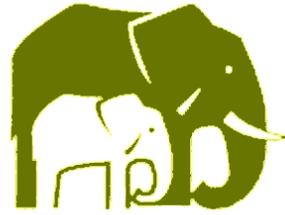


KENYA
WILDLIFE
SERVICE



Hell's Gate-Mt. Longonot Ecosystem Management Plan, 2010-2015



A walk on the wild side



Hell's Gate-Mt. Longonot Ecosystem Management Plan, 2010-2015

*Planning carried out
By*

Hell's Gate/Mt. Longonot National Park Managers and
KWS Biodiversity Planning and Environmental Compliance Department

In accordance with the

KWS Management Planning Standard Operating Procedures

Acknowledgements

This General Management Plan was developed by a Planning Team comprising Park Wardens, KWS Area and Headquarters Scientists, and a resource person from the tourism industry, Mr. Daniel Njaga.

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The planning team would like to express their gratitude to Mr. Ojwang, Peter Mwangi, Zachary, Lilian Aberi, and Rose Mbwire for compiling the resource base information that was needed to support management planning for Hell's Gate/Mt. Longonot Ecosystem. Our special thanks to Mathew Thiga, GIS Expert, who prepared the maps contained in this plan.

Approval Page

The management of the Kenya Wildlife Service has approved the implementation of this management plan for the Hell's Gate-Longonot Ecosystem

A handwritten signature in black ink, appearing to read 'Julius Kipng'etich', with a large, sweeping flourish extending to the left.

Mr. Julius Kipng'etich
Director

Executive Summary

The Plan foundations

This 5-year (2010-2015) management plan for the Hells Gate/Longonot Ecosystem has been developed in accordance with the Standard Operating Procedure (SOP) for developing management plans for protected areas. The plan is one of four management planning initiatives piloting the revised standard operating procedure, the other being Kisumu Impala, Ndere and Ruma National Parks. In line with this SOP, this plan aims to balance conservation and development in the target protected areas.

In order to fulfil the Plan's functions, the plan structure has been developed to be as simple as possible, and as such, easily understood by stakeholders and implemented by Hell's Gate/Longonot Ecosystem management. The plan is divided into four key parts i.e. **Plan Foundations, Zonation Scheme, Management Programmes, and Plan Monitoring.**

Area description

The Hells Gate-Mt. Longonot Ecosystem (HG/LE) comprises Hell's Gate and Mt. Longonot National Parks and their wildlife dispersal areas. The dispersal area includes majority of the vast Kedong Ranch which lies between the two parks and also abuts both of them.

Purpose Statement

The HG/LE purpose statement summarises the importance of the HG/LE, clarifies the reasons for its existence, and provides the overall goal that HG/LE management seeks to achieve. The purpose statement is divided into a primary HG/LE purpose followed by a series of supplementary purposes that expand on and complement the primary purpose.

The Purpose of the Hell's Gate/Longonot Ecosystem is:

To protect and conserve outstanding scenic volcanic geomorphological features and their associated wildlife species and habitats for the benefit of present and future generations

Supplementary purposes of the HG/LE are:

- ▶ ***To enable collaboration between stakeholders in the conservation and sustainable use of HG/LE natural resources***
- ▶ ***To preserve all sites of aesthetic and geomorphological significance in the HG/LE***
- ▶ ***To promote scientific research and education in order to guide sustainable management of natural resources in and around the HG/LE***
- ▶ ***To promote eco-tourism in the HG/LE***

HG/LE Exceptional Resource Values (ERVs)

The HG/LE ERVs describe the ecosystem’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 (see table below).

HG/LE Exceptional Resource Values

Category	Exceptional Resource Value
Biodiversity	▶ Endemic Species
	▶ Threatened species.
	▶ <i>Acacia drepanolobium</i>
	▶ <i>Tarchonanthus camophratus</i>
	▶ Reedbucks
Scenic	▶ Fischer’s Tower
	▶ Central Tower
	▶ The Jorowa Gorge
	▶ Obsidian Caves
	▶ Hells Kitchen
	▶ Hobley’s Volcano
	▶ The Crater
	▶ Parasitic Cone
Social	▶ Geothermal Power Generation
	▶ Ranching
	▶ Horticulture
	▶ Wildlife Dispersal Areas
	▶ Olook Karia Masai Cultural Centre
	▶ Tentative listing in the UNESCO World Heritage Site list

Major issues of concern

The major issues affecting the conservation of exceptional resource values in the HG/L ecosystem and the realization of the ecosystem’s purpose relate to:

1. Protection of the Ol Jorowa Gorge

To fully exploit the enormous potential of Hell’s Gate as a tourist amenity, it is essential that key geomorphological tourist attractions are fully protected to safeguard their integrity. In this regard, majority of the main tourist attraction in the park, Ol Jorowa Gorge, is outside the park. Hence, it is important that negotiations be initiated with Kedong Ranch, the land owners, to have the gorge and adjacent land that is seldom used for grazing given some form of legal protection.

2. Water Supply

The soils in the ecosystem are composed of volcanic ash that has very low water holding capacity. As such, it is uncommon to find standing water in the area. The only permanent natural water sources are a small spring in the extreme southern end of the gorge and a trickle from an adjacent steam jet. In view of this, to contain significant wildlife numbers in the Park for visitor enjoyment, water is supplied through troughs that are strategically distributed in the park. The water is from a 130 Km government pipeline from Lake Naivasha to south of Suswa which traverses the Hell's Gate National Park. Maintenance of the artificial water supply system is a costly but worthwhile undertaking as this is the only way of keeping wild-life species of touristic value in the Park.

3. Wild fires

Fire is a common hazard which often emanate from adjacent pastoral lands. These fires can be devastating to the fragile ecological systems at Hell's Gate-Longonot Area. Effective fire prevention measures are therefore required to protect the ecosystem against frequent wild fires.

4. Wildlife dispersal area

The park's wildlife is dependent on the adjoining ranches, Kendong Ranch and Ngati farmers Cooperative Society, for periodic dispersal. Wildlife herds disperse to these ranches in search of food and water. In view of the importance of maintaining this wildlife dispersal area, KWS should negotiate with the land owners of Kedong and Ngati to ensure that land uses in the dispersal area are compatible with wildlife conservation.

5. Road and trail maintenance

The park roads are surfaced with fragile volcanic murram soils and gravel which upon traffic use disintegrate into dust bowls during the dry season. During the rainy season the roads are severely eroded. This makes maintenance of park roads extremely challenging and costly. Similarly, walking trails in both Hell's Gate and Longonot National Parks are prone to water erosion and they deteriorate during the wet season. As such, it is important that both roads and trails are hardened to withstand erosion.

6. Expansion of geothermal exploration

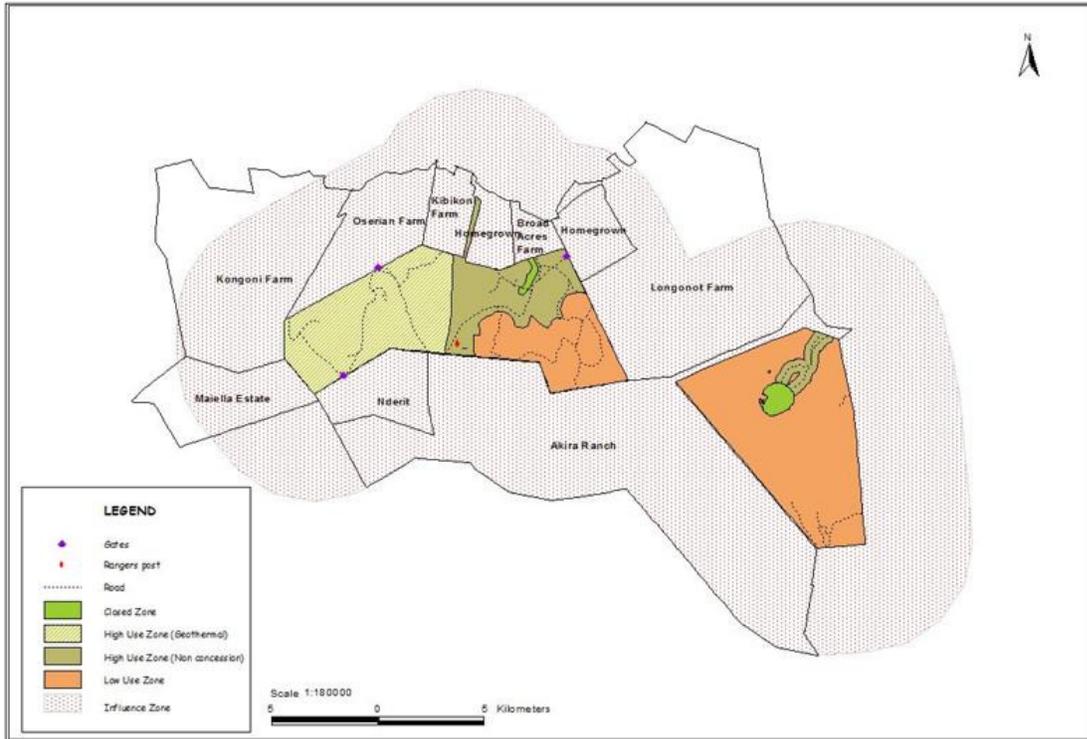
A large proportional of the ecosystem has been concessioned to independent power producers for geothermal power exploration. Construction and operation of geothermal plants constricts wildlife habitat and produce impacts such as gaseous emissions, noise, and potential ground subsidence. Increased harvesting of geothermal power is a threat to the continual existence of geysers. However, given the advantages of geothermal power over conventional power sources such as fossil fuels, geothermal power production should be facilitated but effective measures should be put in place to mitigate negative impacts.

HG/LE Zoning

The primary objective of this management plan is to provide a framework to guide managers in the conservation and management of HG/LE. A key element of the plan is the zoning plan,

which provides prescriptions on what should occur or not occur in different parts of the protected areas. Zoning plays an important role in minimizing conflicts between different users of a park by separating potentially conflicting activities whilst ensuring that activities which do not conflict with the park's values and objectives can continue in appropriate areas. Four zones have been designed for the HG/LE i.e. High Use Zone, Low use Zone, Closed Zone and Influence Zone.

HG/LE Zonation



Management Programmes

Ecological Management Programme

The purpose of the Ecological Management programme at HG/LE is to ensure that *habitat and species diversity is maintained and ecological processes that sustain this diversity are well documented and understood to facilitate effective biodiversity conservation and management*. In implementing this Management Programme, HG/LE management and stakeholders will strive to ensure that: wildlife species are protected, restored and monitored; habitats are protected, conserved and restored; ecosystem connectivity is established to increase resilience; and ecosystem functioning is understood. Key management actions that will be implemented to realize the programme purpose focus on winning space for wildlife through easements and land purchase; controlling spread of invasive species; liaising with relevant stakeholders to reintroduce and manage the lammergeyers; carrying out a vegetation survey; and carrying out regular wildlife censuses in the ecosystem.

Tourism Development and Management Programme

The purpose of the Tourism Development and Management Programme is to ensure that *the ecosystem is providing low impact tourism experience based on the unique wildlife and scenic geomorphological features that offer diverse tourism opportunities*. In implementing this Management Programme, HG/LE management will strive to ensure that diverse low impact tourist activities are offered; low impact tourist facilities are provided; tourism is developed to augment resource protection; and tourist products and services are marketed. The key management actions that will be implemented to achieve the programme purpose include: identifying suitable sites for development of tourist facilities to be operated by private investors and under lease agreement; rehabilitation and upgrading of the current picnic sites and campsites to modern standard of design and functionality; hardening the main road circuit to minimize constant erosion and dust pollution and thereby minimize expensive routine maintenance; and carrying out a visitor product survey to assess the type of innovative geothermal-based visitor products that should be developed in the area. Further to this, management will establish a historical museum of the park to archive and disseminate visitor information; construct visitor information centres; and establish a *Friends of Hell's Gate Club*, which will be assisting in promoting and marketing the Parks.

Community Partnership and Education Programme

The purpose of the Community Partnership and Education Programme is to ensure that *Park adjacent communities are supporting conservation efforts and community livelihoods are improving through sustainable use of natural resources*. In implementing this programme, management will strive to ensure that: community-protected area communications are improved; human-wildlife conflicts are minimised in the ecosystem adjacent areas; communities and other stakeholders are aware of the ecosystem's values and importance; and communities are benefiting from natural resources in the ecosystem. In order to achieve the programme purpose, key management actions that will be implemented include: minimising human-wildlife conflicts by fencing the Eastern side of Longonot National Park; encouraging ranchers to identify and develop suitable enterprise projects that will make it economically profitable to conserve wildlife; supporting and strengthening on-going conservation education activities of other partners such as Elsamere; and carrying out community outreach in the ecosystem.

