



# **Maasai Mara National Reserve**

## Management Plan 2023-32

February 2023

*Celebrating  
75 years  
of conserving  
the Mara  
ecosystem*





The Maasai Mara National Reserve Management Plan 2023-32 has been developed and co-financed by the Narok County.

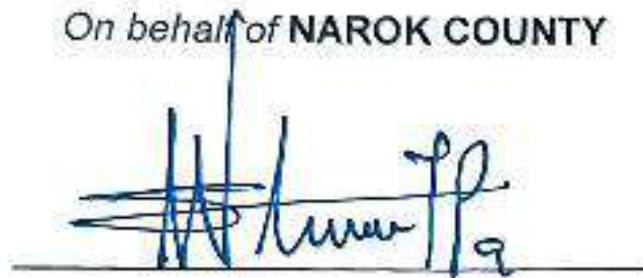


The MMNR Management Plan is based on participatory planning involving a broad cross section of MMNR stakeholders carried out over the periods 2008-2012, 2015-2016, 2020 and 2023. Earlier phases of the planning work were supported and co-financed by the African Wildlife Foundation and the Mara Conservancy.

## Approval page

The Narok County Assembly has approved the implementation of this management plan for the Maasai Mara National Reserve, 2023 – 2032.

On behalf of **NAROK COUNTY**



H.E. Patrick Keturet Ole Ntutu  
Governor, Narok County

Date: 21<sup>st</sup> February 2023

# Foreword

In 2023, the Maasai Mara National Reserve will be celebrating 75 years since its establishment back in 1948. It is especially appropriate that this historic milestone coincides with the release of this **Maasai Mara National Reserve 10-year management plan**, the first stakeholder developed and approved management plan for the Reserve in more than 40 years.

The Mara Reserve is at the heart of the Mara-Serengeti ecosystem and home to the Great Wildebeest Migration, internationally recognised as one of the New Seven Wonders of the World alongside other priceless world heritages such as the Polar Ice Caps and the Grand Canyon. For those who know the ecosystem well, this accolade comes as no surprise because the migration and the natural ecosystem that supports it is without doubt one of the most spectacular and breath-taking natural phenomena on earth.

However, major threats loom that seriously threaten the long-term viability of the Reserve and wider ecosystem. If the Reserve is to survive for another 75 years, we urgently need a roadmap that will enable us all to confront the many challenges the Reserve now faces.

It is for this reason that Narok County is proud to unveil this new MMNR Management Plan. Through a highly participatory process involving the local community, national and county legislators, the tourism industry, ecologists, scientists and Reserve managers, the plan sets out a stakeholder-agreed vision for the future of the Mara Reserve plus, in simple and unambiguous terms that all can understand, the means to achieve that vision. In line with the global significance of the Reserve and the greater ecosystem, the plan sets out a comprehensive agenda for strengthening the management of the Reserve, designed to ensure the survival of this unique and priceless national heritage, and the continuing generation of optimal economic benefits from the Reserve for the people of the Narok County in which the Reserve is located, as well as for all Kenyans.

The Mara Reserve and the greater Mara-Serengeti Ecosystem has had an illustrious and successful past of which we can all be proud, but with the help of this new management plan, we are now embarking on a new future for the Reserve – one which is both in tune with the international significance of this natural spectacle, its economic importance to Kenya and Narok County, as well as with the rapidly mounting threats to the area. To achieve this bright new future in the face of the difficult challenges confronting the Reserve will require both bold leadership and committed management. We look forward to the next 75 years of the Reserve with optimism and excitement about all that will be achieved as the Reserve continues to fulfil its vital role in the conservation of the Mara ecosystem.



Hon. Johnson Ole Sipitiek  
County Executive Committee Member, Tourism & Wildlife  
Narok County  
21<sup>st</sup> February 2023

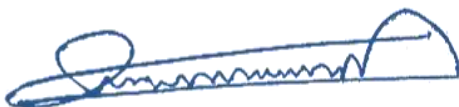
# Acknowledgements

This Maasai Mara National Reserve Management Plan 2023-2032 is the outcome of a combined and concerted effort by the many diverse stakeholders of the Reserve, including the local communities living around the Reserve who support and benefit from the Reserve, the tourism investors and operators that have made the Reserve one of the world's finest wildlife visitor destinations, the ecologists and scientists who have been at the forefront of efforts to enhance the understanding and conservation of the Reserve's exceptional biodiversity and habitats, and the Reserve managers who are charged with taking care of the area.

On behalf of the County Government of Narok, I would like to thank sincerely all the stakeholders who have contributed to the development of this plan, by generously sharing their unique knowledge and investing many hours of their time in the various working group sessions and other stakeholder forums. In total, over 47 separate stakeholder meetings were involved in plan development. The list of stakeholders who have contributed is far too long to thank individually (see Appendix 2 for a list of all the planning meetings held and Appendix 3 for a list of stakeholders who participated in plan development). The County Government very much appreciates the contributions of each and every participant in the planning meetings.

I would especially like to thank all those who have provided technical, in-kind support and generous financial support for the development of the management plan since the outset. The initial major phase of plan development took place over the period 2008-2012 and was co-financed by the Mara Conservancy and the African Wildlife Foundation (AWF), who also provided technical support and facilitation for the planning process. The County Government also gratefully acknowledges the support provided by members of the County Assembly who engaged the community during public participation. Their views and inputs are highly appreciated. This plan could not have come to fruition without the effort and leadership provided by H.E. the Governor throughout the plan development to gazettelement.

Lastly, I wish to acknowledge the steadfast efforts of the Conservation Development Centre (CDC) who facilitated the planning process throughout according to the KWS national protected area planning framework and supported the County Government in drafting the eventual management plan, working hand-in-hand with Reserve managers and stakeholders and under the oversight of a Core Planning Team made up of County Government representatives, key stakeholders and partners.



Samwel Leposo  
Chief Officer, Tourism & Wildlife  
County Government of Narok

# Executive Summary

The Maasai Mara National Reserve is today faced by unprecedented challenges. Inside the Reserve, escalating pressures from tourism development and growing visitor numbers drawn by the world-renown of the Reserve's wildebeest migration and other exceptional natural resources are leading to a decline in the quality of the tourism product, and to a deterioration of the natural habitats on which the Reserve's tourism product is based, which is in turn leading to a major decline in several of the Reserve's charismatic wildlife species. Outside the Reserve, there is growing pressure from local communities to use the Reserve's pastures and water sources for livestock, because of the diminishing supplies of these resources in the wider ecosystem and deteriorating community livelihoods.

Rapidly changing land-use in the Greater Mara Ecosystem and uncontrolled tourism infrastructure development is also leading to diminishing dispersal areas and migratory corridors for the Reserve's wildlife, and escalating poaching and human-wildlife conflict. In the face of all these and other challenges, the Narok County government and the Reserve's management has been unable to respond adequately to the changing circumstances, lacking as it does a clear road map for the future management of the Reserve in a changing world, and also lacking the financial resources, manpower and infrastructure to address the emerging challenges.

In response to these serious concerns about the future of the Reserve, the Narok and Trans Mara County Councils (now succeeded by Narok County) together with the Mara Conservancy (which is responsible for managing the Mara Triangle section of the Reserve) resolved in May 2007 to develop a new 10-year management plan for the Reserve, the first management plan for the Reserve to be developed for more than 40 years.

The initial planning process, which was spread out over the period 2008-2012 was co-financed by the two councils together with the Mara Conservancy and the African Wildlife Foundation (AWF), who also provided technical support and facilitation for the planning process. The Conservation Development Centre (CDC) was enlisted to facilitate the planning process and to draft the eventual management plan, working hand-in-hand with Reserve managers and stakeholders and under the oversight of a Core Planning Team made up of county representatives, key stakeholders and managers.

The finalisation of the plan was put on hold as a result of the dissolution of the county councils in 2013. Subsequently, the Narok County, successor to the two former county councils, took over responsibility for the development of the new management plan, which led to an intensive period of activity to update the draft management plan in 2015-2016. However, the planning work was again put on hold in the lead up to the 2017 general elections.

In August 2020, work again commenced on finalising the new management plan, prompted by the major challenges to the MMNR caused by the COVID-19 pandemic, especially the impacts on the Reserve's economic viability as a result of the sudden collapse of tourism in the area. While without doubt a major setback for the Reserve, the post-pandemic recovery period

has provided a significant opportunity to put the management of the Reserve on a strong footing for the future, and this management plan is designed to help fulfil this.

Final approval of the management plan was postponed as a result of the 2022 general elections, but in early 2023 the new Narok County administration picked up the baton once again leading to the final review and approval of the plan by Members of the Narok County Assembly at a retreat held in early February 2023, followed by signing into law of the plan by the Narok County Governor on 21<sup>st</sup> February 2023.

The main aims of the new management plan are to:

- ▶ Ensure conservation of the Reserve’s globally significant biodiversity
- ▶ Maintain the role of the MMNR as the flagship of Kenya’s tourism industry
- ▶ Improve on a sustainable basis the revenues generated by the MMNR, to support increasing community livelihood and PA management needs
- ▶ Provide a practical management framework to support MMNR managers in carrying out their day-to-day management responsibilities.

In order to achieve these aims, the new plan sets out a set of stakeholder and management agreed goals (the **purpose statements** and **objectives**) that Reserve managers will aim to achieve, and a series of **prescriptions** and **management actions** that will be implemented in order to ensure these goals are achieved. The plan mainly focuses on the management of the Reserve itself, although to a limited degree it also addresses issues beyond the Reserve that are impacting on the area, such as regarding ecological and community issues.

At the heart of the plan are the **Visitor Carrying Capacity** and **Zonation and Visitor Use Scheme** chapters and the **four management programmes**, each of which cover an essential aspect of reserve management. These four programmes are: the Ecological Management Programme, the Tourism Management Programme, the Community Outreach & Partnership Programme, and the Protected Area Operations Programme

The process used to develop the new management plan as well as the plan’s structure were based on the Kenya Wildlife Service’s **Protected Areas Planning Framework**, or PAPF, which aims to provide a planning standard for all of Kenya’s parks and reserves. The plan is the result of extensive participation by the MMNR’s many stakeholders and represents a consensus viewpoint on how this priceless natural and economic asset of the Maasai people and of the nation should best be managed and conserved in the future. In total, 47 separate stakeholder meetings were involved in the development of the plan.

Narok County government acknowledge the significance of the Reserve as a priceless heritage of the Maasai community as well as to the Reserve’s tourism investors and operators. Accordingly, a concerted effort has been made to ensure that the views of these major stakeholders have been incorporated into the plan.

This new MMNR management plan has a duration of 10 years. However, in accordance with the Wildlife Conservation & Management Act (2013) Fifth Schedule (Management Plans), plan implementation will be evaluated after the first five years and adjustments made to plan activities and prescriptions according to lessons learnt and changing circumstances.

An important aspect of the new plan is that it aims to provide a mechanism for managing the MMNR as a **single visitor destination and ecological unit**. Over the years, the management of the Central Mara (Narok) and Mara Triangle sections of the Reserve have gradually diverged, to the extent that today there are significant differences on both sides of the Reserve, which leads to confusion amongst the area's users and inefficiencies in the use of management resources. One of the key underlying principles in developing this management plan was therefore to bring the management of the two sides of the Reserve much closer together, through coordinated and unified management based on a shared vision and objectives, and common management action priorities.

## Visitor Carrying Capacity

An underlying challenge that this management plan must address is how to optimise the Reserve's tourism revenues while at the same time reducing the impacts of tourism on the Reserve's natural environment, upon which tourism ultimately depends. Addressing this challenge in the MMNR is particularly important because of the Reserve's role as the flagship of both the Greater Mara Ecosystem and Kenyan tourism product. One of the main tools available for achieving this balance between economic development and environmental conservation is the establishment of the Reserve's visitor carrying capacity. It is important to note that determination of a protected area's carrying capacity is also a requirement under the Wildlife Conservation & Management Act (2013) Fifth Schedule (Management Plans).

Visitor carrying capacity is often expressed in terms of average visitor density in the protected area concerned, which can in turn be estimated from the number of visitor beds that are available in accommodation facilities in and around the PA, and the annual occupancy rates of these facilities. The foundation for understanding these factors in the MMNR is provided by the MMNR Tourism Accommodation Database which was prepared early on in the planning process and updated on several occasions subsequently.

Based on this database, visitor densities in the MMNR have been determined to be significantly higher than in most other Kenyan protected areas. For example, before the current decline in visitation resulting from the COVID-19 pandemic, it is estimated that high season visitor densities in the Central Mara section of the Reserve were well in excess of **2 visitors per km<sup>2</sup>**, potentially as much as **3 visitors per km<sup>2</sup>**. This figure is likely to be still further exceeded during peak tourism periods such as during the wildebeest migration, and in key visitor attraction areas, such as along the Mara River.

By comparison, tourism operators in the conservancies to the north of the MMNR have established a high season visitor carrying capacity of approximately **0.5-0.6 visitors per km<sup>2</sup>**. The Mara conservancies are clearly intending to provide a lower volume and higher value visitor experience than is provided by the MMNR, so it is to be expected that the visitor carrying capacity of the Reserve will be set at a higher level to that for the conservancies. In this regard, the high season visitor density in the Mara Triangle is generally regarded as the optimal density that the Reserve can accommodate without a deterioration of both the visitor experience and the Reserve's environmental values.



That is, the optimal carrying capacity of the MMNR is approximately 1-1.2 visitors per km<sup>2</sup>.

Since high season visitor densities significant exceed this carrying capacity in parts of the Reserve, especially the Central Mara (Narok) section, this underscores the need to implement a variety of management prescriptions designed to both reduce the high visitor densities, as well as prescriptions and actions designed to mitigate the impacts of these high visitor numbers on the Reserve's fragile ecological areas (e.g. through zonation and restrictions on off-road driving), and on the quality of the visitor experience (e.g. through controlling visitor numbers at key visitor attractions and providing alternative visitor attractions such as picnic sites and interpretation centres). The MMNR's zonation scheme and related visitor use prescriptions described below set out how this will be achieved.

The proposed MMNR optimal visitor carrying capacity is a target visitor density designed to be monitored throughout the duration of this management plan, and further adjustments to the carrying capacity may be made according to the actual impacts of high visitor densities on the Reserve's environment and the success of management efforts to enhance the MMNR's visitor experience. In this regard, the plan sets out a set of indicators that will be used to monitor the impacts of visitor use.

## The Zonation and Visitor Use Scheme

The primary function of the MMNR's zonation scheme is to manage and regulate visitor use and impacts in the different MMNR zones. Specifically, the zonation scheme establishes four categories of zone:

- ▶ **High Use Zone**
- ▶ **Low Use Zone**
- ▶ **Mara River Ecological Zone**
- ▶ **MMNR Buffer Zone**

In designing the scheme, the zones have been kept as simple as possible and, wherever possible, zone boundaries have been aligned with roads or rivers to aid interpretation on the ground. While separate zone areas have been defined for both the Central Mara (Narok) and Mara Triangle sections of the Reserve, all prescriptions for each zone type are standard throughout the entire Reserve (as set out in more detail in the following sections).

The **High-Use Zone** covers those areas that are presently used by the majority of Reserve visitors. This zone will be the focus of management efforts to enhance the Reserve's tourism product and will aim to provide a high quality, proactively managed, wildlife viewing experience for visitors.

The **Low Use Zone** covers those areas that have in the past been characterised by low visitation, and in these areas the emphasis will be on environmental protection, with lower visitor densities and providing a sense of exploration and wilderness.

The **Mara River Ecological Zone** is established primarily to provide the necessary degree of protection to this zone's sensitive riverine forests, rhino breeding areas, wildebeest crossing

points, and the Mara River itself, and is the only zone with a primary ecological protection function. Because of the high tourism pressures in this zone, special management prescriptions and actions are needed to protect the zone's environment while facilitating sustainable tourism practices.

The **MMNR Buffer Zone** is a two-kilometre strip surrounding the entire MMNR except for its southern boundary with Serengeti National Park across the international border with Tanzania. As detailed in the Visitor Carrying Capacity chapter, the Buffer Zone is where the majority of the Reserve's visitors originate from, yet because it is not part of the Reserve it is subject to the least controls on development. Influencing future developments in the MMNR Buffer Zone is an important priority for this management plan.

The scheme includes detailed prescriptions on the visitor accommodation and activities that are permitted in each zone, as well as for the entire Reserve. Overall, the plan prescribes that, in view of the current very high bed capacity and visitor densities in the Reserve and in order to work towards the visitor carrying capacity limits specified above, there will be no new tourism accommodation developments and no expansion of existing bed capacity permitted in all MMNR zones during the lifespan of this plan.

In addition, Appendix 1 details the different types of visitor accommodation that are permitted in the MMNR and sets out detailed prescriptions applying to all accommodation facilities that fall under each category. MMNR accommodation is categorised as: lodges, ecolodges, eco-camps and special campsites.

Visitor activities in all three zone types will be primarily restricted to game viewing and sight-seeing balloon flights. Other activities found in other Kenyan protected areas, such as walking safaris, night drives and horseback safaris, will not be permitted in the MMNR. This is to enable the surrounding community areas of the Greater Mara Ecosystem to capitalise on these niche markets, giving the community areas a potential tourism boost.

With regard sightseeing ballooning in the Reserve, the zonation scheme demonstrates that existing densities of balloons operating in the Reserve are already extremely high, and that to avoid a negative impact on the Reserve's environment and tourism product, no new ballooning concessions or expansion of existing concessions will be permitted in the MMNR during the lifespan of this plan, including balloons taking off from outside the Reserve. The zonation scheme also sets out detailed prescriptions for balloon operation in the MMNR designed to minimise the environmental impacts of these activities and to ensure the safety of visitors.

## Ecological Management Programme

Human populations and activities both within and around the MMNR have increased dramatically over recent decades. These pressures on the Reserve range from internal factors such as high visitor densities impacting on the Reserve's habitats and wildlife, to even more profound long-term external factors, such as diminishing quantities and erratic flow of water in the Mara River, the lifeline of the Reserve, and changing land-use practices, such as conversion to wheat farming in the north of the ecosystem, which is eroding the dispersal areas and migration corridors that are critical to the survival of the Reserve's wildlife. The scale of these

pressures is such that concerted action by Reserve managers and other stakeholders is now urgently needed, which is the major function of the Ecological Management Programme.

To address these issues, the Programme first identifies the most important and representative biological features of the Reserve's ecosystem – called the **Conservation Targets** - including the key species and habitats that are represented in the Reserve, as well as the system-level features that are critical to the Reserve. The programme then identifies the key ecological attributes that are vital to maintaining the Conservation Targets, as well as the critical threats impacting on the targets. This information is then used as a basis for the development of the Programme's management objectives and actions, with the aim of ensuring that management attention is focusing on the most important biological components of the Reserve and the most important threats impacting on them.

The programme's first objective focuses on the critically endangered **Black rhino** population (one of the only two remaining "*indigenous*" populations remaining in the country), which remains under serious threat from commercial poaching and diminishing habitat and has suffered from very slow population growth over recent years. Actions included focus on enhancing monitoring collaborations with KWS and TANAPA and supporting the implementation of the National Black Rhino Strategy and Action Plan. Also at the species level, the programme's second objective focuses on the **Roan antelope** and **Greater kudu**, both of which are no longer present in the Reserve but for which there are plans to reintroduce as part of the process to restore the Reserve's natural species diversity.

The programme's third objective focuses on the protection and management of the MMNR's characteristic **habitat mosaic**, which is not only important for maintaining the Reserve's species diversity and abundance but also forms a crucial part of the area's tourism attraction. A major focus of management action is fire management, which is one of the most important threats to these habitats. At the wider ecosystem level, the programme's fourth objective focuses on the threats to the **Mara River**, whose catchment forests are coming under increasing pressure from human activities, especially in the Mau Escarpment. While addressing these issues is outside the direct mandate of MMNR managers, in view of their potentially devastating consequences for the Reserve's ecology, the Programme includes management actions for both the Narok County and Reserve managers to collaborate in and support wider efforts to address these issues.

The final objective in this programme focuses on enhancing **research and monitoring** in the area. Whereas the Reserve has a strong history of ecological research and is host to the KWS-managed Mara Research Station, much of this research has not been of direct relevance or application to management. This objective therefore focuses on putting into place the necessary human resources, systems and structures to ensure that research is of direct practical benefit to management, and to enable management to understand and focus on emerging threats to the Reserve's ecology in the future. This will include efforts to upgrade the Mara Research Station to a centre of excellence in Mara Ecosystem research and monitoring.

## Tourism Management Programme

There have been major increases in visitor numbers to the MMNR over recent years, primarily as a result of the growing international recognition of the area as one of the world's finest wildlife destinations. One of the greatest challenges now facing the Reserve is the management of these high numbers of visitors in order to maintain the area's world-class tourism product and secure the economic benefits the area provides, while also ensuring that visitor use does not undermine the area's exceptional biodiversity. Once the COVID-19 pandemic is over, trends in high visitor demand for the MMNR are likely to resume, and concerted management action is now needed to ensure that the benefits of tourism to the area's financial sustainability and conservation are optimised, and that the Mara tourism brand is not undermined by over-use; this is the primary function of the Tourism Management Programme.

This aim aligns with that of the Zonation and Visitor Use Scheme, and the programme includes a number of management actions designed to implement important aspects of this scheme. For example, through improvements to the area's **visitor attractions, amenities and infrastructure**, the programme's first objective aims to enhance the tourism product on offer in the High Use and Mara River Zones, while also reducing the environmental impacts of intense visitor use in these areas. The objective includes actions for the development of specific visitor attractions and an MMNR Visitor Interpretation Centre, as well as improving the area's game viewing track and road network, with the overall aim of improving visitor use patterns and minimising overcrowding and congestion throughout the area.

In contrast, but also closely associated with the zonation scheme, the next objective aims to strengthen the **regulation of visitor activities** across the entire MMNR, in order to improve the quality of the visitor experience while reducing the environmental impacts from visitor use. This will be achieved by clarifying and disseminating visitor regulations, measures to improve management of migration river crossings that come under intense visitor pressure at key times of year and strengthening visitor patrols including the deployment of Ticket Inspection Units. Also under this objective are actions to improve standards of driver/ guides in the Reserve, including the creation of a new scheme by Narok County for the licensing of local driver/ guides.

The programme's third objective shifts the focus of management attention to issues relating to the standards of **visitor accommodation facilities**. This objective includes actions to support the rationalisation of MMNR tourism accommodation lease arrangements, as well as the rolling out of new MMNR tourism accommodation standards for all lodges, ecolodges, eco-camps and special campsites operating in the Reserve (described in detail in Appendix 1). To ensure compliance with the accommodation standards, Narok County and MMNR management will carry out periodic accommodation audits, on commencement of implementation of the management plan and every three years thereafter.

Linked to the new accommodation standards, the management plan also recommends that Narok County introduces a new MMNR tourism accommodation licence fee (single business permit) scheme that will in future provide the principal future mechanism for the County to collect revenues from tourism facility operators in (and potentially adjacent to) the Reserve.

The licence fee will be determined in the annual Narok County Finance Bill and will be aligned with the category of accommodation that a particular MMNR accommodation facility falls. The objective also includes actions designed to ensure all tourism facilities are complying with national environmental impact legislation and best practice and are thereby having the minimal impact on the area's environment.

The final tourism objective addresses the improvements in **tourism administration systems** needed to address escalating tourism management challenges over the years ahead, and to support the successful implementation of the Zonation and Visitor Use Scheme, and in particular the new complexities to area management that this scheme implies. Actions are included to improve ticketing and revenue collection systems throughout the Reserve, to strengthen customer care and service at MMNR entrance points, and to improve communication and collaboration with tourism industry stakeholders, whose support and collaboration on a variety of issues set out in this programme and the zonation scheme remain vital for plan success.

## Community Outreach and Partnership Programme

The reciprocal impacts of the MMNR and communities on one another have increased considerably over the past few decades. This includes community activities in the wider ecosystem that are impacting on the ecology of the Reserve (as discussed above under the Ecological Management Programme), as well as incidences of human-wildlife conflict occurring when animals, and particularly large predators, disperse from the Reserve to surrounding community areas. However, many community members living around the MMNR have maintained a close relationship with the Reserve and have retained a unique sense of pride and ownership in the area, and in the exceptional natural resources it conserves. This programme aims to capitalise on and strengthen this special relationship between the MMNR and its neighbours, as a crucial foundation for the long-term conservation of the Reserve, as well as the Greater Mara Ecosystem beyond.

Key in achieving this aim is ensuring that **strong and constructive relationships** between the MMNR and neighbouring communities are established. This is the thrust of the programme's first objective, which primarily focuses on the establishment or enhancement of management-community communication mechanisms and improving community awareness and appreciation of the Reserve through both outreach activities and the development of a new MMNR Education Centre, which will be used to support school visits to the area and thereby establish a growing base of support for the Reserve's conservation.

The programme's second objective focuses on actions to improve the array of **community benefits** from the MMNR, including direct benefits provided by the Narok County's MMNR Community Support Fund, employment opportunities, and enhancing tour operator social responsibility programmes, as well as the development of tourism attractions in the wider ecosystem. The third objective complements this approach by focusing on reducing **human-wildlife conflict** around the MMNR, and in particular on strengthening the financial sustainability of the existing "*consolation scheme*" and expanding its coverage around the entire

MMNR, as well as the piloting of more innovative conflict prevention techniques, such as the development of “*predator proof bomas*” and the establishment of a “*lion guardian scheme*”.

The last objective in this programme focuses on enhancing **conservation-compatible land-use** and development in the greater ecosystem, with a particular focus in areas neighbouring the MMNR. Although beyond the immediate mandate of the MMNR’s managers, addressing issues in these areas is becoming increasingly important for the maintenance of both the MMNR tourism product, and for the conservation of the Reserve itself. Actions are included to strengthen support for the Mara Ecosystem’s growing network of community conservancies as well as cultural village associations, as well as to support regulation and management of trading centres on the MMNR’s boundary.

## Protected Area Operations Programme

The implementation of the actions and prescriptions set out in this plan, especially in a logistically difficult and resource-constrained environment such as the MMNR, is an ambitious undertaking, and in order to succeed it is essential that management operations are strengthened and streamlined to support the effective and efficient delivery of the plan’s actions. In addition, strengthened collaboration between management within the MMNR is also vital to ensure that plan implementation proceeds in a coordinated and coherent manner, and that the Reserve is managed as a single visitor destination and ecological unit.

This programme sets out a framework designed to address these issues and to strengthen the effectiveness and complementarity of management operations within the MMNR, as well as collaboration with key stakeholders in the wider Mara-Serengeti Ecosystem. Its first objective focuses on **strengthening and harmonising management systems** and **improving internal collaboration** between the two sections of the Reserve, through for example, the establishment of an internal management committee and harmonising staff terms of service, the harmonisation of airstrip landing licensing throughout the Reserve, and actions to improve relations with major stakeholders (such as Narok county legislators and officials, and neighbouring Serengeti National Park). Also included under this objective is an action focusing on the recognition of the MMNR as a **World Heritage Site**, which is considered vital for the future conservation of the Reserve’s biodiversity and habitats as well as for maintaining its status as one of the world’s foremost visitor destinations.

The second objective concentrates on improving the effectiveness and efficiency of **security operations** to protect visitors and natural resources in and around the Reserve. Despite recent successes in reducing banditry and commercial poaching, this remains a vitally important issue in the area, to which a significant amount of management resources and manpower are dedicated. Actions under this objective cover a wide variety of security issues, including measures to: enhance collaborative security operations, improve the management of security information, formalise the status of MMNR uniformed staff as Kenya Police Reservists, upgrade the Reserve’s security support facilities, equipment and staff training, and to investigate more innovative methods of preventing crime, such as the use of tracker and sniffer dogs.

The programme’s third objective is crosscutting and specifies the steps that need to be taken in order to address **critical MMNR human resource requirements**, and in particular to

meet the capacity needs that the implementation of this plan entails. Importantly, this includes the recruitment of a variety of specialist staff that will be essential for leading the implementation of a number of the management programmes in technical areas that have not traditionally been a strong focus of MMNR management (such as Tourism and Community Wardens and a Reserve Ecologist).

The programme is completed by its final objective which addresses the issues of the **MMNR road network** and sets out a series of actions designed to ensure that all new developments are supporting the development of the tourism product set out in the zonation scheme, and/or to enhance the security of the area. The objective includes a number of management actions to: ensure that classified roads in the Reserve as well as major access routes are well maintained with all-weather status, improve the game viewing track network in the High Use Zone, ensure that the visitor use of the Mara River Zone is well managed and on defined tourism tracks, and to address long-term road construction and maintenance equipment needs.

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# Acronyms

BRM	Biodiversity, Research and Monitoring
CAP	Conservation Action Planning
CCN	County Council of Narok (former – succeeded by Narok County)
CCTM	County Council of Trans Mara (former – succeeded by Narok County)
CPT	Core Planning Team
DICE	Durrell Institute of Conservation and Ecology
DRSRS	Department of Resource Surveys and Remote Sensing
EIA	Environmental Impact Assessment
ERV	Exceptional Resource Value
FIRMS	Fire Information for Resource Management System (NASA)
FoC	Friends of Conservation
HUZ	High Use Zone
HWC	Human Wildlife Conflict
IUCN	International Union for Conservation of Nature
KATO	Kenya Association of Tour Operators
KEA	Key Ecological Attribute
KPR	Kenya Police Reservists
KTF	Kenya Tourism Federation
KWS	Kenya Wildlife Service
LUZ	Low Use Zone
MC	Mara Conservancy
MCA	Meru Conservation Area
MMNR	Maasai Mara National Reserve
MMWCA	Maasai Mara Wildlife Conservancies Association
MoU	Memorandum of Understanding
MRZ	Mara River Ecological Zone
NC	Narok County
NEAP	National Elephant Action Plan
NEMA	National Environment Management Authority
PA	Protected Area
PAPF	Protected Area Planning Framework
PREPARED	Planning for resilience in East Africa through policy, adaptation, research, and economic development (USAID Project)
SNP	Serengeti National Park
SSC	Species Survival Commission
TANAPA	Tanzania National Parks
TCA	Tsavo Conservation Area
TIAHU	Ticket Inspection & Anti-Harassment Unit
TSV	Tourism Service Vehicle
TNC	The Nature Conservancy
WD	Wheel-drive
WRUA	Water Resource User Associations
WWF	World Wide Fund for Nature

# 1. Plan Foundations

## 1.1 The problem

The Maasai Mara National Reserve (MMNR, or the Reserve) is widely recognised as the Jewel in the Crown of Kenya's protected area system, and the great wildebeest migration that the Reserve hosts together with the neighbouring Serengeti National Park is acknowledged internationally as one of the new Seven Wonders of the World. The Reserve is also a major cultural heritage of the Maasai People, whose cultural practices and traditions have over the years helped to ensure the survival of wildlife throughout the greater Mara-Serengeti Ecosystem. The Mara Reserve's exceptional wildlife resources and economic benefits are, however, now under serious threat from a wide variety of escalating and intensifying pressures; these include:

- ▶ **Steep declines in populations of key wildlife species**, including both herbivore and carnivore numbers. Many of these species are vital not only for the ecological integrity of the area, but also underpin the MMNR's tourism product and the revenue the Reserve generates.
- ▶ **Reduced water levels and increasingly seasonal flows in the Mara River**. The Mara River is the principal perennial river in the Mara-Serengeti Ecosystem, and the lifeblood of the MMNR. It is highly likely that without access to this river at critical times of year, the wildebeest migration will be unable to survive in its current size, resident wildlife species will be seriously impacted, and the area's ecology could be irreversibly altered. Increased effluent discharge from a variety of sources is also seriously impacting on the quality of the water the river contains.
- ▶ **Deteriorating tourism product and visitor experience**. Extremely high levels of visitor use in recent years has led to severe overcrowding and vehicle congestion in several parts of the Reserve, especially at Mara River crossings during the migration (where more than 150 vehicles have sometimes been recorded at a single crossing), and around kills, predators and the "*Big Five*" species. The MMNR's growing reputation as an overcrowded destination, aside from leaving visitors unsatisfied, is greatly undermining management's ability to ensure that tourism continues to make an optimal contribution to the Reserve's financial sustainability.
- ▶ **Increased impacts on the environment and wildlife from tourism**. Very high levels of visitor use, especially the harassing/crowding of wildlife and off-road driving in unsuitable conditions and locations, as well as rapidly expanding tourism accommodation developments in the greater ecosystem, are all having a severe impact on the Reserve's environment and exceptional natural habitats. In some places back-to-back tourism facilities have created a "*hard edge*" along the Reserve's border, preventing wildlife movements, while in others they occupy important wildlife habitats (such as riverine forest) or potentially reduce wildlife migratory and dispersal areas. The cumulative impacts of these visitors and the facilities they occupy now risks undermining the very features that attracted them to the Reserve in the first place.

- ▶ **Sustained pressure from poaching and livestock grazing.** Both poaching and livestock grazing remain ever-present threats to the ecology of the MMNR. Poaching has the potential to impact on targeted species (such as elephants or rhinos for commerce) or other wildlife species susceptible to snares. Livestock grazing within the Reserve not only disturbs particular species, such as the Black rhino, and alters the area's ecology, but also seriously undermines the tourism product the MMNR is able to offer.
- ▶ **Inadequate management infrastructure, equipment and systems.** Investment in the management of the MMNR has now fallen behind that in comparable protected areas managed by the Kenya Wildlife Service and as a result the Reserve's managers struggle to cope with the escalating management challenges that they face. Inadequate professional protected area management systems and structures have hampered the flexibility and adaptability that managers require to address rapidly emerging management challenges.

All of these human-derived factors are now threatening to undermine the long-term viability of the Reserve's exceptional natural resources. Of great consequence, the ongoing decline of the Reserve's environment also threatens to eventually kill the cash-cow that the MMNR represents to the Narok County and the local community whose livelihoods are dependent on the ecosystem's tourism product.

If these trends in the status of the MMNR and its tourism industry are to be decisively reversed, the MMNR now more than ever needs **a set of clear objectives and a strategic action framework upon which the Reserve's future management can be based.** Such a framework needs to focus the limited management resources and finances available on the priority activities required to address the emerging management challenges. It also needs to be strongly supported by all the Reserve's stakeholders, since success will ultimately require the united action of all concerned. The framework needed is provided by this new MMNR 10-year management plan.

## 1.2 The plan

The development of this management plan was first approved by the former County Councils of Narok and Trans Mara together with the Mara Conservancy (which is responsible for managing the Mara Triangle section of the Reserve) in 2007. The initial planning process, which was spread out over the period 2008-2012, was co-financed by the two councils together with the Mara Conservancy and the African Wildlife Foundation (AWF), who also provided technical support and facilitation for the planning process. The Conservation Development Centre (CDC) was enlisted to facilitate the planning process and to draft the eventual management plan, working hand-in-hand with Reserve managers and stakeholders and under the oversight of a Core Planning Team made up of county representatives, key stakeholders and managers. CDC had previously developed the general management plan for neighbouring Serengeti National Park as well as providing support to Kenya Wildlife Service in developing the Protected Area Planning Framework, or PAPF, which provides the planning standard for all of Kenya's parks and reserves.

The finalisation of the management plan was put on hold as a result of the dissolution of the county councils in 2013. Subsequently, the Narok County, successor to the two former county councils, took over responsibility for the development of the new management plan. This led to an intensive period of activity to update and refine the draft management plan in 2015-2016, but the initiative was again put on hold in the lead up to the 2017 general elections.

In August 2020, work again commenced on finalising the new management plan, prompted by the major challenges to the MMNR caused by the COVID-19 pandemic, especially the impacts on the Reserve's economic viability as a result of the sudden collapse of tourism in the area. While without doubt a major setback for the Reserve, the post-pandemic recovery period has provided a significant opportunity to put the management of the Reserve on a strong footing for the future, and this management plan is designed to help fulfil this.

Final approval of the management plan was postponed as a result of the 2022 general elections, but in early 2023 the new Narok County administration picked up the baton once again leading to the final review and approval of the plan by Members of the Narok County Assembly at a retreat held in early February 2023, followed by signing into law of the plan by the Narok County Governor on 21<sup>st</sup> February 2023.

The specific aims of the new MMNR Management Plan 2023-2032 are to:

- ▶ Ensure conservation of the Reserve's globally significant biodiversity
- ▶ Maintain the role of the MMNR as the flagship of Kenya's tourism industry
- ▶ Optimise the revenues generated by the MMNR, to support increasing community livelihood and Reserve management needs
- ▶ Provide a practical management tool to support MMNR managers in carrying out their day-to-day management responsibilities.

In order to achieve these aims, the plan sets out a series of stakeholder and management-agreed goals (the **purpose statements** and **objectives**) that the Reserve management will aim to achieve over the plan's 10-year lifespan, and a series of **prescriptions**<sup>1</sup> and **management actions** that will be implemented to ensure these goals are achieved. The plan focuses on the management of the MMNR itself, although to a limited degree it also addresses issues beyond the Reserve that are seriously impacting on the area, especially regarding ecological issues and community engagement.

