultation and disclosure also prescribe a clear stakeholder engagement plan during plan implementation[43].

Thus the stakeholder engagement plan for NNP will consist of the following key elements[44]:

- Stakeholder Identification and Analysis
- Information Disclosure
- Stakeholder Consultation
- Negotiation and Partnerships
- Grievance Management
- Stakeholder Involvement in Project Monitoring
- Reporting to Stakeholders
- Management Functions

The stakeholder engagement plan outlines how the above key elements and best practices will be implemented during the NNP management plan implementation. As such, the stakeholder engagement plan will be developed at the start of the implementation of the NNP management plan collaboratively between KWS and the Buffer Zone and Community Zone owners to ensure that the NNP and its dispersal area are managed in accordance with the plan's strategic principles. The engagement plan will spell out the obligations of each party in the management of wildlife, fence maintenance and tourism management in the NNP and its dispersal area.

Action 1.2: Develop and implement Memorandum of Agreements with buffer zone land owners to be fenced in, including Naretunoi Community Conservancy and Sheep and Goats Ranch

Many of the principles underlying the development of a single management plan extension to the park's influence zone involve management collaboration and agreements on a number of key management issues. In particular, for long-term viability, there is need for a high level of institutional collaboration between KWS and its partners in the buffer and community zone. Unless successful management collaboration can be achieved amongst these diverse land owners, the implementation of this management plan will be seriously undermined, with an increased risk of conflicting management strategies, and potential long-term negative impacts on the NNP's conservation.

As such, collaborative agreements between KWS and the Buffer Zone and Community Zone owners are essential to ensure that the NNP is managed in accordance with the strategic principles specified in this plan. To realise this, workable Memorandum of Agreements (MOA) that are legally binding will be drawn between KWS and the buffer and Community Zone owners.

[43] IFC, 2007. Stakeholder Engagement: A good practice Handbook for companies doing business in emerging markets.
[44] Ibid

Action 1.3: Establish a wildlife tourism forum for the buffer zone residents, Naretunoi Community Conservancy and Sheep and Goats Ranch

Active involvement of the landowners of the buffer and community zones, is critical to achieving conservation success in the NNP and its now severely truncated ecosystem. The buffer zone and community zone owners are in a position to curb illegal activities such as livestock incursion and bush meat poaching, as well as land subdivision and sale, which are currently a major threat to wildlife conservation in the dispersal area. In order to stem further environmental degradation (particularly of wildlife) that is taking place in the dispersal area, it is crucial that a conservation agenda for NNP and its dispersal area is owned by KWS and its partners. This management action will therefore establish an NNP Wildlife Tourism Forum to specifically lobby for and promote wildlife conservation and tourism in the NNP ecosystem. The meetings of this forum will be held quarterly and will be chaired by the Senior Warden, NNP.

Action 1.4: Establish an NNP management committee comprising all stakeholders with interest in the conservation of the NNP

Collaboration between stakeholders who operate within the NNP (such as tourism industry investors or operators and/or scientific researchers, conservation NGOs) and the park's management is a key aspect of effective management. The NNP management planning process has greatly benefited from the input of other conservation stakeholders, particularly in the development of management programmes. To ensure that these programmes are fully implemented, it is important that stakeholders, and especially key stakeholders, participate in the management of the NNP. Stakeholders can participate in a wide range of activities including tourism promotion and marketing, supporting community projects, ecological research and monitoring, and pollution control, among others. Considering that conservation is a very expensive venture with only a few protected areas in Kenya making a profit, stakeholders can also help fundraise to supplement KWS finances.

Through this action, NNP Management Committee will be established comprising of key stakeholders in the NNP. These will include KWS, Buffer Zone land owners, Naretunoi Community Conservancy, Sheep and Goats Ranch, FONNAP, NTC, honorary wardens and other relevant conservation NGOs. The role of this committee will be to promote and market the NNP in line with the management actions specified in the Tourism Development and Management Programme, mobilize funds to implement management actions specified in this management plan, and to monitor plan implementation.

Specifically the committee's functions will be:

a) co-ordinate the implementation of the Plan;
b) mobilize resources for Plan implementation;
c) monitor and evaluate the progress of activities;
d) identify constraints in plan implementation;
e) produce annual progress reports on plan implementation; and
f) recommend review of the management plan.

Action 1.5: Collaborate with County governments of Nairobi, Kajiado and Machakos in minimising threats to the ecological integrity of NNP

Although it is located in Nairobi County, NNP is still greatly influenced by activities and developments in the surrounding areas, in Machakos and Kajiado Counties. Linkages between NNP Management and the three counties that have major stakes in the park is wanting,

leading to minimal support lack of awareness on threats facing NNP by county officials, especially those responsible for land use planning.

Current representation of the NNP in County Committees is poor, and in some cases KWS officers who work outside the park, in Kajiado and Machakos, articulate NNP issues. This action aims to ensure that NNP issues are well articulated at County committee meetings. Towards this, the NNP Senior Warden will attend Nairobi County meetings whereas the County Wardens of Machakos and Kajiado will represent NNP at the county meetings. However, the two County Wardens will be briefed on the issues to be brought to the attention of each committee.

Action 1.6: Review the NNP management plan

According to Section 44(1) of WCMA, 2013 every protected area in Kenya is supposed to be managed in accordance with an approved management plan. It is on the basis of this legal requirement that KWS has developed the NNP management plan in a participatory planning manner incorporating the views of a wide range of stakeholders. This is a 10-year management plan which will be implemented through annual park operational plans. Thus plan monitoring during the implementation phase will be done continuously by the NNP park management committee comprising of KWS managers and stakeholders. Plan review will be done after five years while plan evaluation will be conducted at the end of the plan duration. This is an adaptive plan and thus plan amendments will be undertaken as new information arises.

Action 1.7: Assess NNP's management effectiveness

Management effectiveness is the assessment of how well protected areas are managed in terms of protecting values, achieving set goals and objectives over a period of time. KWS field managers use the Management Effectiveness Tracking Tool (METT) to evaluate the parks management plan implementation twice in a year. Undertaking the METT exercise helps in harmonized reporting on different programs, tracks improvements and helps managers to know whether they are achieving the park's management objectives. Consequently, under this management action, the NNP management will assess plan implementation using the METT bi annually.

Objective 2: Performance and motivation of NNP staff improved

The desired future state of the NNP is one where the NNP is optimally staffed with highly motivated staff that have skills and training matching the jobs at the NNP. The staff establishment presently comprises 120 staff against an optimum staffing level of 216. This means the park is understaffed by 96 staff.

This objective therefore aims to achieve improvement of staff numbers, efficiency, welfare, morale and output. The management actions to be implemented to achieve this objective are elaborated in the following sections.

Action 2.1: Deploy new staff to understaffed sections

According to the proposed staffing level for the park, the park has 120 staff against an optimum staffing level of 216 (Annex 4). The sections that are seriously understaffed are security, rhino surveillance and tourism. Therefore, under this management action, NNP man-

agement will liaise with KWS Human Capital Department to deploy adequate staff to NNP starting with the seriously understaffed sections.

Action 2.2: Train staff in relevant skills

Staff training is vital in ensuring that staff have necessary and up-to-date skills to efficiently carry out their work. KWS has recently carried out a training needs assessment for its entire staff including NNP staff. Therefore, NNP management will liaise with KWS HQ Training Department to ensure that NNP staff are considered for both local and international training when opportunities arise. .

Action 2.3: Improve staff welfare

To enhance staff welfare and boost morale there is need to have mechanisms where staff issues can be promptly addressed. Issues such as provision of medication and treatment for staff and their families need to be prioritized. Staff complaints also need to be promptly and amicably resolved. In addition, staff need to be made aware of the need to regularly update their personal records. And for staff that may have social or medical challenges, there is need for a mechanism to ensure that they are promptly referred to the KWS HQ employee wellness office for professional counselling as well as medical referrals for specialized treatment. To ensure that staff in distress are supported to withstand the distress e.g. loss of next of kin, NNP management will coordinate funerals in liaison with the next of kin. Where staff have sustained major injuries in the course of their duties, management will report staff injuries to KWS insurance office for further action. Medical claims from recommended medical facilities will also be processed promptly.

Action 2.4: Establish sport clubs and a choir at NNP

One of the initiatives under Strategic Objective 6, "*Strengthen institutional capacity*", of the KWS Strategic Plan 2019-2024 states that KWS will "*facilitate employee participation in sports, music and other talent activities*". Thus under this management action, NNP management will support its staff to participate in sports both at NNP and outside, as well as encourage participation in other activities that enhance teamwork like choirs. As such, sports clubs and a choir will be formed and provided with relevant equipment.

Objective 3: Infrastructure, transport and communications to support PA management and tourism development improved

The future desired state at NNP that this objective seeks to achieve is one where Infrastructure and communication to support PA management and tourism development is improved. The main issue areas relating to the improvement of infrastructure and communications include the upgrading of roads and other tourism infrastructure as well as improvement of communications within and outside NNP.

Effective communication both within and outside the NNP is essential for efficient management, and key to improving NNP management's response to urgent issues. Currently, the park has a telecommunications workshop to ensure an efficient and reliable radio communication, maintain the electronic ticketing power back-up systems and the park's telephone

network. The workshop covers Nairobi National Park, Ol Donyo Sabuk and Amboseli National park and their associated field stations.

In addition to communication facilities, another key ingredient for ensuring effective and efficient PA operations is reliable and sufficient transportation infrastructure and equipment. As such, this objective has been developed to ensure that NNP management is suitably equipped and supported by adequate and appropriate transportation infrastructure.

The management actions that have been designed to achieve this objective are elaborated in the following sections.

Action 3.1: Upgrade, rehabilitate and maintain roads, tracks, firebreaks and trails

The total road network in NNP is approximately 287 kilometres. Most of the road network inside the Park is unpaved and lightly trafficked with less than 500 vehicles per day (VPD). Apart from major road upgrading works that will be carried out on the existing road network, no major construction of new tourist roads is envisaged. To reduce construction and maintenance costs on these roads, low-cost bituminous techniques will be used to increase the service life of the road using the locally available materials and adopting relaxed rigid pavement standards.

The technique that will be used is Bitumen Emulsion Treated Base (ETB), which involves the application of slow curing cutbacks SC 70 or SC 250 to gravel bases. The light oil penetrates the base, conferring cohesion and preventing moisture absorption, therefore, prolonging the life of the pavement. The proposed ETB will have a functional life of approximately six years. Table 15 shows advantages of the ETB while Figure 34 shows the tourism circuits to be upgraded.