Protected Area Operations and Security Management Programme

The purpose of the Protected Area Operations and Security Programme is to ensure that *Operational systems are effectively and efficiently supporting the implementation of management programmes and that the ecosystem is safe for visitors and wildlife*. In implementing this programme, management will strive to ensure that: staff welfare and motivation is enhanced; effective and efficient management infrastructure is provided; and wildlife and visitor security is enhanced. To achieve the programme purpose, HG/LE management will implement the following key management actions: organize fund raising events to generate income to supplement financial resources; construct and maintain staff houses to boost staff morale; harden roads and walking trails in the parks to improve park accessibility to visitors; re-design and re-construct water troughs to ensure that they are suitable for wildlife of all sizes and age groups; sink a borehole to supplement the water supplied by the Ministry of Water pipeline; establish an emergency rescue team and set up an emergency centre at the gorge to assist visitors who may be exposed to security and safety problems of any kind; and

initiate review of MOU with Kengen to ensure all issues pertaining to the lease of the land for geothermal are clearly stipulated and that park management concerns are addressed.

Plan Monitoring

The plan monitoring section gives a framework to guide the assessment of the potential impacts (both positive and negative) resulting from the implementation of management actions set out in this plan.

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Acronyms

CAP	Conservation Action Planning
CSR	Corporate Social Responsibility
ERVs	Exceptional Resource Values
HG/LE	Hell's Gate/Longonot Ecosystem
HQs	Headquarters
KEAs	Key Ecological Attributes
KWS	Kenya Wildlife Service
Kengen	Kenya Electricity Generating Company
MoU	Memorandum of Understanding
PA	Protected Area
PAPF	Protected Area Planning Framework
SOP	Standard Operating Procedure
TNC	The Nature Conservancy

Plan Foundations

The Plan

This 5-year (2010-2015) management plan for the Hells Gate/Longonot Ecosystem has been developed in accordance with the Standard Operating Procedure (SOP) for developing management plans for protected areas. The plan is one of four management planning initiatives piloting the revised standard operating procedure, the other being Kisumu Impala, Ndere and Ruma National Parks. In line with this SOP, this plan aims to balance conservation and development in the target protected areas.

Plan structure

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

- ▶ **Plan Foundations.** This chapter describes the plan's functions and structure and provides an introduction to the ecosystem's constituent protected areas, exceptional resource values and major management issues of concern. It sets out the Ecosystem's Purpose Statement, which explains why the HG/LE's protected areas have been established, and the major functions and roles they are expected to fulfil.
- ▶ **Zonation Scheme.** This section sets out areas of the ecosystem where different types of visitor use and tourism developments are permitted. The scheme contains prescriptions on the size and number of tourism developments allowed in different parts of the ecosystem, and specific prescriptions on the types of visitor activity allowed in each zone.
- ▶ **The four management programmes.** The main bulk of the plan is divided into four management programmes:
 - **Ecological Management Programme**
 - **Tourism Development and Management Programme**
 - **Community Partnership and Education Programme**
 - **Protected Area Operations and Security Programme**

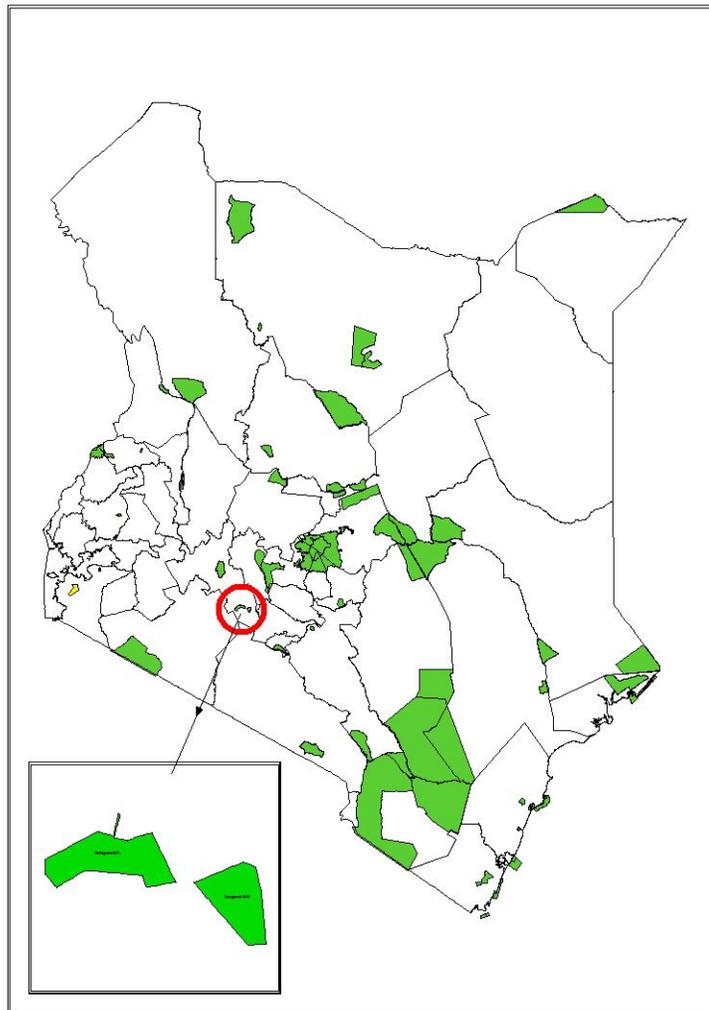
Each programme includes a programme purpose statement, which sets out the overall goal to which management under this programme is working towards, and guiding principles underpinning the management programme. Each programme also contains management objectives that set out the goals that management aims to achieve, and a set of specific management actions to achieve these goals.

- ▶ The **plan monitoring** framework provides guidance to enable the assessment of the potential impacts, positive, and where appropriate negative, resulting from the implementation of each of the four management programmes. The framework sets out the desired impact of each programme's objectives, and any potential impacts that may occur. The framework also includes easily measurable and quantifiable indicators for assessing these impacts, and potential sources of the information required.

Area description

The Hells Gate-Mt. Longonot Ecosystem (HG/LE) comprises Hell's Gate and Mt. Longonot National Parks and their wildlife dispersal areas. The dispersal area includes majority of the vast Kedong Ranch which lies between the two parks and also abuts both of them. The ecosystem is home to a wide variety of plains game and diverse bird species that utilise the diverse habitats ranging from rocky cliffs to savannah bushland and grasslands. The wildlife and more so the scenic geomorphological features of the two parks provide outstanding opportunities for photographic safaris. Such locations and features include the Fischer's Tower, Central Tower, and the Ol Jorowa Gorge in Hells Gate, and the crater at the peak of Mt. Longonot. The ecosystem supports diverse tourism opportunities including wildlife viewing, hiking, biking, mountain climbing, rock climbing and bird watching. In addition, the ecosystem is an economically prime area supporting land uses such as ranching, horticulture, fishing, and geothermal energy production and exploration.

Figure 1: HG/LE Regional Setting



The following sections provide a brief overview of the HG/LE's two constituent protected areas areas.

Hell's Gate National Park

The name Hells Gate is derived from the most impressive feature in the Park, the Njorowa Gorge, which runs through the middle of the park. The gorge formed the overflow of Lake Naivasha between lower and middle Cambrian times. The Park was gazetted under legal notice number 13 of 2nd February 1984 and covers 68.25 Km². The park boundaries are delineated on boundary plan number 204/55. The Park is accessible via tarmac road from Nairobi (90 Kilometres) via Naivasha Town on the South Lake Road at a Junction 5 Kilometres south of Naivasha.

Hell's Gate National Park provides a variety of wildlife, unusual flora and many species of birds and is one of the two only Kenyan Parks where Climbing, Walking and Biking are allowed. Covered by ashes from the Longonot eruption which occurred 100 years ago, the Park is famous for its geothermal station, Lower Gorge and spectacular sceneries (cliffs, volcanoes, gorges, geothermal steam). The Park is characterized by diverse topography and geological scenery. It is an important home of a rare bird of prey, the lammergeyer. The Park is surrounded by a number of private ranches which are a home to a wide variety of wildlife species.

Mt. Longonot National Park

Mt. Longonot National Park is located 90 Km from Nairobi in the Lake Naivasha Basin. The name Longonot is derived from the Maasai word Oloonong'ot meaning mountains of many spurs or steep ridges. The Park was gazetted under the legal notice number 13 of 26th January 1983 and covers 52 Km² most of which is an extinct Volcano. The park boundaries are delineated on boundary plan number 204/52. The volcano, which is 2776 metres above sea level, is a popular hiking destination which is the main tourist activity in the Park. In addition to hiking, hikers can also view diverse wildlife species including buffaloes, giraffes, and zebras which inhabit the Park. Mt. Longonot National Park is surrounded by small scale farmers to the east and by Kedong ranch to the west which forms a convenient link between Longonot and Hells Gate parks. The Kedong ranch is home to a large variety of plains game and animals move between the park and the ranch.

Purpose Statement

The HG/L ecosystem purpose statement summarises the importance of the HG/LE, clarifies the reasons for its existence, and provides the overall goal that HG/LE management seeks to achieve. The purpose statement is divided into a primary HG/LE purpose followed by a series of supplementary purposes that expand on and complement the primary purpose.

The Purpose of the Hell’s Gate/Longonot Ecosystem is:

To protect and conserve outstanding scenic volcanic geomorphological features and their associated wildlife species and habitats for the benefit of present and future generations

Supplementary purposes of the HG/LE are:

- ▶ ***To enable collaboration between stakeholders in the conservation and sustainable use of HG/LE natural resources***
- ▶ ***To preserve all sites of aesthetic and geomorphological significance in the HG/LE***
- ▶ ***To promote scientific research and education in order to guide sustainable management of natural resources in and around the HG/LE***
- ▶ ***To promote eco-tourism in the HG/LE***

The development of the above Purpose Statement was based on the stakeholder identification of the HG/LE’s “Exceptional Resource Values” (ERVs). These ERVs are discussed and elaborated in the following section.

HG/LE Exceptional Resource Values (ERVs)

The HG/LE ERVs describe the ecosystem’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 HG/LE ERVs that have been prioritised by HG/LE management and their importance to the area. These sections have been set out according to the four categories of ERV identified: Biodiversity, Scenic, Social and Cultural (see Table 1).

Table 1: HG/LE Exceptional Resource Values HG/LE Exceptional Resource Values

<i>Category</i>	<i>Exceptional Resource Value</i>
Biodiversity	▶ Endemic Species
	▶ Threatened species.
	▶ <i>Acacia drepanolobium</i>
	▶ <i>Tarchonanthus camophratus</i>
	▶ Reedbucks
Scenic	▶ Fischer’s Tower
	▶ Central Tower
	▶ The Jorowa Gorge
	▶ Obsidian Caves
	▶ Hells Kitchen
	▶ Hoble’s Volcano
	▶ The Crater

<i>Category</i>	<i>Exceptional Resource Value</i>
	▶ Parasitic Cone
Social	▶ Geothermal Power Generation
	▶ Ranching
	▶ Horticulture
	▶ Wildlife Dispersal Areas
	▶ Olook Karia Masai Cultural Centre
	▶ Tentative listing in the UNESCO World Heritage Site list

Biodiversity values

Endemic Species

Hells Gate National Park was once the home of the lammergeyer (bearded vulture) and these birds were regionally endemic since they are only found in one more country, Ethiopia. The bird has however not been sighted in the park for the last decade.



Plate 1: Lammergeyer

Threatened species

The Leopard is a threatened species according to the International Union for Conservation of Nature (I.U.C.N.) Red list of Threatened Animals. It is found in both Parks.

Species of Special Concern

The Hells Gate National Park has two plant species which are of concern to conservation, while in both Mt. Longonot and Hells Gate National Parks one animal species is of special concern.

Acacia drepanolobium (Whistling thorn). This is the most abundant acacia species and forms an important source of food for the giraffes. It is armed with long, sharp thorns, which are swollen at the base to form a round chamber. These chambers are often inhabited by small ants that hollow out the swelling and derive nourishment from the tree's secretions. In

PLAN FOUNDATIONS

return the ants provide protection from leaf-eating herbivores. It is the wind whistling past the openings of the swellings that gives the tree its name. It has a very hard wood and is used for fencing around Masai Bomas.

Tarchonanthus camophratus (Leleshwa). This species though not very important as a food item, is important in that it provides cover and habitat for other fauna components. Its camphor wood and the camphor oil which the bush produces help protect the plant against insect attack and fungal diseases. It is traditionally used for fencing and the leaves are used by the Maasai as a deodorant. The “leleshwa” is disappearing in most of the Rift Valley due to human cultivation and hence the need for its proper conservation.

Mountain Reedbuck. The mountain reedbuck (*Redunca fulvorufula*) is a species of special concern in Longonot and Hells Gate National Park since it is rarely found in the rest of the ecosystem save for the parks.



Plate 2: Mountain Reedbuck

Scenic values

Hells Gate and Longonot National Parks have several sites and areas that are of special interest. The sites are discussed below.

Fischer’s Tower

The Fischer’s Tower is 25 meters high rocky tower formed by semi-molten rock forced to a fissure, cooling and solidifying as it extruded. It is located near the main gate and is named after German explorer, Gustav Fischer, who was sent by the Hamburg Geographical Society to find a route going from Mombasa to Lake Victoria.

In Masai folklore, the tower is a Masai girl which was turned to stone after disobeying the family before her wedding. The tower is a popular site for rock climbers and education groups and, together with adjoining cliffs, attracts hundreds of nature enthusiasts, especially on weekends and public holidays.