The process used to develop the new management plan as well as the plan's structure have been based on the KWS PAF. Also in line with the PAF, the new management plan has been developed in a highly participatory manner, incorporating and building on ideas from a broad cross-section of the Reserve's stakeholders. In total, there have now been approximately **47 separate stakeholder meetings** involved in the development of the new management plan since the start of the planning process (see Appendix 2 for further details).

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<sup>1</sup> In the context of the PAF, prescriptions are the management plan's rules for the management and use of the Reserve, to be enforced and adhered to over the lifespan of the plan.

Narok County government acknowledge the significance of the Reserve as a priceless heritage of the Maasai community as well as to the Reserve’s tourism investors and operators. Accordingly, a concerted effort has been made to ensure that the views of these major stakeholders have been incorporated into the plan.

Over the years, the management of the two sections of the Reserve – the Mara Triangle to the west of the Mara River and Central Mara (Narok) to the east of the Mara River - have gradually diverged. As a result, despite ongoing efforts to standardise management in both sections of the Reserve, there are still significant differences in management in each section, which leads to inefficiencies in the use of management resources as well as confusion amongst the area’s users. Another key aspect of the plan, therefore, is to provide a mechanism for managing the MMNR as a **single management and ecological unit**, by bringing the management of the two sides of the Reserve much closer together, involving **coordinated and integrated management** based on a shared vision and objectives, and common management action priorities.

The following two sections provide a brief overview of the structure of the management plan, and the process and stakeholder involvement that has led to its development.

### 1.3 Plan structure

The plan structure has been developed to be as simple as possible, and as such, easily understood by stakeholders and implemented by MMNR managers. Table 1 below summarises the main chapters of the plan, and the key components of each chapter.

Table 1. Plan structure, functions and contents

Chapter	Function and contents
Plan Foundations	<ul style="list-style-type: none"> <li>▶ Introduces the plan, and describes the plan’s structure and the process leading to the plan’s development</li> <li>▶ Introduces the MMNR, its location, and management</li> <li>▶ Sets out the MMNR’s Purpose Statement, and exceptional resource values</li> </ul>
MMNR Visitor Carrying Capacity	<ul style="list-style-type: none"> <li>▶ Provides an optimal visitor carry capacity for the Reserve, in line with the Wildlife Conservation &amp; Management Act (2013) Fifth Schedule (Management Plans), and considering current visitor use of the Reserve and adjacent areas</li> <li>▶ Establishes carrying capacity indicators for the Reserve, designed to provide measures of the impact of visitation on the MMNR tourism product, ecology and financial viability</li> </ul>
Zonation and Visitor Use Scheme	<ul style="list-style-type: none"> <li>▶ Provides a mechanism to enable the spatial management of visitor use and protection of key ecological areas within the MMNR</li> <li>▶ Sets out areas of the MMNR where different types of visitor use are permitted</li> <li>▶ Sets out Reserve-wide prescriptions on visitor facilities and use</li> </ul>

Chapter	Function and contents
	<ul style="list-style-type: none"> <li>▶ Provides specific prescriptions on the types of visitor activity allowed in each zone</li> </ul>
Management Programmes	<ul style="list-style-type: none"> <li>▶ Provides a framework to guide management activities in achieving a future desired state for specific aspects of PA management (i.e. ecology, tourism, community participation and protected area operations)</li> <li>▶ Includes a programme purpose statement that defines and frames the desired future state for the MMNR under each programme</li> <li>▶ Contains management objectives that set out the specific goals that MMNR management aims to achieve</li> <li>▶ Provides a set of specific management actions that management will implement to achieve these goals</li> <li>▶ Provides a monitoring framework to enable the assessment each objective's achievement, and sets out indicators of success, and methods of measurement</li> </ul>

## 1.4 Plan development

In accordance with the KWS PAPP, the development of this management plan involved a high degree of stakeholder participation. This was designed to ensure that the eventual plan is both realistic and appropriate, and to build stakeholder understanding and support for the plan's implementation. Three principal mechanisms were used to ensure that all stakeholders could meaningfully contribute to the plan's development: the **Core Planning Team**, **stakeholder workshops**, and specialist **working groups**. The functions and membership of these participation forums are elaborated in Table 2 below. Appendix 2 gives a full list of the many consultation and planning meetings held as part of the process of preparing the plan.

Table 2. Participation mechanisms, functions and membership

Mechanism	Functions and membership
Core Planning Team	<ul style="list-style-type: none"> <li>▶ Provided overall guidance and oversight to the entire planning process</li> <li>▶ Members included: Narok County (previously CCN and CCTM), the Mara Conservancy, African Wildlife Foundation, Kenya Association of Tour Operators, National Environment Management Authority, and the Conservation Development Centre (plan facilitators)</li> <li>▶ The team met at intervals throughout the process, and also kept in frequent contact through email and phone conversations</li> </ul>
Stakeholder Workshop	<ul style="list-style-type: none"> <li>▶ A Stakeholder Planning Workshop was held at the beginning of the planning process, and identified key problems and opportunities the plan needed to address, and the area's exceptional resources</li> <li>▶ Public consultations will be held at the end of the planning process as part of the Narok County Assembly's formal process to adopt the new management plan</li> </ul>

Mechanism	Functions and membership
Working Groups	<ul style="list-style-type: none"> <li>▶ Four working groups were formed, each of which developed one of the four management programmes, and contributed to the MMNR Zonation &amp; Visitor Use Scheme</li> <li>▶ Each group developed the detailed contents of the management programmes (i.e., the purpose, objectives, and the management actions)</li> <li>▶ Membership consisted of CPT members and other invited stakeholders and specialists</li> <li>▶ The number of working group meetings depended on the complexity of the issues involved (see Appendix 2 for details)</li> </ul>

## 1.5 Plan implementation

The main framework for the implementation of the MMNR management plan will be a series of three-year action plans that will set out the detailed activities to be implemented to deliver on the plan’s objectives and actions, timelines for activity delivery, and responsibilities for implementation. The 3-year action plan will be developed by MMNR management in collaboration with the Narok County Executive Committee, and forwarded to the County Assembly Tourism & Wildlife Committee for review. The action plan will be rolled forward annually and revised according to progress made and changing circumstances.

## 1.6 Plan review

This MMNR management plan has a duration of 10 years. However, in accordance with the Wildlife Conservation & Management Act (2013) Fifth Schedule (Management Plans), the implementation of the plan will be evaluated after the first five years and adjustments will then be made to both plan activities and prescriptions in accordance with achievements and challenges, lessons learnt, and changing circumstances in the intervening period.

The plan evaluation will be carried out by Narok County technical officers working together with external specialists as required, and the evaluation report will be submitted to the County Assembly Tourism & Wildlife Committee and shared with other stakeholders.

## 2. The Maasai Mara National Reserve

### 2.1 History and purpose

The Maasai Mara National Reserve was first established in 1948, when the Mara Triangle, a 520 km<sup>2</sup> area between the Siria escarpment, the Tanzanian border and the Mara River, was declared a National Game Reserve. The Reserve was primarily created to protect the spectacular wildlife of the ecosystem. In 1961, the Reserve was brought under the control of the County Council of Narok, and the core area was extended to the east to encompass an area of 1,831 square kilometres. In 1984, parts of Reserve were excised to provide access to watering points for livestock, and the Reserve was brought to its present size of 1,530 square kilometres, as shown in Figure 1 above.

Figure 1. The Maasai Mara National Reserve



In 1995, following the creation of the Trans Mara District, the management of the Reserve was split between the County Councils of Narok and Trans Mara, with CCN responsible for the Reserve to the east of the Mara River, and CCTM responsible for the Reserve to the west of the river (known as the Mara Triangle). In 2001, the day-to-day management of the Mara Triangle was contracted to an independent non-profit protected area management company, the **Mara Conservancy**, under an initial five-year management agreement. This management agreement has been subsequently extended.

In 2013, as part of the constitutional reforms to Kenya local government, the two county councils were superseded by the Narok County, which is now responsible for the management of the entire Reserve. However, the Mara Conservancy still manages the Mara Triangle on behalf of Narok County and, under a recently endorsed collaboration agreement with the County, is playing an increasing role in bringing about the unified management of the entire Reserve.

Despite these changes in the size and management of the Reserve in the 75 years since the area's initial gazettement, the MMNR has throughout this time provided a vital refuge for wildlife, most notably the elephant and Black rhino populations, and for the spectacular annual



large mammal migrations. In addition, as a result of the area's high popularity with visitors, the Reserve has also generated significant economic benefits at both the local level (through employment, benefit sharing, and tourism-related enterprises) and at the national level, where the MMNR has proved to be a driving force for tourism in the country as a whole.

However, it is important to recognise that the Mara National Reserve is primarily established as a crucial Kenya wildlife conservation area, and only secondarily as a tourism destination. From the outset, tourism in the MMNR has always played a supportive role to the Reserve's primary conservation purpose - facilitating the management of the Reserve and the conservation of its biodiversity through the provision of revenues, and enabling visitors, both Kenyan and international, to appreciate and enjoy the biodiversity and habitats for which the MMNR is justly renowned.

These major functions that the Reserve has played correspond with oral testimony given by local residents on the reasons the Reserve was gazetted, which states: "*it was the intention that the game reserve should be Maasai owned. The idea was for African participation and to serve tribal interests by conserving wild life for the material improvement of the Maasai*".

As its name suggests, the Maasai Mara National Reserve is therefore unique amongst Kenya's protected areas in its role as a cultural and natural heritage of the Maasai. The purpose that the MMNR serves is not simply to provide a sanctuary for wildlife and revenue generation through tourism, but also as a living and vivid testimony to the Maasai's traditional conservation-compatible and wildlife tolerant pastoralist livelihood. Since the Maasai communities' traditional land use practices are responsible for the preservation of the Reserve's exceptional natural resources in the first place, it is also important that the benefits that are now being derived from these resources are first and foremost channelled back to these communities. In short, the **purpose** of the Reserve can be summarised as:

The Maasai Mara National Reserve is the keystone of the greater Mara-Serengeti Ecosystem, a safe haven for the great migration, a powerhouse of sustainable economic benefits, and a living testimony to the Maasai community's conservation ideals and affinity with wildlife.

This purpose is further elaborated in the individual programme purpose statements which are provided at the beginning of each of the four management programmes.

The following section provides an overview of some of the most valuable attributes of the MMNR (its "*Exceptional Resource Values*"), as identified by stakeholders during the management plan development, and which provided a basis for the identification of the key problems and opportunities addressed throughout this plan.

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<sup>2</sup> Mol, Father F. 1980. Maasai Mara. Privately published, Nairobi, Kenya. Quoted in: Hughes, L., (2007) Rough Time in Paradise: Claims, Blames and Memory Making Around Some Protected Areas in Kenya, Conservation and Society, Pages 307–330, Volume 5, No. 3.

## 2.2 Exceptional Resource Values

The MMNR Exceptional Resource Values (ERVs) describe the area's key natural resources and other features that provide outstanding benefits to local, national and international stakeholders and that are especially important for maintaining the area's unique qualities, characteristics and ecology. The following sections describe the MMNR ERVs as identified by stakeholders during the planning process, 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 (as listed in Table 3 below).

Table 3. MMNR Exceptional Resource Values

Category	Exceptional Resource Value
Biodiversity	<ul style="list-style-type: none"> <li>▶ Large mammal migrations</li> <li>▶ Natural self-regulating ecosystem</li> <li>▶ Faunal diversity</li> <li>▶ The Mara River</li> <li>▶ Woodland-grassland habitat mosaic and cycles</li> </ul>
Scenic	<ul style="list-style-type: none"> <li>▶ Wilderness qualities</li> <li>▶ Mara, Talek and Sand Rivers</li> </ul>
Social	<ul style="list-style-type: none"> <li>▶ National economic importance</li> <li>▶ Local economic importance</li> <li>▶ Security</li> <li>▶ Roads</li> </ul>
Cultural	<ul style="list-style-type: none"> <li>▶ Maasai culture and community</li> </ul>

### 2.2.2 Biodiversity values

#### Large mammal migrations

The annual large mammal migration between the MMNR, the Serengeti National Park, the Ngorongoro Conservation Area and neighbouring community areas, consisting of around two million wildebeest, zebra and Thompson's gazelle, is the defining characteristic of the greater Mara-Serengeti Ecosystem. The migration is not only a major attraction drawing high number of visitors to the area, but also plays a keystone role in the ecosystem, and impacts on the abundance and diversity of the large mammal community by affecting competition and predation, as well as having a host of other complex indirect ecological effects. In addition, a smaller, separate "*northern*" migration consisting of the same species remains within the Kenyan part of the ecosystem, mixing with the larger migration in the MMNR between July and September.

#### Natural self-regulating ecosystem

MMNR forms a small part of a much larger protected area complex (including the Serengeti National Park, Ngorongoro Conservation Area, and a number of game reserves), which together cover over 25,000 km<sup>2</sup>. This ecosystem is large enough to maintain many of its natural ecological processes and functions that have been lost in smaller or more fragmented areas, as illustrated not only by the continued existence of the large mammal migrations discussed

above, but also a host of other seasonal animal movements and ecological processes, such as fire regimes and key hydrological cycles. The conservation of these large-scale ecological processes helps ensure that the Mara-Serengeti Ecosystem retains sufficient ecological resilience to adapt and respond to ecological and environmental fluctuations and remains one of the world's most important areas for conservation and ecological research.

### Faunal diversity

Although best known for the annual large mammal migrations, the MMNR also supports a huge diversity and abundance of resident ungulates and other herbivores, which combined with the annual migrations, provide sufficient food to support one of the highest densities of carnivores in Africa (including lions, hyenas, leopards, and cheetahs). The MMNR is particularly important in this regard, as it is one of the few areas in Kenya that is large enough (when considered with the greater ecosystem) to support ecologically viable populations of lions.

In addition, the area contains a number of other species of conservation concern, including elephants, which have been shown to play a keystone role in the area's ecology, and one of only two remaining indigenous Black rhino populations in Kenya. The MMNR is also classified as an Important Bird Area by BirdLife International and, as a result of the abundance of game in the area, six out of the seven species of vulture found in Kenya (Egyptian, Hooded, Griffon, Nubian, White-backed and White-headed) can be seen in the Reserve, and in total over 500 bird species are known to occur, including 53 birds of prey.

### The Mara River

The Mara River is the only perennial river in the Mara-Serengeti Ecosystem, and rises in the Mau Escarpment from where it flows through the MMNR and the Serengeti National Park to Lake Victoria. It is the primary, and occasionally the only, dry-season source of water for wildlife in the MMNR and Serengeti National Park, and the survival of the large mammal migrations in their current form depends on seasonal access to this river, especially during periodic droughts. Its main tributaries are the Amala and the Nyangore Rivers, which drain from the western Mau escarpment, and the Sand and Talek Rivers, which rise in the Siana and Loita Hills.

### Woodland-grassland habitat mosaic and cycles

The Mara-Serengeti Ecosystem has undergone a series of well-documented woodland-grassland cycles over the last 100 or so years, and recent research suggests that the ecosystem can exist in multiple states of woodland or grassland, and that long-term change between different states is a natural phenomenon. Figure 2 overpage illustrates the grassland-woodland dynamic and the main factors that cause the transitions between stable states. As illustrated, fire incidences, themselves modulated by rainfall patterns, are the main factor influencing vegetation states; however, keystone species (such as wildebeest and elephants) also play an important role in maintaining and influencing these states through their grazing/browsing patterns.



## 2.2.4 Social values

### National economic importance

The MMNR is one of the best known and most visited protected areas in Africa, and the area generates significant economic benefits for the Narok County through visitor entrance fees and accommodation licences. In addition, as a result of the MMNR's international reputation as one of the best wildlife viewing areas in Africa, the MMNR is also a vital driver for tourism at the national level. The Reserve is one of the primary reasons that a significant number of visitors come to Kenya (rather than an increasing variety of other beach or wildlife destinations) and provides a unique selling point around which businesses can promote and package visits to other protected areas and accommodation facilities across the country. As a result, the MMNR is pivotal in supporting and sustaining the economic benefits that the nation as a whole receives from tourism.

### Local economic benefits

Local communities living around the MMNR also derive significant benefits from the MMNR. At one level, this includes the funds remitted to Narok County from the Reserve that are used to support the County's development activities, and a percentage of which is also allocated to communities living adjacent to the area. In addition, and more directly, local community members can also benefit through improved employment opportunities with tourism enterprises either within or around the Reserve and are also employed by Reserve management wherever possible. Community members also benefit from the large numbers of visitors to the Reserve through cultural tourism initiatives and other tourism-based enterprises. Lastly, MMNR tourism has acted as a catalyst and hub for the development of the tourism industry in neighbouring areas, where there are now more than twice as many lodges and camps as in the Reserve itself.

### Security

Primarily due its close proximity to the international border, areas around the Reserve remain vulnerable to a number of illegal activities, including cattle rustling. MMNR management has however helped to reduce this problem by tracking and engaging with thieves when they try to escape through the Reserve with their stolen cattle. In addition, MMNR managers have also worked with tourism facilities in the wider ecosystem to help track and apprehend thieves. These efforts have contributed to the general improvements in security that the area has experienced and enhanced the safety and wellbeing of local residents going about their daily activities.

### Roads

MMNR management allocates a significant proportion of its budget to the maintenance of roads within the area, and in addition they also lobby and raise awareness with central government road agencies when improvements are needed to major access roads in the greater ecosystem. Although the priority of area managers is to ensure that transportation infrastructure is sufficient to support visitor use and MMNR management operations, the presence of the Reserve and the continuing improvements that managers make to roads, both within and

immediately beyond the MMNR boundaries, have significantly improved access and communication for local residents.

## 2.2.5 Cultural values

### Maasai culture and community

The Maasai are one of Kenya's best-known and most iconic tribes. However, as is common all over Kenya, traditional societies and cultures are increasingly coming under threat, and in many cases cultural norms are breaking down as younger generations migrate to urban areas in search of better opportunities for supporting themselves and their families. As mentioned above, through the provision of direct employment opportunities and a potential market for other enterprises such as handicraft making or cultural tourism, the MMNR helps reduce the need for migration away from the area and can help support the survival of important elements of the Maasai culture and way of life in areas around the Reserve.

On the other hand, the colourful and unique Maasai culture makes a major contribution to the differentiation of the Reserve as a tourism destination and is very much part and parcel of any visit to the Reserve. Over the long-term, Maasai culture, with its affinity and tolerance towards nature and wildlife, has been a major factor in ensuring the continuing abundance of wildlife and their habitats in the greater Mara-Serengeti Ecosystem. All in all, the association between the Maasai culture and the Mara National Reserve is deep-rooted and indisputably of mutual benefit to both the Reserve and the Maasai people.

## 3. MMNR Visitor Carrying Capacity

### 3.1 Introduction

An important function of this management plan is to provide a framework for the conservation and sustainable use of the MMNR's natural resources, in particular the **protection of the MMNR's exceptional ecological values**, especially the sensitive ecological habitats and breeding areas for rare species along the Mara River, and the **strengthening of the Reserve's tourism product**, which provides the basis for the Reserve's economic potential to Narok County and the nation. A key consideration here is the rapid expansion of tourism in the Reserve in recent years, which has led to overcrowding and vehicle congestion, and thereby to the deterioration in the Reserve's overall visitor experience and, at the same time, to increasing impacts on the MMNR's exceptional natural resources.

The challenge for this management plan, and especially for the plan's visitor carrying capacity and zonation prescriptions, is to minimise the impacts of tourism on the Reserve's natural environment on which the entire MMNR tourism product depends, while at the same time ensuring that the Reserve provides an optimal visitor experience and sustained tourism revenues, which are crucial for underwriting the costs of management of the Reserve and for financing the Narok County's broader development objectives. Addressing this challenge is especially important in the case of the MMNR because of its role as the flagship of the Greater Mara Ecosystem, as well as of Kenya's national tourism product. Upholding the reputation and standard of the MMNR as a leading international wildlife destination and the flagship of Kenya's tourism industry is therefore an important overall aim of this management plan.

This plan uses a variety of different mechanisms designed to bring about sustainable and optimal tourism use of the Reserve alongside conservation of the Reserve's natural environment. This includes the definition of a variety of **management actions** in the plan's various programmes, such as the Tourism Management, PA Operations, and Ecological Management Programmes. Also crucial is the definition of a range of **management prescriptions** designed to optimise the Reserve's tourism product while minimising impacts on the MMNR's environmental values.

Two fundamental protected area management concepts are used as a basis for defining the plan's management prescriptions: 1) visitor carrying capacity; and 2) management zonation. These two concepts are detailed in this chapter and the following one which describes the Reserve's zonation and visitor use scheme. It is important to note that the definition of a protected area's visitor carrying capacity and zonation are a **requirement under the Wildlife Conservation & Management Act (2013) Fifth Schedule (Management Plans)** for all Kenyan protected areas faced with complex management challenges, as is the case in the MMNR.

### 3.2 MMNR visitor densities

A protected area's **visitor carrying capacity** is a measure of how many visitors can be permitted into an area without risk of degrading the site and the visitors' experience of it<sup>4</sup>. Accordingly, determining a protected area's optimal visitor carrying capacity is important not only from the perspective of the delivery of an optimal tourism product, but also to minimise impacts on the area's key ecological values.

Visitor carrying capacity is often expressed in terms of average visitor density in the protected area concerned, which can in turn be estimated from the number of visitor beds that are available in accommodation facilities in and around the PA, and the annual occupancy rates of these facilities. In the case of the MMNR, the **MMNR Tourism Accommodation Database** prepared between 2009-2010 at the beginning of this planning process provided detailed information on MMNR accommodation facilities and estimates of MMNR visitor density, and can be used as a basis for determining the Reserve's carrying capacity.

As shown in Table 4 below, in 2009-2010 there were at least **140 tourism facilities** in the Greater Mara Ecosystem, comprising more than **4,100 beds** in total. This data serves to underscore the intense tourism development and visitor use pressure on the wider ecosystem and, as far as this current planning process is concerned, on the MMNR itself.

Table 4. Tourism accommodation facilities in the Greater Mara Ecosystem, 2009-10

Accommodation type	Number of facilities	Number of beds
Lodge	13	1,359
Permanent tented camp/ecolodge	45	1,631
Seasonal tented camp	8	92
Bungalows/cottages	3	120
Special campsite	46	642
Public campsite	3	60
Unknown/other	22	241
<i>Grand total</i>	<i>140</i>	<i>4,145</i>

Based on this accommodation inventory, combined with knowledge of occupancy rates and where visitors spend their time, it is possible to derive estimates of visitor numbers in the Reserve and visitor densities. These estimates are shown in Table 5 overpage for the MMNR's tourism high season.

<sup>4</sup> Pedersen, Arthur (2002). *Managing Tourism at World Heritage Sites: a Practical Manual for World Heritage Site Managers*. UNESCO World Heritage Centre, Paris. Pp 1-96.



Table 5. MMNR visitor use estimates (in 2009-10)

	Central Mara (Narok)	Mara Triangle
Estimated high season visitor nos. per day	2,074	593
Section area (km <sup>2</sup> )	1,072	488
<b>Estimated high season visitor density (number visitor/km<sup>2</sup>)</b>	1.93	1.22

The estimated visitor densities (visitors per km<sup>2</sup>) for Central Mara (Narok) and the Mara Triangle are shown in Figure 3 below, alongside similar visitor density figures for four other Kenyan protected areas: the Meru Conservation Area (Meru National Park and Bisanadi and Mwingi National Reserves), the Tsavo Conservation Area (Tsavo East and West National Parks), and Amboseli National Park.

Figure 3. MMNR visitor use estimates compared with Meru Conservation Area, Tsavo East and West National Parks, and Amboseli National Park

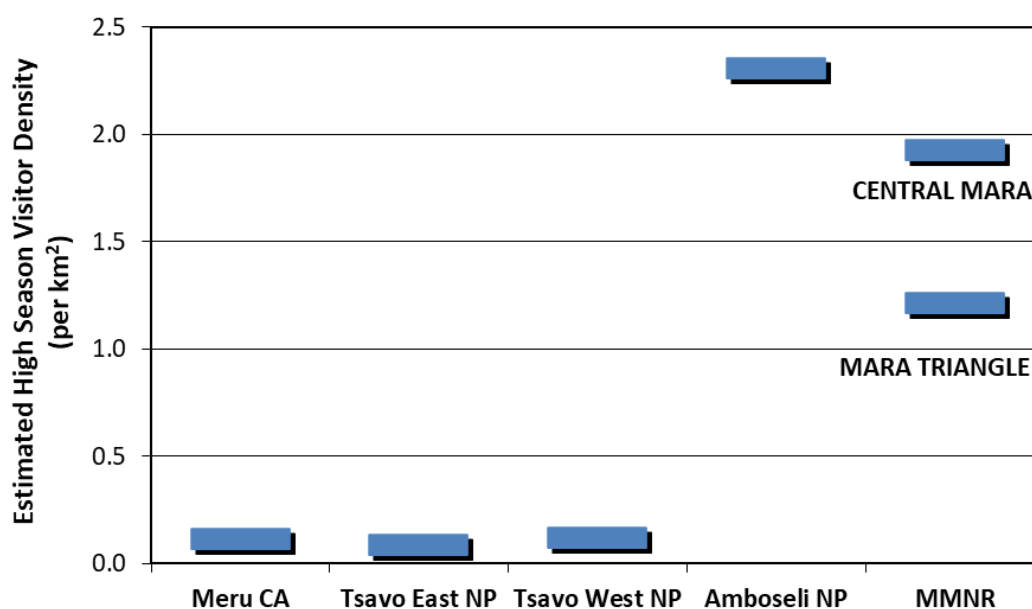


Figure 3 illustrates that visitor densities in the two MMNR sections are an order of magnitude higher than the visitor densities found in the Meru and Tsavo Conservation Areas, although still lower than visitor densities in Amboseli National Park. However, Amboseli's high visitor densities are a result of the small size of the park - 388km<sup>2</sup>, compared to the MMNR's 1,560km<sup>2</sup>.

Since the MMNR Tourism Accommodation Database was developed in 2009/10, there has been continuing development of accommodation facilities both in the Central Mara (Narok) section of the Reserve, as well as in the buffer zone neighbouring the Reserve. In this regard, a tourism facilities audit carried out in the Reserve by the East African Wild Life Society on

behalf of Narok County and the USAID PREPARED Project in May 2016<sup>5</sup> found that there were 31 lodges and permanent/ semi-permanent tented camps within the Reserve, with a total bed capacity of 1,382. This represents an increase of 529 beds in the MMNR compared with this plan's own accommodation inventory carried out about five years previously. Part of this increase was brought about by the conversion of existing special campsites into permanent/ semi-permanent tented camps in the intervening period. However, the 2016 MMNR accommodation audit did not look at accommodation facilities and bed capacity in the Reserve's buffer area, and it seems likely that there have been similar increases in areas outside the Reserve as well.

As a result of these developments, in 2016 the MMNR planning team estimated that high season visitor density in the Central Mara section of the Reserve was well in excess of two visitors per km<sup>2</sup>, potentially as much as three visitors per km<sup>2</sup>, a figure even higher than that for the heavily used Amboseli National Park. This figure is likely to be still further exceeded during peak tourism periods such as during the wildebeest migration, and in key visitor attraction areas, such as along the Mara River.

The MMNR Tourism Accommodation Database also provides information on the major sources of Reserve visitors. In this regard, Table 6 below illustrates the percentage of MMNR visitors that originate from outside the boundaries of the Reserve.

Table 6. Percentage of zonal visitors originating outside the MMNR (in 2008/2009)

Section	Percentage of total visitors originating outside the MMNR
Central Mara (Narok)	63 percent
Mara Triangle	57 percent

As can be seen, the **majority of visitors to the Reserve stays in lodges and camps outside the Reserve** (mainly in the Reserve buffer zone), but nonetheless make heavy use of the Reserve for their wildlife viewing. This is especially acute in the Central Mara (Narok) section, which adjoins areas outside the Reserve with exceptionally high concentrations of tourism facilities, and where 63 percent of visitors are believed to originate from outside the Reserve.

### 3.3 MMNR optimal visitor carrying capacity

As detailed above, the visitor carrying capacity for a protected area relates to the environmental impacts caused by visitor use, and the visitor experience that is desired in the area. The higher the visitor density in the area, the greater the impacts on the natural environment and the poorer the visitor experience. High visitor densities can be partially mitigated by management prescriptions or actions – for example, by defining zones designed to protect especially fragile ecosystems, and controlling visitor numbers at key visitor attractions. The

<sup>5</sup> East African Wild Life Society (2018). Masai Mara National Reserve Tourist Facilities Audit Report. EAWLS/USAID, Nairobi. Pp. 1-47.

management prescriptions designed to mitigate the impacts of high visitor density in the MMNR are detailed in the following chapter on the MMNR's Zonation & Visitor Use Scheme.

As a basis for monitoring changes in MMNR visitor use and the impacts of this use on the MMNR environment and visitor experience, it is useful to define the MMNR's optimal visitor carrying capacity. In this regard, tourism operators in the conservancies to the north of the MMNR have established a target number of visitor beds for their conservancies of 1 bed per 350 acres. Assuming 80% occupancy in the high season, this equates to a high season visitor density of approximately **0.5-0.6 visitors per km<sup>2</sup>**.

The Mara conservancies are clearly intending to provide a lower volume and higher value visitor experience than is provided by the MMNR, so it is to be expected that the visitor carrying capacity of the Reserve will be set at a higher level to that for the conservancies. In this regard, the high season visitor density in the Mara Triangle is generally regarded as the optimal density that the Reserve can accommodate without a deterioration of both the visitor experience and the Reserve's environmental values.

That is, **the optimal carrying capacity of the MMNR is approximately 1-1.2 visitors per km<sup>2</sup>**.

While this visitor density broadly equates with current high season visitor densities in the Mara Triangle, high season visitor densities in the Central Mara (Narok) section of the Reserve are much higher (with potential visitor densities being from 2-2.5 visitors per km<sup>2</sup>). This emphasises the need to implement a variety of management prescriptions designed to both reduce the high visitor densities in the Central Mara section of the Reserve, as well as management prescriptions and actions designed to mitigate the impacts of these high visitor numbers on the Reserve's fragile ecological areas (e.g. through zonation and restrictions on off-road driving) and on the quality of the visitor experience (e.g. through controlling visitor numbers at key visitor attractions, and providing alternative visitor attractions such as picnic sites and interpretation centres). The MMNR's zonation scheme and visitor use prescriptions are described in the next chapter.

The proposed MMNR optimal visitor carrying capacity is a **target visitor density** designed to be monitored throughout the duration of this management plan, and further adjustments to the carrying capacity may be made according to the actual impacts of high visitor densities on the Reserve environment, and the success of management efforts to enhance the MMNR's visitor experience. In this regard, and associated with the desired MMNR visitor carrying capacity, the next section sets out a series of indicators that will be used to monitor the impacts of visitor use.

### 3.4 MMNR carrying capacity indicators

As discussed above, determining a protected area's optimal carrying capacity is important not only from the perspective of the delivery of an appropriate tourism product and visitor experience, but also to minimise impacts on the Reserve's key ecological values (and, particularly in the case of the MMNR, to optimise the revenue generated to support area management and development activities in Narok County). Table 7 below sets out a set of indicators that

have been developed to enable the assessment of the impacts of visitation on these three aspects of the area.

Table 7. MMNR carrying capacity indicators

Area of Impact	Indicators
Visitor Experience	<ul style="list-style-type: none"> <li>▶ Number of vehicles at carnivore sightings</li> <li>▶ Number of vehicles at migration river crossings</li> <li>▶ Visitor waiting times at MMNR entrance gates</li> <li>▶ Vehicle encounters on the Sekanani-Keekorok main road (C12)</li> <li>▶ Number of vehicles stopping at the Mara River bridge</li> </ul>
Ecological Integrity	<ul style="list-style-type: none"> <li>▶ River pollution from tourist accommodation facilities</li> <li>▶ Amount of litter at designated picnic sites</li> <li>▶ Number of unofficial off-road tracks</li> <li>▶ Displacement of rhinos (i.e. average home range size)</li> <li>▶ Number of wildebeest drowned crossing Mara River</li> <li>▶ Length of time taken by hyenas to locate killed animals</li> </ul>
Economic Viability	<ul style="list-style-type: none"> <li>▶ Average revenue to the MMNR per visitor</li> <li>▶ Amount of revenues retained to support management</li> </ul>

The indicators listed are intended to provide a measure of the impacts of visitation on the MMNR tourism product, the ecological integrity of the area, and its financial viability over the long term. If monitoring reveals a sustained decline in any of these indicators this should provide MMNR management with a warning that the current levels of visitation (i.e. the carrying capacity as defined above) are too high, and therefore need to be either revised downwards, or mitigated through appropriate visitor management actions and prescriptions.

However, if stronger visitor management still proves ineffective in reducing the impacts of visitation on the indicators above to acceptable levels, action may be needed to reduce the overall numbers of visitors in the MMNR. Since the majority of visitors in the MMNR originate from outside the Reserve itself (see Table 6 above), this may require introducing daily quotas on the number of tickets issued to visitors originating from outside the Reserve, as is used in many other protected areas around the world.

## 4. MMNR Zonation and Visitor Use Scheme

### 4.1 Rationale

Zonation is a powerful management tool that allows managers to achieve different management aims in different parts of a protected area, in particular through defining the specific activities and developments that are permitted in the different zones. In this way, zonation enables the spatial management of the protected area to facilitate both the **protection** of the area's key ecological features and sensitive habitats, and the **sustainable utilisation** of the area for tourism.

The MMNR's zonation scheme achieves these ends through the management and regulation of visitor use and accommodation facilities in the different MMNR zones. Specifically, the zonation scheme establishes four categories of zone:

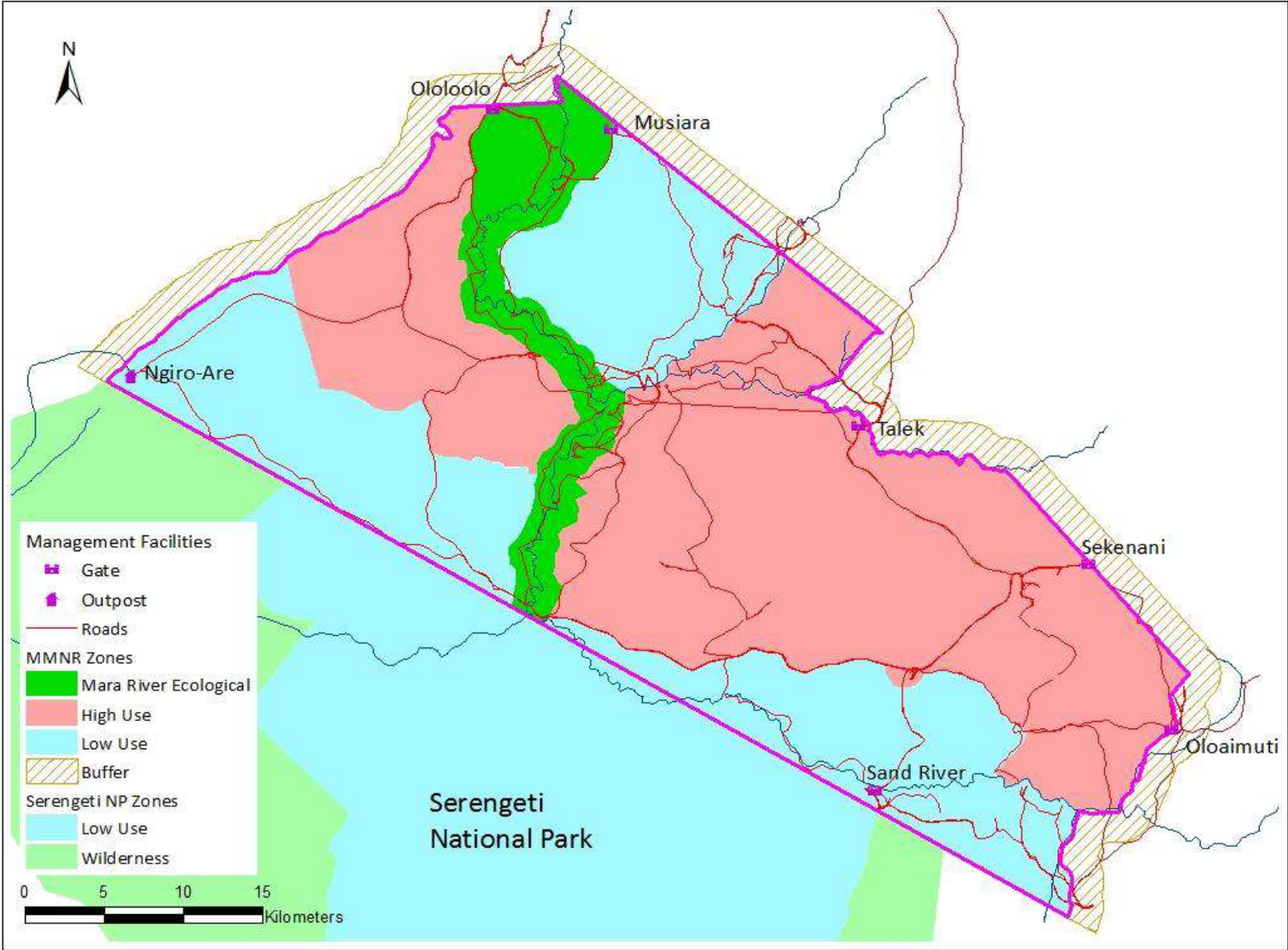
- ▶ **High Use Zone**
- ▶ **Low Use Zone**
- ▶ **Mara River Ecological Zone**
- ▶ **MMNR Buffer Zone**

The areas that are included in these zones are illustrated in Figure 4 overpage. As the map shows, the **High Use Zone** covers those areas that are presently used by the majority of Reserve visitors. This zone will be the focus of management efforts to enhance the Reserve's tourism product and will aim to provide a high quality, proactively managed wildlife viewing experience for visitors. The **Low Use Zone** covers those areas that have in the past been characterised by low visitation, and in these areas the emphasis will be on environmental protection, with lower visitor densities and providing a sense of exploration and wilderness.