Table 15. Advantages of the Emulsion Treated Base

Criteria	Advantages
Accessibility	▶ Roads are usable no matter the weather with limited dust emissions to the environment ▶ Open to traffic straight after compaction
Durability	▶ Allow gravel roads to last longer with less maintenance required ▶ Reduce moisture sensitivity
Economically	▶ Half-way between an untreated track and a paved road
Safety	▶ Bringing comfort to the user, fewer vibrations and no dust
Environmentally friendly	▶ Limited imports of material, conservation of natural aggregates ▶ Minimising the water needs ▶ Cold-Applied techniques, energy savings and reducing carbon footprints, less haulage

The cost of Emulsion Treated Base (ETB) construction of the base alone, excluding earthworks and drainage works, is between KSh. 2.8 to 4.6 million per kilometre within cross-sectional standards provided for in KWS roads[45].

Fence road/Firebreaks: The fence road (that acts as a fire break together with other roads) is used for routine fence maintenance and for patrols aimed at forestalling vandalism of fence parts. Some sections of this road are however impassable during the wet season. These sections will be rehabilitated to make the entire road usable in all seasons to facilitate these patrols. In areas where drainage is very poor, culverts will be used. Further, the new southern fence will also have a maintenance road which will be regularly maintained.

Management tracks/ off road tracks: In addition, patrol roads will be maintained to facilitate vehicle patrols to enhance rhino security. The Park will maintain management tracks for research, monitoring and other management activities. Visitors will not use these tracks and signage indicating the restriction will be installed.

Nature trail: Hippo pool nature trail will be maintained for visitor use.

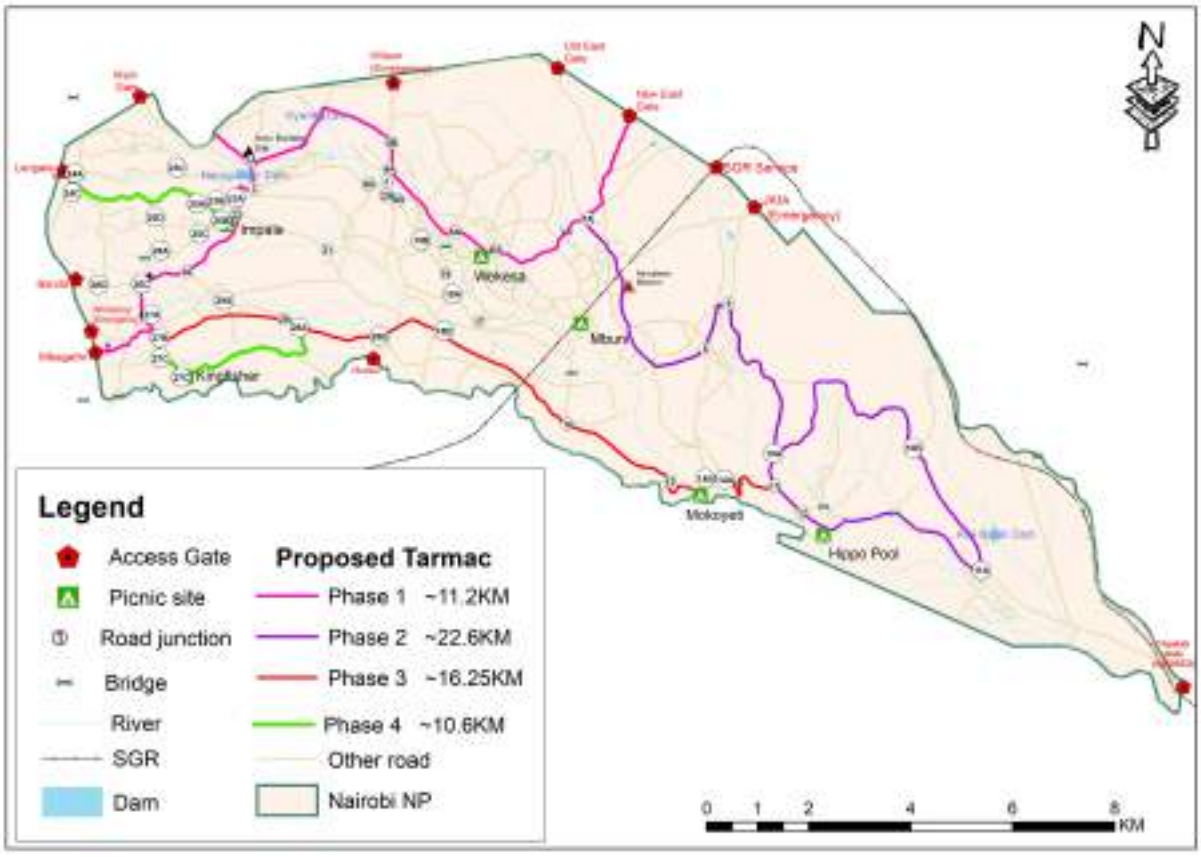


Figure 34. Proposed road upgrading in NNP

Action 3.2: Construct, rehabilitate and maintain residential and Non residential buildings

The park has set aside development zones where administrative infrastructure can be established to support KWS Headquarters and NNP functions. Staff housing for KWS Headquarters staff are located near the KWS Headquarters; at Banda Gate where there are two senior staff houses; at Central workshop where there are also two senior staff houses; and at

[45] Nairobi National Park Experience Masterplan

the KWS Club House which is the former Director General's residence. NNP staff housing is provided at all the gates apart from the main gate (Figure 35).

Both residential and non-residential buildings in the Park are inadequate and in deplorable conditions. As such, during the plan period most of the NNP junior staff houses will be rehabilitated while the senior staff houses will be maintained. The water supply system will be regularly maintained to curb leakage and ensure efficient supply. The sewage system will be maintained through regular emptying of septic tanks and unblocking waste pipes.

One bed-roomed houses will be constructed at Masai, East and Langata gates while an office will be built at the Masai gate. Buildings at hippo pools and Marimbet outposts will be rehabilitated within the plan period. Further, since the Director General's residence is being converted into a high end restaurant, a new DG's house will be constructed adjacent to the current KWS Club House (DG's Residence).

The Park headquarters consists of a block with a reception, the Senior Warden's office, Deputy Warden's office, Human Resource and registry, Tourism office, telephone exchange section, Accounts office, Community wildlife office, and two other offices, one shared by rhino and research units and the other shared by procurement, mechanical, and fencing units. The office accommodation is not adequate and as such a new main gate and office block will be designed and constructed to provide adequate office space.

To enhance staff morale, there is need to offer better accommodation for Park staff. One block consisting of four toilets and four bathrooms will be constructed during the plan period. Efforts will be made to construct modern staff houses to replace old condemned buildings, uniports (Iron-sheet structures), and one-roomed houses.

Two rangers' houses, suitably and discretely located, will be constructed at hippo pools to increase ranger accommodation so that more rangers can be accommodated here to enhance security in this area.

To curb human wildlife conflict in Kitengela dispersal area, two new outposts will be established at Empakasi and Sholinge centers. Permanent houses will not be constructed at these outposts, but instead rangers will be accommodated in uniports.

Further, a small carpentry and sign writing workshop, store, and shed for vehicles will be constructed during the plan period.

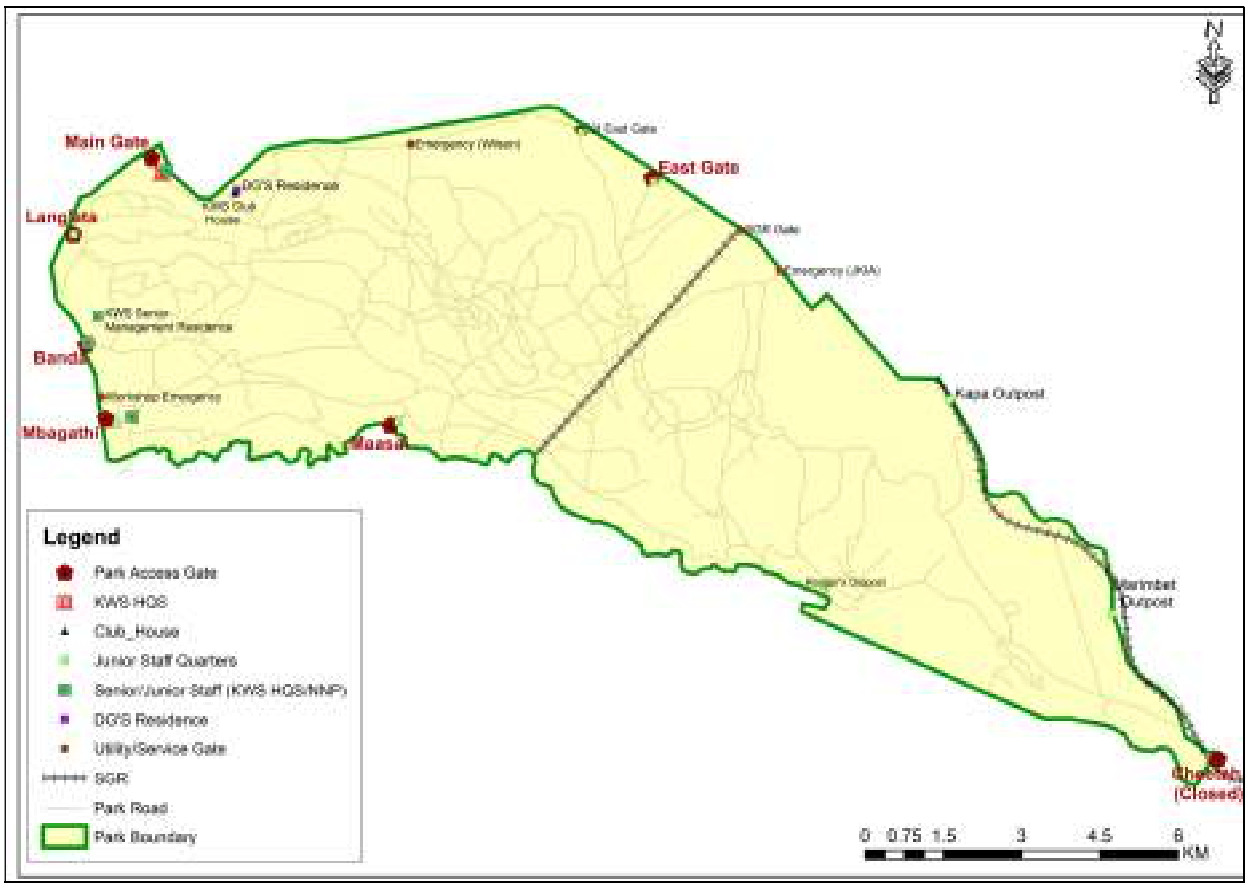


Figure 35. Location of KWS HQ and NNP staff residential areas

Action 3.3: Ensure prompt service of vehicles and machinery

Prompt service of vehicles and machinery pre-empts lengthy work disruptions and unnecessary loss of working hours. Currently, delays in vehicle servicing are attributed to slow procurement of spare parts. This action seeks to correct this by requiring that all section heads ensure that vehicle and machinery maintenance schedules are adhered to and procurement of spare parts is expedited. Spare parts that are commonly required for routine maintenance of vehicles will be procured and stored at the NNP mechanical workshop. The workshop will strive to maintain an optimal fleet of vehicles and to ensure that all NNP sections are functional at all times. In addition, staff shortages at the mechanical workshop are also contributing to delays in servicing and repair of vehicles. To ease workload at the workshop, mechanics have been employed on casual terms, which are less attractive than permanent terms, and this negatively affects staff morale. To boost staff morale, therefore, mechanics on casual terms will be employed on permanent terms.