Plate 3: Fischer's Tower

Central Tower

The Central Tower is also called "Embarta" (The Horse), and is much larger than the Fischer's Tower. The Central tower is hardly seen along the road, it can be viewed from very far along the Buffalo Circuit. It is a popular site with climbers but due to its height, only qualified and experienced climbers are advised to scale it. The Fischer's and Central Towers are compared with the Biblical story of Lot and his wife by enthusiasts of Hells Gate geomorphology.



Plate 4: Central Tower

The Ol Jorowa Gorge

This is the most popular site in Hells gate national park and is usually referred to plainly as "the gorge". Most visitors in the park enjoy hiking in the gorge. It is unique in structure being composed of steep vertical walls on both sides and very attractive rocks which were formed when Lake Naivasha used to drain through it. Botanically, the gorge is habitat to a wide variety of succulent plant species which are found on its sides. The gorge is approx. 1 ½ km in length and is a popular filming site which has featured in several films like the *Tomb Raider*, *Cradle of Life*, *King Solomon's Mines*, *'SHEENA' Queen of the Jungle* and *Mountains of the Moon*.

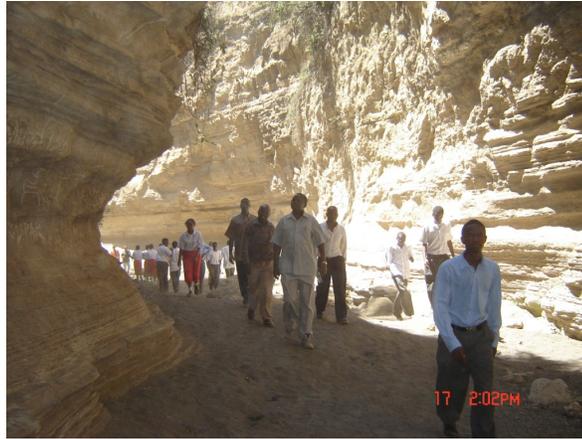


Plate 5: Ol Jorowa Gorge

The Cliffs

The Main Wall of Hell's Gate is almost 150m vertically high. It is renowned not only for its scenic values but also for its importance as habitat for numerous birds of prey and swifts. Several birds of prey breed in the cliffs including the verreaux's eagles, Egyptian and Ruppell's vultures, peregrine and Lanner Falcons. Swifts, which are preyed upon by peregrine and lanner falcons, also breed in the cliffs.



Plate 6: Main Wall

Obsidian Caves

Hells Gate National Park Obsidian Caves are located on the Buffalo Circuit. Obsidian is the result of rapid cooling of molten volcanic lava coming in contact with water while being poured into a lake or ocean resulting to the glassy texture of the rock.



Plate 7: Obsidian Caves

Hells Kitchen

This is an area of great interest found at the park boundary with Kongoni Ranch. It has small amounts of hot steam and red/brown coloured rocks. It is also a strategic point for viewing the Olkaria hill.

Hobley's Volcano

This feature is important because of its potential in tourism diversification. At the volcano there are big holes emitting steam from almost 30 feet deep. It harbours mountain reedbucks (*Redunca fluvorula*) and has highly specialized plant species such as *Dissotis Senegambiensis*.

The Longonot Crater (Caldera)

The name Longonot originates from the Masaaai word Oloonong'ot, meaning 'mountain of steep ridges'. The entire perimeter of the now extinct crater is characterised by deep ridges. The crater is one of the largest calderas in Africa. Walking up to the top and around the rim of the crater is a popular tourist activity for which Longonot is famous.



Plate 8: Longonot Crater

Parasitic Cone

This is found towards the northern part of the Longonot National Park and it is a pictorial object of a scenic beauty for the visitors to behold.

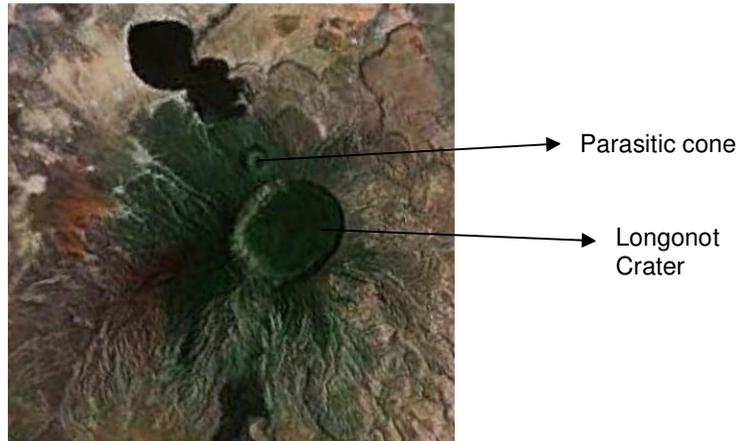


Plate 9: Parasitic Cone

Social values

Geothermal Power Generation

Olkaria Geothermal Station, the first of its kind in Africa, is located within Hell's Gate National Park. Olkaria generates power from underground with super-heated pressurized water. The urgent need to be self-reliant in electricity generation is illustrated by the fact that oil imports consume a relatively large proportion of the country's foreign exchange hence the geothermal resource development helps to conserve the much-needed foreign exchange for other uses rather than importing more oil for thermal power generation.



Plate 10: Geothermal Plant at Hell's Gate N.P

Ranching

Ranching is an economic activity undertaken in the ecosystem. The main ranches include Kongoni and Kedong. These ranches practice mixed ranching and farming whereby crops especially horticultural crops are grown and livestock for beef production are reared. Some tourism facilities are available at some of the ranches where such activities like game viewing and horse riding are on offer.

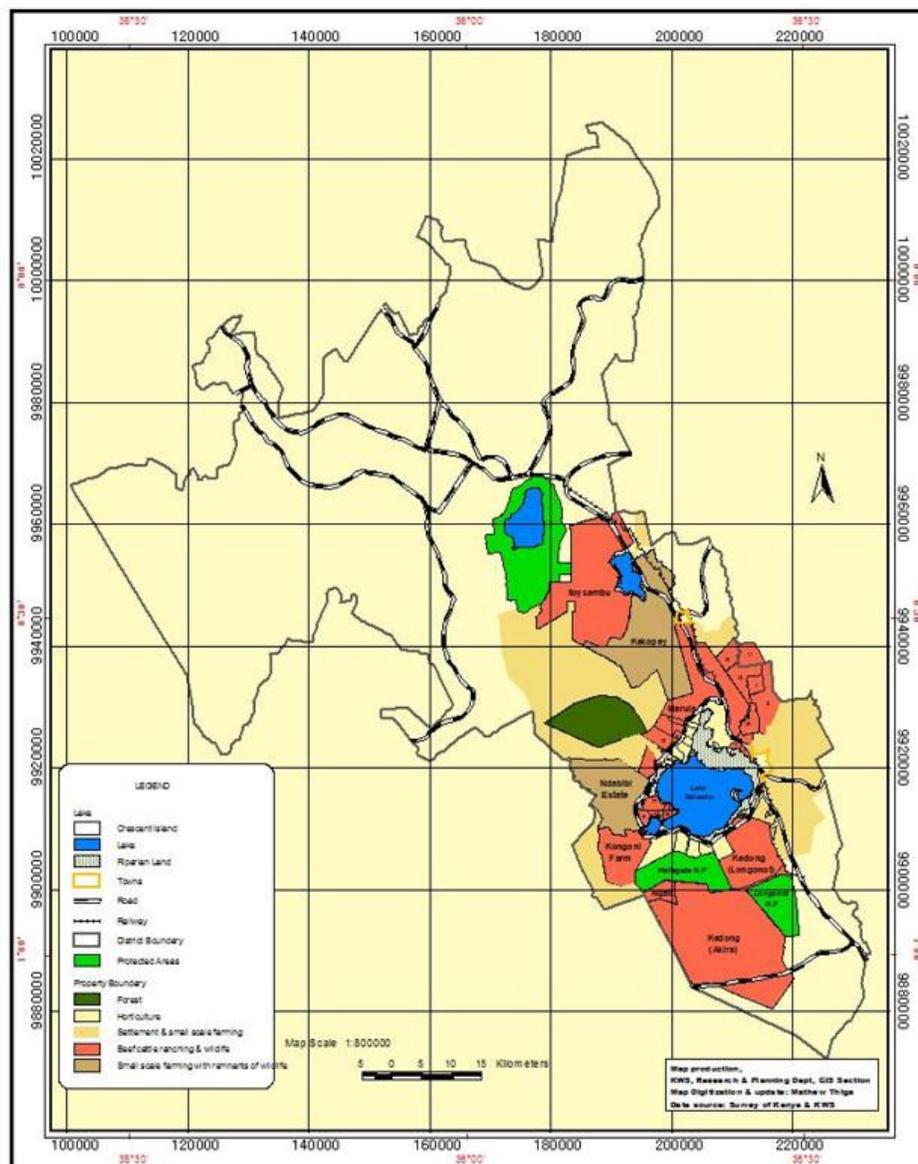
Horticulture

Within the Hells Gate/Longonot Ecosystem, horticulture is an important economic activity, the main produce being flowers and vegetables for export.

Wildlife Dispersal Areas

Kedong, Akira and Kongoni ranches which border Hells Gate National Park are important dispersal areas of wildlife from the park. However, land use conversion in these ranches from ranching to horticulture, is negatively affecting wildlife and increasing human-wildlife conflict.

Figure 2: Land Use in HG/LE and adjacent areas



Cultural values

Olook Karia Masai Cultural Centre

Hell's Gate National Park Olook Karia Masai Cultural Centre offers a glimpse of authentic Maasai culture. More than 100 years ago, Hell's gate was in the heart of the Masai land and Lake Naivasha was a traditional refreshing point for Masai herds. Nowadays, Masai people are hardly seen in Naivasha town and lake but they still inhabit the unpopulated area surrounding the lake.

Tentative listing in the UNESCO World Heritage Site list

Hell's Gate National Park was included in the World Heritage Tentative list in February 2010. Its inclusion was based on fulfilment of World heritage Site selection criteria (viii) to *be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features*. Hell's gate represents an area of great geological phenomenon (i.e. hot water geysers and hot springs) these land formations and on-going geological processes at Hell's gate make the area exceptionally beautiful and unique compared to any other area. Presence of vegetation around the hot water is remarkable as these plants are able to survive in very high temperatures.

Major issues of concern

The major issues affecting the conservation of exceptional resource values in the HG/L ecosystem and the realization of the ecosystem's purpose are:

7. Protection of the Ol Jorowa Gorge

To fully exploit the enormous potential of Hell's Gate as a tourist amenity, it is essential that key geomorphological tourist attractions are fully protected to safeguard their integrity. In this regard, majority of the main tourist attraction in the park, Ol Jorowa Gorge, is outside the park. Hence, it is important that negotiations be initiated with Kedong ranch, the land owners, to have the gorge and adjacent land that is seldom used for grazing given some form of legal protection.

8. Water Supply

The soils in the ecosystem are composed of volcanic ash that has very low water holding capacity. As such, it is uncommon to find standing water in the area. The only permanent natural water sources are a small spring in the extreme southern end of the gorge and a trickle from an adjacent steam jet. In view of this, to contain significant wildlife numbers in the Park for visitor enjoyment, water is supplied through troughs that are strategically distributed in the park. The water is from a 130 Km government pipeline from Lake Naivasha to south of Suswa which traverses the Hell's Gate National Park. Maintenance of the artificial water supply system is a costly but worthwhile undertaking as this is the only way of keeping wild-life species of touristic value in the Park.

9. Wild fires

Fire is a common hazard which often emanate from adjacent pastoral lands. These fires can be devastating to the fragile ecological systems at Hell's Gate-Longonot Area. Effective fire prevention measures are therefore required to protect the ecosystem against frequent wild fires.

10. Wildlife dispersal area

The park's wildlife is dependent on the adjoining ranches, Kendong Ranch and Ngati farmers Cooperative Society, for periodic dispersal. Wildlife herds disperse to these ranches in search of food and water. In view of the importance of maintaining this wildlife dispersal area, KWS should negotiate with the land owners of Kedong and Ngati to ensure that land uses in the dispersal area are compatible with wildlife conservation.