The **Mara River Ecological Zone** is established primarily to provide the necessary degree of protection to this zone's sensitive riverine forests, rhino breeding areas, wildebeest crossing points and the Mara River itself, and is the only zone with a primary ecological protection function. Because of the high tourism pressures in this zone, special management prescriptions and actions are needed to protect the zone's environment while facilitating sustainable tourism practices.

The **MMNR Buffer Zone** is a two-kilometre strip surrounding the entire MMNR except for its southern boundary with Serengeti National Park across the international border with Tanzania. As detailed in the Visitor Carrying Capacity chapter, the Buffer Zone is where the majority of the Reserve's visitors originate from, yet because it is not part of the Reserve it is subject to the least controls on development. Influencing future developments in the MMNR Buffer Zone is an important priority for this management plan.

Figure 4. MMNR zone types and boundaries



In designing the scheme, the zones have been kept as simple as possible and wherever feasible zone boundaries have been aligned with roads or rivers to aid interpretation on the ground. While separate zone areas have been defined for both the Central Mara (Narok) and Mara Triangle sections of the Reserve, all prescriptions for each zone type are standard throughout the entire Reserve (as set out in more detail in the following sections).

## 4.2 Reserve-wide prescriptions

In addition to the specific zonal visitor prescriptions set out later in this chapter, a number of MMNR wide tourism prescriptions have been established and are set out in this section. Table 8 below sets out the Reserve-wide visitor activity prescriptions.

Table 8. MMNR-wide visitor activity prescriptions

### MMNR Prescriptions

- ▶ All visitors must enter the MMNR through an approved entry point and must possess a valid MMNR ticket
- ▶ All Tourism Service Vehicles<sup>6</sup> (TSVs) entering the MMNR will be required to be painted in earth colours (e.g. dark green, brown or beige)<sup>7</sup>
- ▶ No scenic over flights by aircraft permitted below 1,500 feet above ground level
- ▶ No walking, horseback, or bicycle safaris permitted
- ▶ No night game drives

### 4.2.1 MMNR entry points

Table 9 below shows the designated entry points for visitors to the MMNR as approved for the duration of this management plan.

Table 9. Approved entry points for visitors to the MMNR

Public Road Access	<ul style="list-style-type: none"> <li>▶ Sekanani</li> <li>▶ Talek</li> <li>▶ Musiara</li> <li>▶ Ololaimutia</li> <li>▶ Sand River</li> <li>▶ Enoompuai (new: see PA Operations Programme Action 3.5)</li> <li>▶ Oloololo</li> </ul>
Camp-specific Access (not for public use)	<ul style="list-style-type: none"> <li>▶ Angama</li> <li>▶ Mara Engai</li> <li>▶ Osero Sophia</li> </ul>

<sup>6</sup> In accordance with the National Transport and Safety Authority (Operation of Tourist Service Vehicles) Regulations, 2015, tourist service vehicle means any vehicle (including private hire vehicles) operated by a licensed tour operator and used exclusively for the carriage of tourists

<sup>7</sup> As discussed in Action 2.4 of the Tourism Management Programme, the schedule for implementation of this regulation will be agreed through consultation between MMNR management, Narok County, and tourism industry representatives.

## Air Access

- ▶ Keekorok
- ▶ Olkiombo
- ▶ Musiara (Governors)
- ▶ Mara Serena
- ▶ Kichwa Tembo

## 4.2.2 Reserve-wide accommodation prescriptions

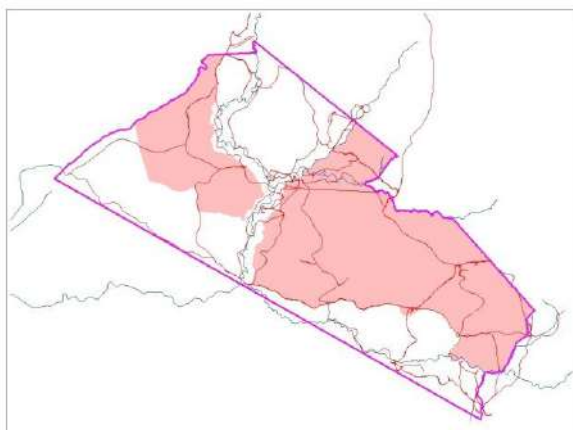
As detailed in the Visitor Carrying Capacity chapter, both the Central Mara (Narok) and Mara Triangle sections of the Reserve are experiencing exceptionally high visitor densities, especially in Central Mara where the Reserve's visitor carrying capacity is already greatly exceeded. To address this issue, this management plan establishes the following overall prescriptions for ALL accommodation offered within the Reserve for the duration of this management plan:

Table 10. Reserve-wide overall visitor accommodation prescriptions

- ▶ **NO** new visitor accommodation developments
- ▶ **NO** expansion of existing facility bed capacity
- ▶ Compliance with MMNR accommodation facility standards

The standards for MMNR accommodation facilities are defined according to the category of accommodation concerned (lodges, ecolodges, ecocamps and special campsites). See Appendix 1 and Action 3.2 of the Tourism Management Programme for further details.

## 4.3 High Use Zone



The **High Use Zone** incorporates those areas in the MMNR that are already used by the majority of Reserve visitors. The zone will be the primary focus of proactive management efforts to enhance the current visitor experience in the MMNR, and to ensure that the environmental impacts of visitation on the MMNR's wildlife and habitats are kept to a minimum.

In addition to the zonal prescriptions set out below, this will be achieved through a number of management actions including the further development of the road and track network in these zones, which will reduce congestion as well as the incentive for off-road driving (see Protected Area Operations Programme Action 4.3 and Tourism Management Programme Action 1.4), and enhanced visitor management at key points and attractions where visitors currently concentrate. New tourism attractions including interpretation points and stopping points will also be established to enhance and diversify the visitor experience, and to encourage visitors to spend more time out of their vehicles and off the roads, thereby easing traffic congestion.





In the Central Mara (Narok) section of the Reserve, the HUZ covers just over 638 km<sup>2</sup>, and includes all currently intensively used parts of the MMNR. In the north, the zone covers the area east of the Ntiakitiak and Olare Orok Rivers to their confluence with the Talek River. From here the zone boundary follows the Talek River west until it reaches the Mara River Ecological Zone (MRZ). The HUZ boundary then continues south along the MRZ until it meets the Keekorok-Mara River main road, which forms the southern boundary of the HUZ. In the east, the HUZ boundary coincides with the MMNR boundary.

In the Mara Triangle, the HUZ covers approximately 198 km<sup>2</sup>, and encompasses the intensively used parts of the Mara Triangle in the north of the area. The southern zone boundary follows the cattle trail down the escarpment to the swamps just north of the salt lick area, skirts around these swamps and then follows a minor river to join the Mara Bridge-Serena main road around 2 km south from the junction with the Ngiro-Are road. The boundary then continues south along this road to “*BBC Lugga*”, which it follows until it meets the boundary of the Mara River Ecological Zone. All of the Mara Triangle north of this boundary is included in the Mara Triangle HUZ, except a small section east of the main Oloololo Gate – Serena road immediately south and east of the Oloololo Gate, which has been incorporated into the Mara River Ecological Zone to protect the important rhino habitat this area contains.

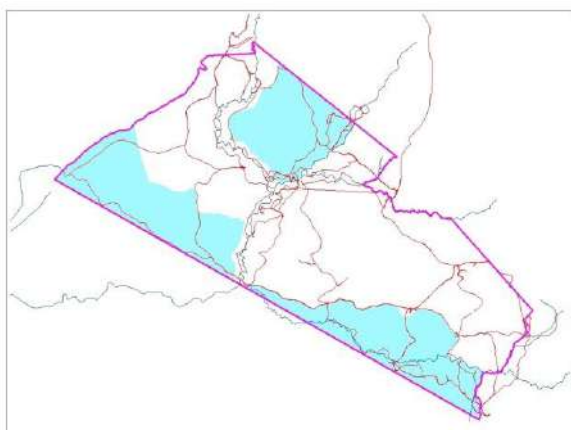
### 4.3.1 HUZ visitor activity prescriptions

Visitor activities in the HUZ are primarily focussed on vehicle-based game viewing. This has the advantage of not only enabling MMNR management to concentrate its resources on steps to ensure a high quality experience for visitors (such as development of new or improvement of existing tracks) but also enables tourism facilities located in community areas outside the Reserve to capitalise on niche markets that will not be catered for in the MMNR, such as walking or horseback safaris. Game viewing in the HUZ is confined to official roads and tracks only. Table 11 below sets out the HUZ visitor activity prescriptions.

Table 11. High Use Zone activity prescriptions

	Activities
 <b>Allowed</b>	<ul style="list-style-type: none"> <li>▶ Vehicle-based wildlife viewing on maintained and clearly identified game viewing tracks</li> <li>▶ Balloon safaris (By MMNR approved operators. No further expansion. See section 4.6 Sightseeing Ballooning below for further details)</li> <li>▶ Bush dinners (at specific sites approved by management. Access to site must be direct to and from accommodation. Return to accommodation facility by 9:00pm)</li> </ul>
 <b>Not Allowed</b>	<ul style="list-style-type: none"> <li>▶ Off-road driving prohibited under all circumstances</li> </ul>

## 4.4 Low Use Zone



The Low Use Zone (LUZ) incorporates those parts of the Reserve that have not traditionally been used by large numbers of visitors, and will be primarily focused on the protection of the Reserve's habitats and species, alongside low density, low impact visitor use, characterised by a sense of exploration, adventure and wilderness. Enhancement of the LUZ visitor experience will be achieved through a variety of management approaches, such as prohibition of 2WD vehicles except on main transit routes

as well as of overland trucks and buses in the zone.

In the Central Mara section of the Reserve, the LUZ covers 374 km<sup>2</sup>. In its northern section, the zone's western boundary runs parallel to the Mara River, separated from it by the Mara River Ecological Zone. The Talek River then forms the LUZ's southern boundary, while the Ntiakitiak River separates it from the HUZ to the east. The north-eastern boundary of the LUZ coincides with that of the Reserve.



The southern section of the LUZ, which is separated from the northern section described above, is located in the south and south east of the Reserve. The zone boundary follows the Keekorok-Mara Bridge main road from the Mara River Ecological Zone (skirting below Keekorok lodge) as far as the Olosidan River. The boundary then follows this river south to join the Sand River, which it then follows upstream south of the Ololoitikoshi Hill to the Reserve boundary.

In the Mara Triangle section of the Reserve, the LUZ covers an area of 203 km<sup>2</sup>, and occupies the southern section of the Mara Triangle adjacent to Serengeti National Park, as far north as the cattle trail, swamps and BBC Lugga boundary with the HUZ (as described in more detail above under the HUZ description).

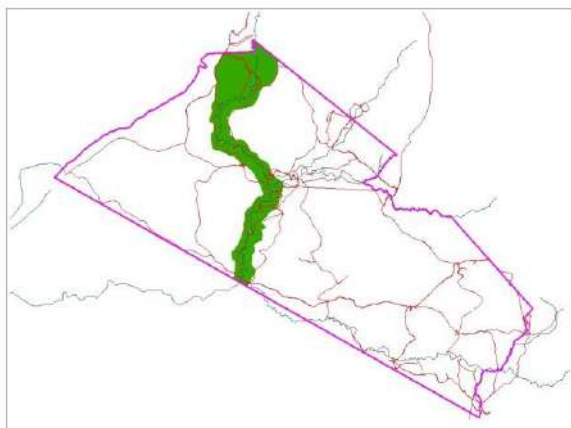
### 4.4.1 LUZ visitor activity prescriptions

As indicated previously, visitor activity prescriptions for the Reserve's LUZ focus on providing a less managed visitor experience with a sense of wilderness. Table 12 overpage gives the LUZ visitor activity prescriptions.

Table 12. Low Use Zone activity prescriptions

	Activities
 <b>Allowed</b>	<ul style="list-style-type: none"> <li>▶ Vehicle-based wildlife viewing on maintained and clearly identified game viewing tracks</li> <li>▶ Balloon safaris (By MMNR approved operators. No further expansion. See section 4.6 Sightseeing Ballooning below for further details)</li> <li>▶ Bush dinners (at specific sites approved by management. Access to site must be direct to and from accommodation. Return to accommodation facility by 9:00pm).</li> </ul>
 <b>Not Allowed</b>	<ul style="list-style-type: none"> <li>▶ All vehicles with a seating capacity of more than 12 people</li> <li>▶ 2WD vehicles prohibited, except on main transit routes</li> <li>▶ Off-road driving prohibited except to approach big cats. Maximum 5 vehicles at sighting at one time. When vehicles are waiting, maximum 15 minutes at sighting permitted. Minimum viewing distance to big cats: 25 metres.</li> </ul>

#### 4.4.2 Mara River Ecological Zone



The Mara River Ecological Zone (MRZ) is established to protect the riverine forests, rhino breeding areas and wildebeest crossing points along the Mara River, and to reduce the impact of tourism facilities on this critical area. In order to mitigate environmental impacts and to secure the role of the MRZ as the linchpin of the Reserve's tourism product, visitor use in the MRZ will be intensively managed. This includes the enforcement of no off-road driving, and the establishment of temporary viewing areas for wildebeest crossing areas.

Access to specific points along the Mara River will be from east-west tracks originating from a defined wildlife-viewing track running north-south along the zone's boundary (to be developed as necessary, see PA Operations Programme Action 4.4).

The MRZ consists primarily of a 1.5 km strip either side of the Mara River for its entire length within the Reserve, which is extended where riverine forest falls outside this area. Also included in the MRZ is a small area in the northern Mara Triangle incorporating the Musiara wetlands and the wooded areas neighbouring Little Governors. The zone boundary follows the main Oloololo-Serena road until just after the first lugga meets the road, from where it continues due south down a minor road towards the Mara River.



The areas covered by the MRZ on either side of the Reserve are comparable in size, with just over 62 km<sup>2</sup> within the Central Mara (Narok) section and just under 77 km<sup>2</sup> within the Mara

Triangle section. Under management actions defined in the PA Operations Programme Action 4.4, roads will be developed along either side of the river to clearly mark the zone boundary.

### 4.4.3 MRZ visitor activity prescriptions

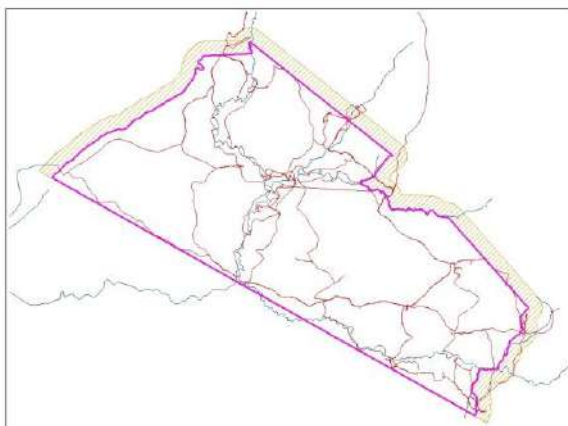
At peak times, the MRZ is the most intensively used part of the MMNR, and as such visitor activities in the area will be tightly regulated and managed. Table 13 below gives the MRZ visitor activity prescriptions.

Table 13. Mara River Ecological Zone activity prescriptions

	Activities
 <b>Allowed</b>	<ul style="list-style-type: none"> <li>▶ Vehicle-based wildlife viewing on maintained and clearly identified game viewing tracks</li> <li>▶ Permanent and/or temporary viewpoints and car parks at wildebeest crossings</li> <li>▶ Balloon safaris (By MMNR approved operators. No further expansion. See section 4.6 Sightseeing Ballooning below for further details)</li> </ul>
 <b>Not Allowed</b>	<ul style="list-style-type: none"> <li>▶ All off-road driving prohibited</li> <li>▶ Bush dinners</li> </ul>

The MRZ experiences even higher visitor densities than the High Use Zone, especially in the tourism high season when wildebeest crossings are taking place. Because of these crossings and other exceptional wildlife and scenic features of the MRZ, the zone is the flagship of the MMNR's tourism product, and any further deterioration in the visitor experience in this zone is certain to impact severely on the overall quality of the Reserve's tourism product. Equally critically, the MRZ protects the Reserve's key exceptional ecological resource values, in particular the riverine forests and woodlands that are critical to the survival of the endangered Black rhino population, as well as the Mara River itself. For these reasons, all MMNR stakeholders have accorded highest priority to the MRZ's protection and careful management.

## 4.5 MMNR Buffer Zone



The MMNR Buffer Zone is a 2 km wide strip (total area just under 250 km<sup>2</sup>) along the outer boundary of Reserve where it adjoins community areas within Kenya. The Buffer Zone does not extend along the south-western boundary of the Reserve where this coincides with the international border between Kenya and Tanzania.

As detailed in the Visitor Carrying Capacity chapter, an especial challenge for MMNR management with regard tourism accommodation relates to the budget tourism facilities that have

rapidly developed in the Reserve's Buffer Zone in recent years. These lodges and camps are sometimes poorly constructed, have not been subject to appropriate environmental impact assessments, and may offer poor standards of service and visitor care. As a result, they reflect badly on the Maasai Mara as a visitor destination, and on the Kenyan tourism product as a whole. Nevertheless, as explained in the Visitor Carrying Capacity chapter, these camps account for around 60 percent of the visitors to the MMNR, especially to the adjacent High Use Zone.

The development of tourism accommodation in the MMNR Buffer Zone as well as the quality of tourism services on offer in the Zone has profound implications for the MMNR tourism product and the environmental impacts of tourism in the Reserve. However, because these facilities are all established on public or private land outside the Reserve, responsibility for the implementation of prescriptions and actions regarding the regulation of tourism and other developments in this Zone largely falls directly to the Narok County government. In addition, this plan incorporates initiatives to support conservation-compatible tourism ventures in the greater ecosystem in the Community Outreach & Partnership Programme.

## 4.6 MMNR sightseeing ballooning operations

Sightseeing ballooning is a popular addition to many MMNR visitors' itineraries and, by providing an opportunity that is not widely available elsewhere in Kenya, diversifies the tourism product on offer in the Reserve. However, ballooning has a high visual impact on the experience of other visitors using the Reserve, and if not carefully regulated, can seriously undermine the sense of wilderness that most visitors to the area expect. Balloons may also disturb wildlife, and balloon collection vehicles can also cause significant environmental damage when they are forced to drive off road - especially during wet weather.

In order to prevent "*undue habitat destruction, animal harassment and the deterioration of the Reserve's aesthetic values*", the previous MMNR Management Plan stipulated that "*a maximum of five balloons be allowed in the air on any one day*" over the MMNR, and that these be permitted to take off from three specific staging points. However, as illustrated in Figure 5 below, there are now at least five take-off points in or next to the MMNR, with up to 33 balloons in the air over the MMNR at any one time (2020 data), representing a density of one balloon for every 50 square kilometres.

Many MMNR stakeholders have argued that there are now far too many balloons operating in the MMNR, and that this is undermining the quality of the tourism product and in particular the wilderness values that are an important aspect of MMNR tourism. Such a high density of ballooning is also of significant concern from an environmental and wildlife behaviour perspective.

Figure 5. MMNR ballooning flight paths (2008 data)

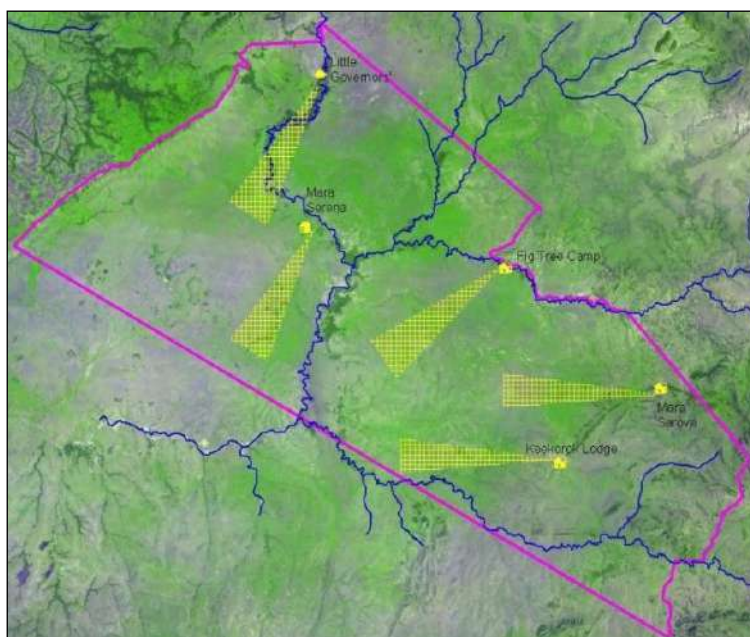


Table 14 below details the overall prescriptions relating to ballooning concessions over the 10-year lifespan of this management plan. These include any ballooning concessions that take-off outside but land within the MMNR.

Table 14. MMNR balloon concession prescriptions

- |  |
|--|
| <ul style="list-style-type: none"> <li>▶ <b>NO</b> new ballooning concessions</li> <li>▶ <b>NO</b> expansion of existing ballooning concessions</li> <li>▶ Compliance with MMNR balloon operating prescriptions</li> </ul> |
|--|

Table 15 below sets out prescriptions applying to the operation of all balloons in the MMNR. These prescriptions are established to ensure that both the environmental and visual impacts of ballooning are kept to a minimum. As with the ballooning concession prescriptions, the prescriptions apply to any balloons that take-off outside but land within the MMNR.

To complement these prescriptions, Narok County will open discussions with existing operators to examine options for reducing the impact of ballooning on the MMNR’s tourism product and environment, for example through a transition to fewer, larger balloons, or through the reduction in balloon numbers alongside increased costs of a balloon flight (see Action 2.5 of the Tourism Management Programme).

Table 15. MMNR balloon operating prescriptions

Attribute	Prescriptions
Number of balloons	▶ Maximum of five balloons per balloon concession
Licence fee	▶ Levied per balloon. Licence fee will be determined in the annual Narok County Finance Bill

Attribute	Prescriptions
Balloon size	<ul style="list-style-type: none"> <li>▶ Maximum capacity of 20 passengers per balloon (i.e., typical size of a Cameron Foxtrot basket, with an envelope size of up to 450,000 cubic feet)</li> </ul>
Approval/licensing requirements <sup>5F</sup> <sup>8</sup>	<ul style="list-style-type: none"> <li>▶ Formal approval and licensing from Narok County</li> <li>▶ All approvals and licences as required by the Kenya Civil Aviation Authority</li> <li>▶ EIA licence from the National Environment Management Authority</li> <li>▶ Other government tourism licences as appropriate</li> </ul>
Environmental restrictions	<ul style="list-style-type: none"> <li>▶ Management may suspend all flights during unseasonable wet weather, when the ground is waterlogged, or for other reasons</li> </ul>
Take off time/location	<ul style="list-style-type: none"> <li>▶ No movement of vehicles for passenger collection or transfer within the reserve is permitted before 04:30 am</li> <li>▶ Take off only allowed between 06.00 and 07.00 am, and only permitted from bases approved by MMNR management</li> </ul>
Landing location	<ul style="list-style-type: none"> <li>▶ Balloons must land near to maintained or clearly identified roads</li> </ul>
Flight height/route	<ul style="list-style-type: none"> <li>▶ Minimum in-flight height of 10 metres above objects (trees, wildlife, etc) to be maintained at all times, except during take-off, landing and in emergency</li> <li>▶ No balloon taking off outside the MMNR is permitted to overfly or land in the Reserve (without the approvals and licences specified above)</li> </ul>
Landing	<ul style="list-style-type: none"> <li>▶ Must land as close as possible to a graded road or game viewing track</li> </ul>
Bush breakfasts	<ul style="list-style-type: none"> <li>▶ May only take place at one of two approved alternative locations designated for each flight path, as agreed between the operator and MMNR management<sup>9</sup></li> <li>▶ Operators must provide temporary chemical toilets and ablution facilities at breakfast locations</li> <li>▶ All breakfast locations must be completely cleared after each use by 10:30 am: chemical toilets removed, and all waste/litter packed out</li> </ul>
Recovery vehicles	<ul style="list-style-type: none"> <li>▶ Only flat-bed trucks are permitted (no tractors). The lightest possible vehicle to be used for the recovery of all landed balloons</li> <li>▶ Recovery vehicles not permitted to travel to the landing site before 10am in the wet season</li> <li>▶ All recovery vehicles to be earth coloured in line with general Reserve prescription, see Table 8</li> </ul>

<sup>8</sup> As no additional operations in/over the MMNR are permitted, these requirements will only apply as existing agreements expire and/or are renegotiated.

<sup>9</sup> These should be inconspicuous and not easily visible from popular game viewing tracks; they should also be located within the High Use Zone wherever this is feasible

# 5. Ecological Management Programme

## 5.1 Programme purpose

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The MMNR's ecological structure, functions and services are better understood and conserved through adaptive ecological management and improved research and monitoring

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Although long-term ecological change is a natural and important aspect of the Mara-Serengeti Ecosystem, human activities and impacts, particularly in the greater ecosystem beyond the MMNR's boundary, have dramatically increased over recent decades, and in some cases have already substantially impacted on the area's ecology. This is perhaps most evident in the significant decline of migratory species in the Kenyan part of the ecosystem, and also in the potentially ecologically destructive reduction of water levels in the Mara River. At the same time, pressures from tourism development and visitor use within the Mara Reserve have also greatly intensified, which unless appropriately managed have the potential to seriously impact on the ecology of the Reserve itself, and to undermine the very resources that make the area so attractive to visitors.

Managing these and other human-induced changes impacting on the MMNR's ecology and balancing the competing needs of resource conservation and use are arguably the greatest challenges facing the management of the MMNR today. The Ecological Management Programme will play a crucial role in spearheading management responses to these issues, not only by providing the ecological information that is needed to better understand the underlying factors driving these impacts, but also by leading the implementation and adaptation of management interventions designed to address the most significant threats to the area's exceptional natural resources.

## 5.2 Targeting ecological management in the MMNR

In accordance with the PAPF planning methodology adopted for this planning process, the Nature Conservancy's Conservation Action Planning (CAP) methodology has been used to help identify the Ecological Management Programme's management objectives and actions. The CAP methodology provides a mechanism for focusing ecological management by enabling the identification and development of an accurate definition and understanding of the area's most significant ecological features, and the major threats to these features.

This methodology has now been applied in many conservation areas around the world, and it is based on the premise that, with limited human and financial resources available to managers, it is impractical to attempt to manage and monitor every single aspect of the complex ecology of an area, and management effort is therefore best focused on a limited number of the area's most important features.



Applying the CAP methodology to the MMNR, a limited number of “*conservation targets*”, were first identified, which represent and encapsulate the unique biodiversity contained within the MMNR, or the ecological features that require specific management actions (such as particularly endangered species or habitats). The definition and understanding of each of these targets was further elaborated through the subsequent identification of the “*key ecological attributes*” (KEAs), upon which the long-term survival of each conservation target depends. This laid the foundations for the identification of the “*threats*” to these targets and attributes, and the subsequent prioritisation of these threats according to their significance.

The nine MMNR conservation targets, important subsidiary targets (i.e. other ecosystem components that share KEAs and threats with the conservation target concerned), and the KEAs for each target are set out in Table 16 below. Table 17 overpage shows the priority threats to the MMNR conservation targets and their KEAs.

Table 16. MMNR conservation targets, subsidiary targets and KEAs

	Targets	Rationale for selection	Subsidiary targets	KEAs
<b>Systems</b>	Southern migration	The defining characteristic of the Mara-Serengeti Ecosystem, and plays a keystone role in determining key ecological processes and animal and plant diversity and abundance. Even relatively small alterations to the migration could have far-reaching impacts on the MMNR’s ecology and biodiversity.	<ul style="list-style-type: none"> <li>▶ Wildebeest</li> <li>▶ Zebra</li> <li>▶ Thompson’s gazelle</li> <li>▶ Eland</li> </ul>	<ul style="list-style-type: none"> <li>▶ Population size of key migratory species</li> <li>▶ Habitat connectivity</li> <li>▶ Habitat size (grassland)</li> <li>▶ Pasture quality and quantity</li> <li>▶ Mara River (quality and quantity of water)</li> </ul>
	Northern Migration	A smaller migration that remains within the Kenyan part of the ecosystem, primarily consisting of the same species as the southern migration. Less well known, and much more severely impacted by human activities than the southern migration; animal numbers have severely declined over the last 40 years.	<ul style="list-style-type: none"> <li>▶ Resident ungulates: warthog; buffalo, giraffe; topi; kongoni; and impala</li> <li>▶ Plus species listed above for southern migration</li> </ul>	<ul style="list-style-type: none"> <li>▶ Population size of key species</li> <li>▶ Habitat connectivity</li> <li>▶ Habitat size (grassland)</li> <li>▶ Pasture quality and quantity</li> <li>▶ Mara River (quality and quantity of water)</li> </ul>
	Mara River	The primary, and occasionally the only, dry-season source of water for wildlife in the Mara-Serengeti Ecosystem. The survival of the southern migration in its current form depends on seasonal access to the river, especially during periodic droughts. River flow and sediment loads have been severely affected by upstream activities in recent years, especially in the Mau Forest.	<ul style="list-style-type: none"> <li>▶ Talek, Sand and other key rivers</li> <li>▶ Riverine forest</li> <li>▶ Crocodiles</li> <li>▶ Hippos</li> <li>▶ Waterbuck</li> <li>▶ Bushbuck</li> <li>▶ Reedbuck</li> <li>▶ Riverine bird species</li> </ul>	<ul style="list-style-type: none"> <li>▶ Sustained and adequate water flow</li> <li>▶ Water quality</li> <li>▶ Size and extent of Mau Forest</li> <li>▶ Size and extent of Siana and Loita Hills forests</li> <li>▶ Extent and canopy cover of riverine forest</li> </ul>

	Targets	Rationale for selection	Subsidiary targets	KEAs
Habitats	Savannah/Hill woodlands	The woodlands of the MMNR have suffered dramatic declines over the previous four decades, primarily through a combination of impacts from both elephants and fire. These habitats are vital for a number of species and evidence suggests increased competition amongst browsers for woody resources within the Reserve.	<ul style="list-style-type: none"> <li>▸ Acacia species</li> <li>▸ Pangolins</li> </ul>	<ul style="list-style-type: none"> <li>▸ Extent of woodlands</li> <li>▸ Plant species composition</li> <li>▸ Plant species age structure</li> <li>▸ Population size of browsers (e.g. giraffe, impala)</li> </ul>
	<i>Croton-Euclea</i> thickets	Similar declines have been observed in the MMNR's <i>Croton-Euclea</i> thickets over recent years. Evidence has shown that these species are important food sources for Black rhinos (accounting for about 25% of their diet); this importance has increased as other woodland species in the MMNR have declined.	<ul style="list-style-type: none"> <li>▸ <i>Balanites</i> species</li> </ul>	<ul style="list-style-type: none"> <li>▸ Extent of thickets</li> <li>▸ Plant species composition</li> <li>▸ Plant species age structure (especially regeneration of <i>Balanites</i>)</li> <li>▸ Population size of browsers (e.g. giraffe, impala)</li> </ul>
Species	Black rhino ( <i>Diceros bicornis michaeli</i> )	Classified as critically endangered by IUCN. Global population declined drastically over last 30 years. MMNR contains one of two “indigenous” populations in Kenya, but it remains both small and vulnerable.	N/A	<ul style="list-style-type: none"> <li>▸ Age/sex structure and ratio</li> <li>▸ Population size</li> <li>▸ Habitat size and quality</li> <li>▸ Recruitment</li> <li>▸ Genetic diversity</li> </ul>
	Large carnivores	Play an ecologically and economically essential role in the MMNR. Many species (e.g. lion, cheetah) declining nationally. Wild dogs are classified as endangered by IUCN. Grouped together as they face common threats including human-wildlife conflict and reduction of dispersal areas.	<ul style="list-style-type: none"> <li>▸ Lion</li> <li>▸ Spotted hyena</li> <li>▸ Cheetah</li> <li>▸ Wild dog</li> <li>▸ Leopard</li> </ul>	<ul style="list-style-type: none"> <li>▸ Age/sex structure and ratio</li> <li>▸ Population size</li> <li>▸ Prey species availability</li> <li>▸ Habitat availability and connectivity</li> </ul>
	Roan Antelope ( <i>Hippotragus equinus</i> )	Rated as “low risk, conservation dependent” by IUCN. Once common in the MMNR but has declined significantly in the Mara-Serengeti ecosystem, <b>and is no longer present in the MMNR</b> itself. Its restoration is a priority for the Mara Conservancy.	N/A	<ul style="list-style-type: none"> <li>▸ Age/sex structure and ratio</li> <li>▸ Population size</li> <li>▸ Habitat size and quality</li> <li>▸ Recruitment</li> <li>▸ Genetic diversity</li> </ul>
	Greater Kudu ( <i>Tragelaphus strepsiceros</i> )	Also considered as low risk, conservation dependent by IUCN. Although <b>no longer present in the MMNR</b> , it is still found in woodlands to the east of the Reserve.	N/A	<ul style="list-style-type: none"> <li>▸ Age/sex structure and ratio</li> <li>▸ Population size</li> <li>▸ Habitat size and quality</li> <li>▸ Recruitment</li> <li>▸ Genetic diversity</li> </ul>

Table 17. Threats to MMNR conservation targets

Threats \ Targets	Northern Migration	Southern Migration	Mara River	<i>Euclea-croton</i> thickets	Savannah/hill woodlands	Black rhino	Roan & kudu	Large Carnivores
Deforestation	Very high	Very high	Very high					
Water extraction	High	High	Medium					
Fire	Very high	Very high	Medium	Medium	Medium			
Poaching <sup>10</sup>	Medium	Medium				Very high	Very high	
Disease	Medium	Medium				Low	High	Medium
Human settlements	High	High						Medium
Settled agriculture & fencing	High	High						
Exclusion from water sources	Very high							
Intensive pastoral practices	Very high							
Harassment/ Persecution	Very High							High
Pollution			Medium					
Tourism facilities <sup>3</sup>			Very high		Medium	Medium		
Tourism activities <sup>11</sup>		Low		Medium	Medium	Medium		
Elephant damage				Medium	Medium			
Loss of habitat (woodland)						Very High		
Inbreeding						High	High	
Predation/competition							Very High	Medium
Declining prey species								High
Declining suitable range								High

<sup>10</sup> Security issues are primarily covered under the Protected Area Operations Programme

<sup>11</sup> Also addressed under the Tourism Management Programme

## 5.3 Management objectives and actions

The identification and ranking of the threats to the MMNR conservation targets and their KEAs provides the basis for the development of the Ecological Management Programme's management objectives and actions. These objectives are developed to address the clusters of threats shown in Table 17 above.

The five objectives for the MMNR Ecological Management Programme are:

1. Black rhino conservation and management strengthened
2. Understanding of the ecology and status of MMNR species conservation targets enhanced
3. Protection and management of MMNR habitat mosaic improved
4. Collaboration with relevant institutions in maintaining MMNR water catchments strengthened
5. Targeted ecological monitoring and management-orientated ecological research carried out

Each of these management objectives, and the management actions that have been developed to ensure their achievement are set out in detail in the following sections. Management objectives and actions addressing the conservation of dispersal areas and reduction in human-wildlife conflict are covered under the Community Outreach & Partnership Programme (see Objectives 3 and 4).

### 5.3.1 Objective 1: Black rhino conservation and management strengthened

There are currently around 50 Black rhinos in the MMNR (approx. 38 of which are ear-notched). Although this represents a significant increase from a low of 11 individuals in 1984, this number is still well below the Reserve's recorded population high of around 150 in the 1960s. The MMNR Black rhino population is exceptionally important as it is one of two “*indigenous*” populations in Kenya (i.e. with no inward translocation of individuals from other areas), and is the only unfenced, free-ranging population outside of a national park in the country. The population is also ecologically connected to a sub population of around ten individuals in the adjacent Serengeti National Park, and individuals frequently move between the two countries. The effective management of this population will also be vital in achieving the goals of the Black Rhino Conservation and Management Strategy 2012-2016 and the Kenya Black Rhino Action Plan (2017-2021)<sup>12</sup>.