In addition, the existing vehicle fleet that has outlived its economical life will be bonded and replaced. The park plans to buy two vehicles annually in the plan period.

A summary of the plant and machinery (including requirements) at the park is given in table 16 below.

Table 16. Plants and Machinery at Nairobi National Park

Plants/machinery	Registration No.(No.)	Required
Mitsubishi M-grader	KAD 150M	-
Caterpillar M-grader	GK 514L	1
Mitsubishi M-grader	KAD 151M	-

Plants/machinery	Registration No.(No.)	Required
Caterpillar M-grader	GK 634L	-
Dozer	-	1
Dynapac compactor	KAE 658F	-
Mitsubishi tipper	KAD 123M	-
Mitsubishi tipper	KAE 655F	
Tractor trailers	Z13 283	1
New Holland tractor	KAH 932F	-
New Holland tractor	KAH 921F	-
Ford wheel shovel	KAC 608G	-
Lawn mower	(2*)	2
Concrete mixer	(1)	-
Power saw	(0)	1
Water pumps	(4)	-
Komatsu truck shovel	KAE 659F	-
Bulldozer	(0)	1
Foot path compactor/roller	-	-
Water tank build on a trailer (2-3 tons)	(0)	1
Total	**19**	**7**

***:** One working but not efficient; one out of order

Action 3.4: Improve radio Communication

The park has thirteen V.H.F. radios. Six are distributed among the park gates and seven are fitted in Park vehicles. All the radios are in good working condition but they need regular routine maintenance. The Park has eight Hand Held radios that are distributed to officers in the Park. Each senior officer at the park is required to have a Hand Held radio for easy communication, but the current number of radios is not adequate. In addition, Hippo Pools, Mbagathi, Fence patrol unit, Park patrols, and the residential camp all require Hand Held radios. Two vehicles also need to be fitted with VHF radios.

The life span of a VHF radio is ten years. Some radios within the park have been in use for more than ten years. These radios will be replaced. Radio requirements are given in table 17.

Outside the Park there are two radio stations at Kajiado and Ngong station. However, outposts in these two areas will be covered by radio communication.

Table 17. Radio communication requirements

User	Existing		Requirements	
	VHF	HHELD	VHF	H/HELD
Main gate	1	8	1	8
Langata gate	1	0	1	0
Banda gate	1	0	1	0
Masai gate	1	0	1	0
Cheetah gate	1	0	1	0
East gate	1	0	1	0
Mbagathi gate	1	0	1	1
Hippo pools outpost	1	0	1	1
Vehicles	7	0	7	0
Park Patrol	0	0	3	5
Fence Patrol	0	0	0	2
Rhino patrol	3	6	0	0
NCOs	0	0	0	4
4 new outposts	0	0	4	0
Total	18	14	22	21
Park headquarters	Existing		Required	
	Telephone switch board		Telephone switch board	
Total	1 (old)		1 (new)	

Action 3.5: Improve telephone network coverage

The park has an old switchboard with a capacity of four direct lines and sixteen extensions. Due to the expansion of Park activities, which has resulted in a corresponding increase in the number of officers, all the available extensions have been allocated leaving some officers without extensions. In order to cater for all staff, a new switchboard with a capacity of at least six direct lines and thirty extensions will be procured. Further, there is poor mobile phone connectivity in many parts of the park which reduces visitor experience. As such, under this management action, the telephone switchboard at the Park HQ will be upgraded to ensure that it can handle more telephone extensions. KWS will also work with mobile telephone service providers to ensure that mobile phone network coverage in the park is improved.

Action 3.6: Provide adequate computers and accessories

The park has elaborate computer systems that are currently linked via KWS HQs network The Park computers will be networked and will be serviced by an independent Internet Service Provider.

The park has several office equipment, which is located in different offices. However, most of the equipment is obsolete and will be replaced. A summary of the equipment is provided in table 18 below.

The rate of POA, POS, and POI equipment breakdown is very high. The spares for the equipment are difficult to procure since they are not sold in many outlets. This equipment will be replaced with those that are easy to service and have a longer life span. Auditing of the equipment will be undertaken each year.

Table 18. Office equipment at Nairobi National Park

Section	Equipment	Available	Required
Administration	IBM	1	1
	Compaq computers	2	2
	LQ-1170 printer	1	1

Section	Equipment	Available	Required
	Desk-jet	1	1
Rhino	IBM computer	1	1
	Desk-jet 840C printer	1	1
	Digital Camera	0	1
	Binoculars	5	2
	GPS unit	2	2
Research	Computer	0	2
	Printer	0	2
	Digital camera	0	2
	GPS	0	2
	Binoculars	0	5
	Topo fils (tape)	0	2
	Pin frame	0	5
Community Wildlife Service	Compaq Computer	1	1
	Desk-jet 5652 printer	1	1
	Digital Camera	0	1
	GPS	0	1
Kifaru Shop	Xerox photocopier	1	0
	Music system	1	0
	IBM computer	1	0
	Desk-jet Printer	1	0
	Video deck	1	0
	Sonny TV	1	0
	Front Office*	0	1
	Fridge	2	0
Point of Issue	Data card printer	3	3
	Monitors	1	0
	Computers	1	1
	Digital cameras	2	2
	Receipt Printers	2	2
	Display Poll	1	1
	LQ-2189 Printer	1	1
	Cash drawers	2	0
	Nashuatec 3722 Photocopier	1	1
Point of Assess	POA terminals	6	6
	Docking stations	5	6
	Solar panels	4	0
	Control chargers	4	0
	Solar battery	4	4
Accounts office	Computer	1	1
	Calculators	2	2
	Printer	0	1
Point of Sale	Computer	2	2
	Cash boxes	2	0
	Display poles	2	0
	Till printers	2	1
	LQ computer printer	1	1
	Currency scanner	1	1
	Calculator	1	1

Action 3.7: Construct entry gates

As detailed in the Tourism Development and Management Programme, it is envisaged that enhanced visitor management and investment in the NNP will attract more visitors than are currently being hosted. In order to facilitate visitor entry into the NNP, an additional entry gate

will be constructed near Hippo pools, to cater for visitors coming from Namanga road. Another option is to re-open old Cheetah Gate or establish a gate at a site near Mlolongo.

Action 3.8: Demarcate PA boundaries

Increased ecosystem degrading activities like livestock incursions and illegal bush meat poaching can partly be attributed to unclear and unmarked protected area boundaries between the NNP and adjacent community land in the southern park boundary. To remove this ambiguity, and stem illegal activities in the NNP, the NNP boundary will be cleared and marked to inform people when they are entering the park. The boundary markings with clear signs indicating, "Y*ou are now entering the NNP*", will be installed at all major incursion points. Further, fence maintenance will involve identification and replacement of the damaged sections, upgrading the existing line and installation of intrusion detection systems along the fence. Vegetation, bushes and other forms of undergrowth will be cleared.

Objective 4: Resource requirements for effective management provided

The future desired state of NNP is one where resources required for effective management of the park are available, all revenue due to KWS is collected, expenditure is controlled and adheres to approved work plans, the procurement of goods and services is expedited, and supplementary funding is solicited from funding agencies to support conservation projects in the NNP. Under this objective, ways of controlling expenditures and enhancing revenue are elaborated in the following management actions.

Action 4.1: Develop a NNP E-park portal

The E-park portal will be the official web portal for the KWS NNP platform. Its functions include but are not limited to online booking, park entry ticket, donations and payments, marketing, management, referral and integration with forms and subscriptions, notifications, hosting and archiving of photo galleries and video libraries of NNP. The web portal will be a 24/7 365 days per year, highly available and highly secure link, accessible from anywhere in the globe, and responsive on any standard device form and screen size.

For KWS to have a holistic online reservation and donation system, it must embrace mobile apps. In line with this, the system will come up with two mobile apps in IOS and Android versions. It will also have a Citizen app that will have all functions available

The E-park portal will include the following information and features:

- Nairobi Park Microsite
- Background of the park
- Key attractions and facilities
- How to get there,
- Digital map/ google map,
- Notifications,
- Contact persons and emergency numbers
- Park rules, prices, links to service providers
- Ticketing & Payment Gateway (Visa, MasterCard)
- Donate

Box 1: Key advantages of using E-park payment system

1. **Ensure maximum revenue collection**. The system will eliminate revenue leakages currently existing as all operations are automated. Removing cash payments in favour of mobile and card payments is the primary avenue for preventing revenue leakage.
2. **Provide multiple revenue collections platforms and instruments.** These include Point of Sale collection points for mobile money platforms, card payments, through the Bank payments and online transfers.
3. **Reduce the cost of collecting revenue**. With revenue collection automated, KWS only needs to employ a few staff who will manage the collections and reconciliations.
4. **Ensure extensive geographical reach in revenue collection**. The system can process both online and offline payments, which mean revenue will be collected in the most remote areas of the Parks.
5. **Ensure efficiency and performance management**. The officers in charge of collections have their reports in the system with a real-time recording of any receipt issued, making it difficult for an officer to present less amount against the record. Integration and information sharing leads to efficient monitoring. Individual performance will also be measured against the targets set for them in the system by their supervisors.

With the adoption of the E-Park system, revenue is projected to grow from the current half a billion shillings to over one billion shillings by 2024, including Park Entry Fee and other incomes (Table 19). This growth is expected to be fuelled by the investment to realise sustainable wildlife management and visitor experience[46].