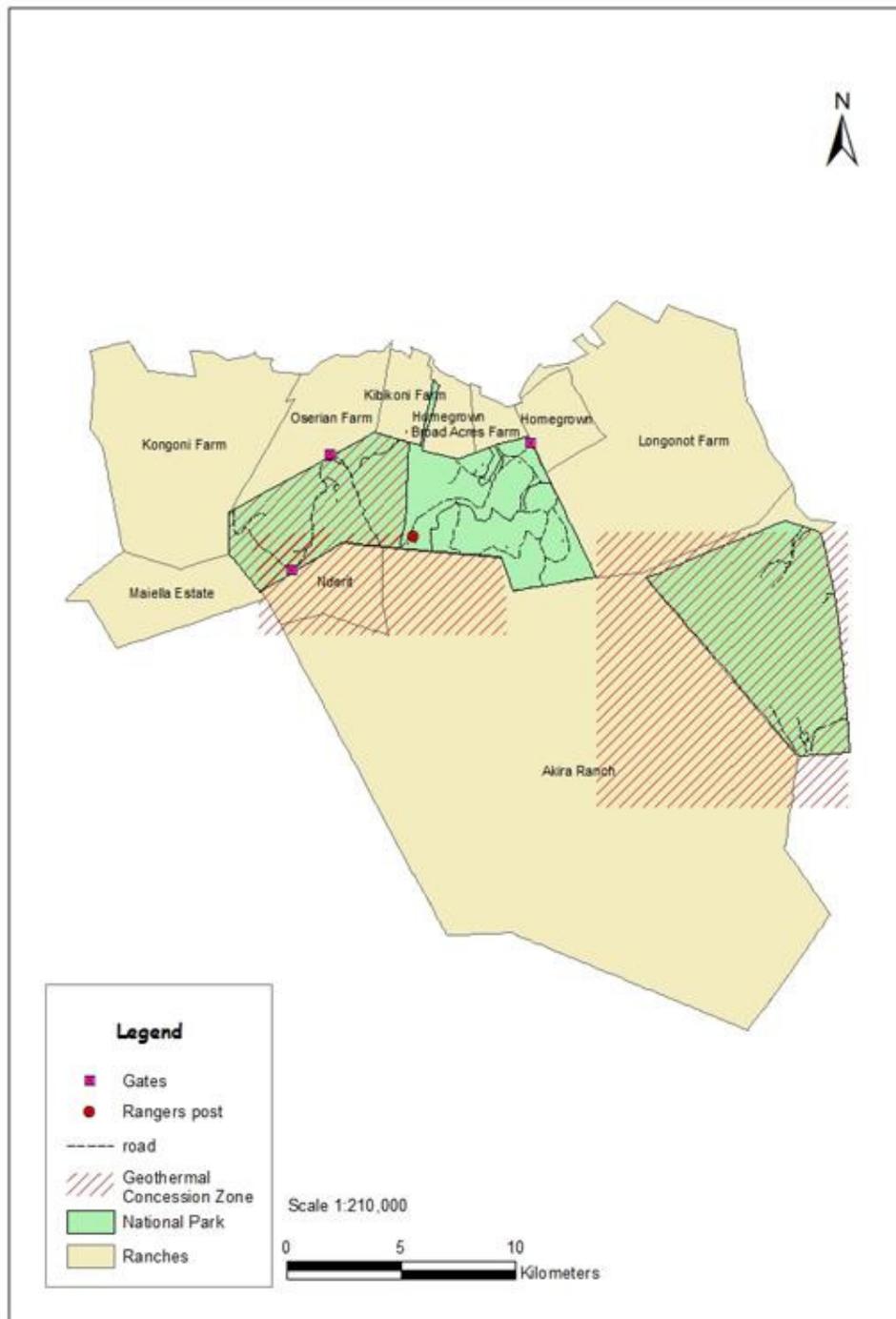
11. Road and trail maintenance

The park roads are surfaced with fragile volcanic murram soils and gravel which upon traffic use disintegrate into dust bowls during the dry season. During the rainy season the roads are severely eroded. This makes maintenance of park roads extremely challenging and costly. Similarly, walking trails in both Hell's Gate and Longonot National Parks are prone to water erosion and they deteriorate during the wet season. As such, it is important that both roads and trails are hardened to withstand erosion.

12. Expansion of geothermal exploration

A large proportional of the ecosystem has been concessioned to independent power producers for geothermal power exploration. Construction and operation of geothermal plants constricts wildlife habitat and produce impacts such as gaseous emissions, noise, and potential ground subsidence. Increased harvesting of geothermal power is a threat to the continual existence of geysers. However, given the advantages of geothermal power over conventional power sources, geothermal power production should be facilitated but effective measures should be put in place to mitigate negative impacts.

Figure 3: Approximate location and extent of Geothermal Concession Areas in Hell's Gate and Longonot National Parks

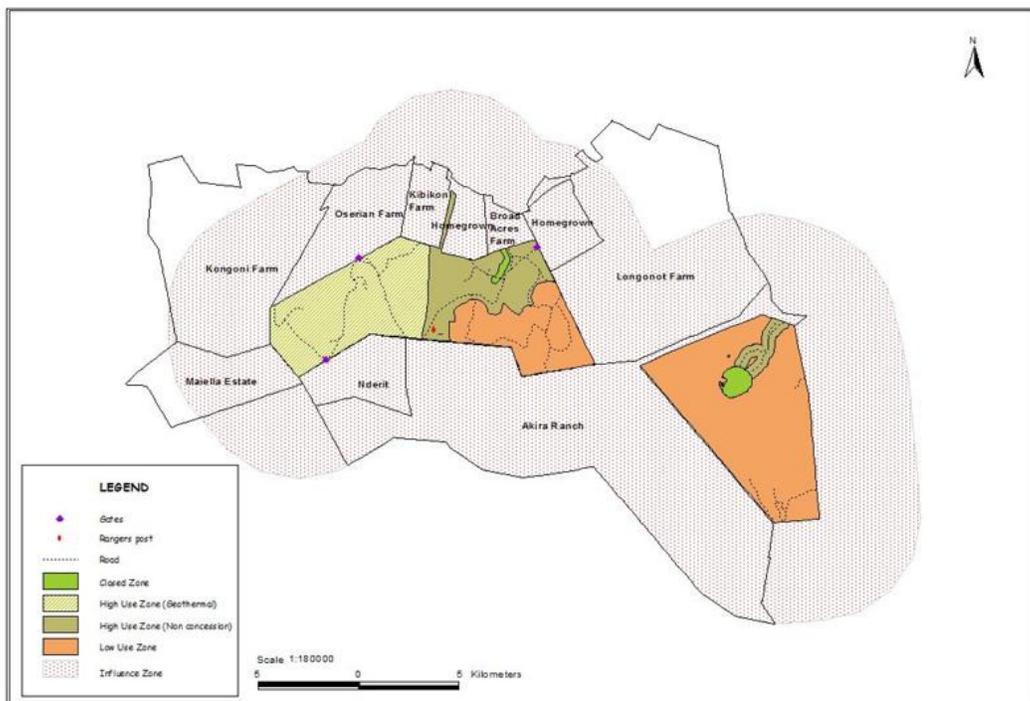


Zonation Scheme

Zoning Overview

The primary objective of this management plan is to provide a framework to guide managers in the conservation and management of HG/LE. A key element of the plan is the zoning plan, which provides prescriptions on what should occur or not occur in different parts of the protected areas. Zoning plays an important role in minimizing conflicts between different users of a park by separating potentially conflicting activities whilst ensuring that activities which do not conflict with the park's values and objectives can continue in appropriate areas. Four zones have been designed for the HG/LE i.e. High Use Zone, Low use Zone, Closed Zone and Influence Zone. These zones are discussed in the sections below while zonal prescriptions are provided in table 3 and 4.

Figure 4: HG/LE Zonation



High Use Zone

The high use zone covers the whole area under geothermal power production and exploration, the gorge area and the stretch between Elsa and Olkaria Gates covering the main road circuit. There is also a small section of high use zone at the Hobley's Volcano. This zone is and will continue to host a high density of visitors and vehicles both for tourism and administration at the geothermal plants. The zone has two components; the **geothermal area** and the high use **non concession area** under direct authority of the KWS.

The **high use geothermal area** is open for game viewing, camping, cycling and walking at the gorge and other designated nature trails as at the Hobley's Volcano. The geothermal activities shall also expand to include geothermal tourism activities like steam jets, natural saunas etc. Facilities permitted here include one restaurant at Ol Karia gate and an educa-

tion centre at the same place. A helipad is also proposed near the education centre and the picnic sites and Banda will be upgraded. In Mt. Longonot National Park, the High Use Zone is defined by a 100 Meter corridor along the hiking trails.

The high use zone in the **non concession area** shall be used for walking, biking, camping, horse riding and such activities. It will also be used for game viewing and sports and recreational tourism like rock climbing and hiking, wheel barrow racing etc. One 24 bed eco-lodge is allowed in this zone and one restaurant and an information centre at the main gate

Low Use Zone

In Hell’s Gate National Park, the low use zone covers the area around Obsidian Caves. No permanent facilities are permitted here and no public campsites. A special campsite is allowed. The activities proposed for this zone include birding, game viewing and horse riding. In Longonot National Park, the Low Use Zone covers majority of the mountain apart from hiking corridors and the crater rim.

Closed Zone

The closed zone covers the main wall, which is a habitat for raptors. It also used to be the habitat for the lammergeyer and is the focal point for reintroduction of the bird in Hell’s Gate. The activities here are restricted to research or any such controlled use with approval by the Senior Warden. In Mt. Longonot National Park, the closed zone is the crater which needs to be protected from visitor impacts.

Influence Zone

The influence zone covers private or community land that is adjacent to the two protected areas and together with the Parks constitutes the Hell’s Gate/ Longonot Ecosystem. The key components of this zone are the Kedong, Ngati and Kongoni ranches, the Horticultural farms abutting the Hell’s Gate National Park, and the small scale farms next to Longonot National Park. Visitor use of these areas is not restricted as this zone is primarily designated as agricultural land. However, the ranches harbour large numbers of wildlife that support viable wildlife viewing tourism ventures that are being exploited by the ranch owners.

Table 2: Permitted tourist accommodation and eating facilities

High Use Zone - Non Concession	High Use Zone - Geo-thermal	Low Use Zone	Closed Zone	Influence zone
Restaurant at Elsa gate	Restaurant at OI Karia Gate	Special Camp-site	No facilities allowed	All categories of tourism accommodation facilities are allowed
24- bed eco-lodge	Education Centre-hostels			
Special campsite	Banda			

ZONATION SCHEME

Table 3: Tourism zonal activity prescriptions

High Use Zone - Non Concession Area	High Use Zone- Geothermal	Low Use Zone	Closed Zone	Influence zone
Game viewing	Game viewing	Game viewing	Research	All nature based tourist activities allowed
Camping	Camping	Bird watching	Controlled rock climbing	
Biking	Nature trails	Picnicking		
Wheel barrow racing	Geothermal tourism	Filming & photography		
Rock climbing	Biking	Nature walks		
Hiking	Filming & photography	Horse riding		
Horse riding				
Filming & photography				

Ecological Management Programme

Programme Purpose and guiding principles

The purpose of the Ecological Management programme at HG/LE is:

To ensure that habitat and species diversity is maintained and ecological processes that sustain this diversity are well documented and understood to facilitate effective biodiversity conservation and management

In implementing the Ecological Management Programme, HG/LE management and stakeholders will strive to ensure that:

1. *Wildlife species are protected, restored and monitored;*
2. *Habitats are protected, conserved and restored;*
3. *Ecosystem connectivity is established to increase resilience; and*
4. *Ecosystem functioning is understood.*

Targeting ecological management action

The KWS Protected Areas Planning Framework (PAPF), the management planning standard for protected areas, 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. This is because with limited human and financial resources a manager cannot monitor every parameter in a protected area. The CAP identifies and develops an accurate definition and understanding of the most important ecological features and their management needs, and the major threats to these features. This programme therefore adopts the CAP methodology, in line with the PAPF.

The methodology has three stages: 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 to enhance the conservation of the protected area. These key stages are elaborated in the following sections.

Conservation targets

The first stage consists of two key steps. First, identification of the area's conservation targets, that is biodiversity, whose continued conservation reflects conservation success. Biodiversity in an area is represented by species, communities or ecological systems that are

usually measured as an index of ecosystem functioning. A small suite of about 8 conservation targets at different levels of biodiversity hierarchy are sufficient indicators of ecosystem health, functioning and stability.

In the second step, Key Ecological Attributes (KEAs) for each conservation target are identified. These represent such parameters as biological composition, structure, interactions and processes, environmental regimes, and landscape configuration etc that, if missing or altered, would lead to the loss of that target over time. In the case of HG/LE, the conservation targets and the rationale behind their selection are set out in Table 5.

Threats to conservation targets

Once conservation targets are identified, threats to conservation are also identified and ranked on the basis of how much they stand to affect conservation targets. Threats are activities or processes that have caused, are causing or may cause destruction, degradation and/or impairment of biodiversity and natural processes. Identification of threats helps to identify the various factors that immediately affect conservation targets and then rank them so that conservation actions and resources are concentrated where they are most needed. Table 6 shows the priority threats impacting or likely to impact on conservation targets and their KEAs.

Ecological management objectives and actions

Three objectives developed for the HG/LE Ecological Management Programme are:

- MO 1. HG/LE habitats conserved and restored**
- MO 2. Wildlife species management enhanced**
- MO 3. Ecological monitoring enhanced and improved**

These management objectives and the actions developed to achieve them are described in detail in the sections below.