Although studies<sup>13</sup> have shown that the current sex ratio of the MMNR Black rhino population is around 1:1.2 males to females, which is in line with other East African populations, and that recruitment and age structure is also close to that expected, concerns have been raised about

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<sup>12</sup> Kenya Black Rhino Action Plan (2017 – 2021). Kenya Wildlife Service. Sixth edition. 2016

<sup>13</sup> Walpole *et al.* Population dynamics and future conservation of a free-ranging black rhinoceros (*Diceros bicornis*) population in Kenya, Biological Conservation (2001) 237 – 243.

slower than anticipated population growth and range expansion within the MMNR. This has been attributed to a number of possible factors, but most commonly the decline in woodlands within the Reserve, which may have in turn reduced the area's ability to support rhinos, as well as disturbance and/or destruction of rhino breeding areas by the MMNR's visitors and accommodation facilities. In addition, and connected to this issue, is the need to enhance the coordination of rhino monitoring and surveillance within the Reserve, and between the Kenyan and Tanzania sides of the ecosystem.

In order to address these and other key issues impacting on the MMNR Black rhino population, and to strengthen the conservation and management of Black rhinos in the MMNR, five management actions have been developed; these are elaborated in detail in the following sections.

#### Action 1.1 Develop improved scheme of service for Rhino Protection Ranger Unit staff

The Narok County and its predecessor Central Mara (Narok) have been operating a rhino monitoring and surveillance programme in the MMNR since the mid-1980s, which has successfully recorded and monitored long-term changes in rhino numbers within the Reserve. Alongside the issue of the coordination of these activities across the ecosystem (discussed under Action 1.3 below), the other major factor impacting on the efficiency of rhino surveillance and monitoring operations has been the high turnover of staff in the Rhino Protection Ranger Unit. This high turnover has been attributed to a number of causes, including the heavy workload and long hours expected of the rhino rangers, and the relatively remote locations in which these rangers operate for much of the time. This loss of staff has undermined both the effectiveness of any training that monitoring staff have received, and the retention of experienced staff within the unit.

As a first step towards addressing this issue, MMNR management will develop new terms of service for Rhino Protection Ranger Unit staff, which will aim to ensure that staff remain in the unit for at least three years. Features of the terms of service that will help achieve this goal will include: specification of times on and off duty (e.g. a two-weeks on, two-weeks off system), and the introduction of an incentive scheme for rhino surveillance staff, potentially through donor support (as is currently the case in the Serengeti National Park). The terms of service should also include the option to extend service in the unit for a further three years, providing both the ranger concerned and MMNR management agree.

#### Action 1.2 Strengthen MMNR management's capacity to undertake rhino research and monitoring, with support from KWS

As mentioned above, KWS has recently developed a new Kenya Black Rhino Action Plan which will guide the management of the species on a national level from 2017-2021. In recognition of the importance of the MMNR in rhino conservation and management, the action plan contains a number of specific actions to be implemented by MMNR management in collaboration with KWS during its five-year implementation period. These actions include: implementing a standardised rhino monitoring and reporting protocol in the Mara-Serengeti ecosystem; undertaking genetic profiling of the Mara-Serengeti ecosystem rhino population, and carrying out rhino habitat assessments.

To undertake this rhino research and monitoring, it will be necessary for Narok County to recruit a dedicated ecologist to the area with expertise on species conservation and data analysis. This requirement is further addressed in Action 3.2 of the Protected Area Operations Programme.

Action 1.3 Collaborate with TANAPA in undertaking rhino population monitoring, research and protection

As discussed above, individuals from the MMNR Black rhino population frequently move between the Central Mara (Narok) and Mara Triangle areas of the MMNR, between the MMNR and the Serengeti National Park, and potentially into adjacent community areas as well. If the Mara rhino population is to be effectively monitored, and the movements and dynamics of the population better understood, these movements necessitate strong collaboration between the managers of different areas within the greater Mara-Serengeti ecosystem.

However, while there is significant ongoing collaboration between MMNR management, KWS and Serengeti National Park management in rhino monitoring, there is scope for this collaboration to be strengthened and formalised, including overcoming existing inconsistencies in monitoring protocols and in data recording and storage between the different areas.

Under this Action, MMNR management will support the strengthening of this collaborative rhino monitoring and surveillance system, first by initiating or supporting steps to establish a formal basis for rhino monitoring collaboration between MMNR management, KWS and TANAPA (e.g. through the development of an MoU or similar collaboration framework). This will be followed by efforts to ensure the standardisation of rhino monitoring data collection forms, making staff available for training as and when required, and providing any additional support needed by KWS to expedite the development of the joint Mara-Serengeti monitoring system as appropriate.

Action 1.4 Initiate studies to determine factors impacting on rhino population growth and distribution

It has been suggested that the dramatic decline of woodland within the MMNR has made the area less suitable for rhinos, which may be leading to increased dispersal from the MMNR to the SNP. In response to this uncertainty, the KWS Black rhino action plan includes actions to undertake studies on factors negatively affecting rhino numbers and distribution, including undertaking genetic profiling of the Mara-Serengeti ecosystem rhino population and carrying out rhino habitat assessments.

Wherever possible and appropriate, MMNR management will therefore provide logistical and technical support to streamline the initiation and implementation of these studies and ensure that their results are reported back to managers in order to inform the adaptive management of the MMNR's rhino population.

### 5.3.2 Objective 2: Understanding of the ecology and status of MMNR species conservation targets enhanced

Besides Black rhinos, several other species were identified through the CAP process as MMNR conservation targets, and these species will also require ecological management action and monitoring. These target species are: Roan antelope; Greater kudu; and large carnivores (including lion, Spotted hyena, cheetah, Wild dog, and leopard) and pangolin. Of these, Roan antelope were once a common feature in the MMNR, in particular the Mara Triangle area along the Siria Escarpment, but the species is now extinct in the Reserve, and the only remaining population in Kenya is in Ruma National Park. Similarly, the Greater kudu was also once commonly seen in the MMNR, particularly in the eastern part of the Reserve, but has now become locally extinct in the Reserve itself (although it is still present in the hills to the east of the ecosystem).

Large carnivores remain in high numbers in and around the MMNR, and the ecosystem is one of the few areas remaining in Kenya with sufficient prey and habitat to support ecologically functional populations of these animals over the long-term. The selection of large carnivores as a conservation target reflects their particular importance in the MMNR, not only due to the vital ecological roles these predators play, but also their economic importance as one of the key features that attracts high number of visitors to the area (especially outside of the annual migration period).

However, recent research has indicated that there may have been a 40 percent decline in lions inside the MMNR in the last 20 years<sup>14</sup>, and concerns have also been raised about the populations of other carnivores, such as cheetah. The reasons for the decline remain unclear, but it is likely to be due to a combination of factors such as habitat loss, disease, decline in prey availability, and direct killing due to conflict with local people.

In order to address these and other key issues impacting on the status of MMNR species conservation targets, five management actions have been developed; these are elaborated in detail in the following sections.

#### Action 2.1 Undertake reintroduction feasibility study for Roan antelope and Greater kudu based on IUCN/SSC Reintroduction Guidelines

Roan antelope were last seen in the Mara Triangle in the late 1980s, and the decline of the species has been attributed to a number of factors, most commonly hunting and the loss of its preferred *Combretum*-dominated habitats. Although not of significant conservation concern globally, their reintroduction would help restore the natural species composition of the Reserve, provide a valuable refuge for this species in Kenya, and an additional attraction for visitors to the Reserve.

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<sup>14</sup> Dloniak, S.M. (2006) Annual report of research activities, 2005. Maasai Mara Predator Research Project, Maasai Mara National Reserve, Kenya. Unpublished report.

With regard Greater kudu, although this species was once commonly seen in the eastern part of the Reserve, they are no longer found in the area. The reasons for this decline within the MMNR are unclear, although, similar to Roan antelope, it could be due to the reduction of their favoured woodland and bushland habitat within the MMNR. However, Greater kudu are still found in the hills to the east of the Reserve, but it is not known in what numbers or where populations are concentrated.

The IUCN/SSC Guidelines for Re-Introductions specify that restoration of a species should only take place if the habitat and landscape requirements of the species are satisfied (and are likely to be sustained for the foreseeable future), and the cause of the previous decline has been identified and eliminated or reduced to an acceptable level. In line with these guidelines, MMNR management will carry out or support studies that will investigate these factors and establish the feasibility of reintroducing Roan antelope and Greater kudu to the Reserve. This will include establishing the remaining localities and size of Greater kudu populations in the Greater Mara ecosystem. This work will either be carried out by the newly recruited MMNR ecologist (see Action 5.1 below) and other MMNR staff in collaboration with WRTI, or by an independent researcher, potentially as part of a masters or doctorate research study.

#### Action 2.2 Support and respond to studies of the population dynamics of lion and other predators in the MMNR

Ongoing research on lion population dynamics have established a good understanding of lion population trends in the MMNR as well as in the greater Mara ecosystem. Currently, there are an estimated 270 lions in the Reserve and over 500 individuals in the greater ecosystem. While population trends seem to be more stable than they were, lions are an important predator species in the Reserve on both ecological and economic grounds, and it therefore important that research on the lions of the MMNR and the factors influencing their population trends continues. As such, MMNR management will continue to promote research on factors influencing lion population dynamics in the MMNR and will also respond to research findings by implementing management actions to help reverse negative trends in lion numbers.

There are also concerns about cheetah numbers in the MMNR, especially in the Mara Triangle where the cheetah population size seems to be declining, possibly as a result of competition with hyaena and other predators. Under this action, MMNR management will also promote research into factors contributing to population declines in the MMNR cheetah population and will respond with management actions to help reverse these trends where this is appropriate.

#### Action 2.3 Support and respond to studies to assess causes of declining prey species and impacts on carnivores in the MMNR

The total of all non-migratory wildlife species in the Kenyan section of the Mara-Serengeti ecosystem has declined by more than 70 percent in the last 40 years. At the individual species level, declines of over 70 percent have been recorded in buffalo, giraffe, eland and waterbuck,



and 88 percent in warthog<sup>15</sup>. Research into the factors responsible for these declines suggests that livestock grazing within the Reserve boundaries as well as both human population growth and the development of tourism infrastructure inside and around the Reserve have strong negative correlations with herbivore diversity and with the size of resident and migrant herbivore populations<sup>16</sup>.

The wider ecological impacts of these declines in herbivore numbers on large carnivores as well as other aspects of the MMNR's ecology are not fully understood. Therefore, potentially in conjunction with the study described under Action 2.2 above, MMNR management will support further studies to help identify the causes of these declines and any impacts on the large carnivore populations in and around the MMNR, and to suggest concise and practical steps that can be taken by MMNR management to help address these issues.

#### Action 2.4 Support programmes to deal with domestic-wild animal disease transmission

Both communities around the MMNR and scientists/researchers working in the area have highlighted disease transfer between wildlife and domestic animals and *vice versa* as a major issue. Evidence has shown that disease impacts can be particularly severe on large carnivores, and canine distemper virus (CDV) is thought to have caused several fatal epidemics in lions and canids within the Serengeti National Park.

Similarly, rabies has in the past seriously impacted on the wild dog population in the wider ecosystem. In both cases, domestic dogs have been identified as a major source of disease transmission. In response, the Mara Conservancy has been supporting the vaccination of dogs in Mara Triangle to reduce the incidence of both rabies and canine distemper in domestic dogs around the Reserve. Wherever possible, MMNR management will continue to support this and other programmes to combat domestic-wild animal disease transmission in and around the MMNR (such as MCF, "*turning disease*" or rinderpest).

#### Action 2.5 Support research on the ecology and status of the pangolin in the MMNR

The pangolin or scaly anteater is one of the world's most illegally trafficked species. The species found in the MMNR is the ground pangolin (*Smutsia temminckii*), which is classified by the IUCN Red List as vulnerable. Currently, little is known about the current status, population dynamics, habitat requirements and threats to the species in the MMNR.

Under this Action, MMNR management will promote and support applied research concerning the species and will respond to research recommendations designed to better protect and conserve the Reserve's pangolin population.

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<sup>15</sup> Ottichilo et al (2000) Population trends of large non-migratory wild herbivores and livestock in the Maasai Mara ecosystem, Kenya, between 1977 and 1997; African Journal of Ecology, 38 (3), 202-216

<sup>16</sup> David S. Green, Zipkin, E.F., Incorvaia, D.C. and Holekamp, K.E. (2019). Long-term ecological changes influence herbivore diversity and abundance inside a protected area in the Mara-Serengeti ecosystem. *Global Ecology & Conservation*, 20, 1-14.

### 5.3.3 Objective 3: Protection and management of MMNR habitat mosaic improved

Although the Mara-Serengeti ecosystem has undergone a series of well-documented woodland-grassland cycles over the last 100 or so years, and, as some authors have noted “*stability has no place in systems such as these*”<sup>17</sup>, concerns have been raised about the current decline in the extent and species diversity of woodland habitats and thickets, which appears to be specific to the MMNR part of the ecosystem. Within the Reserve, woodlands have declined dramatically over the past four decades, and 46 percent of the Reserve has been converted from shrubland to grassland between 1979 and 1998.

It has also been estimated that mature trees are being lost in the MMNR at a rate of eight percent per year, necessitating significant regeneration if woodlands are to be maintained. These woodlands and thickets provide vital food and shelter for a number of wildlife species, and their reduction within the MMNR may have already seriously impacted on diversity and distribution of some wildlife species within the MMNR.

A combination of unprescribed fires and elephants has been identified as the primary cause of this decline. It has been suggested that repeated burning events, especially “*hot*” fires late in the dry season, have prevented the regeneration of woodlands, and have resulted in a distorted age structure of old trees. This situation is exacerbated by the relatively high, and increasing, population of elephants in the area that maintain the grassland state by eating any new tree seedlings that emerge. Elephants are considered especially important in this regard, as studies have shown that while the majority of seedlings impacted by fire or wildebeest re-sprout within six months, recovery is much slower and damage much greater after browsing by elephants<sup>18</sup>.

In order to address these issues and to improve the protection and management of the MMNR’s habitat mosaic, five management actions have been developed; these are elaborated in more detail in the following sections.

#### Action 3.1 Develop and implement a fire management action plan

A fire management plan was last developed for the MMNR in 1993. However, since this time there have been significant changes in the management of the area, notably the division of the MMNR between Central Mara (Narok) and Mara Triangle, and the intensification of land-use practices and the use of fire as a management tool in areas around the Reserve. As such, the first action under this objective focuses on the development of a simple and practical fire management action plan for the entire MMNR, which will provide managers with clear guidance on the management and control of fire across the area. This action plan will also serve

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<sup>17</sup> Norton-Griffiths, M. (1979) The influence of grazing, browsing and fire on the vegetation dynamics of the Serengeti. In Serengeti, Dynamics of an Ecosystem, edited by A.R.E. Sinclair (1979).

<sup>18</sup> Dublin (1995) Vegetation Dynamics in the Serengeti-Mara Ecosystem: The Role of Elephants, Fire and Other Factors. In Serengeti II, Ed. by A.R.E Sinclair.

to ensure the coordination of fire management practices within the MMNR and enhance compatibility with the approaches used by TANAPA in the neighbouring Serengeti National Park.

The new MMNR Fire Management Action Plan will include the division of the Reserve into burning blocks with associated prescriptions detailing the timing, frequency and rotation of burns, and the identification of areas where firebreaks will need to be developed and/or maintained. Currently, managers on the Mara Triangle side of the Reserve burn around one block per year as soon as possible after the long rains, which accounts for approximately 15 percent of the Mara Triangle area per year, with an interval of 3-5 years between burns. Alongside the lessons learnt from this ongoing management regime, the new plan will also incorporate any appropriate prescriptions and recommendations from the 1993 plan, which include:

- ▶ Early burning (around June) in: Talek/Olemelepo grasslands; Possee/Meta Plains; between Sand River and the Tanzanian border; south of Serena between the road and Mara River; and the Musiara/Emarti areas
- ▶ Early patch burns along the whole of the Siria Escarpment
- ▶ No burn areas around woodlands or thickets, and in the Ngama, Olopilokonya and Ololoitikoishi Hills (by early controlled burning to isolate the hills)
- ▶ Establishment of firebreaks along the Tanzanian border between the Triangle and Lemai Wedge, and around the Ngama and Ololoitikoishi Hills

Once the action plan has been developed (in collaboration with the planned MMNR Ecologist (see Action 5.1 below) and other researchers as appropriate) rotational burning of blocks within the MMNR will then be carried out, and firebreaks established and maintained, ideally through the conversion of existing security tracks wherever possible. Action 3.4 below, and the MMNR Ecological Monitoring Plan, will provide feedback on the impacts and effectiveness of this plan, and inform any management adaptations as necessary.

### Action 3.2 Improve response to unprescribed fires in the MMNR

Improving the effectiveness of management responses to unprescribed fires in the MMNR is an essential complement to the improvements in fire management and control set out in the MMNR Fire Management Action Plan. In order to achieve this, a number of lookouts will be established at key locations around the MMNR to help with the early detection and reporting of fire outbreaks in the area.

Key training needs and critical equipment shortfalls that are impacting on the ability of staff to detect or combat fire will also be identified and addressed. In addition, there are a number of organisations that now provide emails alerting managers of fire outbreaks in specified protected areas (such as the NASA Fire Information for Resource Management System - FIRMS). These will be investigated and, if appropriate, utilised by MMNR management to help improve responses to fires either within or in the vicinity of the MMNR.

### Action 3.3 Map and record geographical and temporal distribution of fires in the MMNR

The development of the Fire Management Action Plan will provide the basis for a more structured and coordinated approach to fire management within the MMNR. However, MMNR management will require information on the impacts of the action plan's implementation in

order to ascertain the effectiveness of the revised fire management and control practices. As a first step towards achieving this, the geographical and temporal distribution of all incidences of fire in the MMNR will be mapped and recorded. This could potentially incorporate both data collected on the ground, using a handheld GPS, and remote sensing data, such as that provided by FIRMS.

This information will then be consolidated and periodically updated in order to provide MMNR managers with a clear picture of any geographic and temporal trends in unprescribed fires in the MMNR, and to help inform management responses and any adaptations necessary. This Action will be linked to the development and implementation of the MMNR Ecological Monitoring Plan (discussed under the final section of this programme).

#### Action 3.4 Initiate studies designed to assess the impacts of fire management on habitat and wildlife diversity, distribution and abundance

Alongside information on the effectiveness of the Fire Management Action Plan, Reserve management will also need information on any effects the revised fire management practices may be having on the area's ecology, and in particular impacts on the diversity and extent of woodland and shrubland habitat within the MMNR, and any alternations in the movements and distribution of wildlife in response to the new burning regimes.

MMNR management will therefore initiate and provide support to studies designed to establish the impact of fire management impacts on habitat and wildlife diversity, distribution and abundance, and, as appropriate, to recommend management adaptations to optimise fire management in the area. This will either be carried out by MMNR staff themselves, in collaboration with WRTI, or by an independent researcher, potentially as part of a masters or doctorate research study.

#### Action 3.5 Monitor trends in MMNR elephant population dynamics and impacts on key habitats

As discussed above, elephants have been identified as the other major factor causing the decline in woodlands and thickets in the MMNR and appear to be keeping the MMNR in a grassland state. Recent studies have indicated that elephants are one of the few species that are currently increasing in the MMNR. While this is a testament to the success on the part on managers in preventing the decline of this species, this increase runs the risk of exacerbating the impacts of the elephants on the MMNR habitat mosaic, and undermining other efforts set out in this programme to manage and protect this important feature of the MMNR's ecology.

It is therefore essential that the population trends and dynamics in the MMNR elephant population continue to be monitored, and that their impacts on the MMNR's vegetation be clearly ascertained, in order to provide a firm information base for any future management responses that may be necessary. MMNR management will therefore promote and support research that focuses on monitoring trends in elephant population dynamics in the area and their impacts on key habitats, such as the research work being carried out by the Mara Elephant Project. Of special importance will be research that is aligned with research priorities identified in the Kenya National Elephant Action Plan (NEAP).

### 5.3.4 Objective 4: Collaboration with relevant institutions in maintaining MMNR water catchments strengthened

The trans-boundary Mara River Basin covers 13,834 km<sup>2</sup> (65 percent of which is in Kenya). The 395 km-long Mara River is the principal perennial river in the greater Mara-Serengeti Ecosystem, and rises in the Mau Escarpment at around 2,932 m, from where it flows through the MMNR and the Serengeti National Park to an altitude of 1,134 m where it enters Lake Victoria. The river's main perennial tributaries are the Amala and the Nyangore Rivers, which drain from the western Mau escarpment, and the Sand and Talek Rivers, which rise in the Siana and Loita Hills respectively. The Mara River is the primary, and occasionally the only, dry-season source of water in the MMNR and Serengeti National Park, and the survival of the large mammal migrations in their current form, and the vast majority of wildlife within the MMNR, depend on seasonal access to the river, especially during periodic droughts.

However, over recent years the river's flow has become increasingly seasonal and unpredictable, primarily due to deforestation in its forest catchments and intensifying water extraction along its course. Digital analysis of remote sensing images has showed that between 1973 and 2000, forests and shrubland in the Mara River Basin have reduced by 32 and 34 percent respectively. In addition, simulation results have shown that 2000 land cover data produces higher flood peaks and faster travel times compared to the 1973 land cover data<sup>19</sup>. It appears likely that increased effluent discharge from a variety of sources is also seriously impacting on the quality of the water the river contains.

In order to address these issues and help maintain sufficient provision of unpolluted water to the MMNR, four management actions have been developed. These are elaborated in detail in the following sections.

#### Action 4.1 Carry out water level and quality monitoring in Mara, Talek and Sand Rivers

As discussed above, the Mara River provides a critical dry season source of water for much of the Reserve's wildlife and is also vital for the survival of the wildebeest migrations in their current form. Several past and present projects have focussed on monitoring water flows in the Mara River and improving water management in the Mara River Basin. These include the WWF-supported project "*Transboundary Water in the Mara River Basin*" initiative, Wageningen University's Mau Mara Serengeti Sustainable Water Initiative (MAMASE), and Yale University's Mara Project.

MMNR management will support these and related initiatives through the establishment of water level monitoring points at key points within the Reserve. Water levels will then be monitored at these points, in line with the protocols specified by the project, and the resulting information provided to the project for collation and analysis.

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<sup>19</sup> Mutie, S.M. *et al* (2006). Evaluating Land Use Change Effects on River Flow using USGS Geospatial Stream Flow Model in Mara River Basin, Kenya. Proceedings of the 2nd Workshop of the EARSeL SIG on Land Use and Land Cover

Action 4.2 Support the development of a low water early warning system for key rivers in the MMNR

Information from Action 4.1 will help establish a robust information base of long-term trends and variation in water levels in key rivers in the MMNR. However, although an essential first step, pressure for water extraction and use is likely to intensify during the 10-year implementation period of this plan, and monitoring alone will not be sufficient to ensure that sufficient water reaches the MMNR and the SNP to support the wildlife these areas contain. As such, MMNR management and Narok County will collaborate with key stakeholders and research initiatives in the catchment to support the development of low water early warning system for key rivers in the MMNR. This will be designed to trigger responses upstream to reduce extraction, and hopefully increase the river's overall water level during critical periods.

Using the information from Action 4.1, and other existing literature and studies, a vital first step will be to establish critical low water thresholds that once crossed will initiate an upstream response. Once these benchmarks have been established, MMNR management and Narok County will continue to support and participate in the establishment of the low water level early warning system, and in discussions with key upstream stakeholders regarding their responses when the low water thresholds are breached.

Action 4.3 Participate in Mara River Basin Water Resource User Association(s)

Water Resource User Associations (WRUAs) were created under the Water Act of 2002 as an institution to manage water at local levels. They provide a forum through which allocation and utilisation of water resources in a basin or sub-basin can be overseen, and conflicts over water use can be addressed and resolved. They have proved successful at resolving water resource use and allocation conflicts, and by the end of 2003, nine out of 13 WRUAs had dealt with more than 52 different cases of conflict through arbitration and negotiation, 85 percent of which were successfully addressed.

With support from WWF, a "*Mara River Basin Water Users Association*", was formed and registered in August 2003, which has several sub-committees along the Kenyan sub-catchments of the Mara River, and which meets regularly. In order to help ensure that issues impacting on the MMNR are discussed and hopefully resolved through the WRUA, MMNR management will participate in WRUA meetings whenever possible and appropriate.

Action 4.4 Participate in transboundary water users' forum

Although 65 percent of the Mara River basin is in Kenya, activities upstream could have far-reaching consequences not only on the MMNR, but also on the Tanzanian part of the ecosystem, and in particular on wildlife populations and distribution in the Serengeti National Park. In order to help address these concerns it, a transboundary water users forum has been established under the "*Transboundary Water in the Mara River Basin*" project. This forum plays a key role in helping to develop a shared understanding of the conservation needs of both the MMNR and SNP, and in establishing the potential roles of stakeholders in developing a water allocation schedule and transboundary management mechanism. As key stakeholders in the transboundary ecosystem, MMNR management will continue to support and participate in the transboundary water users' forum.

### 5.3.5 Objective 5: Targeted ecological monitoring and management-orientated ecological research carried out

There is a long history of ecological research and monitoring in the MMNR, which has made significant contributions to the global understanding of the area's ecology and biodiversity. Much of the early research and assessment of the area's ecology was carried out under the auspices of the Department of Resource Surveys and Remote Sensing (DRSRS), and later on through KWS. In addition, many foreign and Kenyan universities have conducted research in the area, with some studies going as far back as the 1970s, and a large number of both Kenyan and other international graduate students have also conducted studies in the Reserve. The Maasai Mara Research Station located in the Central Mara (Narok) part of the Reserve is currently the responsibility of the Wildlife Research & Training Institute, Naivasha. The Station has supported a number of researchers and projects in the area and provides a base for the Mara Mobile Veterinary Unit.

However, to date, both ecological research and monitoring have often focussed on topics of interest to researchers themselves, rather than addressing specific management needs. In addition, as is common in many other protected areas around the world, communication and collaboration between managers and researchers has been relatively weak. This situation is particularly problematic in the MMNR, as the researchers and managers often work for different organisations and are not obliged to report to each other on their various activities.

Although the development and implementation of this Ecological Management Programme will go some way towards addressing this problem, by ensuring an explicit link between ecological management actions and ecological monitoring, further steps are needed to strengthen the linkages between researchers and managers, and to ensure that ecological research and monitoring activities are capitalising on their potential to make a positive and significant contribution to the management of the area.

In order to address these issues and improve the targeting and contribution to management of ecological research and monitoring in the MMNR, four management actions have been developed; these are elaborated in detail in the following sections.

#### Action 5.1 Strengthen collaboration between MMNR management and the Wildlife Research & Training Institute regarding ecological research and monitoring

As mentioned above, one of the key issues impacting on the coordination and management of ecological research and management in the MMNR is the several institutions with responsibilities for different aspects of the area's management. In the past, ambiguities in the relationships between these organisations have inhibited the flow of information between researchers and managers of the area, which has both undermined the impact of research findings on management and created problems for scientists conducting research in the area.

In response, the first Action under this objective focuses on formalising the existing relationship between Narok County/ MMNR management and WRTI with regard ecological research and monitoring in the Reserve. This agreement will specify the roles and responsibilities of

each of the parties, and in particular set out respective responsibilities for the implementation and coordination of ecological monitoring and research activities in the MMNR.

Once the collaborative arrangements between MMNR management and WRTI with regard ecological research and monitoring have been clarified, under this Action MMNR management and Narok County will also work with WRTI towards upgrading the Maasai Mara Research Station with the aim of establishing the Station as a centre of excellence for the Greater Mara Ecosystem, including a geo-spatial observatory. The Research Station will have the following main objectives:

- Carrying out innovative training in effective management of protected areas, endangered species, biodiversity and ecosystems
- Collecting and categorizing all research and monitoring being done in the Mara ecosystem and building a globally significant information repository
- Supporting the dissemination of cutting-edge best management practices sourced from protected areas around the world

These efforts will also be linked to efforts to develop part of the Maasai Mara Research Station as an education centre for local school and youth groups (see Action 1.4 of the Community Outreach & Partnership Programme). Narok County and MMNR management will look at the feasibility of establishing a small animal rehabilitation centre at the Research Station for treating injured wildlife. Such a centre could also serve as a learning facility and visitor attraction.

Lastly, in order to provide a basis for the ongoing engagement of MMNR management in the implementation of this Ecological Management Programme, under this Action, Narok County will recruit an ecologist to oversee research and monitoring activities in the Reserve, provide a direct link between management and research and monitoring activities in the area, and help ensure that all activities are reported to area management in a concise and appropriate format (see Protected Area Operations Programme, Action 3.2).

#### Action 5.2 Design and implement MMNR Ecological Monitoring Plan

Ecological monitoring of the MMNR is a vital part of the Ecological Management Programme. Ecological monitoring has been carried out, to varying degrees, in and around the Reserve since the mid-1970s, and a formal ecological monitoring programme focusing on specific aspects of the area, such as rainfall, herbivore age and sex, and vegetation plots, was carried out between 1989 and 2003. However, the sustainability of this programme, which was implemented by a variety of organisations in turn (FoC, WWF, and DICE) was a problem, and linkages between the information collected through this programme and management of the area were weak<sup>20</sup>.

This management programme provides the basic information needed for the development of a revised and updated MMNR Ecological Monitoring Plan based on the MMNR conservation targets, their key ecological attributes and the priority threats to their integrity (as identified

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<sup>20</sup> Walpole M. (2003) A brief review of the Maasai Mara Ecological Monitoring Programme. DICE.



through the TNC CAP process), and also elaborated in the Ecology Programme Monitoring Framework section (see below). The continued use of the attributes identified through the TNC process as a basis for ecological monitoring helps to ensure clear and explicit links between the elements of the MMNR that are the focus for ecological management, and those that are being monitored (thereby enhancing the ability of monitoring information to inform management of the area). The MMNR Ecological Monitoring Plan will be developed as one of the first actions to be implemented under this management programme and will subsequently provide the basis for all routine ecological monitoring in the MMNR.

The monitoring plan's development will involve an initial review of the relevant information presented in this programme, and the subsequent definition of the conservation targets' KEAs and threats that will be included in the monitoring plan. This will be followed by the identification of appropriate monitoring indicators, and methods of measurement (as outlined in the programme monitoring section), along with the development of detailed monitoring protocols, and the allocation of responsibilities for collecting and analysing information between WRTI, MMNR management and any external organisations.

Once monitoring work is underway, concise and easily digestible annual summaries of the information collected will be prepared and presented to MMNR management, KWS BRM Division and other relevant stakeholders. Any important trends or implications for management will be highlighted in these reports, with suggested management adaptations as appropriate. This last point is especially important, as without this vital link, much of the ecological information is likely to be unused or unusable, wasting both time and resources of those collecting and analysing the data.

### Action 5.3 Facilitate application of research protocols for priority MMNR research projects

The MMNR is fortunate to have a number of long-running, independent research projects, which have made substantial contributions to the existing knowledge of the area's ecology. However, although the potential contribution of external researchers to MMNR conservation and management remains high, some research programmes and students that have worked in the area have not in the past provided managers with reports of their findings, or have not provided the information in a concise and easily digestible form.

On the other hand, researchers have had difficulty in getting the necessary permissions to begin work in the Reserve and to date there has been no formal procedure for processing and approving applications for researchers wishing to work in the MMNR, which has led to wasted time and resources and forced some researchers to delay work or pursue options elsewhere.

In response to these issues, Narok County is in the process of developing research protocols that set out parameters for conducting research within the MMNR, and the obligations of researchers that are granted permission. Once the protocols are finalised, MMNR management will support their dissemination and will provide guidance and support to priority potential research initiatives (see next section) in fulfilling the Narok County application process, as well as the research approval requirements of the National Commission for Science, Technology and Innovation and WRTI.

**Action 5.4 Identify and publicise priority research needed to support MMNR ecological management and monitoring**

There are a large number of ecological issues that need to be better understood in the MMNR that neither the Maasai Mara Research Station nor MMNR management have staff or the resources to address. However, the MMNR is a highly desirable research location, and the demand for carrying out research in the MMNR by external researchers and scientists is unlikely to diminish over the implementation period of this plan. If properly targeted and reported back to management (in line with the NC research protocols established under the previous action), the information generated by these external researchers has the potential to play an important role in informing the ecological management of the area.

Therefore, while not seeking to exclude non-management orientated research in the MMNR, priority areas that MMNR management would like information on will be identified and publicised. Any subsequent applications to carry out research addressing these areas will be given priority, especially if there are a high number of applications for research at a given time. A preliminary list of studies that have already been identified as research priorities during the development of this management programme is shown in Table 18 below. Once finalised, this list will be made available, along with the NC Research Protocols, from MMNR management, the Maasai Mara Research Station, and on the Internet.

Table 18. MMNR Research Priorities

Study topic	Rational and recommendations
Impacts of tourism facilities on stream water quality and fuel-wood harvesting	<ul style="list-style-type: none"> <li>▶ Focus on concentrations of facilities e.g. around main gates</li> <li>▶ Study could also examine rubbish dumpsites and impacts on wildlife distribution (e.g. baboons, Marabou storks, etc.)</li> </ul>
Impacts of fire	<ul style="list-style-type: none"> <li>▶ On species composition and diversity, especially woodlands</li> <li>▶ Influence of fire frequency and intensity</li> </ul>
Impacts of off-road driving on habitats and wildlife	<ul style="list-style-type: none"> <li>▶ In particular, impacts on wildlife distribution and use of space, behaviour and activity budgets, and habitat degradation/destruction</li> </ul>
Size, distribution and impacts of livestock grazing on wildlife populations	<ul style="list-style-type: none"> <li>▶ Some research already carried out/ongoing</li> <li>▶ Focus along northern and eastern MMNR boundaries</li> <li>▶ Cover both diurnal and nocturnal activities, and include adjacent areas where grazing pressure is higher</li> </ul>
Large carnivore demography distribution, natality and recruitment dynamics	<ul style="list-style-type: none"> <li>▶ Some research already carried out/ongoing</li> <li>▶ Important in view of recurrent climatic extremes, and possible associated decline in herbivore populations</li> <li>▶ Focus should include lion, cheetah, hyena and leopard</li> </ul>
Habitat desiccation and implications for herbivores	<ul style="list-style-type: none"> <li>▶ Recent frequent and severe droughts have highlighted the importance of this aspect of the area's ecology</li> <li>▶ Focus on impacts on herbivore forage quality and quantity, and water availability</li> </ul>

Study topic	Rational and recommendations
Poaching impacts on wildlife distribution, demography and mortality	<ul style="list-style-type: none"> <li>▶ Particular focus on impacts within the Mara Triangle where pressure is higher</li> </ul>
Impacts of changing land uses on wildlife abundance and movements	<ul style="list-style-type: none"> <li>▶ Some research already carried out/ongoing</li> <li>▶ Issues of particular importance include impacts of changes on seasonal movements between the MMNR and adjacent areas</li> <li>▶ Also need to examine historical concentration grounds and any changes in or impacts on migration routes</li> </ul>
Competition between buffalo and livestock within and adjacent to the MMNR	<ul style="list-style-type: none"> <li>▶ Some research already carried out/ongoing</li> </ul>

## 5.4 Programme monitoring framework

The Ecological Management Programme Monitoring Framework provides a mechanism for assessing the achievement of each of the management programme's five objectives. As shown in Table 19 below, the framework sets out the desired positive impact of each of the programme's objectives, indicators that the objective has been successfully achieved, how these indicators can be measured, and potential information sources.