Table 19. Revenue projections, Operation and maintenance costs

Financial Year	2019/20	2020/21	2021/22	2022/23	2023/2024
Revenue	580,364,721	652,419,429	935,282,344	1,062,338,812	1,252,923,515
Personnel Emolument	195,461,376	142,339,338	146,609,518	151,007,804	155,538,038
Operation & Maintenance Expenditure	32,482,920	35,406,383	38,592,957	42,066,323	45,852,293
Surplus/Deficit	**352,420,425**	**474,673,708**	**750,079,868**	**869,264,685**	**1,051,533,185**

Action 4.2: Align the management plan with the corporate scorecard and annual work plans and budgets

KWS has been preparing Protected Area Management plans over the years, but their usefulness in guiding the management of protected areas has been minimal. In most cases the planning process has integrated international best practice for planning, including stakeholder participation, but despite this inclusiveness these plans have ended up on shelves. The main reason for the lack of plan implementation is the lack of policies or mechanisms to guide plan implementation and monitoring. Hence, even though some PAs have elaborate management plans, managers are not obliged to use them. It is therefore important that a clear plan implementation process, which links the management plan to the annual work plans and budgets and has support from the top echelons of KWS and the field, is adopted. To ensure that the NNP management plan is implemented, therefore, annual work plans will be based on the management actions and activities outlined in this management plan. The management plan scorecard (Annex 1) will be aligned with the corporate scorecard to ensure that funding and other resources are allocated to implement this plan. The park scorecard will be further cascaded to individual performance contracts of all staff in NNP.

[46] Nairobi National Park Experience Master Plan

Action 4.3: Expedite procurement of goods and services at the NNP

Delays in procurement of goods and services have occurred at the NNP. This has been attributed to non-adherence to procurement procedures by NNP staff and lack of procurement plans. To expedite the procurement process, NNP heads of sections will be required to prepare comprehensive procurement plans to accompany the annual work plans. The procurement officer will also ensure that all NNP heads of sections adhere to the KWS procurement procedures when they procure goods and services for their sections.

Action 4.4: Establish a financial management database

Presently it is very difficult and time consuming to retrieve historical financial information concerning NNP revenues and expenditure, as most of the data is not computerised. In addition, the computerised data is not stored in a format that can facilitate quick analysis to generate information for planning. To organize finance data for easy retrieval and manipulation, a database will be established. Both current and historical financial data will be captured and stored to facilitate monitoring of revenue and expenditure trends. In addition to revenue and expenditure data, the database will include annual work plans and budgets for both KWS as well as donor-funded projects. To ensure data sharing with KWS Headquarters is possible, the database design and development will be carried out in close collaboration with KWS Headquarters Finance Department.

Action 4.5: Prepare project proposals for funding

The role of stakeholders in conservation and management of Kenya's wildlife is given due recognition in the KWS Mission Statement, which is "*to sustainably manage Kenya's wildlife and its habitats for the benefit of nature and humanity".* In addition, *"strengthening relationships with stakeholders and partners"* is one of KWS' strategic objectives in its corporate strategic plan 2019-2024. NNP stakeholders have already played a major role in enhancing wildlife security as well as wildlife monitoring in the park. To ensure that stakeholders continue to contribute to the conservation activities at the NNP, NNP management will work closely with the KWS Resource Mobilization Office to develop proposals for soliciting funding from potential donors. These proposals will mainly target non-core KWS activities like community projects. However, to enhance knowledge of environmental resources at the NNP, research proposals will also be prepared in collaboration with academic institutions of higher learning, and funding sought from conservation stakeholders.

Plan Monitoring

The plan monitoring framework set out in the following tables has been designed to provide guidance for the assessment of the potential impacts resulting from the implementation of each of the five management programmes. The framework sets out the desired positive impact of each programme's objectives, as well as any potential negative impacts that may possibly occur. The framework also includes easily measurable and quantifiable indicators for assessing these impacts, and potential sources of the information needed. Monitoring the impacts of the plan implementation is a key aspect of the ultimate success of the plan and for informing adaptive management of the NNP and its dispersal, and as such ensuring that overall benefits from plan implementation are maximised, and that any negative impacts are appropriately mitigated.

Table 20. Ecological Management Programme Monitoring Plan

Objective or Sub-Objective	*Potential Impacts (Positive and Negative)*	*Verifiable Indicator*	*Sources and means of verification*
Objective 1: Conservation status of the NNP's threatened large mammals and landscape species enhanced (Rhinos, lions, migratory species, and Masai Giraffe)	**The Black rhino population is increasing at target rates**	**Population size and recruitment rates**	**Population counts**
	The population of threatened species and landscape species are increasing at optimal rates	**Population size and recruitment rates**	**Population counts**
	Habitat connectivity between the park with neighbouring Naretunoi Community Conservancy and Mbagathi River frontage land owners is maintained	**Extent of new land subdivisions, sales, and settlements in the land adjacent to the NNP**	**Land use/land cover change study through satellite data interpretation and groundtruthing Land cadastre information from the land registries at Kajiado and Machakos Counties**
	Wildebeest and other dispersing species are able to continue moving between the NNP and dispersal areas	**Wildebeest movements**	**Reports on collared animals**
	Increase in HWC(livestock predation, human injury or death, disease transmission) in the wildlife dispersal area	**Incidences of HWC (livestock predation, human injury or death)**	**HWC NNP database; the Occurrence book**
Objective 2: Important NNP habitats managed and improved	**The area of grassland with palatable grass for key grazing species in the NNP is increased**	**Area of grassland with short palatable grass**	**Habitat assessment reports**
	Fire is making a positive contribution to the conservation of the NNP's key habitats	**Incidence of unprescribed fires in the NNP**	**Fire outbreak reports**

Objective or Sub-Objective	*Potential Impacts (Positive and Negative)*	*Verifiable Indicator*	*Sources and means of verification*
	Increase in fire tolerant species	Density of fire tolerant species	Pre and post burning habitat assessment reports
	Reduced species diversity of wildlife species that cannot escape fires	Insect abundance and diversity	Pre and post burning species assessments reports
Objective 3: Wildlife dispersal areas and river systems in the greater NNP landscape protected, in collaboration with other stakeholders	The NNP is supplied with sufficient unpolluted water to ensure maintenance of water sources for wildlife	Water quantity and quality	Water flow and quality analysis reports
Objective 4: Ecological monitoring and research information dissemination is enhanced	Capacity of the NNP Research Station to conduct ecological research and monitoring is strengthened	A well equipped and functional research station is established	NNP progress reports

Table 21. Tourism Development and Management Programme Monitoring Plan

Objective	*Potential Impacts (Positive and Negative)*	*Verifiable Indicator*	*Sources and means of verification*
Objective 1: The NNP tourism investment opportunities developed	Increased NNP visitation	Annual visitor numbers	KWS HQ visitor database
	Improved revenue generation from NNP	Annual park revenue	NNP revenue returns
	Reduced visitor satisfaction because of high density of vehicles and visitors	visitor and investor satisfaction	Feedback from NNP investors and visitors Visitor satisfaction surveys
Objective 2: NNP tourism product improved to enhance visitor experience	Increased visitor satisfaction	Visitor satisfaction index	Visitor satisfaction surveys
	Increased visitor spending in the NNP	Revenue received by concessioned facilities in the NNP	Investor financial reports
	Environmental degradation from new tourist activities and/or supporting infrastructure	Evidence of pollution/litter or habitat degradation at sites where activities or infrastructure are located	Targeted inspections by NNP staff
Objective 3: NNP is marketed locally and internationally	Improved visitor understanding of the NNP's facilities and attractions	Number of people visiting the NNP E-portal Number of guidebooks and maps sold Number of visitors visiting the NNP visitor service centre	NNP tourism records Visitor Service centre records
	The NNP's environmental qualities are compromised around attractions	Evidence of litter and environmental damage at NNP attractions	Targeted inspections by NNPstaff
Objective 4: NNP tourism management improved	Increased collaboration between KWS and Tourism stakeholders	Number and participation at tourism stakeholder forums	Meeting minutes

Table 22. Community Partnership and Conservation Education Programme Monitoring Plan

Objective	*Potential Impacts (Positive and Negative)*	*Verifiable Indicator*	*Sources and means of verification*
Objective 1: Conservation education and awareness programme strengthened	Improved understanding of the NNP's conservation importance	Number of conservation talks given to organized groups Number of participants on sponsored NNP tours	Community Wildlife Service records

Objective	Potential Impacts (Positive and Negative)	Verifiable Indicator	Sources and means of verification
	Increased community support for the conservation of NNP	Number of local community members arrested for illegal activities in the NNP	Security Section Records
Objective 2: Conservation-compatible community land uses and practises promoted	Decreased conversion of wildlife habitat to permanent settlement and agriculture in the Naretunoi Community Conservancy	Area covered by permanent agriculture and settlements, and trends in land subdivision and sales	Land Use/ Land cover change study
	Reduced illegal natural resource use in the NNP and its dispersal area	Number of local community members arrested for illegal natural resource use	Security Section Records
Objective 3: Human - wildlife conflict reduced	Reduced costs of wildlife to adjacent communities	Incidents of human-wildlife conflict around the NNP	Community Wildlife Service records (monthly reports and occurrence books)
	Enhanced relationships between NNP management and surrounding communities	Incidences of NNP - community conflict	Community Wildlife Service records
Objective 4: Opportunities for communities to benefit from the NNP improved	Increased value and importance of the NNP to surrounding communities	Income from activities linked to the conservation of the NNP	Naretunoi Community Conservancy financial records
	Increased tourism related benefits to owners of Mbagathi river frontage	Income from tourism activities in the park's buffer zone	Financial records of tourism facilities

Table 23. Security Management Programme Monitoring Plan

Objective	Potential Impacts (Positive and Negative)	Verifiable Indicator	Sources and means of verification
Objective 1: Natural resource protection in NNP and its dispersal areas enhanced	Reduced impact of poaching on wildlife	Number of poaching incidents Number of snares recovered Population trends of wildlife species that is prone to poaching	NNP Security Section records Wildlife population census reports
Objective 2: Collaboration with stakeholders in enhancing NNP security improved	Increased efficiency of law enforcement efforts	Number of arrests made per law enforcement effort	NNP Security Section records (patrol records and monthly, quarterly and annual reports)
	Increased disincentive for undertaking illegal activities in the NNP and adjacent areas	Number of repeat offenders caught in the NNP and adjacent areas	NNPSecurity Section records