Table 4: Conservation targets

	Conservation target	Rationale for selection	Important subsidiary targets	Key ecological attributes
Species	Maasai giraffe	It's a chief browser in this ecosystem. Its population not well known and the effects of land use changes are impacting on its habitat.	<ul style="list-style-type: none"> ▶ Impala; ▶ Buffalo 	<ul style="list-style-type: none"> ▶ Habitat size and quality (water and forage) ▶ Population size, recruitment and structure ▶ Movement patterns
	Klipspringer	An important species of the rocky and cliff habitats. Confined to small area and population structure and dynamics not known	<ul style="list-style-type: none"> ▶ Mountain reedbuck; ▶ Rock hyrax 	<ul style="list-style-type: none"> ▶ Habitat size and quality (water and forage) ▶ Population size, recruitment and structure
	Ruppell's vultures	.	<ul style="list-style-type: none"> ▶ Other raptors and species that inhabit cliffs 	<ul style="list-style-type: none"> ▶ Nesting sites ▶ Dispersal area ▶ Population size, recruitment and structure ▶
Habitats	Tarconathus bushland	Habitat for buffalo and other browsers. This bushland can be invasive taking over grassland	<ul style="list-style-type: none"> ▶ Buffalo ▶ Warthogs 	<ul style="list-style-type: none"> ▶ Size and distribution ▶ Vegetation structure and composition ▶ Species distribution
	Grassland	Habitat for herbivores, and particularly grazers. Ideal areas for wildlife viewing in the Park	<ul style="list-style-type: none"> ▶ Buffalo ▶ Warthogs ▶ Elands ▶ Giraffe ▶ Hartebeest 	<ul style="list-style-type: none"> ▶ Vegetation structure and composition ▶ Species distribution ▶ Size and distribution
	Cliffs	Important habitat for birds	<ul style="list-style-type: none"> ▶ Raptors ▶ Swifts ▶ Swallows ▶ Rock hyrax ▶ Klipspringer ▶ Baboon 	<ul style="list-style-type: none"> ▶ Nesting sites
Systems	Savannah grassland	Habitat for wildlife and important livestock grazing areas	<ul style="list-style-type: none"> ▶ Ungulates such as elands and Burchell's zebra 	<ul style="list-style-type: none"> ▶ Vegetation structure and composition ▶ Size

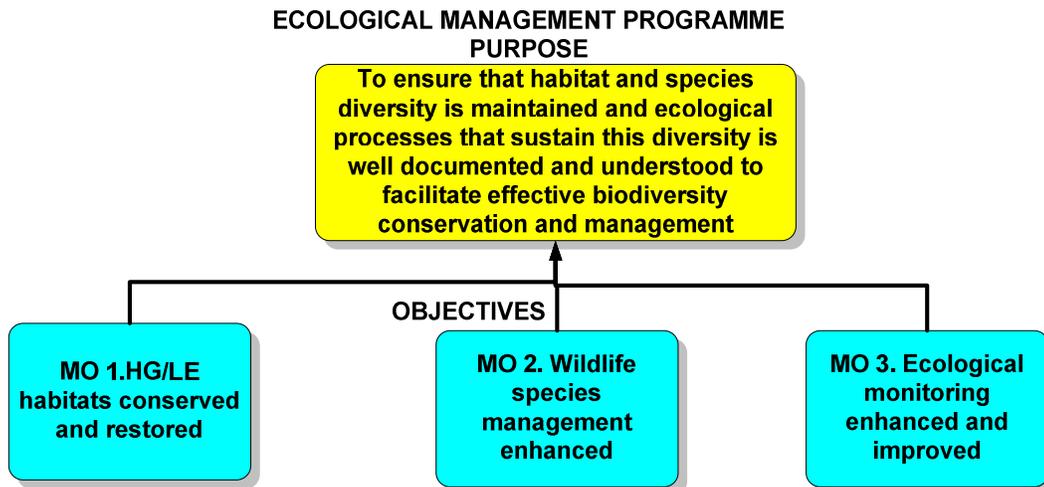
Table 5: Threats to Conservation Targets

TARGETS	Grasslands	Tarchonan- thus	Cliffs	Maasai Giraffe	Klip- springer	Ruppell's Vulture
Poaching				Low	Low	
Loss of dispersal areas	Very High	Very High		Very High	Low	High
Diseases and pests				Low	Low	Low
Alien and invasive species	High	Low		Low	Low	Low
Over-grazing of livestock	Medium	Low		Low	Low	Low
Charcoal burning		Low		High	Low	Low
Excessive water abstraction from the lake and ground water aquifers				Low	Low	
Wild Fire	Low	High		Low	High	High
Geothermal activities	Medium	Medium	Low	High	High	High
Visitor impact	Low	Low	Low		Low	Low
Human-Wildlife conflict						Low
Climate change	Low	Low		Low	Low	Low

Management Objectives

Figure 5 below shows the overall objectives tree for the HG/LE Ecological Management Programme. These objectives are discussed further in the following sections.

Figure 5: Ecological Management Programme objectives tree



Objective 1: HG/LE habitats conserved and restored

The objective of habitat management in Hell’s Gate and Longonot National Parks is to ensure the parks retain a stable composition of diverse natural habitats that contribute to its uniqueness as scenery, wildlife and geothermal producing parks. The bushland habitat, constituted mainly by *Tarconanthus camophratus* and *Acacia drepanolobium* offers browse and cover to animals like giraffes, buffaloes, warthogs etc., and its integrity should be maintained. The grassland vegetation also supports majority of wildlife in the park who are grazers and should be protected from continued degradation from overgrazing and domination by invasive species. The cliffs offer unique habitat and ecological niches for some species like raptor birds, leopards, klipspringers, rock hyraxes etc. This habitat needs to be maintained not only for the sake of its unique biota but also because the physical attributes of these features are a special attraction for which the park is famous.

There are management concerns that the bushland habitat is extending and compressing the grassland. This tends to confine grazing animals to small areas causing overgrazing and degradation. Degradation in the grassland areas is manifested through continuous spread of invasive species and wind and water erosion in areas where soil cover has been removed by animals especially around water points. The other threat to habitats in the park is frequent wild fires that often originate from outside the park and pose ecological instability to different habitats.

Previously, the Nakuru–Naivasha conservation areas were interlinked allowing free movement of wildlife within these areas but at present rapid changes in land use have taken place that include the mushrooming of human settlements and urban centres, extensive agricultural activities and the conversion of *Acacia* woodlands to open grasslands for grazing pur-

poses. This has led to confinement of wildlife to selected pockets hindering their free movement.

To preserve these habitats, active management will be done routinely to control spread of bush land. The management will prescribe burning and mechanical harvesting of the Tarconanthus shrub to stem colonization of grasslands. Invasive species will be routinely managed through physical removal as a means of reclaiming the degraded grassland areas. Degraded areas will be rehabilitated through planting of trees and grasses and erosion controlled through gabions and closure of some roads to allow vegetation recovery where necessary.

To avoid the problem of overpopulation which causes habitat destruction, the management will seek more space for wildlife by exploring ownership of adjacent lands through easements or land purchase. Currently the park management in collaboration with other stakeholders are engaged in talks envisaged to develop and map out a wildlife corridor allowing free wildlife movement with the Naivasha and Nakuru conservation areas. The management engages the stakeholders through consultative meetings to develop strategies that may include the purchase of land along proposed wildlife corridors and easements. Presently the proposed wildlife corridor has been mapped out and documented for necessary actions.

A summary of management actions to achieve this objective is given in box 1.

Box 1. Summary of Management Actions

1. Develop and implement prescribed burning.
2. Clear and remove Tarconanthus shrubland from colonized areas.
3. Purchase or lease land within wildlife corridors and dispersal areas.
4. Reclaim land around Longonot park headquarters from squatters.
5. Develop public private partnerships with stakeholders through easements, MoUs, agreements.
6. Remove invasive species.
7. Plant grass, trees and shrubs in degraded areas
8. Construct gabions to control soil erosion
9. Establish fire breaks

Objective 2: Wildlife species management enhanced

The objective of wildlife management in the park is to ensure all wildlife indigenous to the park and ecosystem are protected from security and ecological threats to ensure healthy populations and species diversity. Of concern to the management regarding species diversity is local extinction of the lammergeyers and failure to establish a viable population after a trial reintroduction few years ago. Also compression of main wildlife populations within small areas around water troughs implies severe competition which hurts some vulnerable species. Further, the current expansion of geothermal activities characterised by the extensive pipeline networks in Hell's Gate National Park is fragmenting and reducing the habitat range accessible to wildlife by over 60%. This has resulted to over-utilization and consequently degradation of the remaining sections of the park.

The HG/LE management will liaise with relevant stakeholders to reintroduce and manage the lammergeyers with a view to having a healthy and naturally thriving population of the bird species. To manage competition and habitat degradation, water troughs will be distributed at different parts of the park and temporary closure of existing ones will be considered to allow recovery of vegetation and soil texture.

A summary of management actions to achieve this objective is given in box 2.

Box 2. Summary of Management Actions

1. Re-introduce Lammergeyers.
2. Provide wildlife watering points.
3. Translocate wildlife from the Park

Objective 3: Ecological monitoring enhanced and improved

The desired state for HG/LE with regard to ecological monitoring is where comprehensive biodiversity information including species composition and distribution as well as changes to ecosystems processes and their interactions and trends is readily available. And because of the activities of geothermal power production and on going explorations which have an effect on the atmosphere, there is critical need for data on weather parameters like air, dust, and gases associated with geothermal activities like sulphur dioxide.

To realize this desired state, regular wildlife censuses will continue and data analysis maintained to produce reports on animal numbers and trends. A vegetation survey will be conducted with a view to mapping vegetation structure and composition which will be used for future monitoring. The management will also liaise with relevant government departments to conduct a pollution level assessment on select parameters like dust and potentially poisonous gases that emanate from geothermal wells.

A summary of management actions to achieve this objective is given in box 3.

Box 3. Summary of Management Actions

1. Carry out wildlife censuses.
2. Map vegetation composition and structure.
3. Carry out habitat stocking level assessments.
4. Map geothermal well, pipeline networks and power transmission lines.
5. Conduct pollution level assessments.

Tourism Development and Management Programme

Programme Purpose and Guiding Principles

The purpose of the Tourism Development and Management Programme is to ensure that:

The ecosystem is providing low impact tourism experience based on the unique wildlife and scenic geomorphological features that offer diverse tourism opportunities

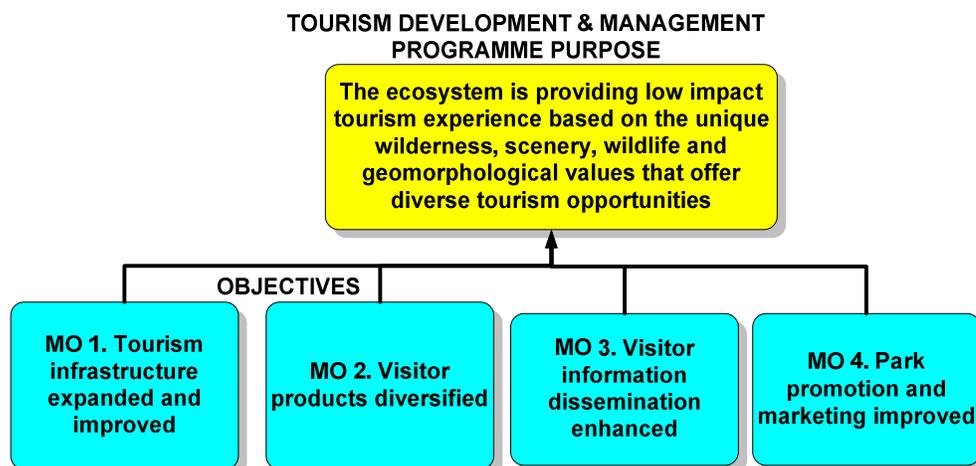
In implementing the Tourism Development and Management Programme, Management will strive to ensure that:

1. *Diverse low impact tourist activities are offered;*
2. *Low impact tourist facilities are provided;*
3. *Tourism is developed to augment resource protection; and*
4. *Tourist products and services are marketed*

Management Objectives

The management objectives designed to achieve the programme purpose are summarised in Figure 6 below. These objectives are elaborated in subsequent sections.