Table 19. Ecological Management Programme Monitoring Framework

Management objective	Success indicators	Specific measurements	Data source
Obj. 1: Black rhino conservation and management strengthened	The MMNR Black rhino population is growing in accordance with National Rhino Strategy targets	MMNR Black rhino population size	Rhino monitoring records (c.f. Action 1.3)
		Rhino population recruitment rates	
		Rhino age and sex ratios	
	Critical woodlands and breeding habitats used by the rhino population are maintained	The extent of riverine forest along Mara, Sand and Talek Rivers	MMNR Ecological Monitoring Records (c.f. Action 5.2)
		The extent and species composition of woodlands and thickets	
	Black rhino deaths through poaching or other human-induced causes are being maintained at acceptably low levels or eliminated	The number of human-induced black rhino deaths	Rhino monitoring records (c.f. Action 1.3)
Obj. 2: Understanding of the ecology and	Large carnivore population dynamics and factors negatively impacting on	Population sizes of selected large carnivore species in and around the MMNR	Ecological monitoring records (c.f. Action 5.2)

Management objective	Success indicators	Specific measurements	Data source
status of MMNR species conservation targets enhanced	carnivore numbers in and around the MMNR are understood and documented	Identification of key factors impacting on large carnivore population dynamics	Research study reports (c.f. Action 2.3 and 2.4)
	The feasibility of reintroducing Roan antelope and Greater kudu to the MMNR is fully understood and a reintroduction programme has been developed, as appropriate	Identification of key factors leading to Roan antelope and Greater kudu decline and extinction in the MMNR	Research study reports (c.f. Action 2.1)
		Documentation of Reintroduction Programme according to IUCN-SSC guidelines	MMNR management records
	The ecology and population dynamics of Greater kudu in the Greater Mara Ecosystem is better understood	Greater kudu population size in the Greater Mara Ecosystem	Research study reports (c.f. Action 2.2) and Ecological monitoring records (c.f. Action 5.2)
Spatial distribution of Greater kudu in the Greater Mara Ecosystem			
Obj. 3: Protection and management of MMNR habitat mosaic improved	Fire in the MMNR is well managed and is making a positive contribution to the conservation of key MMNR habitats	Incidence of unprescribed fires in the MMNR	Ecological monitoring (c.f. Action 5.2) and management records (c.f. Action 3.3)
		Extent of unprescribed fires within the MMNR	
		Species composition of woodland and thickets	Ecological monitoring records (c.f. Action 5.2)
	Human-induced declines in MMNR woodlands and thickets have been halted or reversed	Area of woodland and thickets within the MMNR	Ecological monitoring records (c.f. Action 5.2)
Obj. 4: Collaboration with relevant institutions in maintaining MMNR water catchments strengthened	Information on the quantity and quality of water in key MMNR rivers is routinely collected and documented	Monthly water levels and flow in the Mara, Sand and Talek Rivers	Ecological monitoring records (c.f. Action 5.2)
		Water quality (sediment and dissolved chemicals) in Mara, Sand and Talek Rivers	
	MMNR water requirements and issues are being tabled and addressed in water catchment decision-making forums	MMNR management participation in Mara River Basin management forums	MMNR management records or reports
Obj. 5: Targeted ecological monitoring and	Information on the status of MMNR Conservation Targets is being routinely	Routine management reports on the MMNR Ecological Monitoring Plan prepared by	MMNR management records or reports

Management objective	Success indicators	Specific measurements	Data source
management-oriented research carried out	collected and made accessible to MMNR managers	the MMNR Ecologist (c.f. Action 5.2)	
	MMNR research findings are being incorporated into MMNR management programmes	Management reports on MMNR research studies produced by the MMNR Ecologist or study leader	MMNR management records

# 6. Tourism Management Programme

## 6.1 Programme purpose

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The MMNR is providing a world-class tourism product that builds on and preserves the ecosystem's outstanding ecological features and wildlife, and that provides optimal economic benefits for Narok County communities and the nation

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The MMNR has experienced major increases in visitor numbers over recent years, primarily as a result of the growing numbers of tourists visiting Kenya, coupled with growing international recognition of the Reserve as one of the world's finest wildlife destinations and the rapid development of tourist accommodation facilities in the wider ecosystem. On the positive side, these visitors generate significant revenue through their entrance and bed-night fees that support MMNR management operations, Narok County development projects, and benefit sharing with communities living around the area. However, at the same time, the rapidly escalating visitor use and tourism accommodation development both in and around the MMNR is now impacting on the quality of the area's tourism product, in particular by undermining the wilderness qualities and exceptional wildlife that attract visitors to the Reserve in the first place.

One of the greatest challenges facing the MMNR is the management of these high numbers of visitors in order to develop and maintain a world-class tourism product in the MMNR and secure the sustained flow of benefits accruing from the area, while also ensuring that visitor use does not place excessive pressure on the MMNR's sensitive ecology and wildlife. The increased demand for the Mara tourism product is likely to continue over the lifespan of this management plan, and strategic, proactive, and prioritised management actions are now needed more than ever to ensure that the benefits of tourism to the area's financial sustainability and conservation are maximised, and that the Mara tourism brand is not undermined by overuse.

In response to these and other emerging tourism management issues, this programme sets out a comprehensive set of objectives to be achieved and actions to be implemented, which coupled with the Visitor Carrying Capacity and Zonation and Visitor Use chapters of this plan, will achieve the overall programme purpose statement set out above.

## 6.2 Management objectives and actions

Four management objectives have been defined for the Tourism Management Programme, as follows:

Objective 1. Visitor attractions, amenities and infrastructure enhanced

Objective 2. Regulation and management of visitor activities strengthened

Objective 3. Quantity, quality and management of visitor accommodation optimised

Objective 4. Tourism administration systems improved, in collaboration with tourism industry partners

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

### 6.2.1 Objective 1: Visitor attractions, amenities and infrastructure enhanced

High concentrations of visitors at peak times of year is a common feature of the MMNR, especially around entrance gates and wildlife spectacles, such as river crossings or carnivore sightings, and also at popular tourism attractions that have either been specifically developed in the area, such as the picnic sites in the Mara Triangle, or have developed more informally as demand has increased (such as the popular lunch spot at the hippo pools on the Mara River). Visitor overcrowding and vehicle congestion has not only impacted on the quality of the tourism product that the Reserve is able to offer but has also been the cause of increased disturbance to the area's wildlife and environment.

In contrast to many protected areas, however, the MMNR is fortunate to have high densities of easily visible wildlife distributed throughout the Reserve, and there are a number of strategies that can be pursued by management to influence visitor use patterns and to reduce congestion and overcrowding, with the ultimate aim of improving the quality of the tourism product the Reserve provides, while reducing the environmental impacts from visitor use. These strategies include: the improvement or development of new tourism attractions within the MMNR to encourage wider use of the area; upgrading the Reserve's game viewing track network; and improving visitor information facilities and materials in order to help raise awareness of attractions throughout the area.

In response to these issues, and to capitalise on the untapped opportunities the MMNR presents, this objective has been developed to improve the visitor attractions, amenities and infrastructure provided for visitors to the MMNR. Six actions have been developed to achieve this objective; detailed below.

#### Action 1.1 Improve visitor facilities, amenities and visitor information services at MMNR entrance points

Many visitors arrive at the MMNR after a long and tiring journey by road or air, and the provision of well-maintained and clean bathroom facilities is an important aspect of creating a favourable first impression of the Reserve. Currently, washroom facilities are provided within the MMNR near the Mara Bridge, and other facilities are also available at some gates and airstrips; however they are lacking at a number of important entry points, or else the existing facilities are in a poor state of repair and are not of a standard that visitors expect.

A high priority under this programme is therefore the development of adequate washroom facilities at all entrance gates and airstrips within the MMNR. In conjunction with this development, management will also ensure that all airstrips have adequate shaded rest areas where visitors can wait for their flights in comfort. At entrance gates on the border of the Reserve, the potential for developing additional visitor amenities will also be investigated.

This could include the establishment of shaded picnic areas, the possible development of small cooperative shops to reduce souvenir hawking at gates, and the development of visitor information services, such as information boards informing visitors of the MMNR values and regulations. Additional visitor interpretation materials, such as guidebooks and maps (developed under Action 1.6 below), will also be sold to visitors on arrival. Finally, the opportunities for landscaping and potential screening of staff housing and facilities near entrance gates will also be investigated, and improvements implemented where necessary.

### Action 1.2 Develop new tourism attractions and visitor facilities in the High Use and Mara River Zones

The development of appropriate and conservation-compatible visitor attractions in the HUZ and MRZ has the potential to enhance the MMNR visitor experience by increasing the diversity of the tourism product, providing opportunities for increasing visitor understanding and appreciation of the exceptional resources the Reserve contains, and, in many cases, providing a much-needed opportunity for visitors to spend time out of their vehicles. In addition, the development of such attractions will complement efforts to reduce overcrowding in the Reserve by providing a complementary activity to wildlife viewing, and also has the potential to encourage visitation of currently underutilised parts of the Reserve.

As discussed above, at present there are a small number of picnic sites established in the Mara Triangle, and other sites that have developed more informally elsewhere in the Reserve. In light of their popularity and the benefits described above, under this action new attractions will be developed within the High Use and Mara River Zones to complement these existing attractions. This will include the development of resting areas and toilet facilities at the Mara River Bridge, which will be complemented by the development of a permanent viewing platform at the already popular hippo pool in this area, and the possible development of a short walking trail along the river (which will require a ranger escort, as has been initiated and proved popular along the Mbagathi River in Nairobi National Park).

In addition, a number of new picnic sites will be developed in both zones, including several along the Mara River. Simple visitor toilet conveniences will also be developed at other key areas in the High Use Zone, such as Lookout Hill, and other locations identified by area managers, in consultation with relevant tourism stakeholders, during the implementation period of this plan.

### Action 1.3 Develop and implement standard signage guidelines for entire MMNR

At present there are no established signage standards in the MMNR. As a result, a number of tourism facilities in and around the area have erected their own signs within the Reserve, all of which are in different styles and materials, and some of which are large and out of keeping with the “*natural*” ambience that is an important feature of the MMNR tourism product.



Furthermore, increased signage from management will be required throughout the area during the implementation of this plan, which will include signs to encourage use of new game viewing circuits (discussed under the next action), to mark the zone boundaries, and signs at any new attractions and entrance gates.

This action therefore focuses on the development of standard signage guidelines that will subsequently be implemented throughout the Reserve as a way of addressing these issues, and also to help consolidate the image of the Mara brand. These guidelines will ensure that all signage within the Reserve is in keeping with the image of the area that MMNR management is working to convey, and could include, for example, stipulating the use of wood or local stone or other natural materials/colours, sign size and layout, and logos or symbols to be incorporated.

Once the standards for signage have been agreed by management, this will then be rolled out to signs across the entire Reserve. This will necessitate the replacement of existing operator signs with those developed according to the new guidelines, and the erection of signs at other key areas, such as entrance gates, zone boundaries and along game viewing circuits.

#### Action 1.4 Improve game viewing circuits in the High Use Zone

The development of sufficient, well-placed and well-maintained game viewing circuits in the MMNR High Use Zone is perhaps the most important strategy for improving the overall quality of the visitor experience in these areas. The development of such circuits is also vital for enhancing the dispersal of visitors throughout the HUZ and reducing both vehicle congestion and the temptation for tourism vehicles to go off road. As a first step towards improving game viewing circuits in the High Use Zone, MMNR management will build on and enhance current efforts to rationalise the game viewing track network in key areas by clearly demarcating approved tracks, signposting existing circuits, and closing any inappropriate unofficial tracks that may have developed.

As a basis for this work, a comprehensive review of game viewing tracks was carried out across the MMNR in 2019, including mapping of game viewing tracks to be maintained and unofficial ones that need to be closed. Based on this mapping, detailed budgets and plans of works need to be developed for each new road development in line with the review's recommendations. This action will be implemented with Action 4.3 of the Protected Area Operations Programme, which addresses the same issue.

#### Action 1.5 Develop MMNR Visitor Centre at the South Mara Bridge

The development of an MMNR Visitor Information & Interpretation Centre has the potential to add a new and exciting dimension to the MMNR tourism product, and an effective mechanism for informing visitors about the exceptional resources the Reserve protects and the work that is involved in managing the area. The centre could include a museum that illustrates the biodiversity and cultural significance of the Reserve and wider ecosystem. The centre would serve to reduce traffic on the roads while visitors explore the centre, thereby helping to reduce traffic congestion within the Reserve.

The Serengeti National Park has an excellent visitor interpretation centre in Seronera at the heart of the park (developed with funding from the EU), which has proved extremely popular with visitors, many of whom picnic there if they are out for a full day's game drive. Although somewhat out of date, a visitor survey included in the 1983 Reserve management plan showed that almost 75 percent of visitors to the MMNR would be interested in visiting a "*museum or ecology centre*".

The South Mara Bridge has been identified as the most appropriate location for a new visitor interpretation centre, because this area is already heavily used by visitors, and this location would enable visitors from both sides of the Reserve to benefit from the centre's existence. The development of such a centre is clearly an ambitious task, and its establishment to the quality and standards that a destination like the MMNR demands is likely to require significant investment, and options for private sector and/or donor funding will need to be investigated.

As a first step towards achieving this, an initial concept paper outlining the proposed centre's functions and facilities will be developed together with an idea of the likely costs involved, which can then be used to approach potential donors. Once funding has been sourced, detailed plans will need to be developed, an EIA carried out, and stakeholder consultations initiated to solicit feedback on the proposals. Following on from any adaptations to the proposed plans, MMNR management will subsequently oversee the centre's construction in line with the agreed specifications.

#### Action 1.6 Support updating of the MMNR visitor map and guidebook

The implementation of this management plan will have a variety of impacts on the way visitors use the Reserve, and on the location of amenities and tourism accommodation facilities in the area. These changes (including zone boundaries, accommodation facility location and names, the location of tourism attractions and visitor amenities, as well as the layout of new game viewing circuits) will all need to be conveyed to visitors and guides using the area. One of the most effective methods of achieving this will be the updating of the MMNR visitor map and the development of an associated guidebook.

Under this management action, therefore, MMNR managers will collaborate with service providers to revise the existing map to incorporate recent changes, and to develop a guidebook for the area. Management will provide them with all relevant information including, for example, the location of new game viewing circuits, visitor attractions, and zone boundaries. Once the revised map and guidebook has been produced it will be made available for sale at appropriate points in the MMNR, which could include for example entrance gates and the new visitor centre.

### 6.2.2 Objective 2: Regulation and management of visitor activities strengthened

As in any intensively used protected area, adherence to the MMNR's rules and regulations is vital for ensuring that the high standards of the tourism product are maintained, and that visitor use has the minimal possible impacts on the area's ecology and wildlife. In the past, it has often proved difficult for MMNR managers to control visitor behaviour and enforcing the

area's rules has often been a problematic and time-consuming task. This is due to a variety of factors peculiar to the MMNR, including the predominant grassland habitat in and around the area, which makes off-road driving relatively easy, and which has contributed to vehicles crowding and approaching extremely close to animals.

In addition, the area's long and difficult-to-police border has also made it easy for vehicles to either intentionally or unintentionally enter the area without paying entrance fees. There has also been a low general awareness of the area's rules and regulations which, when combined with the inexperienced drivers and guides used by some operators, has also contributed to frequent infringement of MMNR rules. This situation has been further compounded by short-falls in personnel and equipment dedicated to monitoring visitor activities, which has meant that the majority of offences in the area have often gone either undetected or unpunished.

Significant progress has recently been made to address this issue, most notably in the Mara Triangle with the introduction of three vehicles dedicated to regulating visitor conduct. However, at peak times of year these resources are heavily stretched, and visitor behaviour in the remaining part of the Reserve remains unmonitored for most of the year. In response to these issues, this management objective has been developed to bring about the desired future state where all visitors and tourism operations in the area are aware of and are following the MMNR's rules and regulations, with the ultimate aim of enhancing the visitor experience and tourism products the Reserve is offering, while ensuring the protection of the area's exceptional resources. The five actions developed to achieve this objective are set out below.

#### Action 2.1 Develop and disseminate MMNR Visitor Regulations

Clear rules regulating visitor behaviour within the MMNR are essential to ensure that visitor impacts on the MMNR's exceptional wildlife and habitats are minimised, and that a high-quality visitor experience is maintained. Although both the Mara Triangle and Central Mara (Narok) sections of the Reserve have existing visitor regulations, they are not aligned with one another and, in the Central Mara, have not been easily accessible to visitors to the area.

To address this issue, the box below sets out a simple set of MMNR Visitor Regulations for use across the entire MMNR. The regulations will be reproduced in a small leaflet and/or on the back of a postcard and made freely available at key points in and around the Reserve, such as entrance gates, lodges, and ticket outlets. The regulations will also be reproduced on a poster that can be displayed at all MMNR gates and entry points.

### **Maasai Mara National Reserve Visitor Regulations**

Welcome to the MMNR, a natural and cultural heritage of the Maasai, and home of the Great Migration, the Big Five, endless savannahs, and a host of other natural spectacles waiting to be discovered. Please help us to preserve this heritage by following these few simple rules, designed to make your visit safe and enjoyable. Please make sure that your driver/guide doesn't break these rules in their enthusiasm to be of service to you!

**1) Entering and exiting the Reserve**

- ✓ Reserve visitors and their guides are only permitted to enter and exit the Reserve by road at the following designated gates manned by Reserve staff:
  - Sekanani
  - Talek
  - Musiara
  - Ololaimutia
  - Sand River
  - Enoompuai
  - Oloololo
- ✗ Entry to the Reserve by road at any other point is not permitted and will be subject to penalties. Please make sure your guide does not use these illegal entry points.

**2) Please drive carefully**

- ✓ Keep within the maximum speed of 50 km/hour on graded roads, and 30 km/hour on all other roads.
- ✓ Always slow down for animals crossing the road. Never drive through animal herds.
- ✓ Except in the Mara River Zone, you may leave the road to view big cats (lion, cheetah, and leopard) that you have sighted from the road, but you must return directly to the road after you have finished viewing.
- ✓ Be sure you leave the Reserve by 19.00pm if staying outside the area or are back at your accommodation by 19.00pm if staying inside.
- ✗ Do not drive off road in the High Use or Mara River Zone: keep to graded roads and cut tracks in these zones.
- ✗ If you drive off road in the Low Use Zone to view big cats, don't follow the tracks of other vehicles – follow a different line to approach the animals, and avoid waterlogged areas, sharp turns and wheel spinning
- ✗ Do not sit or stand on the vehicle's roof at any time.
- ✗ If you drive off road to view big cats near the Tanzanian border, be sure not to cross the border into Tanzania. The MMNR management will not take any responsibility for people arrested in Tanzania for crossing the border illegally.
- ✗ You are not be permitted to enter the Reserve after 18:30pm.

**3) Observe, but don't disturb**

- ✓ Keep at least 25 metres distance from all animals whenever possible.
- ✓ A maximum of five vehicles are allowed around lions, rhinos, leopards and cheetah.
- ✓ If there are five vehicles already viewing, please wait at least 100 metres away for others to finish viewing before approaching.
- ✓ When other vehicles are waiting to view, you must move on after 15 minutes with the animals.
- ✗ Do not chase, follow or harass animals.

**4) Consider other visitors too**

- ✗ The use of two-way radios is not permitted when near wildlife. Also, make sure that the volume of the radio is turned down so as not to disturb the wildlife or other visitors.
- ✗ Similarly, if using a digital camera, please keep all sound effects off or at low volume.
- ✗ When viewing animals please talk quietly, and do not clap, shout or cheer.

**5) At migration river crossings**

- ✘ Don't block or disturb crossings by parking too close or driving through animal herds.
- ✘ Never alight from your vehicle at or around crossing areas; this is extremely dangerous.

#### 6) **Health and safety**

- ✓ Fire is always a risk: please take care with cigarettes and matches. No campfires are permitted except in authorised campsites.
- ✓ Please only get out of your vehicle at picnic spots or other designated areas; if you must get out, please stay within 10 metres of the vehicle at all times.
- ✓ Don't feed the animals, it is not only very dangerous, but can upset their natural behaviour patterns.
- ✓ Please take all your litter with you when you go, and don't remove any bones, flowers, plants, wood or other objects from the Reserve.

Please respect these rules and our rangers, who are there to ensure the protection of the wildlife and the environment, as well as your safety. If you break any of the above rules, rangers have the legal right to:

- ▶ Impose an on-the-spot fine
- ▶ Have a vehicle and/or people removed from the park immediately
- ▶ Have a vehicle and/or people banned from the park

Help us to protect the Reserve: If you see park rules being broken, please take a photograph of the incident (preferably with vehicle's number plate) and send to [marainfo@narok.go.ke](mailto:marainfo@narok.go.ke) and [mara@maratriangle.org](mailto:mara@maratriangle.org)

### Action 2.2 Strengthen visitor management at migration river crossings

Migration crossings of the Mara River are one of the Reserve's outstanding and unique wildlife spectacles, and in recent years have been a driving force in attracting the high numbers of visitors to the area. From many visitors' perspective, these crossings are synonymous with the migration, and as a result they are a must-see, and lead to huge concentrations of vehicles building up at crossing points during the tourism high season. In some instances, more than 150 vehicles have been recorded at a single crossing, which not only severely undermines the impression of the Mara that visitors go away with, and the overall quality of the tourism experience, but also has potentially serious environmental impacts (concentrations of vehicles have in the past either interrupted the crossings, or led to large numbers of wildebeest dying as they attempt to cross the river in a stampede).

The management of visitors at migration crossings is therefore one of the major challenges for this Tourism Programme and, alongside the development and dissemination of specific rules and regulations governing visitor behaviour (included in the Visitor Regulations detailed under the previous action), Reserve managers will take specific steps during the lifespan of this management plan to strengthen controls of these trademark MMNR wildlife viewing events.

Under this Action, managers responsible for each section of the Reserve will coordinate with each other when establishing crossing viewing areas to ensure that wherever possible viewing is staggered between crossings, leading to a more desirable outcome from both a tourism product and ecological impact perspective. In addition, a small, unobtrusive viewing platform, with a parking area a short distance away, will be developed on the Mara Triangle side of the

Serena Crossing. The area is well shaded by trees, and only minimal development including a clear path, some seating and a barrier, need to be developed in order for it to provide a good alternative to viewing crossings from vehicles.

However, these measures are unlikely to have a significant impact on the heavy visitor pressure on the migration crossings. For this reason, this plan proposes that Narok County should examine the feasibility of establishing a separate ticket for viewing the migration crossings, which would be in addition to the normal MMNR entrance ticket. The migration crossing ticket would be levied per vehicle and would be limited to a fixed number of tickets daily, designed to ensure that the migration crossings are not overcrowded and that the environmental impacts of visitors are minimised. In addition, if there is extensive demand for these tickets, it may also be necessary to introduce a lottery system to ensure that the tickets are not bought up far in advance by a small number of tour operators.

Although the crossings on the Mara River are the most well-known, they also occur along parts of the Talek and Sand Rivers. Additional, similar management approaches may also need to be implemented along the sections of these rivers, as and when crossings occur in this area. All these initiatives will be complemented by the increased policing of visitor activities, discussed in more detail under the next action.

### Action 2.3 Increase deployment of Ticket Inspection and Anti-Harassment Units

Experience from a number of protected areas has shown that, provided they are sensitively and appropriately implemented, visitor patrols can play an important role in encouraging proper visitor and driver behaviour, and are a necessary complement to the dissemination of standardised rules and regulations as well as other mechanisms to strengthen visitor management described in the previous actions.

The effectiveness of visitor patrols has been demonstrated in a number of heavily used protected areas, including for example Tsavo East National Park, which faces similar challenges to the MMNR, where KWS has deployed a number of specialist “*Ticket Inspection Units*” to help combat illegal or undesirable tourism activities. Similarly, the three Suzuki jeep Ticket Inspection and Anti-Harassment Units (TIAHU) that have been operating in the Mara Triangle have proved vital for ensuring adherence to MMNR rules, and in encouraging better standards of behaviour in visitors, guides and drivers.

Under this Action, similar TIAHUs will be established to cover the Central Mara (Narok) section of the Reserve. These visitor patrols are especially important in Central Mara because of the high numbers of day visitors to the area, and the long and open boundary that makes it easy for people to enter the area without paying. Each TIAHU will consist of one vehicle (such as a small Suzuki jeep as used in the Mara Triangle) and a minimum of two staff. These TIAHUs will form an important part of the new Tourism Units developed under Action 3.1 of the Protected Area Operations Programme, and their initial focus will need to be around the main illegal entrance points (“*panya routes*”) to the Reserve, and, during the migration, around the migration river crossings.

As TIAHU staff will be dealing with potentially sensitive situations, all TIAHU staff throughout the MMNR will be trained in visitor handling, so as to ensure that they approach visitors to the area appropriately, and know how to deal with offending drivers/guides while minimising the disturbance to any visitors they may be accompanying. A TIAHU Staff Code of Conduct will also be developed to ensure that staff are clear as to the standards expected of them, and how they should behave when carrying out their duties. This code will formalise a number of initiatives already underway in the area, such as encouraging all communications between TIAHU staff and drivers/guides to be in English, and therefore transparent to most visitors to the area.

In addition, the database of offending drivers/guides that has been established for the Mara Triangle will be expanded to cover the entire MMNR, which will enable management to prevent repeat offenders entering the Reserve. As has already proved effective, the name and company of drivers/guides caught breaking the Reserve rules will also be publicised on management websites and in monthly reports, as a way of encouraging drivers to obey the rules.

in serious cases, TSV licences that are required for such drivers to enter the Reserve may also be revoked (see Action 2.4 below). Finally, TIAHU staff will also be responsible for reducing overall levels of illegal entry to the area by blocking commonly used illegal routes and/or erecting signs to make visitors aware that they are entering the area illegally, and where the closest legal entrance point is located.

#### Action 2.4 Implement standard requirements for all drivers/guides and TSVs

As in many heavily used protected areas, the standards and behaviour of some drivers and guides within the MMNR is a major issue that impacts on both the Reserve's tourism product and its sensitive wildlife and habitats. Poor driver/guide behaviour particular relates to the regular vehicle congestion that occurs in the area (most notably around large carnivores, other "Big Five" species, and migration river crossings), approaching too close to wildlife, and off-road driving. Although many operators do employ experienced and qualified guides who are at least aware that they may be breaking Reserve rules, other operators do not. In addition, during busy times of year some companies also internally redeploy unqualified staff to driving duties or take on seasonal staff (and vehicles), all of whom are less likely to be aware of the MMNR rules and regulations, and who are less able to provide visitors with a quality wildlife viewing experience.

In response, and in order to ensure that only *bona fide* and appropriately licensed tourism operators are utilising the Reserve, MMNR entrance gate staff will ensure that all TSVs entering the Reserve are displaying "Tourist Vehicle Stickers" (as stipulated in Legal Notice No. 97 under Cap 381 of the Laws of Kenya). These stickers are only issued to the registered vehicles of tour operators that have obtained a "Regulated Tourist Licence" (also under CAP 381). Entrance gate staff will also ensure that all driver/guides have an appropriate and up-to-date Tourism Licence (specified as Citizen/Non-Citizen Tour/Driver Guides- Class C (8)/B(8))<sup>21</sup> before being permitted entrance to the Reserve. The enforcement of these national

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<sup>21</sup> Ministry of Tourism, Tourism Licence Requirements (p4).

regulations will help reduce the use of inexperienced drivers and inappropriate vehicles in the MMNR.

In addition, this management plan supports the Narok County's current efforts to establish a licensing scheme for local resident driver/guides specifically for use in the MMNR and surrounding areas. This will provide a mechanism for enabling local residents who for one reason or another are unable to seek national tourism licensing to participate legitimately in the Mara ecosystem tourism industry. The local resident driver/guide licensing will need to be linked to basic training in guiding, and familiarisation with the MMNR tourism guide Code of Conduct, which each approved local resident guide will be required to sign before they are licensed. Successful trainees will be licensed by Tourism Regulation Authority as well as the County. The County will collaborate with and support the Mara Guide Association in identifying and training local guides as well as in ensuring that guide standards are maintained.

To facilitate local driver/guide training, the Narok County Tourism & Wildlife section will identify, and as appropriate support, suitable training facilities that may be available in the greater Mara region. The County will also liaise with the Maasai Mara Wildlife Tourism College and the Wildlife Research and Training Institute in Naivasha about suitable training opportunities.

The new Narok County regulations for local resident driver/guides should also make provisions for MMNR management to ban drivers/guides (both national and local resident) that repeatedly break MMNR rules from the Reserve (linked to the database to be developed under Action 2.3 above).

Lastly, at a future date to be agreed between MMNR management and tourism industry representative organisations, all TSVs entering the MMNR will be required to be painted in earth colours (e.g., dark green, brown or beige), subject to an adequate lead-in period to allow tour operators to prepare for the changes.

#### Action 2.5 Implement measures to reduce environmental and visual impacts of sightseeing ballooning

The MMNR Zonation & Visitor Use chapter specifies that no new or expansion of existing sightseeing balloon operations is permitted within the MMNR during the lifespan of this plan. The chapter also sets out more detailed prescriptions on the operation of sightseeing balloons in and over the area, in order to ensure that the environmental and visual impacts of ballooning on the MMNR tourism product are minimised. A number of these prescriptions will, however, have important implications for the day-to-day operation of sightseeing balloons.

Operators in and around the MMNR therefore need to be made aware of these prescriptions well in advance of their enforcement, so that they have a suitable period of time to adapt their management and marketing, and to ensure minimum disturbance to their operations. Under this management action, MMNR management will liaise with all relevant sightseeing balloon operators to raise awareness of the new ballooning prescriptions (as set out in Table 15 in the Zonation and Visitor Use chapter), and to establish a suitable lead-in time for their



implementation. This will include the reduction of the maximum number of balloons per ballooning concession to six, as specified in Table 15.

In addition, MMNR management will also liaise with the Kenya Civil Aviation Authority to raise awareness of the plan's sightseeing ballooning prescriptions, and on the need to reduce the overall number of balloons operating in/over the area from both an environmental and tourism product perspective.

### 6.2.3 Objective 3: Quantity, quality and management of visitor accommodation optimised

Objective 2 above addressed MMNR visitor activities, and ways of enhancing and diversifying these activities in order to strengthen the MMNR tourism product and reduce the impacts of visitor activities on the MMNR environment. Objective 3 addresses the other crucial dimension of the MMNR tourism product – the visitor accommodation provided in the MMNR. Like visitor activities, the quantity and quality of MMNR accommodation facilities are crucial both in terms of the overall tourism product on offer as well as the impacts of tourism on the MMNR environment. And as with visitor activities, these impacts have significantly increased in recent years, as the number of tourism accommodation facilities in the MMNR has grown, and individual facilities have gradually expanded both in bed numbers as well as in the visitor amenities provided.

To address this situation, Objective 3 introduces a range of initiatives designed to improve the management of Reserve accommodation facilities. This includes the review and standardisation of MMNR tourism lease and licensing arrangements, designed to bring all these arrangements in line with the prescriptions of this management plan and to enable optimal revenue generation for Reserve management and the Narok County, and the introduction of standards for all categories of MMNR accommodation facility.

From an ecological and environmental perspective, it will also be important that initiatives are taken to ensure that all MMNR accommodation facilities adhere to appropriate environmental management standards to minimise their impacts on the MMNR environment. Most notably, this applies to waste and sewage disposal practices, which if not properly carried out can have serious impacts on the area's environment and wildlife. Ensuring that accommodation facilities are operating to best international environmental standards is also an important aspect of improving the MMNR tourism product, especially as visitors become more and more environmentally aware and begin to demand that the accommodation they occupy in wildlife sanctuaries like the MMNR is environmentally benign.

The five actions developed to achieve this objective are set out below.

#### Action 3.1 Initiate a process to standardise and rationalise MMNR tourism leases

Tourism accommodation facilities in the MMNR have been developed over many years, dating back to 1965 when Keekorok was established as the first lodge in the area. All these developments have occurred on an *ad hoc* basis, without an explicit tourism concession development process or lease procedures. This is the same situation as was until recently the case in most

KWS protected areas, and the end result, just like in KWS PAs, is a wide array of lease arrangements of varying lengths, revenue arrangements, and other provisions.

These disparities are particularly important with regard lease provisions such as the “*exclusion zones*” around concessions in which no other developments are permitted. For example, the Keekorok Lodge exclusion zone is a radius of 16 km and allows no development of tourism accommodation facilities in the area, while the OI Kiombo exclusion zone is half this size and does allow development, provided that the OI Kiombo lease holders are given first refusal.

Faced with similar problems, KWS recently embarked on a process of standardising lease agreements across the network of the protected areas it manages, either on a voluntary basis or as existing leases come up for renewal. Under this Action and building on the lessons learnt and progress made in KWS managed areas, a similar process of lease standardisation will be initiated for all tourism accommodation leases in the MMNR, in order to remove existing anomalies and to provide a level-playing field for all MMNR accommodation facility operators.

Related to this, a management challenge faced in the Central Mara (Narok) section of the Reserve is the historical arrangement where in the past tourism accommodation sites have been allocated to local community members, or “beneficiaries”, who receive a lease or bed-night fee directly from the camp operator instead of these revenues going to the County. A significant negative side effect of these beneficiary arrangements is that they have encouraged the largely uncontrolled expansion of tourism accommodation in the Reserve, often in unsuitable locations (e.g., poor access or flooding in wet conditions or too close proximity to another tourism facility.)

These beneficiary arrangements, while not ideal, have however provided a historical mechanism for distributing the economic benefits of the Reserve to community members. As such, this management plan recognises the existing beneficiary arrangements and proposes that these arrangements be maintained for the duration of the plan.

As part of the process of rationalising all existing lease arrangements in the Reserve, all such beneficiary arrangements will be recorded and formalised in the new leases.

### Action 3.2 Establish new MMNR tourism accommodation standards and associated licensing scheme

Appendix 1 to this plan sets out detailed prescriptions for all accommodation facilities within the MMNR according to accommodation type (lodge, ecolodge, ecocamps and special campsite). Under this Action, all accommodation facilities will be expected to adjust their operations to align to the category of accommodation facility in which they fall, and all future leases issued for accommodation facilities in the MMNR will also comply with the standards set out for the relevant accommodation category.

As a first step, this will require the assignment of individual facilities to the most appropriate category in accordance with their existing characteristics, such as number of beds, type of infrastructure, etc. This process will be carried out by MMNR management and Narok County Tourism & Wildlife officers in consultation with the accommodation facility operators

concerned. Each accommodation facility will then be required to fulfil and comply with the detailed accommodation prescriptions for the assigned category as set out in Appendix 1.

Also under this Action, Narok County and MMNR management will carry out further audits of tourism accommodation facilities in and around the Reserve, following on from the previous accommodation audit carried out in the MMNR by the East African Wild Life Society in 2016 (see section 3.2 of the Visitor Carrying Capacity chapter). An initial audit will be carried out on commencement of implementation of the management plan and every three years thereafter. This will provide a basis for monitoring the progress of accommodation facilities both inside and adjacent to the Reserve towards fulfilling the accommodation standards set out in Appendix 1, as well as informing the ongoing monitoring of the MMNR's visitor carrying capacity targets.

In implementing these tourism accommodation standards, it is Narok County's intention to gradually uplift the overall quality of the MMNR tourism product, to the benefit of the Reserve's ecology as well as economy. To this end, tourism facility operators will be encouraged and guided to fulfil the prescribed standards for their accommodation category. It is not the County's intention to simply close and/or demolish tourism facilities that initially fail to meet the necessary accommodation standards.

Linked to the new MMNR tourism accommodation standards, this management plan also recommends that Narok County introduces a new MMNR tourism accommodation licence fee (single business permit) scheme that is designed to be the principal future mechanism for the County to collect revenues from tourism facility operators in the Reserve. The licence fee will be aligned with the category of accommodation that a particular MMNR accommodation facility falls within as detailed in Appendix 1 and will be determined in the annual Narok County Finance Bill.

This management plan also proposes that Narok County extends this licensing fee to all tourism accommodation facilities located in the MMNR buffer zone, that are not located inside one of the wildlife conservancies to the north of the Reserve. All such accommodation facilities should be required to comply with the standards set out for their accommodation type and should be levied the appropriate licensing fee for that category.

### Action 3.3 Implement effective management of MMNR special campsites

Currently, the Central Mara (Narok) section of the Reserve does not have any designated special campsites (as per the final accommodation category in Appendix 1), as in recent years, these have gradually been replaced by either temporary or permanent ecocamps or ecolodges. Any designation of additional special campsites in the Central Mara section must be approved by Narok County and will be on the strict understanding that these special campsites may not be later converted to another category of tourism accommodation, must be managed in accordance with the special campsite prescriptions and code of conduct in Appendix 1, and may not be subject to the establishment of any beneficiary arrangements.

In the Mara Triangle, there are currently eight designated special campsites, one of which located in the south-west of the Triangle has been allocated an exclusion zone in an effort to develop a premium tourism product in the area.

#### Action 3.4 Initiate environmental assessments of accommodation facilities

Under Part VII of the Environmental Management and Coordination Act (1999), all permanent tourism accommodation facilities in the MMNR are required to carry out an annual environmental audit. These audits are designed to provide “*a systematic evaluation of activities ... to determine how far these activities and programmes conform with the approved environmental management plan of that specific project [developed as part of the initial EIA] and sound environmental management practices*”<sup>22</sup>.

Except for the initial annual audit, which is carried out by environmental audit experts registered by NEMA, all subsequent annual audits are self-assessments facilitated by NEMA, and the assessment reports are subsequently submitted to NEMA. However, as is common in many protected areas, neither Narok County or MMNR management have had access to the environmental management plans for individual facilities, or the subsequent annual self-assessment reports. As a result, neither Narok County nor MMNR management are able to ensure that each facility takes appropriate steps to improve their environmental performance.

Under this management plan, it is proposed that Narok County in future makes the issuance of an accommodation facility’s annual tourism licence (see Action 3.2 above) contingent on the submission of the facility’s annual environmental self-assessment report. Submission of these annual environmental reports will also enable MMNR management to ensure that any outstanding environmental issues or mitigation measures are addressed.

In addition, under the accommodation prescriptions set out in Appendix 1, all permanent and semi-permanent accommodation facilities within the MMNR are required to secure Ecotourism Kenya certification (a minimum standard of gold eco-rating for ecocamps, silver for ecolodges and bronze for lodges). MMNR management will also raise awareness of the importance of achieving this certification and encourage operators to apply for certification and to comply with the subsequent audits every two years.

#### Action 3.5 Carry out rehabilitation and improvements to MMNR public campsites

There are presently three public campsites located within the MMNR (Sand River, Oloololo and Iseyia - near Serena Lodge). These sites do not require advance booking, and primarily cater to Kenya citizens and residents. Of these three sites, only Oloololo currently has adequate facilities, which have been recently upgraded, and additional amenities are needed at the other campsites to bring them up to the required standards. At Iseyia in the Mara Triangle, this will involve the development of toilets and showers, which are currently lacking at the site. While at Sand River, the existing toilet and shower block that was built some years ago has now fallen into disrepair. This facility will be renovated to return it to fully operational

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<sup>22</sup> Environmental Impact Assessment (EIA) Guidelines for the Tourism Sector In Kenya (2007), Ministry of Tourism and Wildlife.

status, and thereafter cleaned regularly to ensure that they are maintained to the standards that visitors expect.