Table 24. Park Operations Management Programme Monitoring Plan

Objective or Sub-objective	*Potential Impacts (Positive and Negative)*	*Verifiable Indicator*	*Sources and means of verification*
Objective 1: Institutional collaborations formalised and strengthened	Enhanced management collaboration between KWS, Naretunoi Community Conservancy, Sheep and Goats Ranch and Mbagathi River frontage land owners	Number of collaborative mechanisms established	Memorandum of Agreements
	Increased stakeholder support for management of the NNP	Number of NNP Management committee meetings or other stakeholder collaboration events held	Meeting minutes or NNP management records
Objective 2: Performance and motivation of NNP staff improved	Improved efficiency of NNP staff undertaking their roles	Staff performance against management plan and corporate strategic plan targets	Quarterly reports Annual reports
Objective 3: Infrastructure, transport and communications to support PA management and tourism development improved	Improved morale of NNP staff	Number of poor morale related incidences	NNP annual reports
	Improved visitor and management access across the NNP	Kilometres of roads improved	NNP management records and KWS HQ GIS database
	Environmental disturbance and pollution during construction or upgrading of management infrastructure	Evidence of litter, pollution or excessive environmental damage	Targeted inspections by NNP staff
	Improved efficiency in management operations (especially security and Problem Animal Control responses)	Ratio of operational to non-operational vehicles	NNP management records and/or periodic surveys
	Improved management response to security or HWC incidents	Number of security and HWC incidences successfully responded to	Community surveys
Objective 4: Resource requirements for effective management provided	Enhanced ability of NNP management to implement the plan	Percentage of management actions implemented	Plan implementation assessment reports Management Effectiveness Tracking Tool reports
	Increased Internal and external financial resources	NNP revenue	NNP annual financial reports

Plan Annexes

Annex 1. Aligning NNP Management Plan with the KWS Balanced Scorecard (NNP annual targets to be included in the final plan)

PERSPECTIVE	STRATEGIC OBJECTIVE	STRATEGY	INITIATIVES (KWS CORPORATE)	MEASURE/KPI	TIMELINE (FY)					NNP MANAGEMENT ACTIONS
					20/21	21/22	22/23	23/24	24/25	
Financial (F)	F1: Enhance financial sustainability	Grow total revenue to Ksh. 12b annually by 2024	Mobilize funding to the tune of Ksh 5b annually by 2024	Amount of funds mobilized						P4.5: Prepare project proposals for funding
			Leverage technology to maximize revenue	NNP E-Park portal operational and enhancing revenue collection						P4.1: Develop a NNP E-park portal
			Develop new products and enhance existing ones	No. of new tourism products developed and amount of revenue generated from these products						T1.1: Establish a high end permanent luxury tented camp
										T1.2: Develop the KWS Club House High-end restaurant (Orpul Place)
										T1.3: Design and establish adventure activity concessions
										T1.4: Facilitate alternative activities to traditional game-viewing
										T1.5: Designate and establish new campsites
										T2.1: Remodel the NNP Main Gate T2.2: Develop the

PERSPECTIVE	STRATEGIC OBJECTIVE	STRATEGY	INITIATIVES (KWS CORPORATE)	MEASURE/KPI	TIMELINE (FY)					NNP MANAGEMENT ACTIONS
					20/21	21/22	22/23	23/24	24/25	
										Visitor Service Centre
										T2.3: Develop the Ivory burning memorial museum-Elephant graveyard
										T2.4: Improve Impala Viewpoint
										T2.5: Upgrade Mokoyiet picnic site and viewing point
										T2.6: Upgrade and expand Hippo Pools Picnic Site, nature trail and Cultural Centre
										T2.7: Upgrade Kingfisher camping site
										T2.8: Develop Dam site viewpoints (Nagolomon, Athi Basin, Hyena)
										T2.9: Upgrade Signage and interpretation
										T2.10: Upgrade visitor facilities at park entry gates
										T2.11: Develop cultural tourism programmes with the local community
			Reduce wastage by curbing unnecessary costs and encouraging saving across the organization	Park METT report						P4.2: Align the management plan with the corporate scorecard and annual work plans

PERSPECTIVE	STRATEGIC OBJECTIVE	STRATEGY	INITIATIVES (KWS CORPORATE)	MEASURE/KPI	TIMELINE (FY)					NNP MANAGEMENT ACTIONS
					20/21	21/22	22/23	23/24	24/25	
										and budgets
										P4.3: Expedite procurement of goods and services at the NNP
										P4.4: Establish a financial management database
										P4.5: Assess park management effectiveness
Customer (C)	C1: Enhance excellence in service delivery	Provide customers with wonderful experiences	Enhance interactions with customers by using multiple channels, including revamping the KWS website, developing mobile apps and using social media and other media forms	No. of positive feedback responses from customers						T3.1: Modernise marketing methods
										T3.3: Organize marketing events
										T3.4: Prepare and disseminate marketing materials e.g. brochures, maps, guide book, stickers and merchandise
										T3.5: Promote the NNP through the mass media and organising and participating in both local and international exhibitions
										T3.7: Improve park interpretation
										T4.1: Strengthen NNP tourism human resource capacity

PERSPECTIVE	STRATEGIC OBJECTIVE	STRATEGY	INITIATIVES (KWS CORPORATE)	MEASURE/KPI	TIMELINE (FY)					NNP MANAGEMENT ACTIONS
					20/21	21/22	22/23	23/24	24/25	
										T4.3: Create more environmental awareness during visitor briefings to infringement on park rules
			Brand internationally designated areas and designate others (Ramsar sites, World Heritage sites and biosphere reserves	NNP established as a INSTO observatory						T3.10: Nominate NNP to join the International Network of Sustainable Tourism Observatories (INSTO)
			Leverage contacts and customer details collected at parks and reserves to gain customer insights and solicit satisfaction levels/feedback	Customer satisfaction index						T4.2: Hold regular meetings with NNP tourism investors and operators
			Develop products and services that respond to or anticipate customer needs	Customer satisfaction index						T3.8: Work with JKIA and other relevant stakeholders to develop a day package for visitors in transit and other stakeholders
			Develop and maintain airstrips, roads water transport infrastructure, buildings, fences and other infrastructure	Customer satisfaction index						P3.1: Upgrade, rehabilitate and maintain roads, tracks, firebreaks and trails
										P3.2: Construct, rehabilitate and maintain residential and Non residential buildings
										P3.3: Ensure prompt service of vehicles and machinery

PERSPECTIVE	STRATEGIC OBJECTIVE	STRATEGY	INITIATIVES (KWS CORPORATE)	MEASURE/KPI	TIMELINE (FY)					NNP MANAGEMENT ACTIONS
					20/21	21/22	22/23	23/24	24/25	
										P3.4: Improve radio communication
										P3.5: Improve telephone network coverage
										P3.6: Provide adequate computers and accessories
										P3.7: Construct entry gates
			Acquire and maintain KWS motor vehicles and boats	Customer satisfaction index						T3.2: Re-introduce a tour bus and additional VIP tour vehicle
			Enhance brand visibility	Customer satisfaction index						T3.9: Sell Park branded merchandise
			Develop and implement innovative prevention and mitigation initiatives to promote coexistence between people and wildlife	No. of HWC incidences No. of complaints regarding wildlife						C3.1: Construct and maintain wildlife fence to protect people and their property
										C3.2: Maintain the human-wildlife conflict database and identify HWC hotspots
										C3.3: Establish an effective communication network to facilitate prompt reporting of human-wildlife conflict incidents
										C3.4: Establish problem animal control (PAC) outposts

PERSPECTIVE	STRATEGIC OBJECTIVE	STRATEGY	INITIATIVES (KWS CORPORATE)	MEASURE/KPI	TIMELINE (FY)					NNP MANAGEMENT ACTIONS
					20/21	21/22	22/23	23/24	24/25	
										C3.5: Provide problem animal control equipment to the community scouts
										C3.6: Identify and recommend gazettement of honorary wardens
										C3.7: Create awareness on the wildlife compensation process among the local community
										C3.8: Train the local community on construction of predator proof Bomas
	C2: Strengthen relationships with stakeholders and partners	Develop and implement stakeholder/partnership engagement strategy	Develop and implement a stakeholder engagement strategy with accompanying stakeholder maps	Stakeholder engagement plan developed and implemented						P1.1: Develop a stakeholder engagement plan for the community conservancy and buffer zone land owners
										P1.2: Develop and implement Memorandum of Agreements with buffer zone land owners to be fenced in, Naretunoi Community Conservancy and Sheep and Goats Ranch
			Develop and implement the Devolution Strategy that will inform engagements with	Size of unsubdivided land available to wildlife in the disper-						P1.5: Collaborate with County governments of Nairobi,

PERSPECTIVE	STRATEGIC OBJECTIVE	STRATEGY	INITIATIVES (KWS CORPORATE)	MEASURE/KPI	TIMELINE (FY)					NNP MANAGEMENT ACTIONS
					20/21	21/22	22/23	23/24	24/25	
			the counties	sal area						Kajiado and Machakos in minimising threats to the ecological integrity of NNP
			Develop and implement the KWS Communication Strategy	No. of tourism stakeholder meetings						P1.3: Establish a wildlife tourism forum for the buffer zone residents , Naretunoi Community Conservancy and Sheep and Goats Ranch
				Park Management committee in place and holding meetings regularly						P1.4: Establish an NNP management committee comprising all stakeholders with interest in the conservation of the NNP
Internal Processes (IP)	IP1: Reverse and stabilize the declining trend across wildlife populations and habitats	Win more space for wildlife	Strengthen engagement with community conservancies, conservation education and awareness, extension services and capacity building	No. of conservation talks given to organized school groups No. of education materials prepared and disseminated No. of community eco-tourism projects in place						C1.1: Create awareness on NNP's values among organised school groups C1.2: Prepare educational materials targeting different age groups
										C1.3: Establish sponsored protected area tours for the local community
										C1.4: Support WCK's education activities
										C1.5: Enhance the community outreach programme

PERSPECTIVE	STRATEGIC OBJECTIVE	STRATEGY	INITIATIVES (KWS CORPORATE)	MEASURE/KPI	TIMELINE (FY)					NNP MANAGEMENT ACTIONS
					20/21	21/22	22/23	23/24	24/25	
										C4.1: Support social projects identified by communities
										C4.2: Support communities in identification and exploitation of ecotourism opportunities
										C4.3: Provide employment opportunities to the local community
										C4.4: Work with other stakeholders to explore other legal Payment for Ecosystem Services (PES) mechanisms that can complement the wildlife conservation lease programme
										C4.5: Support communities in preparation of proposals to seek donor funding
			Secure wildlife corridors and dispersal areas	A functional conservancy in place A functional WRUA in place MOAs with stakeholders drawn and implemented						C2.1: Support establishment of community wildlife conservancies
										C2.5: Support formation of Water Resource Users