Figure 6: Tourism Development and Management Programme objectives tree



Objective 1: Tourism infrastructure expanded and improved

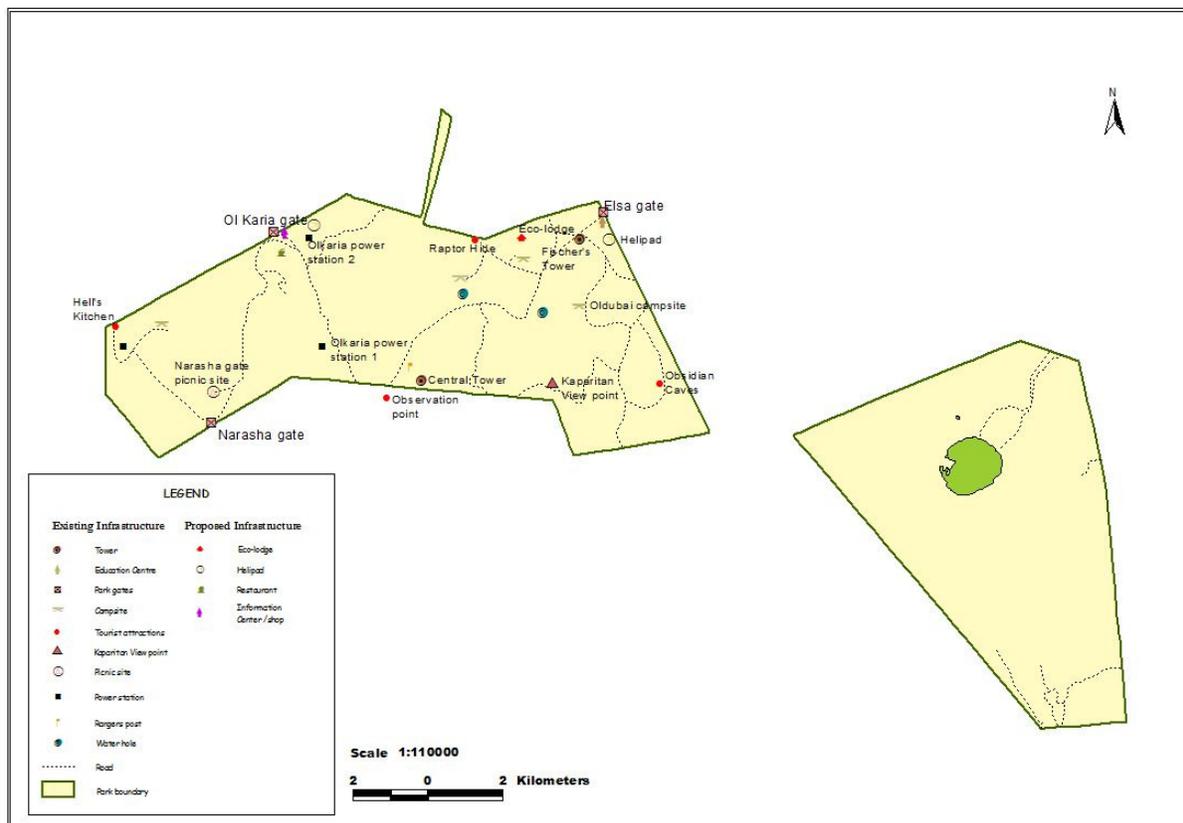
The objective of infrastructure development program in Hells Gate-Longonot National Parks is to ensure the parks have adequate infrastructure in place for sustainable and efficient management and to facilitate tourism, which is an important value of the parks.

Currently the parks lack accommodation facilities and existing campsites and picnic sites are not in optimum conditions that match modern standards. As regards the roads, the soil texture in Hell's Gate National Park is very loose and unstable requiring constant and expensive maintenance. Similarly, the walking trails in Longonot National Park face serious soil erosion problems because of the loose volcanic soils that are easily washed away by run-off.

To ensure that tourism infrastructure is adequate to support the increasing number of visitors, HG/LE management will identify suitable sites for development of tourist facilities to be operated by private investors and under lease agreement. The current picnic sites and campsites will be rehabilitated and upgraded to modern standard of design and functionality. Management will also seek approval for hardening the main road circuit to minimize constant erosion and dust pollution and thereby minimize expensive routine maintenance. Other infrastructures include a horse riding trail to be established and a helipad to be constructed, while visitor gates will be rehabilitated. Also, an environmentally designed walking trail will be established in Mt. Longonot National Park to facilitate hiking in this Park.

The existing and proposed infrastructure is shown in figure 7.

Figure 7: Existing and proposed visitor infrastructure in HG/LE



Box 4 gives a summary of management actions that, implemented, will achieve the above objective.

Box 4. Summary of Management Actions

1. Identify suitable tourist facility sites.
2. Lease out sites to private developers.
3. Harden the main tourist circuit.
4. Establish horse riding trails.
5. Construct a helipad.
6. Rehabilitate visitor gates.
7. Rehabilitate campsites and picnic sites.
8. Construct appropriate signage.

Objective 2: Visitor products diversified

The objective of product diversification is to ensure that visitors appreciate the park as an ideal destination for a wide variety of visitors offering a wide range of attractions and activities. The scenic beauty of Hell's Gate and Longonot National Parks is exceptional. Scenic attractions include the famous Ol Jorowa gorge, towering cliffs, volcanic plugs (Fischer's and Central tower), and steam jets. These attractions and other equally significant values such as biodiversity, support visitor activities including; gorge excursions, rock climbing, biking, mountain hiking, horse riding, corporate team building, bird watching, savannah walks, photography and filming. However, currently the park sells its geographical scenery mainly with low product diversification inspite of many opportunities that can be explored.

To fully capitalize on the area's exceptional resources, management will support continued growth of walking and biking safaris and the annual fund raising event of wheel barrow racing as a way of diversifying the focus of the park from gorge hiking and wildlife viewing. Other activities to be explored include horse riding and helicopter safaris over the gorge and geothermal plants. However, a visitor product survey will be carried out to assess the type of innovative geothermal-based visitor products that should be developed in the area. The management will also establish a historical museum of the park to archive and disseminate visitor information.



Plate 11: Horse Riding in Hell's Gate N.P

A summary of management actions developed to achieve the above objective is given in Box 5 below.

Box 5. Summary of Management Actions

1. Carry out a visitor product survey.
2. Establish innovative geothermal based visitor products.
3. Establish a historical museum of the park.

Objective 3: Visitor information dissemination enhanced

The desired visitor information standards for the park is to have up to date information about the park and other matters of interest like management programs and activities for easy and widespread dissemination to visitors and other stakeholders. Such information makes a visit to a park enriching and also endears the park to the wider public who get to appreciate the park and its objectives and challenges.

Tourism thrives on adequate and up-to-date provision of relevant information on a tourist destination. Hell's Gate /Longonot National Parks have a rich information base that has not been adequately tapped. Nevertheless, tourism information in the form of brochures, leaflets, fliers, guidebooks and, maps exist but are not widely accessible and contain outdated information. Additionally, there is no visitor information centre where visitors can be briefed on the parks' attractions and other activities prior to the actual visit to the park. Such a facility is essential to offer interpretive services that enlighten visitors on the geological significance of the area and to provide them with an explanation of the geological features, vegetation types and animals that can be seen.

To address the visitor information gaps, management will update the visitor information and publish new materials for distribution. In addition, the park management will use both print and electronic media to widely disseminate visitor information as well as set up a web-based interactive information feedback platform. And to ensure that visitors entering the Parks have adequate Park information, visitor information centres will also be constructed at the parks' main gates and they will be stocked with essential visitor information materials.

Box 6 provides a summary of management actions designed to achieve the above objective.

Box 6. Summary of Management actions

1. Update visitor information
2. Publish and distribute visitor information
3. Construct visitor information centres

Objective 4: Park promotion and marketing improved

It is important to establish the HG/LE identity as a distinctive and highly scenic geomorphological destination. This identity should be the centrepiece of the ecosystem's marketing and promotion strategies as the ecosystem seeks to expand tourism and increase revenue

TOURISM DEVELOPMENT AND MANAGEMENT PROGRAMME

generation from visitation (table 7 and table 8 gives visitation and revenue statistics respectively).

To achieve a distinct identity, park management will liaise with KWS Headquarters Marketing Section to develop a marketing strategy that will focus on selling Hell's Gate/Longonot ecosystem as a single destination. The key elements of this strategy will include promotional events and activities such as annual flagship events, and participation in local and international tourism exhibitions and trade fairs. In addition, park management will establish a Friends of Hell's Gate Club, which will be assisting in promoting and marketing the Parks. And in line with objective 3 above, the Parks will be promoted using the electronic and print media.

Box 7 gives a summary of management actions developed to achieve the above objective.

Table 6: Hell's Gate and Longonot visitor statistics (2004 -2009)

Year	Hell's Gate	Longonot
2004	37586	12653
2005	46521	16578
2006	62197	20889
2007	95816	25252
2008	82103	29872
2009	93336	28373

Table 7: Hell's Gate/Longonot revenue statistics (2004 -2009)

Year	Total Revenue(Kshs.)
2004	13,936,876.00
2005	14,067,489.00
2006	21,807,835.00
2007	40,464,488.00
2008	28,982,432.00
2009	60,286,783.00

Box 7. Summary of management actions

1. Hold annual flagship events.
2. Establish a "Friends of Hell's Gate "club.
3. Advertise the Parks through electronic and print media.
4. Participate in tourism exhibitions and trade fairs

Community Partnership and Education Programme

Programme purpose and guiding principles

The purpose of the Community Partnership and Education Programme is to ensure that:
:

Park adjacent communities are supporting conservation efforts and community livelihoods are improving through sustainable use of natural resources

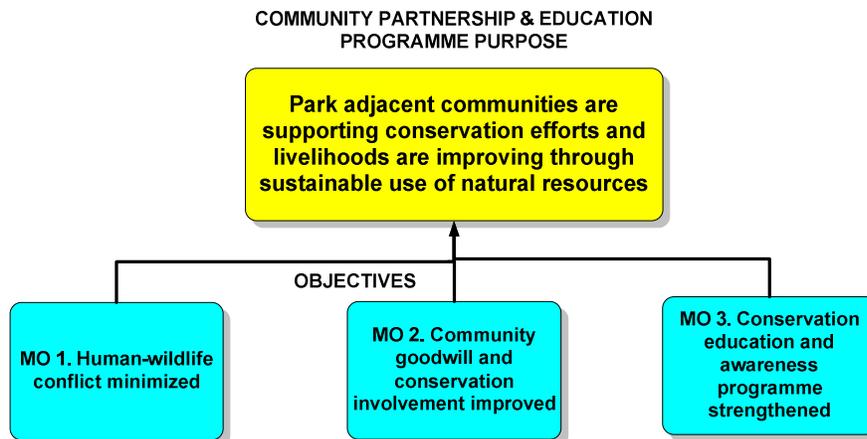
In implementing the Community Partnership and Education Programme, Management will strive to ensure that:

1. **Community-protected area communications are improved;**
2. **Human-Wildlife conflicts are minimised in the ecosystem adjacent areas;**
3. **Communities and other stakeholders are aware of the ecosystem's values and importance; and**
4. **Communities are benefiting from natural resources in the ecosystem.**

Management Objectives

Figure 8 below gives a summary of the management objectives designed to achieve the programme purpose. These objectives are expanded upon in the subsequent sections.

Figure 8: Community Partnership and Education Programme objectives tree



Objective 1: Human-wildlife conflict minimized

The aim of the human-wildlife conflict mitigation program is to ensure that the relationship between the community and the park is cordial and that the people living around the park are not negatively affected by animals and are in turn not hostile to animals and the park management.

The main management concern affecting Hells Gate and Longonot National Parks is the continued land use changes around the parks that are incompatible with wildlife conservation. This has intensified human-wildlife conflict due to crop raids and less space being available for wildlife to feed and roam (see table 9). Human wildlife conflict hotspots in the Hell's Gate/Longonot ecosystem include Longonot/Kendong/Akira area that include Longonot, Ireri, Mai Mahiu, Suswa, Mirera; Marula ranch area that includes: Ututu, Nagum, Kamathatha, Kekopey, Jamaa, KARI, Mbeki, Green Park, Ol-Morok, Malewa Bay, Morendat; Eburru Forest/ Loldia area encompassing Green park, Eburru area, Ndabibi, Shalimar, Ol-suswa Farm; Lake Naivasha area that include the flower farms, hotels and lodges around the lake; and Mundui/Kongoni sanctuary/crater lake area encompassing Kongoni, Moi Ndabi, Ngondi, Korongo, and Maela. The main problem animals include hippopotamus, buffaloes, baboons, hyenas, impalas, leopards, zebras, and elands.

To minimise human-wildlife conflicts, the Eastern side of Longonot National Park will be fenced. A Problem Animal Control Unit will be designated to handle conflict cases and additional conflict outposts established at select conflict hotspot points. Problem animals will also be translocated away whenever appropriate.

A summary of management actions designed to achieve the above objective is given in box 8.

Table 8: Summary of human- wildlife conflicts in Hell's Gate/ Mt. Longonot ecosystem (2003-2009)

Date	Crop damage	Human threat	Property damage	Snaring	Human injury	Human death	Total Incidences
2003	33	44	5	7	3	0	92
2004	94	87	11	14	3	2	211
2005	61	45	9	17	14	3	149
2006	66	52	7	12	11	3	151
2007	88	73	14	0	7	1	183
2008	74	125	13	4	7	0	223
2009	111	195	15	10	16	2	349
	527	621	74	64	61	11	1358

Box 8. Summary of Management Actions

1. Fence the eastern side of Longonot national Park.
2. Designate a Problem Animal Control Unit.
3. Scare and drive away problematic animals.
4. Translocate problem animals.
5. Establish additional PAC outposts.

Objective 2: Community goodwill and conservation involvement improved

The desired future state for community mobilization is where the local community in HG/LE is supportive of the Parks and the biodiversity contained therein. Community support makes management of the parks easy and inexpensive and is the ultimate guarantee of sustainable conservation. The community must therefore value the park as a national resource and appreciate the management's efforts and programs that are geared towards its conservation. In return communities should be mobilized to play an active role in conservation based enterprises so that they can derive economic benefits which also act as an incentive to conserve wildlife in their lands as well as to support management of the parks.