In addition, under this Action, an additional public campsite near to the Musiara Gate in the Central Mara (Narok) section of the Reserve will also be established, including appropriate amenities such as showers, toilets, etc.

#### 6.2.4 Objective 4: Tourism administration systems improved, in collaboration with tourism industry partners

This management programme, along with the Zonation and Visitor Use Scheme, provides a framework for enhancing the MMNR tourism product, optimising tourism revenues and minimising the environmental impacts of visitor use. However, to achieve this positive outcome, there will over the years ahead need to be major changes made in the way tourism is administered and managed throughout the MMNR, in particular significant investments in financial and human resources dedicated to tourism management and a major overhaul of the MMNR's tourism administration systems.

To achieve these major changes in tourism management, it will also be necessary to strengthen the collaboration with tourism industry partners, to not only ensure the timely dissemination of information on any changes impacting on tourism operations, but also to encourage industry support for the plan's implementation.

Objective 4 has therefore been established to ensure that in future, MMNR management has the appropriate tourism administrative systems and capacity as well as the full support of the tourism industry, all of which will be needed to enhance the successful and smooth implementation of this programme and other associated aspects of the management plan. In order to achieve this aim, four management actions have been developed, detailed below.

##### Action 4.1 Improve MMNR ticketing and revenue collection systems

Although there is a common visitor entrance fee for both sides of the MMNR, in recent years different systems have been employed for the ticketing and revenue collection. In the Mara Triangle ticketing and revenue collection is the responsibility of the Mara Conservancy, which has in turn contracted the Kenya Airports Parking Services (KAPS) Ltd as the revenue collection service provider. This system has generally worked very well and has greatly reduced ticket irregularities and revenue leakage. As a result, Narok County has also contracted KAPS as the revenue collection service provider for the Central Mara (Narok) section of the Reserve.

Eventually, it will be desirable to implement a unified revenue collection system covering both sections of the Reserve. Under this Action, it is proposed that the Narok County works with the Mara Conservancy to determine the key features and requirements of such a unified ticketing and revenue collection system. In addition, the County and Mara Conservancy should also investigate other mechanisms for ensuring that revenue collection in the Reserve is robust, for example through the establishment of a pilot tourism vehicle tracking system.

#### Action 4.2 Improve standards of customer care and service at MMNR entrance points

The staff at MMNR entry points are the only representatives of the Reserve's management that the vast majority of visitors will ever meet. As such they are in a unique position to create a positive and professional first impression of the MMNR to the many visitors that pass through the entry gates. However, concerns have been raised that staff at these entry points are currently not sufficiently trained to meet the increasing service standards that tour operators and visitors expect, and in many instances the conduct of entry point staff falls short of the desired standards of professionalism and customer care.

KWS has in recent years faced similar issues regarding visitor handling, and has now replaced rangers with other specially trained customer care staff at the gates to some of its most popular areas (such as popular entrance gates in Tsavo East and West National Parks). Similar moves have also been taken to address this issue in the Mara Triangle, where "*alpha scouts*", who have undergone training in customer care and visitor handling, have replaced rangers at the gates. In addition, in the Central Mara (Narok) section, Narok County has recently posted "Tourism Officers" to entrance gates to take on a similar customer care role.

In order to further improve the standard of customer care and visitor handling across the entire MMNR, under this Action MMNR management will implement measures designed to further strengthen the capacity of Alpha Scouts and Tourism Officers for visitor handling, for example through the provision of specialised on-the-job training. Combined with the improvements to visitor facilities and amenities implemented through Action 1.1 of this programme, this should result in a significantly improved experience for visitors entering the MMNR.

#### Action 4.3 Understand MMNR visitor satisfaction

Visitors to the MMNR are exceptionally well placed to provide the Reserve management with feedback on what they are doing well, on what issues most impacted on their visit, and how they feel management can better serve visitors to the area. To date, however, insufficient effort has been invested in understanding visitor satisfaction and attitudes to the MMNR.

Under this action, MMNR management will intensify its efforts to understand visitor perceptions of the MMNR tourism product, in particular through the regular review of online tourism forums such as TripAdvisor. In addition, occasional visitor questionnaires will be carried out (covering aspects such as their overall rating of the area, the availability of interpretive information, willingness to pay entrance fees, accommodation standards, etc.) that will also enable management to better understand trends in visitor attitude and experience over time.

#### Action 4.4 Convene an annual MMNR tourism stakeholders' forum

Tourism investors and operators are major stakeholders in the MMNR, and their advice and viewpoints need to be regularly solicited by management in order to capitalise on the area's tourism potential, and to successfully implement several of the management actions set out in this plan. This group of stakeholders is also particularly well placed to advise MMNR management on key issues that may be impacting on the quality of the tourism product in the area, and on specific untapped tourism opportunities that management could take advantage

of. The Mara Conservancy has already been holding periodic meetings with investors and operators in the Mara Triangle and surrounding areas.

Under this Action, a single tourism stakeholders' forum for the entire MMNR will be organised on an annual basis. This will be open to all tourism stakeholders who use the MMNR, and will aim to improve general awareness of management successes and challenges during the previous year, to inform stakeholders of anticipated works over the next 12 months, and to enable them to provide feedback on key issues that they feel MMNR management should be addressing. During the early years of plan implementation, this forum may need to be convened on a more frequent schedule in order to raise awareness of new plan prescriptions and of the changes that plan implementation will bring about. In addition, special tourism stakeholders' meetings may also be convened as and when necessary by Reserve management or Narok County in response to specific issues and challenges.

### 6.3 Programme monitoring framework

The Tourism Management Programme Monitoring Framework provides a mechanism for assessing the achievement of each of the management programme's five objectives. As shown in Table 20 below, the framework sets out the desired positive impact of each of the programme's objectives, indicators that the objective has been successfully achieved, how these indicators can be measured, and potential information sources.

Table 20. Tourism Management Programme Monitoring Framework

Management Objective	Success indicators	Specific measurements	Data source
Obj. 1: Visitor attractions, amenities and infrastructure enhanced	Visitors are expressing increased satisfaction with their tourism experience in the MMNR	Level of MMNR visitor satisfaction	Visitor satisfaction surveys (c.f. Action 4.3)
	A significant number of visitors to the MMNR are making use of alternative attractions to wildlife viewing	Proportion of visitors to the MMNR making use of the alternative visitor attractions developed	Visitor satisfaction surveys (c.f. Action 4.3) or spot checks by TIAHU staff
Obj. 2: Regulation and management of visitor activities strengthened	The adherence of visitors and drivers/guides to MMNR rules and regulations is improved	The number of visitors or driver/guides found infringing MMNR Visitor Regulations	TIAHU records
	Traffic congestion at Mara River crossings and wildlife sightings is reduced and maintained within acceptable levels	The number of vehicles at carnivore sightings and river crossings during peak months	TIAHU records, and spot checks by TIAHU staff
	Damage to MMNR habitats as a result of off-	The number of incidences of illegal off-road driving in all zones	TIAHU records

Management Objective	Success indicators	Specific measurements	Data source
	road driving is significantly reduced	The extent of environmental damage from off-road driving	Ecological monitoring records and/or inspections by MMNR staff
Obj. 3: Quantity, quality and management of visitor accommodation optimised	Tourism accommodation facilities are making a positive contribution to the MMNR tourism product	The number, type and size of tourism facilities	Inspections by Narok County and MMNR management
		The extent of compliance with tourism accommodation standards prescriptions	Inspections by Narok County and MMNR management
	The environmental impacts of accommodation facilities within the MMNR are minimised and maintained within acceptable levels	The environmental performance of accommodation facilities with regard environmental management plan/audit stipulations	Annual environmental audit reports
Obj. 4: Tourism administration systems improved, in collaboration with tourism industry partners	Revenues to Narok County from MMNR tourism activities are at optimal levels	The amount of revenue collected from visitor entrance and activity fees per year	MMNR annual audited account records
		The number of visitors found in the MMNR without a valid entrance ticket	TIAHU records
	MMNR management and tourism stakeholders are collaborating to enhance the MMNR tourism product	The number and frequency of tourism stakeholder forums held	MMNR management records



# 7. Community Outreach & Partnership Programme

## 7.1 Programme purpose

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Communities living around the MMNR feel a positive sense of ownership for the Reserve and strongly support conservation efforts in the Greater Mara Ecosystem

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As human populations around the MMNR have grown and traditional land uses changed and intensified over the past few decades, the reciprocal impacts of the MMNR and communities on one another have increased. On the side of Reserve management, activities in the wider ecosystem are increasingly impacting on both the ecology of the Reserve, through for example the reduction of available habitat in dispersal areas or water extraction from the Mara River, and on the quality of the tourism product that the Reserve is able to offer. While on the side of MMNR adjacent communities, incidences of human wildlife conflict have become more common around many parts of the Reserve and, with a dearth of alternative economic opportunities and rising development aspirations, there has been a growing desire from community members to benefit further from the economic opportunities that the Reserve's booming tourism industry generates.

Many community members living around the MMNR still maintain a close relationship with the Reserve, and due in part to its continued management by local rather than national government, they have retained a unique sense of pride and ownership stake in the Reserve and in the exceptional natural resources it conserves. As set out in the purpose statement above, this programme aims to capitalise on and strengthen this special relationship between the Reserve and its neighbours, as a crucial foundation for the long-term conservation of the Reserve, as well as the entire Greater Mara Ecosystem.

The programme aims to increase community support for the MMNR through a variety of strategies, including: enhancing communication between managers and community members; increasing the tangible benefits that communities receive from the Reserve; reducing the incidence of human-wildlife conflict around the area; and improving the conservation compatibility and financial sustainability of community activities in areas around the Reserve.

## 7.2 Management objectives and actions

Based on the Programme Purpose above, four management objectives have been defined for the Community Outreach and Partnership Programme, as follows:

Objective 1: Strong and constructive relationships between the MMNR and neighbouring communities established

Objective 2: Local community benefits from the MMNR improved

Objective 3: Incidence and severity of conflicts between people and wildlife around the MMNR reduced

Objective 4: Conservation-compatible land use and development in neighbouring areas promoted and supported

As these objectives affirm, the CO&P Programme sets out an ambitious work programme for MMNR management in an area that has not traditionally been a strong focus for managers. This will have significant human resource implications and will in particular necessitate the recruitment or designation of Community Wardens and/or Community Liaison Officers. This issue is addressed under Action 3.3 of the Protected Area Operations Programme.

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

### 7.2.1 Objective 1: Strong and constructive relationships between the MMNR and neighbouring communities established

Building strong and constructive relationships with neighbouring communities is an important management strategy for achieving the overall CO&P Programme purpose of strengthening community support for the conservation and management of the MMNR and developing a sense of community pride and ownership for the Reserve. As has been demonstrated in several other Kenyan protected areas, the development of constructive relations between managers and adjacent communities can also play an important role in reducing the impacts of illegal activities (such as livestock grazing or bushmeat poaching) on the protected area's biodiversity.

This strategy has often proved to be an important complement to law enforcement efforts, and, over the long-term, is likely to be much more cost effective than enforcement alone. The fostering of good community relations is especially important in the MMNR because of the unique cultural ties between the Maasai community and the MMNR, which results in a special desire on the part of the community to be involved in the affairs of the Reserve.

This management objective has therefore been developed to bring about the desired future state where there are strong and constructive relationships between MMNR management and surrounding communities. Perhaps the most important foundation for developing or strengthening these relationships is the creation of opportunities and mechanisms for communities and managers to communicate with each other, and to work together in addressing common problems. To achieve this aim, four management actions have been developed that focus on enhancing information exchange between MMNR managers and communities around the Reserve.

### Action 1.1 Participate in relevant community institution and County committee meetings

There are a diversity of institutional arrangements and forums in the Greater Mara Ecosystem, and an increasing number of community wildlife conservancies and landowner associations are being established around the Reserve. These institutions include the Maasai Mara Wildlife Conservancies Association (MMWCA) plus a number of conservancy-specific landowner associations.

Good communication between Narok County, MMR management and these community institutions is important to ensure that any support provided by the County or MMNR managers to improve conservation in the wider ecosystem (discussed below under Objective 4) is well directed, and to enable all parties to exchange information of mutual concern, regarding, for example, illegal activities such as poaching or livestock rustling, or outbreaks of wildfires or animal disease. MMNR management will therefore wherever possible participate in community meetings organised by the various community wildlife and landowner associations in the wider area, and in particular in MMWCA meetings.

This will include investigating the possibility of establishing a joint task force with Mara ecosystem conservancies for carrying out patrols as well as human-wildlife conflict (HWC) mitigation measures. In addition, to strengthen linkages with KWS and other local government authorities, MMNR management will also participate as and when appropriate in the periodic HWC resolution committee meetings (HWC is covered in more depth under Objective 3 below).

### Action 1.2 Strengthen community game scouts in MMNR adjacent areas

A community game scout programme has been operating in the greater Mara for a number of years, with funding and support provided by a variety of sources (including Friends of Conservation and the Durrell Institute of Conservation and Ecology (DICE)). In 2005, the programme employed around 75 scouts across the greater Mara area. More recently, the programme has been complemented by the community game scout network established by the Mara Conservancy that has focused on community areas bordering the Mara Triangle.

The Mara Conservancy currently employs 15 community scouts that have proved beneficial to MMNR management by enabling a variety of issues that have in the past inhibited the development of strong and constructive relations with the community to be addressed more effectively. These include improving response times to human-wildlife conflict and incidences of banditry (in particular cattle theft), enhancing the flow of information between management and communities, and generally improving the relationship between MMNR managers and adjacent communities. In view of the past success of this mechanism for enhancing management-community relations, this Action focuses on further strengthening the MMNR's community game scout network.

Specifically, under this Action MMR management will take steps to extend the existing Mara Conservancy community scout network to cover the areas neighbouring the Central Mara (Narok) section of the Reserve. This will involve either directly employing new community scouts or formalising the employment of any existing volunteer scouts. Once recruited, appropriate training (either in-situ "*on-the-job*" and/or ex-situ courses) will then be provided to

all scouts to ensure that they have the necessary skills to carry out their duties. This may require capacity building in conservation awareness raising, case reporting on human wildlife-conflict, and bush skills, and will need to be complemented by the provision of the equipment necessary to support their roles (most notably communication equipment, such as handheld radios).

### Action 1.3 Carry out awareness-raising activities in schools and other appropriate venues

Community awareness-raising activities are an important component of most protected area community outreach programmes and provide a means of informing the community about the values and functions of the area concerned, gaining the community's support for crucial management strategies and raising the profile of protected area managers in the community. In addition, these awareness activities also provide an important mechanism through which communities can raise issues of concern and can provide feedback on management initiatives and other relevant issues.

Although the awareness activities implemented under this action will need to respond to issues as they emerge during the 10-year implementation period of this plan, the MMNR Plan Community Working Group has suggested that the initial focus should include improving community awareness of the potential costs of losing the MMNR's wildlife dispersal areas and the benefits that can be derived from maintaining them, and raising awareness of the respective roles and responsibilities of MMNR managers, Narok County, KWS, and other security agencies (in particular with regard to responsibility for addressing specific problems such as banditry, problem animal or human-wildlife conflict incidences).

Awareness-raising activities carried out under this Action will primarily focus on visits to schools and adult education establishments, and/or other appropriate meetings or forums located around the MMNR where presentations or talks could take place (see also Action 1.4 below). Activities initiated could capitalise on local events such as school sports days or open days, and could also be linked to other international events, such as World Environment Day in June or World Tourism Day in September. Lead responsibility for organising and carrying out these awareness-raising activities will rest with the Community Wardens/ Liaison Officers designated under Action 3.3 of the Protected Area Operations Programme.

### Action 1.4 Promote school education visits and develop a Community Education Centre at the Mara Research Station

School visits to protected areas are an important feature of community outreach and education programmes in many protected areas in Kenya, such as Meru and Tsavo West National Parks. These visits are designed to give school children a first-hand experience of the protected area on their doorstep and, when accompanied by interpretation and talks by PA staff, can be an important mechanism for improving the wider communities' understanding of the values and functions of the PA. In the MMNR, approximately 15,000 school children visited the Mara Triangle in 2019, with similar numbers visiting the Central Mara section. Under this Action, such school visits will continue to be promoted and supported in both the Mara Triangle and Central Mara (Narok) sections of the Reserve.

Such school visits are often linked to an education centre established within the PA concerned, where interpretive talks and other educational services are provided, and the school party can if necessary stay overnight. In addition to the awareness-raising activities to be implemented under Action 1.3 above, this Action therefore addresses the establishment of a new community education centre in the MMNR, which it is proposed will be co-located with the existing Mara Research Station.

The proposal to establish an education facility at the Mara Research Station was first mooted in the previous 1983-1988 MMNR management plan, but never implemented. The development of the new education centre will be carried out in close collaboration with WRTI, which manages the research station and also has significant experience with developing and operating similar educational facilities elsewhere in Kenya.

The action will entail the construction of new or conversion of existing buildings in order to provide an appropriate meeting room with associated interpretative displays and education materials, as well as dormitories for overnight school parties (including separate accommodation for teachers) and associated amenities (e.g., kitchen and washrooms). All such developments will make use of existing buildings wherever possible, in order to keep construction to a minimum and reduce the centre's overall footprint. Once completed, MMNR management and KWS will raise awareness of the new facilities and enlist the support of other organisations such as the Wildlife Clubs of Kenya in organising educational visits to the new facility.

### 7.2.2 Objective 2: Local community benefits from the MMNR improved

The MMNR was established on community trust land and therefore, in addition to the Reserve's role in protecting the area's exceptional natural resources, a primary function is to provide economic benefits to improve the livelihoods of residents of the Narok County in which it is located. Consequently, an important aspect of achieving the overall purpose of this programme, and in enhancing support for the Reserve's continued conservation, is ensuring that these communities receive tangible economic benefits from the MMNR's vibrant tourism industry.

The provision of these benefits is especially important for communities living adjacent to the Reserve who bear the major costs of conservation, in particular through wildlife-human conflict (discussed in more detail under the next objective), and who are also in a position to engage in and support the development of conservation-compatible land uses and enterprises around the MMNR (discussed under Objective 4 below).

Significant steps have already been taken to help ensure that communities around the MMNR receive economic benefits from the area. Most notably, these include the allocation of a percentage of MMNR entrance fees to communities, the employment of local people in both MMNR management and tourism enterprises, and, in some parts of the MMNR, restricted access to specific natural resources within the area (such as cattle salt licks and medicinal plants). However, these benefits have not always been equitably distributed within the

communities around the MMNR, and in some communities they have been perceived as insufficient to balance the costs they incur from wildlife.

In response, this objective has been developed in an effort to enhance the benefits that the MMNR provides to adjacent communities, and to ensure that these benefits are distributed both equitably and efficiently. The three management actions that have been developed to achieve this are elaborated below.

#### Action 2.1 Strengthen the MMNR's revenue-sharing programme

As one of the MMNR's major revenue-sharing mechanisms, the Narok County currently distributes 19 percent of MMNR entry fee collections to surrounding communities through a Community Support Fund which supports the communities around the Reserve and in Narok County in community welfare, conservation, infrastructural development and wealth creation. The Support Fund is implemented in accordance with Narok County's Maasai Mara Community Support Fund Act of 2016, and future implementation of the Fund will be subject to any changes in the Act.

The Fund is overseen by a Management Committee comprising Narok County officials, while day-to-day operations are the responsibility of a Fund Administrator. The main implementation mechanism used by the Fund is the development and implementation of community support projects, that are overseen by the Management Committee in collaboration with specialised County departments or other agencies.

The establishment of the Community Support Fund has potentially addressed many of the criticisms of the previous MMNR revenue-sharing mechanisms which were generally considered to be ineffective. Under this Action, the Narok County will further strengthen the implementation of the Community Support Fund, based on lessons learnt from ongoing implementation and feedback received from community stakeholders.

#### Action 2.2 Promote and support tourism industry social responsibility initiatives

A number of tourism operators in and around the MMNR have established trusts or foundations through which funds donated by clients, or allocated from their own profits, can be channelled to community projects. Typically, these social responsibility initiatives include support for schools, enhancing access to water or fuel supplies, or supporting educational scholarships.

These projects not only address immediate community needs around the MMNR and help enhance support for the conservation of the area, but also contribute towards the tourism operator's green credentials and ecotourism certification. However, the scope and extent of these social responsibility activities varies significantly between operators; not all initiatives have been successful either from a community or operator perspective, and there remains significant scope in and around the MMNR for the improvement and expansion of such programmes.

As a first step towards addressing this issue, MMNR managers will raise awareness among tourism operators (both inside and outside the MMNR) of the importance and potential

benefits of incorporating social responsibility in their operations, and, as appropriate, will facilitate linkages between tourism operators and communities, and the identification of appropriate projects that can be supported. As part of this process, attention will be paid to ensuring that benefits received are clearly connected to the conservation of the MMNR, and do not undermine traditional cultures around the Reserve.

An important aim of this management plan will be to strengthen local community employment in all MMNR facilities. For the County, this will entail ensuring that 70 percent of MMNR employees are drawn from the local community in accordance with the applicable legislation. MMNR management and Narok County will also encourage Reserve tourism operators to employ residents from Narok County whenever possible (as is already practised at a number of facilities) and will as appropriate support this by raising awareness in MMNR-adjacent communities of any opportunities that may arise.

Lastly, MMNR management will also raise awareness amongst tourism operators of the availability of local produce (such as fresh fruits and vegetables) and handicrafts and aim to enhance the linkages and the supply of these products to tourism facilities in and around the MMNR. For example, MMNR management will promote and support the sale of traditional Maasai beadwork in tourism facilities inside and outside the Reserve as well as at the MMNR's entry points (see Community Programme Action 4.2).

### Action 2.3 Develop and disseminate guidelines for community access to MMNR natural resources

A major cause of resentment between the community and MMNR management is the inability to access natural resources in the Reserve, especially in times of hardship such as drought. Resources that the community would wish to have access to include water, grazing and salt-licks for their livestock, and supplies of medicinal or culturally important plants (some of which are now only found within the MMNR).

While unlimited access to such resources is highly undesirable from an ecological and tourism product standpoint and allowing such access would undermine the status of the MMNR as a protected area held in trust for the wider Maasai community and all Kenyans, restricted and carefully-regulated access to certain key resources can fulfil periodic and compelling community livelihood needs and as a result has the significant potential to increase community support for the Reserve.

Some community resource access is already formally permitted in the Mara Triangle, where livestock owners have been allowed controlled access to a salt lick, and other precedents exist for controlled community access to natural resources within a protected area, such as at Amboseli National Park where communities are allowed controlled access to water points for their livestock at certain times of day and year. Under this Action, the Narok County together with MMNR management will develop explicit guidelines to enable carefully controlled community access to key MMNR resources, such as water and grazing during drought periods, or plants of medicinal or cultural importance. However, because of the extensive impact of livestock grazing on the Reserve's ecology as well as tourism product, livestock grazing will only

be permitted under circumstances of exceptional community need, such as during extended drought periods.

The guidelines will be designed in consultation with the relevant communities, using the various community consultation mechanisms detailed under Objective 1 above, and will aim to provide a practical and enforceable framework for community access to key resources, which meets pressing community needs without undermining the Reserve's ecological or tourism values. Once agreed, the guidelines will be formalised into protocols setting out the steps through which communities can gain access, any restrictions on this access, and the types/amount of resources used/collected and time of year, and will also specify the penalties for infringing these agreements.

As an additional safety net for the community during drought periods, Narok County will assess the feasibility of setting up a scheme for harvesting fodder in the ecosystem during the rainy season, coupled with constructing stores for selling fodder to farmers at cheaper prices during droughts.

All initiatives in support of livestock grazing implemented under this Action will be developed and implemented in collaboration with the Community Livestock Management Committee (involving the MMNR Community Warden and/or Community Liaison Officers - see PA Operations Action 3.3).

### 7.2.3 Objective 3: Incidence and severity of conflicts between people and wildlife around the MMNR reduced

As is common in most unfenced protected areas in Kenya, conflict between people and wildlife in areas neighbouring the MMNR is a major cost for the community and has a significant impact on community attitudes towards the Reserve. The most frequent and costly types of human-wildlife conflict (HWC) include livestock predation, disease transmission and crop raiding, but there are also occurrences of human injury or even loss of life.

In addition, an often overlooked indirect cost of such conflicts is reduced attendance at school by children, who may either be engaged in protecting crops from wildlife or simply can't get to school because of dangers posed by wildlife, particularly in areas frequently used by elephants. As human populations around the MMNR increase, and if, as has already occurred in some MMNR-adjacent areas, land use intensifies and shifts towards permanent agriculture or intensive livestock keeping, these conflicts are highly likely to increase during the 10-year implementation period of this plan.

This objective has therefore been developed to bring about the desired future state where both the incidence and the severity of HWC around the MMNR are reduced. As set out in the three management actions below, this will be achieved through a number of approaches, including actions to improve collaborative responses to HWC incidences, actions to prevent HWC, and actions to strengthen the existing livestock predation consolation scheme.



### Action 3.1 Strengthen HWC responses in the Greater Mara Ecosystem in collaboration with other institutions

Effective mitigation of human-wildlife conflicts requires an ability to understand where and when HWC incidences are most likely to occur, the main causes of such conflicts and the best way to respond to them, coupled with an ability to mount the HWC response rapidly and cost effectively. One of the most effective ways of better understanding HWC is through the careful documentation of information about HWC incidences as and when they occur. In this regard, under this Action, Narok County and MMNR managers will support efforts by other agencies such as KWS and the MMWCA to establish an HWC database in which information on conflict incidences can be recorded (such as the date, type, and location of incidences, etc.).

This database will enable geographic and temporal trends in conflicts around the MMNR to be understood, and as a result, will improve the targeting and efficiency of HWC responses. Collaboration in this regard should be carried out in accordance with the Memorandum of Understanding between MMWCA and Narok County which is currently under discussion, and MMNR management's involvement should be through the proposed Community Wardens designated under Action 3.3 of the Protected Area Operations Programme.

Much of the HWC around the MMNR takes place in remote and inaccessible parts of the ecosystem, far from the borders of the MMNR. Close collaboration in the collection of HWC data with other appropriate organisations operating in the wider ecosystem will therefore be required, as well as in subsequently addressing HWC incidences. This is particularly important with the neighbouring community conservancies, the KWS County Office and the community scout network (supported under Action 1.2).

Effective collaborations will involve awareness-raising and training in protocols for recording and reporting HWC incidences, and may also require the provision of equipment (such as GPS machines or radios), and periodic meetings between collaborators to review data collection procedures and HWC response mechanisms. Once operational, information from the database will be periodically analysed, and the results incorporated into maps and other simple awareness-raising materials to inform communities about main conflict areas and suggested prevention measures (potentially in conjunction with the awareness-raising activities carried out under Action 1.3 above).

### Action 3.2 Improve financial sustainability and coverage of HWC consolation scheme

Predation of livestock by carnivores that periodically disperse from the MMNR into adjacent community areas is one of the most frequent and severe types of HWC. Livestock predation-related conflicts have been the cause of significant resentment towards the MMNR in some communities living around the Reserve and have at times led to the persecution (e.g., poisoning or harassment) of large carnivores by community members.

To address these issues, the Mara Conservancy has been operating a “*consolation scheme*” in the areas bordering the Mara Triangle. The scheme has reimbursed community members the cost of livestock lost to carnivores up to seven kilometres from the MMNR boundary and has had significant success in enhancing community attitudes towards wildlife dispersing from the

MMNR, and in improving relationships between managers and community members. However, the scheme has so far only covered a small area around the MMNR adjacent to the Mara Triangle, and even this has proved difficult to sustain financially during times when visitation to the MMNR is low and revenues have declined as a result.

The Narok County's MMNR Community Support Fund (see Action 2.1 above) has provisions for supporting HWC consolation as well as hospital bills for injured community members. Under this Action, it is proposed that financial support for HWC consolation within the MMNR's 2km buffer zone will be provided through the Fund. Tourism industry stakeholders based in the greater Mara will also be encouraged to set up their own consolation schemes to address issues arising in their surroundings (and thereby reduce the burden on MMNR management).

### Action 3.3 Support and implement pilot schemes to reduce human-wildlife conflict

HWC is a problem throughout Africa, and over recent years a large amount of research and studies have been carried out into methods that can be employed to reduce the incidence of conflicts. A substantial amount of this work has been carried out in areas with similar problems to the MMNR, the results of which can easily be adapted to the Mara situation.

Of particular relevance in this regard is research in the greater Mara that has shown that water points are a conflict hotspot, with people, livestock and wildlife frequently being forced to use the same sources of water, relating to the fact that the majority of permanent settlements are located close to permanent water sources (75 percent are within 2 km of water)<sup>23</sup>. Other research around the MMNR has also highlighted the increasing problems associated with elephants, such as crop damage and human injury or loss of life<sup>24</sup> and, as discussed under the previous action, the predation of livestock by carnivores as well as disease transmission between herbivores and livestock<sup>25</sup>.

As a first step towards addressing these conflicts, Narok County and MMNR management will collaborate with other relevant authorities, including the national government's Constituencies Development Fund, donors and conservancies, in supporting communities living around the MMNR to establish additional water points in order to reduce competition for water, and the resulting conflict incidences at these key points.

In addition, Narok County and MMNR management will also support the piloting of schemes designed to reduce conflict incidences in settlements around the MMNR. This will include the development of "*predator proof*" fences that utilise a fence made from a combination of four tree species, and which besides preventing entry can also provide fuel and fodder (as has been piloted in the Athi River area). MMNR management and Narok County will also collaborate with WWF in undertake Safe System Rapid Assessments, aimed at identifying the key gaps in

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<sup>23</sup> Homewood, K. *et al.* (2001) Long-term changes in Serengeti-Mara wildebeest and land cover: Pastoralism, population or policies? PNAS Vol. 98, no. 22, pp 12544-12549

<sup>24</sup> Walpole, M.J., Karanja, G.G., Sitati, N.W. & Leader-Williams, N. (2001) Wildlife and People: Conflict and Conservation in Maasai Mara, Kenya. DICE.

<sup>25</sup> Nkadaru, S. (2007) Human Wildlife Conflict around Mara Triangle Game Reserve, Kenya. Dissertation for Postgraduate Diploma In Wildlife Management.

current HWC interventions and developing a strategy that will be used by stakeholders to make conflict hotspots safe for people, livestock and wildlife.

Other options that will be investigated that have been piloted elsewhere in Kenya include the use of live fences, such as the Mauritius thorn (*Caesalpinia decapetala*), which is impenetrable to most animal species, and the use of guard dogs to prevent attacks and provide an early warning of potential predators. Lastly, a “lion guardian scheme” will also be piloted, modelled on the successful scheme that has been operating since 2006 in the Amboseli-Tsavo Ecosystem. This scheme has played an important role in reducing the number of lions attacked in community areas and has also proved an effective method of raising awareness and informing communities about the important ecological and economic role of lions and other large predators.

#### 7.2.4 Objective 4: Conservation-compatible land use and development in neighbouring areas promoted and supported

Much of the Tanzanian part of the greater Mara-Serengeti Ecosystem is incorporated into the Serengeti National Park, Ngorongoro Conservation Area, and neighbouring game reserves. In comparison, most of the Kenyan part of the ecosystem (around 75 percent) is privately or communally owned. Nevertheless, these areas are vitally important for a number of MMNR large mammal species that depend on dispersal areas beyond the Reserve’s boundaries, including the northern wildebeest migration.

In this regard, it has long been recognised that the survival of many of the MMNR’s and the wider ecosystem’s exceptional resources up until now can be largely attributed to the conservation compatibility of traditional land-use practices around the Reserve, and the traditional tolerance to wildlife by Maasai communities living in the greater Mara.

This favourable situation for the dispersal areas is however changing rapidly. Human populations around the MMNR have increased dramatically since the Reserve’s establishment - from around 0.8 people/km<sup>2</sup> in 1950 to 14.7 people/km<sup>2</sup> in 2002<sup>26</sup>. This escalation is a result of both local population increases as well as in-migration, often from elsewhere in Narok County. Much of the in-migration to areas around the MMNR is in pursuit of economic opportunities (often associated with tourism facilities established around border of the Reserve), which are difficult to find elsewhere in the greater Mara area.

These changes in human densities in the Mara Ecosystem have been accompanied by similarly dramatic changes in land-use practices and the development aspirations of the ecosystem’s residents. As part of this process, the existing group ranch communal land ownership system is in the process of being dismantled in favour of sub-division to form individually owned plots. In some cases this sub-division has had severe impacts on wildlife populations in and around

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<sup>26</sup> Reid, R.S., Rainy, M., Ogotu, J., Kruska, R.L., McCartney, M., Nyabenge, M., Kimani, K., Kshatriya, M., Worden, J., Ng’ang’a, L., Owuor, J., Kinoti, J., Njuguna, E., Wilson, C.J., and Lamprey, R. (2003). People, Wildlife and Livestock in the Mara Ecosystem: the Mara Count 2002. Report, Mara Count 2002, International Livestock Research Institute, Nairobi, Kenya

the MMNR, as is the case with intensive agriculture in the northern parts of the ecosystem, and above the Siria Escarpment where a “*hard edge*” is developing along the MMNR’s border.

In other cases, however, this security of tenure has enabled groups of individual landowners to form wildlife conservancies and related land-owner associations which are able to avoid many of the problems of revenue sharing that have plagued group ranches in the past, and that have the potential to play both a vital role in the conservation of the ecosystem’s exceptional resources and in providing a valuable source of income for those living around the MMNR.

As human populations, livelihood aspirations, land sub-division and other development pressures continue to increase throughout the ecosystem over the implementation period of this plan, it is crucial that the Narok County and MMNR management provide support to and promote sustainable land use and development activities in the Greater Mara Ecosystem that are at a minimum compatible with, and where possible enhance, the conservation and tourism product of the MMNR. In order to achieve this objective, six management actions have been developed, detailed below.

#### Action 4.1 Provide technical and material support to community wildlife conservancies around the MMNR

Community wildlife conservancies are currently playing a vital role in securing important wildlife areas in the greater Mara ecosystem, and in generating a sustainable, conservation-compatible source of revenue for the area’s owners. These conservancies have enormous potential benefits for the MMNR’s conservation and tourism product goals – by securing the wider dispersal areas for large mammals and by offering a complementary tourism product that reduces visitor pressure on the core Reserve.

For this reason, under this management action, Narok County and MMNR management will collaborate with MMWCA to support and encourage the further development of community conservancies in the greater ecosystem, especially capacity building of the conservancy institutions, setting up professional management systems for conservancies, and promotion of appropriate tourism investment needed to make them financially viable.

Working in collaboration with the MMWCA, Narok County and MMNR management will also support cooperation with conservancies on issues such as security and tourism products.

#### Action 4.2 Provide technical and material support to cultural village associations

Although wildlife tourism is becoming increasingly well developed in the wider ecosystem, access to the income generated from this activity is not universal or evenly distributed. For example, a study found that while around 50 percent of all households in the Koiyaki, Lemek and Siana areas receive some income from tourism, this is highly skewed with a few households earning much more than the majority<sup>27</sup>. A substantial amount of this difference is the

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<sup>27</sup> Homewood, K., Coast, E., Kiruswa, S., Serneels, S., Thompson, M., & Trench, P. (2006). Maasai Pastoralists: Diversification and Poverty [online]. London. LSE Research Online.

result of the relative location of individual plots and their suitability for tourism facility development (for example, those with plots near major rivers or close to MMNR boundaries are able to capitalise on development opportunities).

However, as past tourism patterns have shown, many visitors to the Mara are keen to learn more about the traditional Maasai culture and way of life, and visits to “*cultural villages*” have not only helped improve and diversify the overall visitor experience provided in the Mara, but have also greatly enhanced the wider distribution of revenues from tourism activities to additional community members. Nevertheless, these cultural villages have been beset by a number of management problems in recent years, which have reduced the flow of revenue to the communities operating them and have contributed to the downgrading of the visitor experience these facilities offer.

For community areas neighbouring the Mara Triangle section of the MMNR, the Mara Conservancy has in recent years addressed several of these management problems, for example, by supporting the development of transparent ticketing and payment systems for visits to cultural villages, coupled with a system for rotating visitation between villages in order to benefit different groups.

Based on this experience and lessons learnt, under this Action, Narok County and MMNR management will take steps to initiate similar improvements in other areas around the Reserve. This will include supporting cultural villages to set up an umbrella association for managing cultural manyattas, establishing common standards for the product, and improving the revenue collection and ticketing systems. Linked with the establishment of this association, it is proposed that lodges and camps should in future retain cultural village ticket funds and disburse them directly to the association.

Once these managerial and administrative aspects of the cultural villages have been addressed, Narok County and MMNR management will work to raise standards of the visitor experience at the villages (providing for example, advice on visitor expectations and the best ways to market handicrafts) and will also provide input and support to enhance the marketing and awareness of opportunities for visiting cultural villages.