PERSPECTIVE	STRATEGIC OBJECTIVE	STRATEGY	INITIATIVES (KWS CORPORATE)	MEASURE/KPI	TIMELINE (FY)					NNP MANAGEMENT ACTIONS
					20/21	21/22	22/23	23/24	24/25	
										Associations for management of the section of Mbagathi River in NNP
										P1.1: Develop and implement Memorandum of Agreements with buffer zone land owners to be fenced in, Naretunoi Community Conservancy and Sheep and Goats Ranch
			Secure KWS land assets and real estate	No. of vandalism cases reported						S1.1: Minimise theft and vandalism of KWS assets
										S1.2: Establish an NNP security database and identify security hotspots
			Support the establishment and sustainability of conservancies	Livestock grazing plan developed and implemented Community scouts trained and working for the conservancy No. of wildlife related enterprise projects						C2.1: Support establishment of community wildlife conservancies
										C2.2: Support development of a Conservancy Livestock grazing plan
										C2.3: Train community scouts in relevant skills

PERSPECTIVE	STRATEGIC OBJECTIVE	STRATEGY	INITIATIVES (KWS CORPORATE)	MEASURE/KPI	TIMELINE (FY)					NNP MANAGEMENT ACTIONS
					20/21	21/22	22/23	23/24	24/25	
										C2.4: Support wildlife related community enterprise projects
			Mainstream wildlife conservation in the development of County Spatial Plans and County Integrated Development Plans (CIDP)	No. of NNP issues addressed by the CIDP						C2.6: Work with the County Governments of Kajiado and Machakos in maintaining wildlife dispersal areas
		Maintain the ecological integrity of parks and reserves	Formulate and review park and ecosystem management plans and implement ecosystem management programmes	Fire management plan developed and implemented Integrated water management plan for rivers developed and implemented Revised NNP management plan Management effectiveness assessment report						E2.1: Develop and implement a prescribed Fire Management Plan
										E3.3: Support the preparation of an integrated water management plan for rivers feeding into the NNP
										P1.6: Review the NNP management plan
										P1.7: Assess NNP's management effectiveness
			Undertake environmental audits and environmental impact assessment of	SGR EMP implementation report						E2.9: Implement the Standard Gauge Railway (SGR)

PERSPECTIVE	STRATEGIC OBJECTIVE	STRATEGY	INITIATIVES (KWS CORPORATE)	MEASURE/KPI	TIMELINE (FY)					NNP MANAGEMENT ACTIONS
					20/21	21/22	22/23	23/24	24/25	
			projects in parks and reserves							Environmental Management Plan
			Rehabilitate and restore degraded habitats in parks, reserves and dispersal areas, and deter encroachment	No. Hectares restored Wildlife numbers in the park Size of buffer zone						E2.2: Prevent and control wild fires
										E2.3: Undertake mineral supplementation
										E2.4: Design and implement a grass mowing pilot scheme to maintain short grass lawns
										E2.5: Rehabilitate and restore degraded habitats dispersal areas, and deter encroachment
										E2.7: Establish a buffer zone on the southern park boundary
										E2.8: Carry out NNP land cover change study
										E3.4: Develop alternative water sources for wildlife inside the NNP
										E3.5: Provide sufficient water to wildlife
			Manage invasive species in national parks and reserves	No. of hectares of invasive species						E2.6: Control of invasive and alien

PERSPECTIVE	STRATEGIC OBJECTIVE	STRATEGY	INITIATIVES (KWS CORPORATE)	MEASURE/KPI	TIMELINE (FY)					NNP MANAGEMENT ACTIONS
					20/21	21/22	22/23	23/24	24/25	
				eradicated						plants
			Mitigate impacts of climate change in parks and reserves							E2.10 Mitigate impacts of climate change
			Disease surveillance, monitoring and control	No. of disease surveillance missions						E1.10: Manage wildlife diseases
			Undertake wildlife census, translocations for introduction, re-introduction and genetic augmentation of wildlife populations	No. of rhinos re-introduced/introduced						E1.3: Carry out new rhino reintroductions as appropriate
										E1.4: Carry out routine monitoring of rhino population dynamics and habitat suitability n the rhino sanctuary
										E1.5: Enhance lion conservation and management
										E1.6: Improve management of dispersing species
										E1.7: Minimise threats to the Masai Giraffe and its habitats
										E1.8: Enhance conservation of habitats for Masai Giraffe
										E1.9: Undertake translocations for introduction, re-introduction and genetic augmentation of wildlife populations

PERSPECTIVE	STRATEGIC OBJECTIVE	STRATEGY	INITIATIVES (KWS CORPORATE)	MEASURE/KPI	TIMELINE (FY)					NNP MANAGEMENT ACTIONS
					20/21	21/22	22/23	23/24	24/25	
			Leverage technology for spatial mapping to maintain the integrity of boundaries of wildlife protected areas	KM of park boundary cleared and marked						P3.8: Demarcate PA boundaries
			Conserve and manage water catchment areas falling under KWS jurisdiction	No. of WRUAs supported and functional						E3.1: Establish and maintain water monitoring stations on rivers leading to the NNP
										E3.2: Support establishment of WRUAs to control water use and pollution
		Enhance wildlife research, monitoring and science to inform management decisions in wildlife conservation, protection and management	Develop KWS science, technology and research strategy	Ecological monitoring programme in place						E4.1: Establish an ecological monitoring programme
				Research equipment procured						E4.2: Strengthen the capacity of the NNP research station
				No. of research seminars organised						E4.3: Improve the management, accessibility and dissemination of NNP ecological information
				Management guidelines for a closed system in place						E4.4: Develop closed system management guidelines
			Establish status of wildlife populations	Bi-monthly wildlife census reports						E4.6: Carry out ongoing ecological monitoring
			Enhance collaborations with universities and research	No. of collaborative research projects						E4.5: Conduct management

PERSPECTIVE	STRATEGIC OBJECTIVE	STRATEGY	INITIATIVES (KWS CORPORATE)	MEASURE/KPI	TIMELINE (FY)					NNP MANAGEMENT ACTIONS
					20/21	21/22	22/23	23/24	24/25	
			institution							oriented research
			Formulate and implement endangered species conservation and management recovery plans	%increase in black rhinos						E1.1: Manage and enhance Black rhino population in accordance with the Black Rhino Action Plan 2017-2021
				No. rhinos above the carrying capacity of the park						E1.2: Maintain rhino population below the determined ecological carrying capacity
	IP2: Strengthen law enforcement capacity	Develop and implement strategies, agreements and provide facilities and equipment to fulfil mandate								
			Enhance collaboration with other law enforcement agencies	No. of joint operations						S2.5: Liaise with the local police to enhance security at tourist accommodation facilities
										S2.4: Work with other security agencies to enhance security in the park and its dispersal areas
			Strengthen the capacity of specialized security units	No. of actionable intelligence gathered						S2.1: Expand the intelligence gathering network
										S2.2: Improve intelligence information gathering and analysis
										S2.3: Work with the local community in the dispersal area to

PERSPECTIVE	STRATEGIC OBJECTIVE	STRATEGY	INITIATIVES (KWS CORPORATE)	MEASURE/KPI	TIMELINE (FY)					NNP MANAGEMENT ACTIONS
					20/21	21/22	22/23	23/24	24/25	
										control poaching
			Enhance response capacity to wildlife crime and human wildlife conflict	No. of outposts equipped						S1.3: Equip existing patrol outposts
				No. of ground and aerial patrols % reduction in wildlife poaching						S1.4: Intensify ground and aerial patrols
Learning and Growth (LG)	LG1: Strengthen institutional capacity	Recruit and place talented and suitable individuals		No. of staff recruited						P2.1: Deploy new staff to understaffed sections
		Invest in skills development, multi-skilling and continuous training		No. of staff trained						P2.2: Train staff in relevant skills
			Promote and enhance staff welfare aspects including staff pension scheme, car loan scheme, housing mortgage scheme, staff accommodation/housing, insurance policies and staff medical scheme	No. of staff houses constructed and maintained						P3.2: Construct, rehabilitate and maintain residential and Non residential buildings
				No. of staff complaints						P2.3: Improve staff welfare
			Facilitate employee participation in sports, music and other talent activities	No. of staff participating in sports and other talent activities						P2.4: Establish sport clubs and a choir at NNP

Management Actions Coding

E-Ecological management Programme; T-Tourism Development and Management Programme; C-Community Partnership and Conservation Education Programme; S-Security Management Programme; P-Park Operations Management programme