Currently, there is inadequate collaboration with important stakeholders like ranchers, who host considerable populations of wildlife. There is also lack of active wildlife management in the ranches which causes habitat imbalances and land use conflicts when agricultural activities conflict with wildlife conservation. This makes the ranchers detest wildlife on their land which they feel denies them optimum economic benefits which would accrue from other activities on which they have full control. There is also a lot of political interference with the management as most land owners with vested interests in ranching and economic activities around Hells Gate and Naivasha happen to have strong political influence which they leverage to determine management decisions on the ground.

To strengthen collaboration with land owners in conservation, management will initiate and support joint wildlife censuses within the parks and private ranches and the ranchers will be encouraged to identify and develop suitable enterprise projects that will make it economically profitable to conserve wildlife. Management will also identify and support corporate social responsibility projects in the area to strengthen the park's social image. Further, management will support and facilitate community wildlife committees and training of local game scouts and guides as a way of encouraging communities to take active role in development of conservation and tourism enterprises.

Box 9 below gives a summary of management actions designed to achieve this management objective.

Box 9. Summary of Management Actions

1. Establish community wildlife committees.
2. Identify and support corporate social responsibility projects
3. Conduct conservation education and awareness campaigns.
4. Identify suitable bio-enterprises for ranchers and communities.
5. Train local game scouts and guides.
6. Organize and execute joint wildlife censuses outside the park.

Objective 3: Conservation education and awareness programme strengthened

The desired future state of Hell's Gate/Longonot Ecosystem (HG/LE) is where the existence of the Parks is valued and supported by the local communities to ensure viable wildlife conservation in the long term. This can be achieved by building a strong and active conservation constituency amongst a broad spectrum of the public. It is therefore important to establish a conservation education strategy focusing on various social strata. In view of this, and to ensure long term conservation of biodiversity in the HG/LE, park management will support

and strengthen on-going conservation education activities of other partners such as El-samere, carry out community outreach in the ecosystem, establish eco-schools, and facilitate ecology trips. Additional conservation education awareness will be carried out through national events such as world environment celebrations and preparing and disseminating park interpretation materials targeting local communities.

A summary of management actions is given in box 10.

Box 10. Summary of management actions

1. Carry out community outreach programmes
2. Establish eco-schools
3. Conduct ecology trips
4. Support other stakeholder conservation education programmes
5. Participate in the District Development Committee
6. Participate in world environmental celebrations.
7. Prepare park interpretational materials targeting local communities.

Protected Area Operations and Security Management Programme

Programme purpose and guiding principles

The purpose of the Protected Area Operations and Security Programme is to ensure that:

Operational systems are effectively and efficiently supporting the implementation of management programmes and that the ecosystem is safe for visitors and wildlife

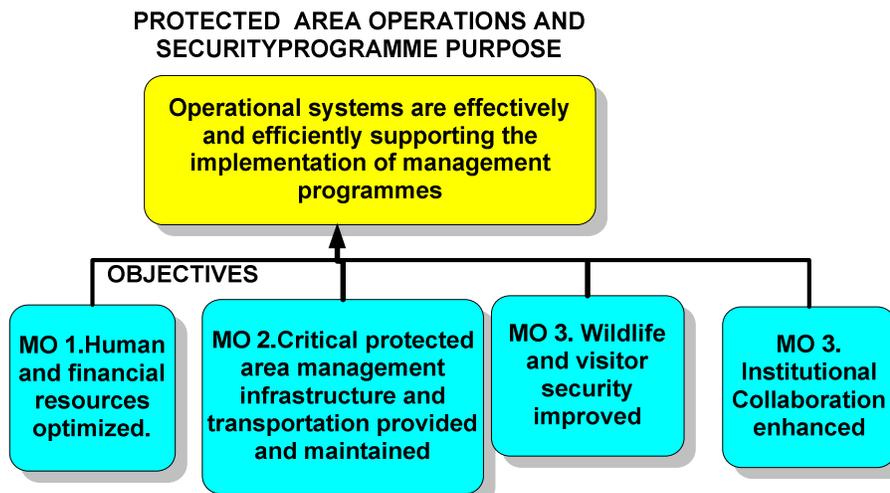
In implementing the Protected Area Operations and Security Programme, Management will strive to ensure that:

1. *Staff welfare and motivation is enhanced;*
2. *Effective and efficient management infrastructure is provided; and*
3. *Wildlife and visitor security is enhanced.*

Management Objectives

Figure 9 below summarises the objectives that have been developed to achieve the Protected Area Operations and Security Programme. These objectives are discussed in subsequent sections.

Figure 9: Protected Area Operations and Security Programme objectives tree



Objective 1: Human and financial resources optimized

The desired human and financial resources status at Hells Gate National Park is where there is an optimum staffing level of professionally trained and deployed workforce. The staff of all calibres should be well housed and their welfare adequately addressed to ensure they are well motivated to their work and the patriotic duty of protecting our national heritage. In turn the park should be able to have enough financial resources to undertake all the planned activities and also keep their staff fully involved in the activities they are hired to do.

Regarding staff welfare, there are inadequate staff houses and ranger posts while some staff are exposed to professional hazards due to pollution from geothermal gases and also dust pollution which is a serious menace in the park.

To address the above issues, the park management will liaise with relevant government departments to provide protection to the staff exposed to pollution. It will also liaise with KWS HQs to ensure that staff are well trained to be multi tasked to cope with shortage where no specialized skills are needed. The park will also organize fund raising events to generate income to supplement financial resources.

A summary of the management actions is given in box 11 below.

Box 11. Summary of Management Actions:

1. Multi-task the staff.
2. Organize fundraising events.
3. Procure and provide protective equipment to staff.

Objective 2: Critical protected area management infrastructure and transportation provided and maintained

The desired future state of the Hell's Gate/Longonot ecosystem is one where essential infrastructure to support effective tourism development and PA management is available.

Staff Housing: The two PAs in the ecosystem lack adequate and appropriate housing for staff (see table 10). This housing shortage lowers staff morale as some staff are forced to share accommodation. In order to boost staff morale, new staff houses will be constructed and old ones maintained to ensure that all staff are appropriately housed

Table 9: Summary of optimal housing requirements for Hell's Gate/ Mt. Longonot and Naivasha Station

Hell's Gate N. Park	House Type	Existing	proposed
Hell's Gate N. Park	Senior Staff (2-3 bdr)	4	8
	Junior Staff (1-2Bdr)	11	19
	Uni-huts	16	0
	temporary	3	0
Longonot N. Park	Senior Staff (3 bdr)	1	0
	Junior Staff(2bdr)	4	8
	Uni-huts	4	0
Naivasha station	Senior Staff (2-3bdr)	2	4
	Junior Staff (unclassified)	19	10 (2bdrm)
	Uni-huts	2	0
	temporary	4	4 (out-posts)

Road network and walking trails: Hell's Gate soils are loose and fragile and therefore they are prone to both water and wind erosion. This has resulted to the road network in the park being unreliable making parts of the park inaccessible while maintenance costs are high. The worst sections of the network are the main circuit, Buffalo circuit and Twiga loop due to their high use by visitors. In Longonot, intense use of the main hiking trail by visitors has caused serious erosion evidenced by deep gullies. This has made it difficult for visitors to access the crater in addition to posing security and safety risks.

During the wet season water from higher grounds collect on the gorge and along the roads often cutting off part of the park to the visitors. Due to the loose nature of the soil, the gorge experience water erosion incidences that lead to loose rock outcrops and slippery sections which can cause serious accidents.

In order to address the above problem, the HG/LE management will harden roads and walking trails in the parks to improve park accessibility to visitors.

Water supply: Hell's Gate and Longonot National Parks have no significant permanent natural water sources. The management has constructed five artificially fed water troughs that supplement water requirements of wildlife species resident in the park. However, there are frequent cases of drowning of wildlife due to poor water trough designs.

To ensure that wildlife has adequate water in the Parks and water troughs are suitable for wildlife, wildlife watering troughs will be re-designed and re-constructed to ensure that they are suitable for wildlife of all sizes and age groups. In addition, a borehole will be sunk to supplement the water supplied by the Ministry of Water pipeline.

Telecommunications: Efficient communications in a national park management system is a prerequisite for effective management. Park managers deployed in different outposts are required to remain in contact to ensure coordinated management. At HG/LE managers use various telecommunication systems to coordinate park management activities. These include communication radios, fixed telephone lines and mobile telephones. Communication radios are commonly used as they are less costly to use and maintain compared to telephones. Telecommunications significantly reduce response time; therefore time and money are saved. As such, HG/LE management will strive to ensure that telecommunication equipment (telephones and radios) are adequate for staff who need them and that the equipment is well maintained.

Information technology: Information technology is a key pillar that drives development. At HG/LE there is need to ensure that all officers have the necessary skills to effectively apply

PROTECTED AREA OPERATIONS AND SECURITY MANAGEMENT PROGRAMME

information technology as they implement their day-to-day management activities. Hence in addition to providing information technology equipment such as computers and Global Positioning Systems (GPS), management will liaise with the KWS Headquarters to ensure that staff are trained in the application of these information management tools.

Transportation: Effective transportation is a critical element of any park management strategy. Indeed all park management programmes require transportation to facilitate execution of management activities. As such, HG/LE management will strive to ensure that vehicles, plant and machinery under its charge are well maintained in accordance with each equipment's maintenance schedule. In addition, management will liaise with KWS Headquarters to ensure that adequate vehicles are allocated to the area to effectively address conservation and management challenges in the HG/LE.

Box 12 gives a summary of management actions designed to achieve the above objective.

Box 12. Summary of management actions

1. Harden the tourism roads and walking trails.
2. Construct and maintain staff houses
3. Redesign and re-construct watering points
4. Establish an Institutional borehole
5. Provide and maintain telecommunication equipment
6. Provide information technology tools such as computers and GPSs
7. Provide and maintain vehicles, plant, and machinery

Objective 3: Wildlife and visitor security improved

The objective of security programme is to ensure the national park boundary is protected from illegal activities and security of wildlife and other resources in the park. A good security programme also ensures visitors to the parks are exposed to minimum safety and security threats. The desired future for the Hell's Gate/Longonot ecosystem is where security operations are revamped to effectively address conservation challenges posed by illegal activities (livestock incursions, bush meat poaching, sandalwood and pumice harvesting, charcoal burning and wildlife trophy hunting) and ensure visitors are safe.

The park, which attracts thousands of nature enthusiasts every year to do rock climbing and gorge hiking still lacks safety equipment or an emergency rescue team notwithstanding that majority of visitors are students and pupils. There is also a ranging problem of bush meat poaching which remains a threat to wildlife in the park and surrounding areas.

To address the above problems, an emergency rescue team will be established and an emergency centre set up at the gorge to assist visitors who may be exposed to security and safety problems of any kind. Adequate road signage will be put in place with necessary safety warnings where necessary.

Security of the park and animals will be boosted through strengthened patrol and surveillance activities and the management will set up security outposts in areas that require more security investment.

Box 13 gives a summary of management actions designed to achieve the above objective.

Box 13. Summary of Management Actions:

1. Acquire safety equipment.
2. Establish and train a rescue team
3. Establish an emergency centre at the gorge.
4. Install safety warning signage.
5. Establish security outposts

Objective 4: Institutional collaboration enhanced

The objective of institutional collaboration program at HG/LE is to ensure different institutions work harmoniously and their respective strengths are harnessed for the benefit of wildlife conservation and national park management. A desired position in this regards is where different institutions collaborate to achieve a collectively desired goal like eradication of poaching, tourism development and promotion of the park and surrounding attractions etc. Regarding collaboration with communities, an ideal situation would have the people supporting the park in its conservation efforts and the park supporting the people in their quest for profitable livelihoods and management of human wildlife conflict.

However, the management still faces serious challenges due to poor or lack of collaboration. For instance, expansion of geothermal activities is not well coordinated between KWS and *Kengen* and conflicting land uses continue to foster mistrust with other stakeholders like ranchers. There are also problems relating to poaching, charcoal burning, fuel wood collection and harvesting of pumice stones. Livestock incursions especially during the dry season are also widespread.

To address these issues, the management will strengthen the national park management committee to ensure its decisions represent as many stakeholders as possible. It will also initiate review of MOU with Kengen to ensure all issues pertaining to the lease of the land for geothermal are clearly stipulated and that park management concerns are addressed. The management will also continue to take an active role in collaborative linkages with all stakeholders to ensure a cordial relationship for collective and conservation benefit.

Box 14 gives a summary of management actions designed to achieve the above objective.