Narok County will also support the development of a beadwork production and marketing centre in the wider ecosystem in partnership with Ushanga Initiative, as well as ensuring that tourism facilities provide suitable beadwork selling spaces in their hotels and lodges. MMNR management will also establish suitable beadwork selling spaces at MMNR tourism information centres and entry points – airports and gates (see Tourism Programme Action 1.1).

All these activities will be guided by the ongoing initiative by the Narok County Budget & Economic Forum Sub Committee on Cultural Promotion to develop guidelines for a Model Manyatta and its associated management systems<sup>28</sup>.

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<sup>28</sup> Narok County Budget & Economic Forum Sub Committee on Cultural Promotion (2019). The Manyatta. Narok County, pp1-6.

#### Action 4.3 Promote new tourism attractions in the greater Mara

The development and promotion of new tourism attractions in the greater Mara not only has the potential to provide a conservation-compatible source of income for community members living in the ecosystem but can also help to reduce visitor pressure on the core Reserve itself. There are a number of attractions around the Reserve that have either been used in the past and are in need of some rehabilitation, or that have not yet been developed but have the potential to be of significant appeal to tourists.

For example, the Nyakwere Forest in Trans Mara has been highlighted as a potential tourism attraction beyond the Reserve's boundaries. This substantial forest area has significant potential for walking safaris which could provide an important source of revenue for local communities and would provide an excellent complement to the vehicle-based game viewing on the plains below the escarpment. Narok County will therefore liaise with communities in the area as well as interested tour operators with regard to establishing this tourism attraction.

As appropriate, Narok County will also provide ongoing support to enhance the establishment and smooth running of this initiative as well as the development of other new tourism attractions in the wider ecosystem, through for example helping with the identification of walking routes, providing or enhancing the training of guides, and helping with marketing through incorporation the activities into MMNR marketing materials and awareness raising. In addition, Narok County will also raise awareness with tourism operators both in and around the Reserve to ensure wide awareness of the opportunities that have been developed.

#### Action 4.4 Promote sustainable energy sources in settlements around the MMNR

Despite the significant diversification in livelihoods, land use and enterprises practised around the MMNR in recent years, the majority of community members still depend directly on the ecosystem's natural resources to meet their livelihood needs. One of the natural resources in most demand is fuelwood and charcoal for cooking and boiling water. Demand for fuelwood and charcoal has contributed to deforestation and habitat degradation in the wider ecosystem and resulted in a rapidly diminishing supply to meet community needs. As a result, the search for fuel takes up a growing proportion of community members' time, which could otherwise be used in more economically productive activities.

Some progress has already been made towards addressing this issue, as illustrated by the construction of a biogas plant in a village near Mara Rianta (funded by Musiara Ltd). This biogas plant uses the dung of cattle and goats to fuel the production of methane gas, which is then piped to around forty houses.

Under this management action, Narok County in collaboration with other relevant agencies will support or initiate similar efforts to improve the sustainable supply of energy to local residents, either through the replication of the biogas project, or through the use of other potential sustainable fuel sources, such as the use of cow dung jikos. In addition, Narok County will work with tourism facility operators to promote the establishment of fuelwood lots, which can then be used by both the facilities themselves for atmospheric campfires, and by communities to meet their livelihood requirements.

#### Action 4.5 Promote and support initiatives to upgrade trading centres adjacent to the MMNR

Because of the boom in Mara tourism and the consequent availability of tourism-related employment opportunities, as well as the general expansion of human populations around the MMNR, many trading centres adjacent to the Reserve have experienced rapid growth in recent years. This growth has often occurred in an *ad hoc* fashion and has resulted in the development of sprawling, unsightly settlements with poor and unsanitary living conditions for residents, that lack even the most basic amenities and services.

The unplanned and unregulated expansion of centres around the MMNR has not only impacted on the quality of the environment for those living in or near to these centres, but, because many centres are close to or located at major access points to the MMNR, has also significantly impacted on the overall quality of the Mara tourism product. In addition, these settlements are also impacting on the ability of animals to disperse from the MMNR to surrounding areas and *vice versa*, by creating a hard edge along parts of the area's border.

For these reasons, this Action will support efforts to improve the planning and regulation of key Reserve-adjacent trading centres, in particular Talek, Sekanani, Oloichurra, and Oloo-laimutia. This will include the relevant Narok County department undertaking proper physical planning of all trading centres as well as the strengthening of County byelaws to prevent the establishment of new centres or the expansion of those that already exist (potentially including stipulations on the minimum distance any new centres must maintain from the MMNR boundary, and limitations on the maximum size of MMNR-adjacent centres as well as the types of business activities permitted).

In addition, Narok County will also enhance collaboration with and as appropriate provide logistical support to NEMA and County health officers to assist them in promoting community awareness and implementation of health and environmental regulations in trading centres. County government will also liaise with tourism industry stakeholders in and around the area to leverage financial or logistical support for cleaning and enhancing the environment in and around the targeted centres, with the aim of ensuring the centres are making a positive contribution to the Mara tourism product.

Key trading centre improvement initiatives will include support for greening activities (such as tree planting and proper waste disposal) and support for environmentally-friendly building design (such as no multi-storey buildings and the use of appropriate roofing materials and wall colours).

As a result of the rapid expansion of such centres and the high number of migrant workers they contain, the traditional community-based institutions governing such centres have often been undermined, or lack the capacity to keep up with the intensifying and diversifying issues that need to be dealt with in and around these settlements. To address this problem, Narok County will also collaborate with appropriate organisations to improve the governance and management of the target trading centres. In the first instance this will involve providing support for establishing or strengthening community management committees, along with the

provision of appropriate training in key areas (such as administration, financial management, record keeping, etc.).

### 7.3 Programme monitoring framework

The Community Outreach and Partnership Programme Monitoring Framework provides a mechanism for assessing the achievement of each of the management programme’s five objectives. As shown in Table 21 below, the framework sets out the desired positive impact of each of the programme’s objectives, indicators that the objective has been successfully achieved, how these indicators can be measured, and potential information sources.

Table 21. Community Outreach and Partnership Programme Monitoring Framework

Management Objective	Success indicators	Specific measurements	Data source
Obj. 1: Strong and constructive relationships between the MMNR and neighbouring communities established	The incidence of conflicts between MMNR management and neighbouring communities is reduced	Incidences of conflict between MMNR management and communities	MMNR Community Programme reports
	Adjacent community understanding of conservation values and challenges is improved	The number of community awareness raising meetings and/or events held by management	MMNR Community Programme reports
Obj. 2: Local community benefits from the MMNR improved	Community adherence to and support for the enforcement of Reserve rules and regulations is strengthened	The number of local community members apprehended for illegal resource use within the MMNR	Security records
	The revenue-sharing programme is strongly valued by eligible community members, who regard the benefits as significant, equitable and reliable	The amount and frequency of revenue disbursed to eligible communities through the MMNR Community Support Fund	MMNR Community Support Fund audited accounts
Obj. 3: Incidence and severity of conflicts between people and wildlife around the MMNR reduced	There is a significantly reduced incidence of human-wildlife conflicts in areas adjacent to the MMNR	The number of HWC incidences around the MMNR	HWC database (c.f. Action 3.1)
	MMNR management is responding to an increased proportion of HWC incidences with practical support and/or consolation	The percentage of live-stock predation incidences addressed through the consolation scheme	MMNR Community Support Fund audited accounts
		Other MMNR management responses to HWC	HWC database and Community Programme reports



Management Objective	Success indicators	Specific measurements	Data source
Obj. 4: Conservation-compatible land use and development in neighbouring areas promoted and supported	The conversion of wildlife habitat to conservation-incompatible land uses in MMNR adjacent community land is prevented	The number of wildlife conservancies in the Greater Mara Ecosystem	MMWCA records (c.f. Action 4.1)
	Community benefits from conservation-compatible land uses/activities and tourism in the Greater Mara Ecosystem are increased	The number of visitors to bomas that are part of organised cultural village associations	Cultural village association ticket records
		The number of visitors to Nyakwere Forest (or other specific attractions in the Greater Mara Ecosystem)	Visitor surveys (c.f. Tourism MP Action 4.3) or CBO records

# 8. Protected Area Operations Programme

## 8.1 Programme purpose

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MMNR management operations are fully supporting and enhancing the Reserve's standing as the world's premier wildlife destination

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The MMNR is currently faced by a wide variety of management challenges and issues, originating from both within and beyond the area's boundaries. Many of these issues, such as tourism development pressures and land-use change in the greater ecosystem, appear set to intensify over the 10-year implementation period of this plan. Targeted and coordinated management responses, as set out in each of the plan's four management programmes, are essential if MMNR management is to work towards addressing these issues, and the Reserve is to retain its status as one of the most outstanding wildlife destinations in Africa.

However, delivering these management responses in a logistically difficult and resource-constrained environment such as the MMNR is an ambitious undertaking, and if managers are to be successful in the implementation of this management plan, it is essential that protected area operations are strengthened and streamlined to support the effective and efficient delivery of the plan's management actions. Strong collaboration between the various institutions responsible for the implementation of these management actions will also be essential to ensure that plan implementation proceeds in a coordinated and coherent manner, as will collaboration with institutions and organisations in the wider ecosystem in addressing issues impacting on the MMNR that originate from beyond the area's boundaries.

The Protected Area Operations Management Programme sets out a framework designed to address these issues and to strengthen the effectiveness and complementarity of management operations within the MMNR, as well as collaboration with key stakeholders in the greater Mara-Serengeti Ecosystem.

## 8.2 Management objectives and actions

Four management objectives have been defined for the PA Operations Programme, as follows:

Objective 1: MMNR management systems and collaboration integrated and strengthened

Objective 2: Effectiveness and efficiency of MMNR security operations improved

Objective 3: MMNR human resource capacity improved

Objective 4. MMNR road network developed and maintained to support optimal visitor use and security coverage

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

is a brief description of the relevant management issues and opportunities, which provides the specific context and justification for the management actions.

### 8.2.1 Objective 1: MMNR management systems and collaboration integrated and strengthened

One of the most important underlying principles of this plan is the management of the MMNR as a single and coherent ecological unit and visitor destination. This integrated approach necessitates a high degree of compatibility and complementarity between the management regimes in the two sections of the Reserve (Mara Triangle and Central Mara), especially with regard the conservation of the area's exceptional resources, the development of a coordinated, coherent and appropriate tourism product across the entire MMNR, and security and other key management operations. In this regard, the establishment in 2013 of the Narok County from the previous two county councils has provided a unique opportunity to bring about the unified management of the entire MMNR.

As both parts of the Reserve started from a common baseline, the rules, regulations and management systems for each area are largely similar. However, there are some differences between the management of the two sections that need to be aligned to support the coordinated management of the MMNR as a coherent unit. This alignment will not only to help improve the streamlining, effectiveness and efficiency of management operations and the administration of the area, but also to enhance visitor and stakeholder understanding of the Reserve's rules and regulations.

In addition, it is also vital that MMNR management capitalises on the potential synergistic benefits of management collaborations in the wider ecosystem, by strengthening ties with other external agencies such as Serengeti National Park and with community organisations and wildlife conservancies as appropriate.

This objective has therefore been developed to address these issues and to ensure that management systems are integrated and enhanced across the MMNR and that management collaboration both within the MMNR and in the greater Mara-Serengeti ecosystem is strengthened. In order to achieve this, seven management actions have been developed and are elaborated in the following sections.

#### Action 1.1 Establish an internal MMNR management committee

As described above, management of the MMNR is currently the direct responsibility of Narok County in the Central Mara (Narok) section of the Reserve, and of the Mara Conservancy acting on behalf of Narok County in the Mara Triangle. Although the Mara River creates a clear boundary between these two management units, in reality the two areas are highly connected not only on an ecological basis but also regarding a number of other key management aspects, such as visitor management and security. This high level of connectivity necessitates strong collaboration between the managers of the two sections of the Reserve in order to achieve the holistic and integrated management of the MMNR that is a key guiding principle of this programme.

In an effort to strengthen collaboration and align the management of the two sections, Narok County signed a collaboration agreement with the Mara Conservancy in June 2020. Since the signing of the agreement, regular management meetings have been held between the two sections, including planning, budgeting and prioritising activities on a quarterly basis. Joint law enforcement patrols are also being undertaken, which have been very successful and well received by patrol staff from both sections of the Reserve.

Under Action 1.1, collaboration between the two sides of the Reserve and alignment in management practices will continue to be strengthened over the duration of this management plan. To further strengthen collaboration and harmonise management practices, an oversight committee will be established with responsibility for the coordination and integration of management practices in the Reserve and for addressing and resolving management issues of mutual concern. The committee, which will meet on a quarterly basis or according to need, will be made up of senior managers from both Reserve management agencies, Narok County Tourism & Wildlife officers, plus other individuals invited from time to time as appropriate.

#### Action 1.2 Review and revise MMNR byelaws

The existing MMNR byelaws were gazetted in 1994 under section 201 of the Local Government Act and cover a wide range of issues such as the role and authority of the senior warden, visitor rules and regulations, and visitor entrance fees. In the past, and in the absence of a strong management plan to guide the management of the MMNR, these byelaws have served a vital function in guiding Reserve management and use. However, while many of the byelaws are still appropriate, some are now outdated and have been superseded by events. In addition, the development and implementation of this new management plan will create the need for further revisions to the byelaws to ensure that they complement and reinforce the management plan's prescriptions.

In response to these issues, Narok County is currently implementing a process to update the Reserve's byelaws. Once finalised, the revised byelaws will need to be gazetted by the Narok County, and then disseminated to the Reserve's stakeholders to ensure compliance with the new regulations.

#### Action 1.3 Regularise MMNR staff terms of service and employment procedures

All uniformed staff in both the Mara Triangle and Central Mara (Narok) sections of the Reserve are Narok County staff and are subject to the same terms of service. A Scheme of Service for Narok County staff has been prepared and is currently being finalised, including approval by the Public Service Commission.

Mara Triangle uniformed staff are seconded to the Mara Conservancy, which is responsible for their remuneration. However, Mara Triangle non-uniformed staff are employed directly by the Mara Conservancy and are currently subject to a different scheme of service. Under this Action, efforts will be made to bring the scheme of service for these staff in line with that in the Central Mara (Narok) section, to ensure uniformity in the terms of service across the entire Reserve.

Over the longer term, a unified MMNR staff employment manual needs to be developed (or updated and consolidated where existing relevant materials exist) in order to standardise qualification requirements, recruitment protocols and the terms and conditions associated with different MMNR posts and grades.

#### Action 1.4 Harmonise airstrip landing fee collection systems

There are six airstrips within the MMNR, each used to varying degrees by commercial operators transporting visitors to destinations in and around the Reserve. On the Central Mara (Narok) side of the Reserve, Narok County takes responsible for the maintenance of airstrips and collects landing fees to underwrite the costs of these activities. This is done by recording each aircraft using the airstrips, and then submitting monthly invoices to the relevant operators. On the Mara Triangle side, the Mara Conservancy maintains the Serena airstrip, and collects landing fees from private but not commercial aircraft.

Under this Action, it is proposed that in future Narok County levies a standard annual landing fee on all commercial aircraft operating in the MMNR that is valid for all landing strips in the Reserve. To further simplify the administration involved, it is also proposed that the annual landing fee will be in accordance with the passenger carrying capacity of the aircraft and will be at a fixed rate that does not depend on the number of landings actually made in the Reserve in a year.

#### Action 1.5 Hold bi-annual meetings with Serengeti National Park management

Although the MMNR forms a keystone of the greater Mara-Serengeti Ecosystem, a large part of the ecosystem is located in Tanzania, mainly within the Serengeti National Park (SNP) directly to the south of the MMNR. The management approaches and activities that are implemented in the SNP are likely to have a significant impact on the MMNR, and *vice versa*. This is perhaps most evident with regard to the ecological aspects of both areas' management, such as controlled burning programmes and their impacts on animal distribution, and regarding anti-poaching operations, which in turn impact on the amount of cross-border poaching that the MMNR and in particular the Mara Triangle experiences.

As a result of these interdependencies, the establishment and maintenance of a strong collaboration between the managers of the MMNR and those of the SNP is a high priority under this management programme. Important existing mechanisms available to achieve this are the Greater Serengeti Conservation Society and inter-governmental transboundary meetings. MMNR managers already participate in meetings of the Greater Serengeti Conservation Society, and under this Action, they will continue to participate in the future as well as to take advantage of collaboration opportunities offered by other transboundary forums.

As with the internal MMNR management meetings, these cross-border meetings will provide a forum where synergies and complementarities between management approaches can be optimised and issues of mutual concern addressed. An important aim of these meetings will be to continue the process of strengthening communication systems and cooperation protocols between the managers of the two areas.

### Action 1.6 Organise MMNR familiarisation visits for County legislators and officials

The full Narok County Assembly undertook a familiarisation visit to the MMNR 2019. However most Narok County legislators and officials are largely unaware of the difficulties of operating in a logistically challenging and isolated environment, and of the scale and intensity of the threats impacting on the area. Under this Action, MMNR management will organise regular familiarisation visits to the Reserve by Narok County officials and members of the County Assembly, in particular members of the Assembly's Tourism, Wildlife and Planning Committee and the County Tourism Board once established. These visits will aim to demonstrate recent progress and improvements made in the Reserve's management, as well as to highlight urgent problems and key areas where resources or support from the County are most needed.

### Action 1.7 Support measures to have the MMNR recognised as a World Heritage Site

Although the MMNR is widely recognised as the host of one of the New Seven Wonders of the World - the Great Migration - unlike the neighbouring Serengeti National Park, the Reserve has not yet been recognised as a World Heritage Site. The addition of the Reserve to the list of World Heritage Sites is vital for the future conservation of the Reserve's biodiversity and habitats and will also promote the Reserve as a visitor destination. In this regard, the initial application to add the MMNR to the World Heritage List was made by KWS in 2010, and the Reserve is currently on the tentative list of future World Heritage Sites.

The approval of this MMNR management plan is an important first step in the process of meeting conditions for acceptance of the KWS' application to the UNESCO World Heritage Committee for the recognition of the MMNR. Other steps will be the necessary improvements in the management of the Reserve's tourism product as well as in ecological management, community participation and protected area operations, as set out in this management plan.

## **8.2.2 Objective 2: Effectiveness and efficiency of MMNR security operations improved**

The MMNR's location besides an international border and in an area with rapidly increasing human populations means that the protection of natural resources in and around the MMNR remains a vitally important issue. The most common illegal activities in the Reserve include bushmeat poaching, cattle rustling, in which cattle thieves use the Reserve as an escape route, and livestock grazing, which has been most severe in the Central Mara (Narok) section of the Reserve.

The prevention of these activities has on occasion proved to be extremely dangerous, and in recent years rangers have been seriously injured during the course of their duties. In addition, and of particular concern, is the maintenance of a safe and secure environment for tourists both in and around the MMNR, as even a single serious incident has the potential to generate a significant amount of international negative publicity and could have serious effects on visitor numbers to the Reserve and surrounding areas.

As is common in all protected areas in Kenya, the vast majority of staff in the MMNR are employed in the security sections. Most security staff are currently housed at ranger bases at or near visitor entrance points, with an additional two ranger bases in the Mara Triangle at Ngiro-Are and at the Mara River Bridge. Although the Narok County and Mara Conservancy have previously undertaken largely separate security operations and ranger patrols in the two sections of the MMNR, an increasing number of joint operations are now being carried out in key areas, e.g. along the Mara River. In addition, in order to help address the significant number of poachers entering the MMNR from Tanzania, Mara Conservancy security operations also take place across the border in cooperation with the Tanzania National Parks authorities, primarily in the Lemai Wedge section of the Serengeti National Park.

However, despite the significant progress that has been made in reducing the overall level of illegal activities within the MMNR, and the maintenance of complete visitor security within the Reserve over recent years, security operations are restricted by both resources and equipment, and there remains significant untapped opportunities and issues that need to be addressed in order to further enhance the effectiveness and efficiency of security in the Reserve.

Nine management actions have been developed that focus on enhancing the effectiveness and efficiency of security operations in and around the MMNR, which are elaborated in more detail in the following sections.

#### Action 2.1 Strengthen internal MMNR security collaboration

Mara Triangle and Central Mara (Narok) security staff have been successfully carrying out joint patrols for several years, and these have now been formalised under the Mara Conservancy-Narok County collaboration agreement signed in June 2020 (see Action 1.1 above). In an effort to strengthen the scope and effectiveness of these joint security operations, under this Action, monthly security coordination meetings will be held between Mara Triangle and Central Mara (Narok) security managers in order to enhance communication, share information, and to integrate security operations.

To further strengthen communications between the two security teams, radio frequencies used for operations will be harmonised. In this regard, the Mara Conservancy has already provided 12 radios for use by security teams in both sections of the Reserve.

#### Action 2.2 Develop an MMNR security database

A crucial requirement for monitoring and evaluating the overall effectiveness of security operations and for their adaptive management is the establishment of an MMNR security database. Such a database enables the identification of areas where security issues are most intense, which can in turn be used to support planning of security operations and patrols, and to identify the optimal location of new security outposts (see Action 2.5 below).

To address this need, the Mara Conservancy has already established a SMART<sup>29</sup> database and is carrying out ranger-based monitoring throughout the Mara Triangle as part of its security

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<sup>29</sup> Spatial Monitoring and Reporting Tool, developed and supported by the SMART Alliance.

patrols. Under this Action, this SMART monitoring system will be extended to cover the Central Mara section of the Reserve.

In addition, this Action will support the installation and further development of the Earth Ranger Real-time Operations Command and Control (C2) system throughout the Reserve. Both the expansion of SMART and the installation of Earth Ranger will require the purchase of new equipment, including computers and smart/GPS devices for rangers, as well as the provision of appropriate training in the use of the systems to rangers, data officers, and Reserve managers.

### Action 2.3 Demarcate MMNR boundary in key areas

Although the southern boundary of the MMNR is clearly demarcated as it runs along the Kenya-Tanzania border, boundary beacons along much of the remaining three sides of the area's boundary are not in place or are no longer easily discernible. As neither community members nor MMNR staff can be certain of where the exact border lies, this has at times caused community members to accidentally enter or graze cattle within the Reserve and has led to misunderstandings and undermined management efforts to foster a positive relationship with the communities living around the Reserve. Through this Action, key areas of the MMNR boundary will therefore be surveyed and clearly demarcated through the placement of beacons along the lines defined.

The two key areas that have been highlighted as requiring demarcation are from the Musiara Gate-Talek Gate in the Central Mara (Narok) section of the Reserve and from the Ololooloo Gate up and along the escarpment to the international border in the Mara Triangle. Both these areas have already been surveyed and title deeds issued for both the Reserve and the neighbouring properties. However, some boundaries are still in dispute and demarcation will be challenging to implement. This will require the strong support and intervention of Narok County government, the national government and local politicians.

### Action 2.4 Regularise status and procedures for MMNR rangers

One of the most serious factors currently undermining the equipping, training and operational capacity of the MMNR security ranger force is that they have not yet been registered as Kenya Police Reservists (KPR). This not only prevents them from receiving training from and collaborating with government forces, such as the General Service Unit, but also places limits on the type of firearms rangers are allowed to carry and their legal powers to follow up on illegal activity incidents.

The registration of all MMNR uniformed staff as KPR is therefore a high priority of this programme, which will pave the way for other improvements in capacity through training and the provision of improved firearms. As a step towards this registration, the Firearms Licensing Board has already carried out an inspection visit to the Reserve and has recommended that MMNR uniformed staff should be registered as KPR and issued with new firearms. Once KPR status has been achieved, all MMNR uniformed staff will be subject to the Code of Conduct of the national police force.



Night allowances for uniformed staff in the MMNR are set by the Salaries & Remuneration Commission and are standard for all MMNR staff. However, there are currently differences in the incentives that security section staff are offered between the Central Mara (Narok) and Mara Triangle sections of the Reserve, particularly with regard arrest bonuses. Under this Action, these will also be standardised between both sections of the MMNR to help ensure that morale and motivation amongst the rangers are maintained across the entire Reserve.

#### Action 2.5 Upgrade MMNR security support facilities

As mentioned above, security operations in and around the MMNR are carried out from a number of bases in the area, the majority of which are located at or near visitor entrance gates, with addition bases currently located at Ngiro-Are and the Mara River Bridge. However, although operations from these bases have been successful in maintaining a relatively good level of overall security in and around the MMNR in recent years, additional support facilities and ranger posts are needed in order to expand the security coverage to include some key parts of the MMNR where security is presently sub-optimal, as well as key areas outside the Reserve.

This expansion of coverage will entail the upgrading or development of new facilities on both sides of the MMNR during the 10-year lifespan of this plan. On the Central Mara (Narok) side of the Reserve, three new ranger posts, Osero Sophia, Zacharia, and Olare Orok have already been established but all are in need of further improvements, especially Olare Orok where flash floods have been a major problem and an alternative site may need to be identified.

In the Mara Triangle, the existing ranger post at the Mara River Bridge has already been upgraded with improved housing and facilities for the rangers based there, and a new ranger post has been established on the Siria Escarpment at the top of the existing cattle trails that run down to the saltlick inside the Reserve.

In addition, a Mara Triangle Operations Room has been established as part of the upgrade of the Mara Conservancy office facilities, but additional improvements will be carried out under this Action. Also under this Action, a new Central Mara (Narok) Operations Room will be established at Keekorok, including provision of all necessary equipment and training of Operations Room staff. As part of this process, the MMNR radio system will be upgraded to a digital system throughout.

#### Action 2.6 Obtain key equipment to enhance security operation effectiveness

MMNR security staff can be exposed to dangerous situations in the course of their work and need to be appropriately equipped in order to ensure the safety and effectiveness of their operations. In this regard, there are a number of areas that MMNR managers have identified as priority equipment shortfalls that need to be addressed, especially with regard transportation for security patrols. Towards this end, the Mara Conservancy has already provided the Central Mara (Narok) section of the Reserve with five new vehicles, as well as carrying out repairs to existing vehicles. Further improvements to security section transportation will be implemented under this Action over the duration of this management plan.

The Mara Conservancy has recently provided all MMNR rangers with new basic outfits (two uniforms plus boots for all rangers). Under this action, MMNR management will continue to upgrade and harmonise ranger outfitting across the entire Reserve. This will include the identification and adoption of a specific ranger uniform for the MMNR which is distinct from the uniform patterns used by other Kenyan armed forces.

The feasibility and utility of acquiring additional specialised equipment to enhance the safety and effectiveness of security patrols will also be investigated, specifically the potential of night vision goggles and protective clothing, such as bullet-proof vests. Firearms will also need to be upgraded during the lifespan of this plan, although this is likely to be contingent on the registering of MMNR rangers as Kenya Police Reservists (see Action 2.4 above). Finally, the possibility of acquiring a small aircraft (such as Piper SuperCub) for aerial surveillance and management support across the entire MMNR will be investigated, and the aircraft will be acquired if deemed appropriate and affordable.

#### Action 2.7 Strengthen MMNR dog section

Sniffer and tracker dogs have proved effective in a variety of protected area law enforcement situations around the world. In the Mara Triangle, the effectiveness of dogs in strengthening the law enforcement effort has been demonstrated in recent years, and the Triangle now has four tracker dogs (two each at Serena and Ngiri Are ranger bases) as well as four sniffer dogs based at Mara Triangle entrance gates.

Under this Action, it is proposed that additional tracker and sniffer dogs be acquired for the Central Mara (Narok) section of the Reserve, with six sniffer dogs needed for Central Mara entrance gates and four tracker dogs. This will require the sourcing of suitable dogs, the establishment of suitable kennel facilities, and the training of dog handlers.

#### Action 2.8 Provide training opportunities for MMNR security staff

The provision of regular training opportunities is vital in ensuring that MMNR staff have necessary and up-to-date skills to carry out their work efficiently. This is especially important with regard security staff who are not only charged with protecting the area's exceptional natural resources, but also with ensuring the safety of the Reserve's visitors as well as other MMNR staff. This management action aims to ensure that security staff are well trained and that suitable opportunities for enhancing staff capacity are capitalised on.

This will include sending staff on short training courses such as those provided by KWS at Manyani or by the Administration Police at Embakasi. In addition, *in-situ* training by specialists, such as the General Service Unit (following registration as Police Reservists) or private agencies will also be provided where appropriate and feasible. Over the long-term, an in-service training curriculum will be established for MMNR security staff, and senior staff will be sent on longer courses so that they themselves are able to function as in-house trainers.

#### Action 2.9 Improve awareness and counter measures for combating terrorism risks

As incidences elsewhere in Kenya and East Africa have illustrated, terrorism poses a serious and ongoing threat to the tourism industry, and even isolated events or threats can have a long-term detrimental impacts on visitation to an area. In today's global political climate, those

responsible for visitors to high profile attractions, such as the Maasai Mara, must be aware of the risk posed by terrorist activities, and must ensure that protocols and procedures are in place to prevent, and if necessary respond to, acts of terrorism or other disasters.

Under this Action, MMNR managers, working in collaboration with tourism industry partners, will take steps to ensure that all MMNR and tourism stakeholder staff are aware of the potential risks of terrorism, and of the methods to reduce the risks of an attack taking place. This will primarily be achieved through *in-situ* training with relevant specialists, such as the Terrorism Unit based in Nairobi, and other counter-terrorism specialists, as appropriate. Particular attention will also be given to the security of airstrips within the Reserve, and the identification of measures that can be taken to enhance the security of passengers and aircraft both on the ground and after aircraft departure.

### 8.2.3 Objective 3: MMNR human resource capacity improved

As is typical for many protected areas, MMNR staffing and infrastructural development priorities have traditionally focused on ensuring and enhancing the protection of the area's natural resources, and in maintaining a safe and secure environment for visitors to the Reserve. As a result, the vast majority of MMNR staff are currently assigned to the Reserve's security sections, and most management infrastructure has been developed to support resource protection operations.

While this remains an essential part of MMNR management (as discussed above under Objective 2 above), protected area managers are increasingly having to operate in an ever more complex environment, and are required to address an increasing variety of issues and threats that are impacting on the areas for which they are responsible. The MMNR is no exception to this, and this management plan sets out a series of management programmes that are designed to assist MMNR management to address a wide variety of emerging management issues.

Of particular importance in this regard are the ecology and tourism programmes, which set out a detailed set of objectives and actions that need to be achieved and implemented in order to ensure the continued conservation of the MMNR's exceptional resources and the enhancement of the area's tourism product. In addition, the Community Programme deals with the growing pressures the Reserve is coming under from surrounding human populations, and the growing requirement for the MMNR's managers to liaise and cooperate with these adjacent communities. The extension of management activities into these new areas will require dedicated and appropriately trained human resources and increased and diversified investment in specialised management infrastructure and equipment.

This objective therefore sets out a number of actions that have been developed to ensure that MMNR management have sufficient, trained staff to implement key aspects of this management plan and that management facilities and infrastructure are of sufficient quality and suitably located to ensure managers can effectively carry out their duties. The four management actions are elaborated in the following sections.

### Action 3.1 Establish MMNR Tourism Units

Major increases in visitor numbers in the MMNR in recent years has meant that the proactive management of tourism is now essential to the maintenance of a high-quality visitor experience and to ensure that tourism development and visitor use are not undermining the area's ecological integrity. This in turn requires that senior officers are designated to take overall responsibility for the MMNR tourism product and for delivering these vital aspects of the plan. In this regard, the Mara Triangle section of the Reserve already has a designated senior tourism officer.

Under this Action, a senior officer will also be assigned overall responsibility for tourism management in the Central Mara (Narok) section of the Reserve. The two responsible officers will need to liaise both with each other and with their line managers to ensure the coordinated implementation of both the Tourism Programme and the zonation prescriptions. These officers will also be responsible for overseeing the activities of other staff recruited to the MMNR Tourism Units (such as the Ticket Inspection & Anti-Harassment Units and specialist visitor handling staff, discussed under Actions 2.3 and 4.2 of the Tourism Management Programme).

### Action 3.2 Establish MMNR Ecology and Veterinary Unit

As with the Tourism Management Programme, the Ecological Management Programme also sets out an ambitious workplan covering an aspect of the MMNR's management that has not traditionally been a strong management focus. Although the MMNR is fortunate to have a dedicated ecological research station staffed by WRTI, MMNR management does not itself currently have an ecologist on its staff who can take the lead in implementing the Ecological Management Programme and in liaising with WRTI as well as external researchers working in the area.

To address this issue, under this Action, Narok County will recruit an MMNR Ecologist to oversee the implementation of the Ecological Management Programme and associated ecological monitoring, to improve linkages between WRTI activities and management priorities, and to strengthen the support to and management of external researchers.

In addition, the KWS-staffed Mara Mobile Veterinary Unit is based at the research station, but has to cover a huge geographical area that includes the entire Maasai Mara, Lake Naivasha, Ruma National Park and Lake Nakuru National Park, as well as the surrounding ranches and dispersal areas. As a result, when veterinary services are required they can sometimes take a number of days to be provided, causing distress to animals and preventing the early resolution of problems. For the Mara Triangle section of the Reserve, a vet has already been recruited with responsibility for looking after the dog unit and for other veterinary operations. Under this Action, a qualified vet will also be recruited for the Central Mara (Narok) section of the Reserve, thereby further relieving pressure on the mobile KWS unit.

### Action 3.3 Recruit or designate Community Warden(s) or Liaison Officer(s)

As the Community Outreach & Partnership Programme describes, interactions between the MMNR and the communities living around it are likely to intensify over the years ahead, and the importance of establishing and strengthening community support for the MMNR's

conservation is now more important than ever before. The programme sets out an ambitious range of objectives to be achieved and actions to be implemented to deliver the programme's overall purpose of fostering a sense of ownership and strong support for conservation efforts in the Greater Mara Ecosystem. However, much of the programme focuses on areas that have not traditionally been a priority of MMNR management and necessitate an increase in human resources and knowledge of specific technical areas.

Although the programme does set out some of the human resource requirements that the programme's successful implementation will require (such as increases in the number of community scouts), there is an additional need to designate or recruit an officer(s) who will spearhead the programme's implementation and form the vitally important link between MMNR management and the communities living around the area.

Under this Action, a community warden or officer will be designated for each section of the Reserve with responsibility for taking the lead in the implementation of the Community Outreach & Partnership Programme. To this end, the Mara Triangle already has a designated community warden based at Ololooloo Gate.

#### Action 3.4 Identify and address key staff capability shortfalls

In addition to the priority specific human resource requirements discussed under the previous two management actions, the implementation of this management plan is likely to have a number of other implications for the MMNR staff establishment. Some key shortfalls have already been recognised and are discussed elsewhere in this plan (for example the strengthening of Ticket Inspection & Anti-Harassment Units, see Tourism Management Programme Action 2.3). However, a comprehensive review of the current staff establishment, including the identification of any key shortfalls in staff numbers or specific training needs, will be essential to ensure that MMNR management has the ability to implement the plan.

As a first step towards addressing this issue, a human resource capacity needs assessment will be undertaken to identify priority needs and to recommend how these can best be addressed. In addition, and building on the results of this assessment, a formal MMNR Staff Training Programme will be developed covering all key aspects of MMNR staff roles, including, as appropriate, both *in-situ* and *ex-situ* training courses, to ensure that all staff have the capacity to carry out their assigned duties.

### **8.2.4 Objective 4: MMNR road network developed and maintained to support optimal visitor use and security coverage**

Most visitors to the MMNR spend the vast majority of their visit in their vehicles and on the Reserve's roads (either game viewing or transiting to or from their accommodations). As a result, the location, distribution and condition of the major roads and wildlife viewing tracks have a significant impact on the quality of the visitor experience in the area, and especially on wildlife viewing opportunities. In addition, the functioning of the MMNR management, security operations and tourism facilities also depend on a reliable and suitable network of well-maintained all-weather roads enabling year-round access to all parts of the Reserve.

However, the existing network of game viewing roads and tracks, particularly in the heavily used areas of the MMNR, has not kept pace with the rapidly expanding number of visitors to the area. This has contributed to heavy vehicle congestion at wildlife sightings and increased the overall impression that the area is heavily overused. Furthermore, severe weather, and a lack of all-weather standard roads, has in recent years not only seriously impacted management operations, but has sometimes led to large number of tourists cancelling their planned visits to the area, and seriously impacted on the quality of the visitor experience to those that have visited the area during these periods.

This objective has therefore been developed in order to upgrade and rehabilitate the entire MMNR road network, thereby optimising visitor use of the Reserve, reducing congestion in heavily used areas, increasing access to new parts of the Reserve where appropriate, and consolidating security coverage of the area. Seven actions have been developed in order to achieve this objective; these are elaborated in more detail in the following sections.

**Action 4.1 Liaise with relevant government sections on classified road maintenance**

As shown in Figure 6 below, four main government-classified roads traverse the Reserve - the C12, E176, E177 and D301. These classified roads are vital transportation arteries not only for visitors, management and tourism facilities, but also for providing some adjacent communities with access to urban centres and associated facilities. Although the Narok County receives funding for the upkeep of the classified roads under its jurisdiction, most of this support is directed towards urban areas and upkeep of the roads in the MMNR has traditionally been seen as the responsibility of Reserve management.

Figure 6. Classified roads in the MMNR



However, due to the significant costs involved, it has proved extremely difficult for MMNR managers to allocate sufficient funds for road repair and despite some successes at obtaining donor funding for this activity, substantial and sustainable external funding for maintaining the Reserve’s classified roads has not been forthcoming. Although managers have the majority of the plant necessary for the works needed, it is expensive to run and requires significant human resources to operate.