Annex 2. Stakeholder participation in plan development

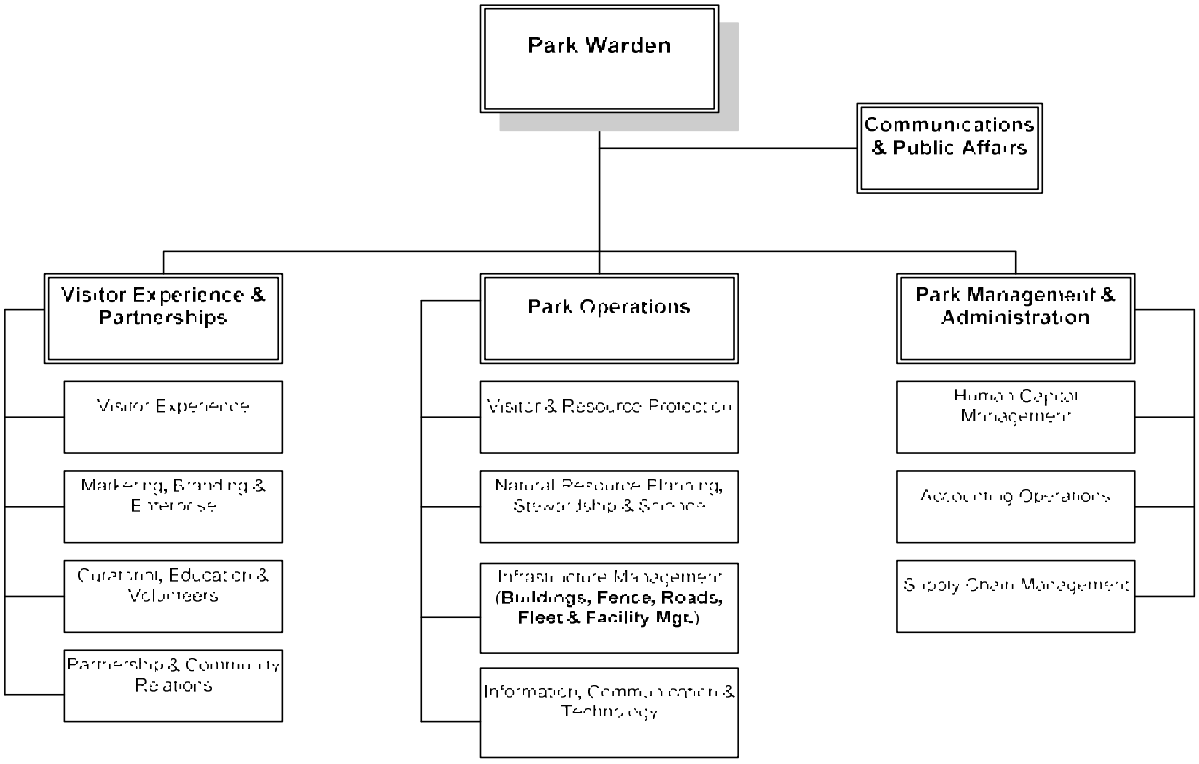
Name	*Organisation/Position*	*SPM*	*PSM*	*NCCM*	*MLLM*
Achoki Josiah	Honorary Warden	X			
Akshay Vishwanath	FoNNaP	X			
Alexander Omondi	KWS		X		
Ali Satar	Volunteer NNP/Machakos	X			
Aliya Habib	FONNAP		X		
Anastacia Mwaura	KWS,HQ -SRP			X	
Anne Pertet	Resident				X
Antony Childs	Emakoko	X			
Apollo Kariuki	KWS HQ	X	X	X	X
Awori Achaka	Oloosirkon residents association	X			
Beatrice Kishoyian	Community			X	
Benard Ngoru	KWS HQ	X			
Benson K. Mutunkai	TWF	X	X		
Bernad Muanza	KWS	X			
Bethuel Thiongo	KWS		X		
Caorgio Vitonne	Honorary Warden	X			
Catherine Kiyeng	KWS	X			
Chelimo Iel	student (JKUAT)			X	X
Cheryl Achesa	Student Kenyatta University			X	
Christine Wangari	KWS	X			
Clemence Samba	NTC		X		
Cyrus Kenyoe	Community Oloosirkon	X			
Daniel Mbugua	Big Foot Adventures	X			
Daniel Muteti	KWS-SRS-SCA	X		X	X
Daniel Ngusur	Community			X	
David Kiroranyi	Community			X	
David Matiko	Enkishon Research Consultants	X			
David Mutwiwa	KWS Machakos	X			
David Sorimpan	Olerai Conservancy	X			
David Western	ACC/Land owner	X			X
Davinder Sikand	TWF			X	
Dickson Kaelo	KWCA	X			
Dr. Elizabeth Wambugu	KFS	X			
Dreip Permisa	Community			X	
Edward Loosli	The Wildlife Foundation	X			
Elphas Bitok	KWS NNP	X			
Emmanuel Koech	KWS		X		
Fidel Nyakundi	KWS	X			
Fred Kaigwa	KATO	X			
Fred Onkware	ORA	X			
Geoff Simpson	Resident				X
Ghulam Samdani	Ole Sereni	X			
Guy Lawrence	NTC		X		
Isaac Kang'o	TWF			X	
Isaac Kishoyian	Community			X	

Name	Organisation/Position	SPM	PSM	NCCM	MLLM
Isaac Tarayia	Community			X	
Isabela Mbandi	Wildlife Clubs of Kenya	X			
Israel Makau	KWS		X		
Jackline Mutwiri	KWS NNP -ARS	X		X	X
Jackson Kingoo	KWS	X			
Jackson Munyaka	Assistant Chief	X			
Jacob Tukai	FoNNaP	X			
James Kiparus	KWS,NNP-Community Warden	X		X	X
Janeth Cherotich	KWS	X			
Jason Tipatet	Assistant Chief	X			
Joel Kasawe	Community			X	
John Solonka	Community (TWF)	X	X	X	
Joseph Abinayo	TWF			X	
Joseph Ccen	NTC	X			
Joseph dadacha	KWS,NNP-SNR Warden			X	X
Joseph Lelesuna	Nairobi Tented Camp	X			
Josian Ole Nkapapa	Community			X	
Josphat Ngonyo	African Network for Animal Welfare	X			
Kahenya Njenga	Enkang Entim (community)	X			
Kamweti Mutu	Chd.cons. Kenya	X			
Lenah Ncharo	Community			X	
Marco Prun	FoNNaP	X			
Margaret Otieno	WCK		X		
Mary Muthoni	WildlifeDirect	X			
Maurine Musimbi	KWS	X			
Mercy Nekesa	KWS	X			
Michael Macharia	KWS		X		
Millicent Kathambi	KWS	X			
Mohanjet Brar	Nairobi Tented Camp/Game Watchers	X			
Mou Ndeti	WRA-MSR	X			
Muraya Githinji	KWS		X		
Muteru W. Njau-ini	KWS Kajiado	X			
Mwanahamisi Twalib	KWS		X		
Nadia Mathews	Land owner				X
Nelly Pelmeris	KWS		X		
Nelson Olpusa	Community			X	
Nickson Parmisa	Community			X	
Nkamunu Patita	IWCD Oloosirkon	X		X	X
Paras Chandaria	WOW Safaris	X			
Parmisa Semei	Community			X	
Patricia Kitheka	KFS Nairobi County	X			
Paul Zara Hatchman	Land owner				X
Peter N.Mwangi	KWS,HQ -SRC-EIA				X
Ranginya Pamela	KWS	X			
Reinnerd Bonke	FoNNap	X			
Rev. Wilson Nanka	Community			X	
Rihaz Sidi	Emakoko	X			
Rosy Russell	Land owner				X
Sen.Eng.Mositef	Resident				X
Shomin Tarayia	Community			X	
Steve Itela	Conservation Alliance of Kenya	X			
Thomas Nkapaapa	Community			X	

Name	*Organisation/Position*	*SPM*	*PSM*	*NCCM*	*MLLM*
Tobias Odhacha	WildlifeDirect	*X*			
Trish Heather	HAYES		*X*		
Vincent Ole Sinad	TWT			*X*	
Wahu Gathu	Wildlife Direct	*X*			
Wanja Kimani	Nairobi Green Line		*X*		
William Kaasha	Senior Chief	*X*			
William Kombe	Community			*X*	
Wilson Kaloi	Senior Chief	*X*			
Zavij Western	ACC	*X*			

Key
PSM – Plan Scoping Meeting
SPM- Stakeholder Planning Workshop
NCC- Naretunoi Community Conservancy Meeting
MLLM- Masai Lodge Land Owners Meeting

Annex 3. Proposed Park Management Organizational Structure



Annex 4. NNP Optimum staffing levels

SECTION	JOB TITLE/POSITION	CURRENT NO.	REQUIREMENTS	VARIANCE
PARK MANAGEMENT & ADMINISTRATION	Assistant Director*	0	1	1
	Senior Warden	1	1	-
	Deputy Warden (WI)	-	1	1
	Warden 11	1	-	-
	Executive Secretary	1	1	-
	Copy Typist	1	1	-
	Snr Sergeant	-	1	1
	Telephone Operator	1	1	-
	Driver	1	2	1
	SS	1	1	-
	Sub-Total	**6**	**10**	**4**
RHINO/FENCING UNIT	AW I*	0	1	1
	AW II	1	1	-
	Sergeant	1	1	-
	Corporal	1	1	-
	Rangers	7	10	3
	Driver	3	4	1
	Fence Technician	1	1	-
	Fence attendant	2	8	6
	Sub-Total	**16**	**27**	**11**
TOURISM	AW I*	0	1	1
	AW II	1	1	-
	Sergeant	1	1	-
	Corporal	3	7	4
	Ranger	24	37	13

SECTION	JOB TITLE/POSITION	CURRENT NO.	REQUIREMENTS	VARIANCE
	Driver	1	1	-
	SS	1	1	-
	Sub-Total	**31**	**49**	**18**
COMMUNITY WILDLIFE SERVICE	AWI*	0	1	1
	Community Wildlife Officer	1	1	-
	Sergeant	-	1	1
	Corporal	1	3	2
	Ranger	11	18	7
	Driver	1	2	1
	Sub-Total	**14**	**26**	**12**
SECURITY	AW I*	0	1	1
	AW II	1	1	0
	Sergeant	-	1	1
	Cpl	-	1	1
	Ranger	-	14	14
	Driver	-	2	2
	Sub-Total	**1**	**20**	**19**
INTELLIGENCE	AW I*	1	1	-
	AW II	1	1	-
	Sgt	1	1	-
	Cpl	1	2	1
	Rgr/Collators	1	3	2
	Rgr/Driver	1	1	-
	Sub-Total	**6**	**9**	**3**
INVESTIGATION	AW I*	0	1	1
	AW II	1	1	-
	Sergeant	-	1	1
	Cpl	-	2	2
	Driver	-	1	1
	Sub-Total	**1**	**6**	**5**
RESEARCH & PLANNING	Snr. Research Scientist*	-	1	1
	Research Scientist	1	1	-
	Research Ass.	1	2	1
	Driver	-	1	1
	Sub-Total	**2**	**5**	**3**
CIVIL WORKS	Works Supt.	-	1	1
	Works Supervisor	1	1	-
	Mason	1	2	1
	Carpenter	2	2	-
	Painter	1	2	1
	Sign-writer	1	2	1
	Plumber	2	2	-
	Plant Operator	4	4	-
	Driver	1	2	1
	Sub-Total	**13**	**18**	**5**
HUMAN RESOURCE	Snr. HR Officer*	-	1	1
	HR Officer	1	1	-
	HR Assistant	-	1	1
	Clerical Officer	-	1	1
	SS	-	1	1
	Sub-Total	**1**	**5**	**4**
PROCUREMENT AND SUPPLIES	Procurement Officer	-	1	1
	Procurement assistant	1	1	-
	Supplies Clerk	1	1	-
	Sub-Total	**2**	**3**	**1**
ACCOUNTS	Park Accountant	1	1	-
	Ass. Acct.	-	1	1
	Accounts Ass.	1	2	1
	Rgr/Accts Clerk	1	1	-
	Sub-Total	**3**	**5**	**2**
KIFARU ARK SHOP	Shop Manager*	-	1	1
	Shop Supervisor	1	1	-
	Shop Attendant	2	2	-
	SS	-	1	1
	Sub-Total	**3**	**5**	**2**
MECHANICAL	Mechanical Supervisor	1	1	-
	MV Mechanic + Plant mechanic	-	2	2
	Sub-Total	**1**	**3**	**2**
POI (POINT OF ISSUE)	POI ticketing assistant	2	2	-
	POI Clerk	4	4	-
	Sub-Total	**6**	**6**	**-**
POS (POINT OF SALE)	POS ticketing assistant	2	2	-