Box 14. Summary of Management Actions:

1. Review the Kengen-KWS MoU to strengthen conservation and exploit tourism potential
2. Negotiate with Kedong Ranch for linkage between Hell's Gate and Mt. Longonot National Parks

Plan Monitoring

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<i>Objective</i>	<i>Potential Impacts (Positive and Negative)</i>	<i>Verifiable Indicator</i>	<i>Sources and means of verification</i>
Objective 2: Visitor products diversified	Increased visitor satisfaction	Number of repeat visitors	Visitor satisfaction surveys
Objective 3: Visitor information dissemination enhanced	Increased visitor satisfaction	Visitor satisfaction index	Customer satisfaction surveys
Objective 4: Park promotion and marketing improved	Enhanced park image	-Increased visitor numbers -Increased revenue	-Visitor statistics -Revenue reports

Table 12: Community Partnership and Education Management Programme Monitoring Plan

<i>Objective</i>	<i>Potential Impacts (Positive and Negative)</i>	<i>Verifiable Indicator</i>	<i>Sources and means of verification</i>
Objectives 1: Human-wildlife conflict minimized	Increased support for conservation	Number of wildlife cases reported	Human wildlife conflict database and reports
Objective 2: Community goodwill and conservation involvement improved	Increased support for wildlife conservation	Number of community conservation projects	Community project reports
Objective 3: Conservation education and awareness programme strengthened	Increased support for wildlife conservation	Number of collaborative initiatives undertaken	Education and awareness reports

Table 13: Protected Area Operations and Security Programme Monitoring Plan

Objective	Potential Impacts (<i>Positive</i> and <i>Negative</i>)	Verifiable Indicator	Sources and means of verification
Objective 1: Human and financial resources optimized.	Increased output given available resources	Staff motivation index	Staff appraisal reports
	Increased number of projects with outsourced funding	Number of proposals funded	Project reports
	Increased human resource capacity	Number of multi-skilled staff	Training reports
Objective 2: Critical protected area management infrastructure and transportation provided and maintained	Increased park accessibility	Number of park infrastructures upgraded/constructed	-Visitor satisfaction surveys -infrastructure project reports
	Environmental degradation during construction phase	Extent degraded	Site inspection reports
Objective 3: Wildlife and visitor security improved	Increased visitor satisfaction and revenue security	Number of revenue and visitor security related crimes	Patrol Reports
	Enhanced wildlife security	Number of wildlife crimes reported	-Wildlife crime database -Wildlife crime reports
Objective 4: Institutional Collaborations enhanced	Increased stakeholder collaborations	Number of collaborative initiatives undertaken	Collaborative initiatives

Plan Annexes

PLAN ANNEXES

<i>Management Action and Activities</i>	<i>Persons Responsible</i>	<i>Timeframe</i>												<i>Milestones</i>
		FY 2010-11				FY 2011-12				FY 2012-13				
		1	2	3	4	1	2	3	4	1	2	3	4	
Objective 3: Ecological monitoring enhanced and improved													An ecosystem land cover map developed by December 2010	
3.1 Carry out wildlife census.	RS	X	X	X	X	X	X	X	X	X	X	X		X
3.2 Map out vegetation composition and structure.	RS										X	X		
3.3 Carry out an all taxa biodiversity inventory	RS													X
3.4 Carry out habitat stocking level assessments.	RS													X
3.5 Map out geothermal well, pipeline networks and power transmission lines.	RS	X	X											
3.6 Conduct pollution level assessments.	RS	X	X	X	X	X	X	X	X	X	X	X		X
3.7 Create a biodiversity information database	RS	X	X	X	X	X	X	X	X	X	X	X		X
3.8 Procure and install automatic weather stations	RS											X		X
3.9 Develop and implement research proposals	RS	X	X	X	X	X	X	X	X	X	X	X		X
Tourism Development and Management Programme														
Objective 1: Tourism infrastructure expanded and improved													An ecolodge developed and operational by December 2012	
1.1 Identify suitable tourist facility sites.	SW	X	X	X										
1.2 Lease out sites to private developers.	SW			X										
1.3 Harden the main tourist circuit.	SW											X		X
1.4 Establish horse riding routes.	SW									X	X			
1.5 Construct a helipad.	SW						X	X						
1.6 Rehabilitate visitor gates.	SW					X	X							
1.7 Rehabilitate campsites and picnic sites.	SW	X	X	X	X									
1.8 Construct appropriate signage.	SW	X	X	X	X									
Objective 2: Visitor products diversified													A museum established by June 2011	
2.1 Carry out a visitor product survey.	SW				X	X								
2.2 Implement the survey recommendations.	SW						X	X						
2.3 Establish a historical museum of the park.	SW											X	X	

Management Action and Activities	Persons Responsible	Timeframe												Milestones
		FY 2010-11				FY 2011-12				FY 2012-13				
		1	2	3	4	1	2	3	4	1	2	3	4	
Objective 3: Visitor information dissemination enhanced													Visitor information updated by December 2010	
3.1 Update visitor information	SW	X	X	X	X	X	X	X	X	X	X	X		
3.2 Publish and distribute visitor information	SW	X	X	X	X	X	X	X	X	X	X	X		
3.3 Construct a visitor information centre	SW										X	X		
Objective 4: Park promotion and marketing improved													A Friends Of Hell's Gate club established by June 2011	
4.1 Hold annual flagship events.	SW				X				X			X		
4.2 Establish a "Friends of Hell's Gate" club.	SW				X									
4.3 Carry out advertisement campaigns through electronic and print media.	SW	X	X	X	X	X	X	X	X	X	X	X		
4.4 Organize exhibitions and trade fair stands	SW				X				X			X		
Community Partnership and Education Programme														
Objectives 1: Human-wildlife conflict minimized													A Human Wildlife conflict database established by December 2010	
1.1 Establish conflict database	CWO			X										
1.2 Identify conflict hotspots	CWO			X										
1.3 Fence off Eastern side of Longonot Park	CWO											X		
1.4 Designate a Problem Animal Control Unit.	CWO											X		
1.5 Translocate problematic animals.	CWO	X	X	X	X	X	X	X	X	X	X	X		
1.6 Establish additional conflict outposts	CWO											X		
1.7 Appraise honorary wardens	SW					X						X		
Objective 2: Community goodwill and conservation involvement improved													At least two Community wildlife committees established by June 2010	
2.1 Establish community wildlife committees.	CWO				X									
2.2 Identify and support corporate social responsibility projects	CWO	X	X	X	X	X	X	X	X	X	X	X		
2.3 Conduct conservation education and awareness campaigns.	CWO	X	X	X	X	X	X	X	X	X	X	X		

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Management Action and Activities	Persons Responsible	Timeframe												Milestones
		FY 2010-11				FY 2011-12				FY 2012-13				
		1	2	3	4	1	2	3	4	1	2	3	4	
2.4 Identify suitable bio-enterprises for ranchers and communities.	CWO	X	X	X	X	X	X	X	X	X	X	X	X	
2.5 Train local game scouts and guides.	CWO	X	X	X	X	X	X	X	X	X	X	X	X	
2.6 Organize and execute joint wildlife censuses outside the park	RS	X	X	X	X	X	X	X	X	X	X	X	X	
Objective 3: Conservation education and awareness programme strengthened														
3.1 Conduct community inreach and outreach programmes	CWO	X	X	X	X	X	X	X	X	X	X	X	X	Two eco-schools established by December 2011
3.2 Establish eco-schools	CWO	X	X	X	X	X	X	X	X	X	X	X	X	
3.3 Conduct ecology trips.	CWO	X	X	X	X	X	X	X	X	X	X	X	X	
3.4 Complement other conservation education endeavours by our collaborators.	CWO	X	X	X	X	X	X	X	X	X	X	X	X	
3.5 Participate in the District Development Committee	CWO	X	X	X	X	X	X	X	X	X	X	X	X	
3.6 Participate in world environmental celebrations.	CWO			X				X				X		
3.7 Prepare park interpretational materials targeting local communities.	SW	X	X	X	X	X	X	X	X	X	X	X	X	
Protected Area Operations and Security Programme														
Objective 1: Human and financial resources optimized.														
1.1 Train Multi-skilled staff.	HRO	X	X	X	X	X	X	X	X	X	X	X	X	At least 50% of required houses provided by December 2013
1.2 Organize fundraising events.	SW	X	X	X	X	X	X	X	X	X	X	X	X	
1.3 Acquire and provide protective equipment to staff.	SW	X	X	X	X	X	X	X	X	X	X	X	X	
1.4 Provide staff housing, office and canteens	SW	X	X	X	X	X	X	X	X	X	X	X	X	
Objective 2: Critical protected area management infrastructure and transportation provided and maintained														
2.1 Harden the main tourist circuit.	SW											X	X	The main tourist circuit hardened by December 2011
2.2 Acquire and install safety equipment.	SW											X	X	
2.3 Establish and train a rescue team.	HRO												X	
2.4 Establish an institutional borehole														

Management Action and Activities	Persons Responsible	Timeframe												Milestones
		FY 2010-11				FY 2011-12				FY 2012-13				
		1	2	3	4	1	2	3	4	1	2	3	4	
2.5 Construct safety warning signage	HRO	X	X	X	X	X	X	X	X	X	X	X	X	
2.6 Redesign and construct all watering points	SW					X	X	X						
2.7 Establish an institutional borehole	SW													X
Objective 3: Wildlife and visitor security improved														
3.1 Establish a communication network between the KWS, key stakeholders and friendly forces	SW			X	X									A communication network established by June 2011
3.2 Provide visitor and revenue escorts, guards and sentries.	SO	X	X	X	X	X	X	X	X	X	X	X	X	
3.3 Establish intelligence gathering network.	SO	X	X	X	X	X	X	X	X	X	X	X	X	
3.4 Carry out security patrols	SO	X	X	X	X	X	X	X	X	X	X	X	X	
3.6 Establish database on wildlife trophies and security incidences	SO	X	X	X	X	X	X	X	X	X	X	X	X	
3.7 Establish an emergency center at the gorge	SO						X	X						
Objective 4: Institutional collaborations enhanced														
4.1 Review the Kengen-KWS MoU to strengthen conservation and exploit tourism potential	SW	X	X	X	X									Kengen-KWS MoU reviewed by December 2011
4.2 Negotiate with Kedong Ranch for linkage between Hell's Gate and Mt. Longonot National Parks	SW			X	X									

Abbreviations

1. SW-Senior Warden
2. RS-Research Scientist
3. CWO-Community Wildlife Officer
4. SO-Security Officer
5. HRO-Human Resource Officer

Annex 2: Summary of wildlife census for the Hell's Gate/Mt. Longonot Ecosystem in 2009

Farm	Crater Lake/ Indu / Lentoria	Ndabibi / Aquila /Kijabe	Mundui	Hippo Point/ Nderit	OLERAI	Kongoni Game Valley	Oserian Wildlife Sanctuary	Oserian Game Corridor	Hells Gate NP	Kedong (Longonot Section)	Kedong (Akira Section)	Longonot NP	Marato Karai ereri	Cresent Island	club/D'Olier/Higgins /Sanctuary	Lake Naivasha	Totals
Species/Acreage	10000	40000	1145	500	500	800	18000	3000	16000	30000	50000	20000	3000	190	100		193235
Zebra	297	236	203	197	36	60	333	310	179	1071	953	231	111	144	107		4468
Thomsons Gazelle	110	132	187	159	28	3	371	51	51	2469	1479	403	8	139	10		5600
Impala	194		141	270	197	103	245	291	154	76	127	30	131	296	318		2573
Eland	118		4	11	15	53	82	51	12	39	20	25	21				451
Buffalo			4	10		33	445	56	32	6		136		31			753
Grants Gazelle			33	7		1	155	57	45	152	407	99		17	6		979
Kongoni		2	6	17	8	28	49	36	3	96		268					513
Waterbuck	18		9	19	18	8	86	8	12		11			78	96		363
Wildebeast							240							356	203		799
Warthog	33		10	73	35	87	866	174	141	27	4		12				1462
Bushbuck	2						1							2			5
Reedbuck							1			3							4
Giraffe	58		8	61	28	8	100	59	22	34	112	50		13	8		561
Hippo	67		29	52	25			48						54		1282	1557
Ostrich							15	0		10	19			1			45
Sub Total	897	370	634	876	390	384	2989	1141	651	3983	3132	1242	283	1131	748	1282	20133

Annex 3: Summary of optimal staff level for Hell's Gate/ Longonot National Parks and Naivasha station.

Position	Current Number	Required Number	Variance(-)
1. SENIOR WARDEN	1	1	0
2. Warden I	0	1	1
3. WARDEN II	2	4	2
4. Assistant Warden I	0	1	1
5. Assistant warden II	1	1	0
6. Senior sergeant	1	2	1
7. Sergeant	3	3	0
8. Corporal rangers	12	10	2
9. Security rangers	0	5	5
10. Gate Rangers	11	15	4
11. Longonot park Rangers	4	6	2
12. Naivasha station Rangers	4	14	10
13. Radio operator	3	3	0
14. Drivers	5	8	3
15. Plant operator	1	2	1
16. Workshop supervisor	1	1	0
17. Motor vehicle mechanic	0	2	2
18. Accountant	1	2	1
19. Account assistant	1	2	1
20. Human resource officer	1	1	0
21. Clerical Officer	0	1	0
22. Supplies officer	0	1	1
23. Supplies clerk	1	1	0
24. Dispatch clerk	0	1	1
25. Mason	1	2	1
26. Plumber	0	1	1
27. Office Assistant	1	3	2
28. Copy typist	0	2	2
29. Secretary	1	1	0
30. Education Guide	0	1	1
31. Shop Attendant	0	2	2
32. Research assistant	1	1	0
33. Research scientist	1	1	0
34. Customer Care	1	15	14