SECTION	JOB TITLE/POSITION	CURRENT NO.	REQUIREMENTS	VARIANCE
	POS Clerk	4	4	-
	Driver	2	1	**1**
	Sub-Total	**8**	**7**	**1**
TELECOMMS	Telecommunication supt.	1	1	-
	Snr. Insp. Electronics	1	1	-
	Insp. Electronics	2	3	**1**
	Telecommunication technician	1	1	-
	Driver	0	2	**2**
	Sub-total	**5**	**8**	**3**
EDUCATION & INFORMATION	Driver	0	1	1
	Education & information officer	0	1	1
	Education & information assistant	0	1	1
	Sub-total	**0**	**3**	**3**
	Grand Total	**120**	**216**	**96**

*: Priority for promotion to position to be given to already existing staff at the park if he/she has the minimum qualification requirements for the position

Annex 5. Plants of restricted distribution found in NNP

family	species	comment
Amaranthaceae	Achyropsis fruticulosa C.B.Clarke	K13467 T2
Lythraceae	Nesaea kilimandscharica Koehne var. ngongensis Verdc.	K46
Sterculiaceae	Hermannia athiensis K. Schum.	K?36
Euphorbiaceae	Euphorbia brevitorta P.R.O. Bally	K346
Euphorbiaceae	Euphorbia gossypina Pax var. coccinea Pax	K3456 T2
Euphorbiaceae	Euphorbia sp. nov.	not traced
Euphorbiaceae	Euphorbia uhligiana Pax	No K4 (K6 T23)
Papilionaceae (Leguminosae)	Dolichos luticola Verdc.	K346 T2
Papilionaceae (Leguminosae)	Indigofera nairobiensis Baker f. ssp. nairobiensis	K1346 T2
Papilionaceae (Leguminosae)	Rhynchosia pulverulenta Stocks	K4 T2 but wider outsi
Papilionaceae (Leguminosae)	Tephrosia athiensis Baker f.	K346
Loranthaceae	Englerina heckmanniana (Engl.) Polhill & Wiens ssp. polytricha Polhill & Wiens	K346 T1235
Vitaceae	Cyphostemma jiguu Verdc.	K14
Apocynaceae	Brachystelma lineare A. Rich.	K34 but also Sud,Eth
Apocynaceae	Raphionacme brownii Scott-Elliot	no K4 in FTEA
Rubiaceae	Dibrachionostylus kaessneri (S. Moore) Bremek.	K4 only
Asteraceae	Ethulia scheffleri S. Moore	U1/3/4 K34
Asteraceae	Gynura sp. nov.	Not traced
Acanthaceae	Asystasia laticapsula Karlström	FTEA K46 T12
Amaryllidaceae	Cyrtanthus sanguineus (Lindl.) Walp. ssp. ballyi Nordal	K46
Commelinaceae	Commelina eckloniana Kunth ssp. nairobiensis (Faden) Faden?	K346
Commelinaceae	Murdannia clarkeana Brenan	K134 ?CAR ?Chad

Annex 6: SGR Environmental Management Plan for the Operational Phase

		program for Waste from Passenger Trains and Terminals				(waste management regulations, 2006)
		Waste storage, collection, transportation and disposal as per Waste Management Regulations, 2006	KRC	SGR operation	KRC policy	Environmental (waste management regulations, 2006)
		Recyclable waste is to be re-used on site and removed for re-use elsewhere.	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
		Hazardous and general waste is to be separated at source.	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
		Hazardous waste is to be disposed at the hazardous waste disposal site.	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
3.1.2	To avoid environmental pollution through improper waste effluent management in the SGR stations	Provide adequate and safe means of handling liquid waste at the stations and terminals	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
		Conduct regular inspections for pipe blockages or damages and fix them appropriately	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
		Ensure regular monitoring of the sewage discharged from the project stations to ensure that the stipulated sewage/effluent discharge rules and standards are not violated	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
		Use of ultra-filtration to extend the life of washing solutions for aqueous parts or use of alternatives to water cleaning	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
		Plumbing connection of floor drains, if any, in maintenance areas to the wastewater collection and treatment system	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
		Prevention of discharge of industrial wastes to septic systems, drain fields, dry wells, cesspools, pits, or separate storm drains or sewers	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
		Pretreatment of effluents to reduce contaminant concentrations	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
		Comply with the provisions of Environmental Management and Co-ordination (Water Quality) Regulations 2006	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
3.1.3	To avoid environmental pollution through improper management of hazardous cargo and waste in the SGR operation	Use of aqueous detergent cleaning solutions or steam cleaning, or use and recycling of aliphatic cleaning solvents (e.g. 140 solvent), for example when removing axle protective coatings or for cleaning of large equipment;	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
		Use of water-based paints;	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
		Use of track mats to retain wayside grease and other contaminants;	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
		Avoiding use of new or replacement	KRC	SGR operation	KRC policy	EMCA (waste

		parts with asbestos containing materials.				management regulations, 2006)
3.1.4	To avoid environmental pollution through oil spillage in the SGR railway stations	Storage tanks and components should meet international standards for structural design integrity and operational performance	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
		Storage tanks should have appropriate secondary containment	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
		Secondary containment in rail fueling areas should be appropriate for the size of the railcar, level, curbed, sealed, and draining to a sump connected to a spill retention area.	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
		The spill retention area should be equipped with an oil / water separator to allow the routine discharge of collected rainwater	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
		Fueling facilities should develop a formal spill prevention and control plan	KRC	SGR operation	KRC policy	EMCA (waste management regulations, 2006)
3.2 BIODIVERSITY PROTECTION						
3.2.1	To minimize disturbance to wildlife in Nairobi National Park	Acquistion of modern train engines	KRC	Throughout the operation phase	Train engines servicing schedule	EMCA (Noise & vibration control regulations, 2009)
		Monitor use of the SGR viaduct corridor by key wildlife species including their behavior	KWS	As required	Wildlife monitoring plan	Wildlife Act, 2015
		Put up warning signage on both ends of the viaduct for train drivers to deem train lights	KRC	Throughout the operation phase	Put up warning signage on both ends of the viaduct for train drivers to deem thair lights	Wildlife Act, 2015
3.2.2	To reduce security risks to wildlife in NNP due to the viaduct	Maintenance of fences and embankments at both ends of the viaduct	KRC& KWS	As required	NNP viaduct maintenance program	Wildlife Act, 2015
3.2.3	To minimize the disturbance of valued habitats along the SGR route	Routine bush control along the SGR route to be restricted within the way leave	KRC	SGR operation	Clear instructions and awareness campaign	EMCA (2009), Environmental (Conservation of biological diversity and resources, and access to genetic resources and benefits sharing) Regulations, 2006, Wildlife Act, 2015
3.2.4	To minimize the night visual impact in the NNP as a result of artificial linear light	Engage a carriageway-lights off in the 6km section over the NNP	KRC	SGR operation	KRC protocol	-
3.3 VISUAL ENVIRONMENTAL IMPACT						
3.3.1	To ensure minimal visual impact in Nairobi National Park	To ensure the viaduct over the park blends with its immediate environs	KRC	Throughout operation phase	KWS park management guidelines	EMCA, 1999
3.3.2	To ensure minimal visual impact in Ngong and Oloisa Forests	To maintain the visual integrity of the SGR corridor through the 2 forest	KRC	As required	KFS forest management guideline	EMCA, 1999 & Forest Act, 2005
3.4 INVASIVE SPECIES						
3.4.1	To prevent the spread of invasive species along the SGR route especially in the	Undertake regular monitoring and control of emerging invasive species in collaboration with KWS	KRC	SGR operation	-	EMCA (Cap 387), IUCN-GISP guidelines
	NNP wildlife flyover corridor	Use modern cargo and passenger coaches with low risk of spreading invasive species	KRC	Throughout the operation phase	Invasive species surveillance guidelines augmented with clear instructions and awareness campaign	EMCA 1999 (Cap 387) & IUCN-GISP guidelines

Annex 7: Nairobi National Park Lion Population Status, April 2016

Identified lions

	Name	Sex	Age Classi-fication	Pride	Date of Birth	Alias
1	Nelly	Female	OA	Athi	2000 / 2001	
2	AC1	Female	LC	Athi	September 2014	
3	AC2	Female	LC	Athi	September 2014	
4	AC3	Male	LC	Athi	September 2014	
5	Alex	Male	OA	Athi & Middle	2005	M2
6	Cheru	Male	OA	Athi & Middle	2004	M1
7	Mumbi	Female	OA	Kingfisher	2004 / 2005	KF6
8	Floppy ear	Female	PA	Kingfisher	2006 / 2007	KF2
9	Kingfisher 3	Female	OA	Kingfisher	2004 / 2005	KF3
10	KC1	Male	LC	Kingfisher	End of 2014	
11	KC2	Male	LC	Kingfisher	End of 2014	
12	KC3	Female	LC	Kingfisher	End of 2014	
13	KC4	Female	LC	Kingfisher	End of 2014	
14	KC5	Female	LC	Kingfisher	End of 2014	
15	Dirk	Male	PA	Kingfisher	2009 / 2010	
16	Neema	Female	PA	Nomadic	2011	
17	Pretty boy	Male	PA	Nomadic	2011	
18	Tall boy	Male	PA	Nomadic	2011	
19	Bertine	Female	PA	Middle	2006 / 2007	MF3
20	Bertine's mom	Female	OA	Middle	2001 / 2002	MF2
21	MC5	Unknown	SC	Middle	End of 2015	
22	MC6	Unknown	SC	Middle	End of 2015	
23	MC7	Unknown	SC	Middle	End of 2015	
24	MC8	Unknown	SC	Middle	End of 2015	
25	MC9	Unknown	SC	Middle	End of 2015	
26	Dot	Female	PA	Middle	2006 / 2007	MF4
27	MC1	Male	LC	Middle	End of 2014	
28	MC2	Female	LC	Middle	End of 2014	
29	MC3	Male	LC	Middle	End of 2014	
30	MC4	Male	LC	Middle	End of 2014	

Not properly identified lions

	Name	Sex	Age Classification	Pride	Date of Birth
31	UKF1	Female	PA	Unknown	Unknown
32	UKC1	Unknown	SC	Unknown	Unknown
33	Dark mane middle subadult	Male	SA	Nomadic?	2012
34	UKF2	Female	SA	Nomadic?	2012



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