Under this Action, Narok County and MMNR management will collaborate with other relevant authorities to maintain the classified roads within the Reserve to adequate standards. In this regard, significant progress has already been made in securing this support, including:

- ▶ Tarmacking of the C12 from Narok to Sekanani Gate
- ▶ Grading of the E177 from Talek Gate to Keekorok by Kenya Rural Roads Authority
- ▶ Grading of Sekanani to Olaimutia road by Kenya Rural Roads Authority.

These completed works demonstrate the good collaboration with the relevant roads authorities that has already been achieved.

**Action 4.2 Maintain the all-weather status of key internal access roads**

The MMNR experiences heavy rainfall at certain times of year, which, combined with the black cotton soils that cover much of the area, can make travel within the area extremely difficult at times. Although historically this has only been a problem during the rainy seasons, in recent years storms or unexpected rains have occurred outside these periods and have resulted in serious disruption to management operations as well as tourism activities in the area. In addition, whereas previously visitor numbers were very low in the rainy seasons, tourism visitation to the area is increasingly a year-round phenomenon.

Figure 7. MMNR proposed roads for upgrading



Under this Action, key MMNR access roads will be maintained, or upgraded where necessary, to all-weather status to enable year-round access within the Reserve. The Action will also support the demarcation and maintenance of access roads in trading centres neighbouring the Reserve such as Sekanani and Talek, in order to avoid non-tourism vehicles entering the Reserve.

#### Action 4.3 Improve game viewing circuits in the High Use Zone

The successful implementation of this plan's Zonation and Visitor Use Scheme necessitates a significant improvement in the game-viewing track network in the MMNR's High Use Zones, with the aim of enhancing the overall quality of the wildlife viewing experience in these areas while reducing vehicle congestion. In addition, a number of unofficial tracks have been developed in the MMNR through continuous use by visitors, rather than being designed and developed by the Reserve's management. Many of these opportunistic roads are not optimally located from a management standpoint, are not maintained by Reserve management, and are having significant adverse environmental and visual impacts.

As a first step towards improving game viewing circuits in the Reserve's High Use Zones, MMNR management will build on and enhance current efforts to rationalise the game viewing track network in key areas by clearly demarcating approved tracks, and closing any inappropriate unofficial tracks that may have developed. As detailed in Action 1.4 of the Tourism Management Programme, a basis for this has already been established through the road mapping exercise carried out across the entire Reserve by the Mara Conservancy in 2019.

In addition, the road demarcating the boundary between the high and low use zones in the Central Mara (Narok) section of the Reserve that passes from the Talek-Olare Orok river confluence across the central plains to "sausage tree crossing" north of the Keekorok – Mara Bridge Road, near Roan Hill, will need to be clearly marked. Once the updated game viewing road plan has been prepared and development priorities identified, detailed budgets and plans of works will then be developed for each new road development in line with the roads plan's recommendations.

#### Action 4.4 Develop roads to enhance management, use and access to the Mara River Ecological Zone

The Mara River Ecological Zone has been established on either side of the Mara River to ensure the protection of the sensitive habitats and wildlife that these areas contain. This includes not only the Mara River itself, but also the riverine forests that run along its banks, Black rhino breeding areas, and wildebeest crossing points. In order to protect these exceptional resources, strict prescriptions on off-road driving, behaviour at crossings, and a surcharge on entry during peak times apply in this zone. However, the road network in these zones is currently inadequate to enable visitors to access the zone and its key attractions, and to clearly demarcate the zone boundaries.

To address these issues, MMNR management will upgrade the north-south oriented track running the entire length of the zone on either side of the Mara River, including the establishment of new sections of track where no suitable existing track is available. In this regard, a suitable track already exists in the Mara Triangle section of the Reserve for much of its length,



but a new track will need to be established in much of the MRZ on the Central Mara (Narok) side.

In addition, a series of east-west oriented side-tracks will need to be developed from these major access tracks to provide access to key attractions along the river (such as the hippo pools and wildebeest crossing points) without needing to drive off-road. These will where feasible be developed as loops, enabling one-way traffic on the side-tracks.

Finally, in order to enable access to the zone for 2WD vehicles on the Central Mara (Narok) side of the Reserve, existing roads will be upgraded where needed and clearly marked to ensure any 2WD vehicles transiting through the adjacent Low Use Zone remain on the designated main access road. This will be done from Musiara Gate to the MRZ, and along the road south of the Talek River.

#### Action 4.5 Improve river crossings at key points in and around the MMNR

The MMNR is fortunate in that there are relatively few major rivers that cross the area over which bridges or drifts need to be established. All-weather crossings or drifts have already been developed across the Sand and Mara Rivers, which have also formed the control points for vehicles entering the MMNR from Tanzania or crossing between the different sections of the Reserve. However, in order to enhance visitor and security patrol access to the Musiara section in the north of the MMNR, bridges are needed for both the Olare Orok and Nkiatakitat Rivers in the area known as “*double crossing*”. The construction work on these two bridges has already commenced. In addition, to facilitate the use of the Reserve by visitors wishing to access the MMNR through Musiara Gate, a new drift will be built on the main access road (the C13) at the approach to this gate.

#### Action 4.6 Address long-term road construction and maintenance equipment needs

As discussed throughout this objective, roads play a vital part in ensuring a high-quality visitor experience, and in enhancing management access and security patrols reach across the entire area. The upkeep of roads to a good standard is essential to ensure that the benefits that the new roads have been developed to provide are sustained, and that the resources and expenditure involved in their development are not wasted. It is therefore vital that MMNR management has sufficient operational plant and equipment to ensure that the existing and any new roads can be maintained, and that the cost of this maintenance is minimised.

Under the Mara Conservancy-Narok County collaboration agreement, the Mara Conservancy has now taken on responsibility for the maintenance of roads in the Central Mara (Narok) section of the Reserve as well as in the Mara Triangle. Under this Action, additional essential road maintenance equipment will continue to be sourced. Immediate heavy machinery needs to address current shortfalls are a grader, mechanical shovel, bulldozer, tipper truck and a fuel bowser.

#### Action 4.7 Establish new visitor entrance gate at Enoompuai

The MMNR is well served by a number of strategically located visitor entrance gates around the Reserve. These are generally at points where classified or other major roads meet the area's boundary, or in areas where there is significant demand to warrant the establishment

of a gate. Enoompuai is the only remaining place in the Reserve where a major road provides access to the Reserve without an entrance gate to control access and to collect entry fees.

This ambiguity in the area’s boundary has encouraged illegal activities, such as livestock grazing, in this section of the MMNR and has forced visitors entering the area to make a detour in order to pay for entrance to the Reserve. To address this loophole, a new and appropriately sized visitor entrance gate, and any associated staff housing needed, will be constructed at Enoompuai at the point where the major road connecting Talek-Musiara Gates meets the Reserve boundary.

### 8.3 Programme monitoring framework

The Protected Area Operations Programme Monitoring Framework provides a mechanism for assessing the achievement of each of the management programme’s five objectives. As shown in Table 22 overpage, the framework sets out the desired positive impact of each of the programme’s objectives, indicators that the objective has been successfully achieved, how these indicators can be measured, and potential information sources.

Table 22. Protected Area Operations Programme Monitoring Framework

Management Objective	Success indicators	Specific measurements	Data source
Obj. 1: MMNR management systems and collaboration integrated and strengthened	Central Mara (Narok) and Mara Triangle managers are working together to deliver coordinated management strategies for the entire Reserve	The number of MMNR oversight committee meetings per year	Meeting minutes or MMNR management annual reports
	Internal management systems, standards and byelaws are aligned throughout the Reserve	Enactment of revised MMNR byelaws by Narok County	Narok County records
	Communication and collaboration with Serengeti National Park managers are enhanced	The number of meetings held with Serengeti National Park management per year	Meeting minutes or MMNR management reports
	MMNR achieves international recognition for its world heritage values	MMNR added to the list of World Heritage Sites	UNESCO World Heritage Site list
Obj. 2: Effectiveness and efficiency of MMNR security operations improved	The levels of poaching and illegal livestock grazing in the MMNR are reduced and/or maintained at acceptably low levels	The number of poachers arrested and/or number of snares collected per year	MMNR management security records
		Size and frequency of livestock incursions and/or the number of herders arrested in the MMNR per year	
	High levels of visitor security both within and around the MMNR are maintained	The number of visitor security incidences in and around the MMNR per year	MMNR management security records

Management Objective	Success indicators	Specific measurements	Data source
Obj. 3: MMNR human resource capacity improved	All necessary specialist staff have been recruited to meet the implementation needs defined in the plan's management programmes	The number of specialist staff recruited in accordance with management plan specifications (c.f. Actions 3.1-3.4)	MMNR management staff establishment records
	MMNR staff are performing their duties to international protected area standards and with high morale	Staff performance verses timeframe defined in 3-year activity plans and annual work plans	MMNR management annual work plans and reports
Number of low morale related incidences			
Obj. 4: MMNR road network developed and maintained to support optimal visitor use and security coverage	High levels of accessibility throughout the MMNR are maintained at all times of year	The number of kilometres of roads/tracks built or upgraded per year	MMNR management records or annual reports
		The number of callouts for stranded vehicles in wet months	
	MRZ/HUZ road networks are of sufficient standard and extent to remove the need to drive off-road	Incidences of illegal off-road driving in the HUZ and MRZ	TIAHU records (as for Tourism Programme monitoring Obj. 2)

# Appendix 1: MMNR Accommodation Guidelines

This appendix describes the different types of visitor accommodation that are permitted in the MMNR and sets out prescriptions applying to all existing and any new accommodation facilities under each category.

## Lodges

Lodges are the oldest established accommodation facilities in many protected areas. The construction of this type of facility was favoured during the 1970s and 1980s, and lodges are generally large facilities of around 100-200 beds. They are permanent single or multi-levelled facilities that typically contain a reception area, gift shop, dining room(s), bar(s) and a swimming pool. All structures are generally made from permanent materials such as reinforced concrete, although guest bedrooms are often under canvas with a thatched or wooden shelter. However, all floors and bathrooms are typically made from concrete or other permanent materials. All lodge guest bedrooms, staff housing and communal structures typically have interior plumbing, running water and electricity (commonly supplied by a generator). Table 23 below sets out prescriptions and standards to be achieved by all MMNR lodges.

Table 23. Prescriptions for MMNR lodges

Attribute	Prescriptions
Bed capacity	▶ Maximum 200 beds
Lease	▶ 15 years
Exclusion zones	▶ To be renegotiated after expiry of existing leases to bring all exclusion zones to 8km radius
Concession area	▶ Maximum 15 hectares
Licensing requirements under Cap. 494	▶ Hotel Licence ▶ Hotel Manager's Licence ▶ Catering Levy Licence
Construction	▶ Maximum of 1 storey ▶ Reinforced concrete, canvas, thatch or other natural materials ▶ Interior plumbing and electricity supply permitted in all buildings
Site management	▶ Inconspicuous electric fencing of concession area permitted when approved by Narok County ▶ Murram, gravel, stone and cement car park and access roads ▶ Murram, gravel, stone and cement footpaths, terraces, seating areas etc. ▶ Site landscaping permitted (no use of exotic species, spotlights or artificial water features/saltlicks to attract game)
Guest amenities	▶ Reception areas, gift shop, dining rooms, bars, swimming pools, and conference facilities (saltwater rather than chlorinated pools preferred)

Attribute	Prescriptions
Guest accommodation	<ul style="list-style-type: none"> <li>▶ Detached or attached bedrooms (attached to communal buildings if preferred)</li> <li>▶ Soaps, shampoos and other guest toiletries provided must be biodegradable</li> </ul>
Staff accommodation and facilities	<ul style="list-style-type: none"> <li>▶ Staff kitchens, canteens and lounge/TV rooms</li> </ul>
Ancillary facilities	<ul style="list-style-type: none"> <li>▶ Staff offices, vehicle garage/workshops, and commercial petrol pumps (when approved by Narok County)</li> <li>▶ Must ensure no fuel contamination of soil/water sources; no vehicle spray painting</li> </ul>
Catering	<ul style="list-style-type: none"> <li>▶ Gas or charcoal briquette cookers (no other charcoal or dead wood)</li> <li>▶ Fully equipped kitchen, food stores and electric cold storage facilities</li> <li>▶ All soaps and detergents used to be organic and biodegradable</li> </ul>
Water supply and use	<ul style="list-style-type: none"> <li>▶ Borehole or other permanent water source when approved by Narok County and other relevant authorities</li> <li>▶ Maximum extraction of 400 litres per guest bed per day (or in line with borehole extraction permit)</li> <li>▶ Dual flush toilets and low water use showerheads mandatory</li> <li>▶ All laundry, vehicle and building washing to use organic and biodegradable soaps and detergents</li> </ul>
Electricity supply and use	<ul style="list-style-type: none"> <li>▶ Petrol/diesel generator</li> <li>▶ Transitioning to solar power for lighting and water heating or other renewable sources preferred</li> </ul>
Solid waste	<ul style="list-style-type: none"> <li>▶ All solid waste removed from MMNR and incinerated</li> </ul>
Waste water	<ul style="list-style-type: none"> <li>▶ Multi-tank liquid waste polishing system or septic tanks with soak pits and secondary treatment chambers</li> <li>▶ Systems must include mechanisms for trapping cooking fat</li> </ul>
Environmental standards	<ul style="list-style-type: none"> <li>▶ Expected to attain Bronze Ecotourism Society of Kenya certification</li> </ul>

## Ec lodges

As the popularity of lodges in protected areas has declined for environmental and tourism product grounds, the focus has shifted towards smaller and more environmentally friendly facilities, termed here “**ecolodges**”, that provide premium visitor accommodation. These facilities are designed and constructed to have a small visual and environmental impact, and usually seek to create a more “*natural*” ambiance and visitor experience than traditional lodges. While ecolodges are still constructed on a permanent basis, they make more use of natural materials that blend with their surrounding environment and attempt to keep the use of permanent construction materials to a minimum.

Ec lodges are restricted to a single level, which may have a permanent cement or wooden platform, and typically have a tented (or other natural material, such as wood and thatch) communal structure(s) containing a reception, dining room and bar, or other similar facilities. Guest accommodation is usually in a series of one-level tented bedrooms, with a cement or

wooden platform base and attached bathroom. Similar to lodges, all bedrooms and communal structures have interior plumbing, running water and electricity. Table 24 below sets out the prescriptions with which all existing and any new ecolodges in the MMNR must comply.

While this is a new category of accommodation in the MMNR, several existing facilities which are currently loosely referred to as “**Permanent Tented Camps**” may well already comply with the prescriptions in the following table or could easily be made to do so with some modifications. However, other facilities which until now have been sometimes referred to as permanent tented camps are clearly not ecolodges and more appropriately fall within the lodge category described above.

Table 24. Prescriptions for MMNR ecolodges

Attribute	Prescriptions
Bed capacity	▶ Maximum 30 beds
Lease	▶ 15 years
Concession area	▶ Maximum 10 hectares
Licensing requirements under Cap. 494	▶ Hotel Licence ▶ Hotel Manager’s Licence ▶ Catering Levy Licence
Construction	▶ Single storey only ▶ Wooden decking for base platforms and bathroom floors and walls; limited use of concrete or other permanent construction materials is permitted ▶ Canvas or natural construction materials used for all other structures or parts of structures (i.e. walls and roofs) ▶ Interior plumbing and electricity supply permitted in all buildings
Site management	▶ No fencing of concession area permitted ▶ Murram or gravel car park and access roads ▶ Murram, gravel or other non-permanent footpaths, terraces, seating areas etc. ▶ Site landscaping limited to essential clearance of vegetation only (no ornamental gardens, spotlights or artificial water features/saltlicks to attract game)
Guest amenities	▶ Reception area, gift shop, a communal dining room and a lounge/bar ▶ No swimming pools, conference facilities or other additional visitor amenities
Guest accommodation	▶ Detached individual bedrooms of canvas and/or natural construction materials ▶ Soaps, shampoos and other guest toiletries provided must be biodegradable
Staff accommodation and facilities	▶ Separate staff canteen and lounge/TV room (no separate cooking areas)
Ancillary facilities	▶ Staff offices and vehicle garage/workshops

Attribute	Prescriptions
	<ul style="list-style-type: none"> <li>▶ No commercial petrol pumps; fuel stored in specialist containment tanks on heavy duty polythene lining or concrete base</li> <li>▶ Must ensure no contamination of soil/water sources; no vehicle spray painting</li> </ul>
Catering	<ul style="list-style-type: none"> <li>▶ Charcoal briquette or gas cookers (no other charcoal or dead wood)</li> <li>▶ Kitchen, food store and electric cold storage facilities</li> <li>▶ All soaps and detergents used to be organic and biodegradable</li> </ul>
Water supply and use	<ul style="list-style-type: none"> <li>▶ Borehole or other permanent water source when approved by Narok County and other relevant authorities</li> <li>▶ Maximum extraction of 350 litres per bed per day (or in line with borehole extraction permit)</li> <li>▶ Dual flush toilets and low water use showerheads mandatory</li> <li>▶ All laundry, vehicle and building washing to use organic and biodegradable soaps and detergents</li> </ul>
Electricity supply and use	<ul style="list-style-type: none"> <li>▶ Solar electricity supply for lighting (minimum back-up use of petrol/diesel generator)</li> <li>▶ Water heated by renewable sources (e.g. solar, charcoal briquettes) backed up by generator when necessary</li> <li>▶ Energy efficiency measures mandatory (e.g. light bulbs, path markers, etc.)</li> </ul>
Solid waste	<ul style="list-style-type: none"> <li>▶ All waste sorted, separated and removed from MMNR</li> <li>▶ Non biodegradable waste removed from MMNR and incinerated</li> <li>▶ Biodegradable waste removed from MMNR and composted</li> </ul>
Waste water	<ul style="list-style-type: none"> <li>▶ Multi-tank liquid waste polishing system or septic tanks with soak pits and secondary treatment chambers</li> <li>▶ Systems must include mechanisms for trapping cooking fat</li> </ul>
Environmental standards	<ul style="list-style-type: none"> <li>▶ Expected to attain Silver Ecotourism Society of Kenya certification within three years of operation</li> </ul>

## Ecocamps

Ecocamps are designed to have minimal visual and environmental impacts while at the same time providing visitors with a luxury bush-camping experience. As defined for the MMNR, they are small permanent or semi-permanent facilities that contain only tented/canvas structures.

Table 25 overpage sets out the prescriptions with which all ecocamps must comply.

Table 25. Prescriptions for MMNR ecocamps

Attribute	Prescriptions
Bed capacity	▶ Maximum 18 beds
Lease	▶ Ten years
Occupancy	▶ Ecocamps may be both permanent and seasonal
Concession area	▶ Maximum 5 hectares
Licensing requirements under Cap. 494	▶ Hotel Licence ▶ Hotel Manager's Licence ▶ Catering Levy Licence
Construction	▶ Tented/canvas structures only ▶ No permanent construction of any kind permitted ▶ Only concealed plastic plumbing permitted ▶ Dual flush composting toilets, aqua privies or composting toilets only ▶ No other plumbing or running water permitted
Site management	▶ No fencing of concession area ▶ No development of parking area beyond grass cutting ▶ Cut grass footpaths (no gravel, murrum or similar materials) ▶ No landscaping of concession area beyond grass cutting
Guest amenities	▶ One communal dining area, and one lounge/bar area
Guest accommodation	▶ Detached individual canvas tented bedrooms ▶ Soaps, shampoos and other guest toiletries provided must be biodegradable
Staff accommodation and facilities	▶ One communal staff canteen/lounge tent
Ancillary facilities	▶ One office tent and one tented store ▶ All fuel stored in specialist containment tanks on heavy duty polythene lining
Catering	▶ Charcoal briquette or gas cookers ▶ Charcoal briquette fridge or renewable source of energy for cold storage ▶ One kitchen tent and one dry food storage tent ▶ All soaps and detergents used to be organic and biodegradable
Water supply and use	▶ Water pumped or transported in from specific source/location ▶ Water stored in temporary tanks ▶ All laundry, vehicle and tent washing to use organic and biodegradable soaps and detergents
Electricity supply and use	▶ Primary power source must be solar or other renewable energies ▶ Water heated by renewable sources (e.g. solar, charcoal briquettes) ▶ Energy efficiency measures mandatory (e.g. light bulbs, use of LEDs, etc.) ▶ Silenced generator as a back-up power source only (up to 12KVA maximum)
Solid waste	▶ All waste sorted and reused/recycled where possible



Attribute	Prescriptions
	<ul style="list-style-type: none"> <li>▶ Non-biodegradable waste removed from MMNR and incinerated</li> <li>▶ Biodegradable waste removed from MMNR and composted</li> </ul>
Waste water	<ul style="list-style-type: none"> <li>▶ Grey water discharged 50 metres from surface water, sloping away from water source wherever possible</li> </ul>
Environmental standards	<ul style="list-style-type: none"> <li>▶ Expected to attain Gold Ecotourism Society of Kenya certification within three years of operation</li> </ul>

## Special campsites

Special campsites are small, designated sites within the MMNR where commercial operators establish temporary and very high standard tented camps which aim to provide visitors with a unique wilderness-style camping experience. Special campsites are used primarily by mobile camping operators, who fulfil a unique high-end niche within the market for which East Africa, and in particular Kenya, is justly famous.

Special campsites are located in secluded and especially attractive parts of the MMNR, most commonly on the banks of the area's various rivers. Special campsites may be reserved on an exclusive-use basis for a maximum of 14 days and, aside from firewood supplied to selected sites, no facilities are provided at these sites. No permanent structures may be established, and all waste must be incinerated or removed from the site after use.

The strict environmental prescriptions applied to the special campsites enable these facilities to be established in areas and sites which would normally be off limits for more permanent and intrusive developments. Table 26 below sets out the prescriptions with which all special campsites must comply.

Table 26. Prescriptions for MMNR special campsites

Attribute	Prescriptions
Bed capacity	<ul style="list-style-type: none"> <li>▶ Maximum of 16 guests per site</li> </ul>
Lease	<ul style="list-style-type: none"> <li>▶ N/A (fees paid on pre-booked, per person bed-night basis through a central booking facility)</li> </ul>
Occupancy	<ul style="list-style-type: none"> <li>▶ Occupancy of the site permitted for a maximum period of 14 days. Site to be returned back to natural conditions for the rest period. No back-to-back booking of the site by the same operator permitted.</li> </ul>
Concession area	<ul style="list-style-type: none"> <li>▶ N/A</li> </ul>
Licensing requirements	<ul style="list-style-type: none"> <li>▶ N/A</li> </ul>
Construction	<ul style="list-style-type: none"> <li>▶ Tented/canvas structures only</li> <li>▶ No permanent construction of any kind permitted</li> </ul>
Site management	<ul style="list-style-type: none"> <li>▶ Use existing campsite "<i>footprint</i>"</li> </ul>
Guest amenities	<ul style="list-style-type: none"> <li>▶ One communal dining tent</li> </ul>
Guest accommodation	<ul style="list-style-type: none"> <li>▶ Separate tented bedrooms</li> <li>▶ Soaps, shampoos and other guest toiletries provided must be biodegradable</li> </ul>

Attribute	Prescriptions
Staff accommodation and facilities	▶ One communal staff mess tent
Ancillary facilities	▶ N/A
Catering	▶ All cooking/catering to use charcoal briquette or gas cookers ▶ All soaps and detergents used to be organic and biodegradable
Water supply and use	▶ All laundry, vehicle and tent washing to use organic and biodegradable soaps and detergents
Electricity supply and use	▶ Power source must be solar or other renewable energies ▶ Water heated by renewable sources (e.g. solar, charcoal briquettes)
Solid waste	▶ All waste/litter removed from MMNR and incinerated
Wastewater	▶ Grey water discharged 30 metres from surface water, sloping away from water source wherever possible
Environmental standards	▶ Management may close a site at any time to allow for ecological recovery ▶ Users must adhere to the MMNR Code of Conduct for Special Campsite Use (see overpage)

## Maasai Mara National Reserve Special Campsite Code of Conduct

Camping is permitted at designated “*special campsites*”, which are located at secluded and especially attractive locations within the MMNR. These camps have been designated to provide users with a wilderness-style camping experience and are used on an exclusive basis by a single party for the duration of their stay.

All special campsites may be used by any commercial operator or private party with a prior confirmed booking in accordance with the following guidelines. These guidelines have been developed to ensure that all sites remain in good condition and all users have a safe, enjoyable and low impact camping experience in the MMNR.

### 1) **Special campsite booking and occupation**

- ✓ All sites must be reserved in advance through the Mara Conservancy or Narok County as relevant
- ✓ Sites may be occupied for a maximum of 14 nights’ continuous use by a single party
- ✓ A maximum of 16 visitors are permitted at each campsite (commercial operator support staff are additional to this number)

### 2) **Use of special campsites**

- ✓ The defined campsite “*footprint*” must be adhered to at all times in order to minimise environmental disturbance
- ✓ No cutting or removal of woody vegetation or clearance of vegetation is permitted
- ✓ No collection of firewood is permitted with the Reserve; all campfires should be made on existing fire scars
- ✓ All soaps, detergents and other cleaning products used must be organic and biodegradable
- ✓ Professional operator camp supply trucks must not leave the campsite between initial camp establishment and final demobilisation (reprovisioning is permitted)

**3) Disposal of solid and liquid wastes**

- ✓ All litter that cannot be effectively burned on site (e.g. tin cans, glass, all plastic, cigarette butts and other biodegradable waste) must be removed from the Reserve
- ✓ All grey water must be discharged at least 30 metres from surface water, sloping away from water source wherever possible
- ✓ Toilet pits must be least 20 metres from a water course; all toilet paper should be burned or packed out

**4) Environmental standards**

- ✓ MMNR management may close a special campsite at any time to allow for environmental recovery
- ✓ Any users in breach of this code of conduct may be temporarily or permanently prohibited from using any MMNR special campsite

***Please inform the Mara Conservancy or Narok County as relevant if any site is showing signs of environmental degradation or was not left by the previous occupier in the condition that you wished to find it.***

## Appendix 2: Planning meetings held

Table 27. MMNR management plan consultation and plan development meetings

Meeting Type	Dates
Full Stakeholder Workshop	<ul style="list-style-type: none"> <li>• 29 January 2007</li> </ul>
Narok County MCA Plan Review & Approval Meeting, Naivasha	<ul style="list-style-type: none"> <li>• 6-8 February 2023</li> </ul>
Core Planning Team (CCN and CCTM and subsequently Narok County)	<ul style="list-style-type: none"> <li>• 20 December 2006</li> <li>• 16 May 2007</li> <li>• 28 February 2008</li> <li>• 11 August 2008</li> <li>• 27 November 2008 (full CCN council)</li> <li>• 20 February 2009</li> <li>• 28 April 2009 (full CCN council)</li> <li>• 19-21 May 2009 (CCN site visit)</li> <li>• 26 May 2009 (CCTM site visit)</li> <li>• 18 June 2009</li> <li>• 29 September 2009 (full CCTM council)</li> <li>• 19 May 2010 (full CCTM council)</li> <li>• 9 August 2010</li> <li>• 26-29 June 2015 (NC retreat #1)</li> <li>• 16-18 July 2015 (NC retreat #2)</li> <li>• 8-9 September 2015 (NC retreat #3)</li> <li>• 20-21 August 2020</li> <li>• 25-26 February 2023</li> </ul>
Ministry of Tourism Task Force	<ul style="list-style-type: none"> <li>• 6 April 2009</li> <li>• 20 April 2009</li> <li>• 29 April 2009 (Ministers)</li> <li>• 6 May 2009</li> <li>• 11 May 2009</li> <li>• 3 June 2009</li> <li>• 10 August 2009</li> <li>• 7-8 September 2009 (retreat)</li> <li>• 25 September 2009</li> <li>• 26 October 2009</li> <li>• 10-11 November 2009 (retreat)</li> <li>• 29 July 2010</li> <li>• 11-13 August 2010</li> <li>• 25 February 2010</li> </ul>

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Meeting Type	Dates
Tourism Working Group	<ul style="list-style-type: none"><li>• 7 December 2007</li><li>• 28 February 2008</li><li>• 10 April 2008</li><li>• 13 June 2008</li><li>• 12 August 2008</li><li>• 19 August 2008</li><li>• 11-13 November 2008 (site visit)</li><li>• 13 April 2010 (KTF Open Day)</li></ul>
Community Working Group	<ul style="list-style-type: none"><li>• 18-20 June 2008</li></ul>
Ecology Working Group	<ul style="list-style-type: none"><li>• 2 October 2007</li><li>• 14 March 2008</li></ul>
PA Operations Working Group	<ul style="list-style-type: none"><li>• 19-20 March 2008</li><li>• 8-9 May 2008</li></ul>

## Appendix 3: Stakeholder participation in plan development

Name	Position/Organisation	Stakeholder Planning Workshop	Core Planning Team Meetings	Ecology Working Group Meetings	Tourism Working Group Meetings	Community Working group Meeting	PA Operations Working Group Meetings	Mobile Camp Operator Meetings	Direct Stakeholder Consultations
Abbonizio, Bobby	David Penrose Safaris (Royal African)							✓	
Addison, Alastair	Operations Director, Serena Hotels				✓				
Agoya, Francis	M & E Officer, Tourism Trust Fund		✓						
Beaton, Gerard	MD, Rehero Camp and Homes				✓			✓	✓
Carr-Hartley, Mikey	The Specialised Safari Co./Sala's Camp							✓	✓
Cheffings, Anthony	OnSafari Kenya							✓	
Cheffings, Simonne	Campfire Conservation Ltd							✓	
Cheli, Stefano	V.Chairman KATO, MD Cheli and Peacock				✓				
Cottar, Calvin	Director, Cottars1920s				✓				
Dloniak, Stephanie	Director, Mara Carnivore Research Project	✓		✓					
Earnshaw, Allan	Chairman, Ker and Downey Safaris				✓			✓	✓
Fenwick Wilson, T.	Abercrombie and Kent								✓
Gichimu, Joseph	Economist, Ministry of Reg. Devt Authorities		✓						
Gichohi, Helen	President, African Wildlife Foundation				✓				✓
Gitu, Charles	Finance Manager, Mara Conservancy						✓		
Grammaticas, Aris	MD, Musiara Ltd/Governors' Camps	✓							✓
Grammaticas, D.	Director, Musiara Ltd/Governors' Camps				✓				✓
Grieves-Cook, Jake	Chairman, Kenya Tourist Board	✓							
Heath, Brian	CEO, Mara Conservancy	✓	✓	✓	✓	✓	✓	✓	✓
Henson, Dave	Prog. Officer, Conservation Dev. Centre	✓		✓	✓	✓	✓		
Inamdar-Willets, A.	Board Member, Ecotourism Kenya				✓				
Iten, Thomas	Director, Private Safaris				✓				✓
Jirmo, Tuqa	District Warden Narok, KWS					✓			
Kaelo, Dickson	Community Coordinator, ILRI			✓		✓			
Kaigua, Fred	CEO, Kenya Association of Tour Operators	✓			✓				✓

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Name	Position/Organisation	Stakeholder Planning Workshop	Core Planning Team Meetings	Ecology Working Group Meetings	Tourism Working Group Meetings	Community Working group Meeting	PA Operations Working Group Meetings	Mobile Camp Operator Meetings	Direct Stakeholder Consultations
Kamanja, Joel	Camp Manager, Mara Siria								✓
Kanga, Erustas	Head Ecological Monitoring, KWS			✓					
Karanja, Geoffrey	Lecturer, Moi University			✓					
Karanja, Peter	Chairman, Kenya Tourism Federation				✓				
Kariuki, Apollo	Senior Resource Planner, KWS		✓						
Kashu, Daniel	Rhino Warden MMNR, C.C. of Narok						✓		
Keiwua, Moijo ole	Olare Orok Conservancy/OI Kiombo Ltd		✓						
Kent-Taylor, Anne	President, A.K. Taylor Fund	✓							
Kepher-Gona, Judy	Executive Officer, Ecotourism Kenya				✓				
Kijabe, Tunai	Director, Oloololo Game Ranch	✓							
Kimojino, Joseph	Ass. Warden, Mara Conservancy						✓		
Kiroro, Duncan	Manager, Maasai Mara Sopa Lodge Ltd								✓
Kisemei, Jackson	Motorogi Conservancy					✓			
Kisoso, Andrew	Assistant Manager, Keekorok Lodge								✓
Kisotu, Stephen Ole	Friends of Conservation/Naikarra					✓			
Kiu, Josphine	County Council of Narok/Siana					✓			
Koikai, Michael	Senior Warden MMNR, C.C. of Narok				✓	✓	✓		✓
Kolongo, Maurice	Club Manager, Mpata Safari Club							✓	
Korompo, Daniel	Warden Talek, C.C. of Narok						✓		
Korrir, Ken	Lodge Manager, Sarova Mara Game Camp								✓
Korton, Joesph	Ass. Warden, Mara Conservancy						✓		
Kuloba, Bernard	Research Scientist, KWS			✓					
Lengirr, Samson	Game Warden, County Council of Narok	✓		✓					
Leperes, Benard Ole	Community Representative, Koiyaki					✓			
Lesarge, Tom	Olonana Lodge, Sanctuary Lodges								✓
Luckhurst, Adrian	MD, Balloon Safaris Ltd				✓				
Macharia, Boniface	Ass. Unit Manager, Heritage Hotels								✓

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Name	Position/Organisation	Stakeholder Planning Workshop	Core Planning Team Meetings	Ecology Working Group Meetings	Tourism Working Group Meetings	Community Working group Meeting	PA Operations Working Group Meetings	Mobile Camp Operator Meetings	Direct Stakeholder Consultations
Macharia, Mike	CEO, KAHC				✓				
Malpas, Rob	CEO, Conservation Development Centre	✓		✓	✓	✓	✓		
Manegene, Stephen	Head Planning, Kenya Wildlife Service	✓							
Masinde, G.	Prog. Officer, African Conservation Centre								
Mbuvi, Mutisya	Ass. Manager/Chef, Acacia Camp								✓
McCartney, Mike	Conservation manager, Ker and Downey	✓			✓				
McConnell, Charlie	Robin Hurt Photographic Safaris							✓	
Mohamed, Fatuma	Senior Research Officer, NEMA		✓						
Moki, Eluid	Land Surveyor, Ministry of Lands		✓						
Monson, Greg	Kichche Camp							✓	
Mukenye, James	Game Clerk, County Council of Narok						✓		
Murithi, Philip	Project Assistant, Ecotourism Kenya	✓							
Muriuki, Duncan	Chairman, KATO				✓				
Muruthi, Philip	Director, African Wildlife Foundation		✓	✓					
Museni, Hassan	Manager, Kichwa Tembo/Bateleur Camp								✓
Musyoki, Harvn	Sales Manager, Abercombie and Kent				✓				
Mutambuki, Elijah	Clerk, County Council of Trans Mara	✓							
Naikada, Samwel Ole	Oloirien Group Ranch					✓			
Nchoe, Dominic Ole	Community Representative, Lemek					✓			
Ngori, Peter	MD, Abercombie and Kent				✓				
Ngoro, Bernard	Research Scientist, KWS			✓					
Njaga, Daniel	Director, Menengai Holidays Ltd				✓				
Njogu, David	Manager, Figtree Camp, Mada Hotels								✓
Njora, Dickson	Compliance and Enforcement, NEMA		✓						
Nkadaru, Sarisar	Administered Officer, Mara Conservancy					✓	✓		
Nkoitoi, Edward	Warden Operations, Mara Conservancy						✓		
Nkoitoi, Sammy	Community Representative, Siana					✓			
Norris, Billy	4 x 4 Safaris (Royal African							✓	



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Name	Position/Organisation	Stakeholder Planning Workshop	Core Planning Team Meetings	Ecology Working Group Meetings	Tourism Working Group Meetings	Community Working group Meeting	PA Operations Working Group Meetings	Mobile Camp Operator Meetings	Direct Stakeholder Consultations
Ntutu, Ignatius	Olchoro Community Officer					✓			
Odera, Godwin	Ass. Lodge Manager, Mara Hippo Lodge								✓
Oduor, Jacob	Manager, Earthview Management	✓							
Ogada, Mordecai	Kenya Wildlife Trust							✓	
Ogola, Maurice	County Clerk, County Council of Narok		✓						
Ogutu, Joseph	Statistical Ecologist, ILRI	✓		✓					
Oguya, Bob	Chief Naturalist, Serena Hotels				✓				
Okita, Benson	Rhino Program Coordinator, KWS			✓					
Olum, Joash	Director, Somak Travel Ltd				✓				✓
Ombara, Doris	Project Manager, WWF			✓					
Opondo, Michael	Sales and Marketing Director, Serena				✓				
Orr, George	MD, Earthview Management	✓			✓		✓		
Otete, Jacob	Private Safari/Kuoni Destination Mgmt							✓	
Parkiusa, Philliph	Ass. Warden Musiara, C.C. of Narok						✓		
Ratcliff, Jennifer	JMAR Safaris/KATO				✓				
Robertson, James	Director, Mara Conservancy/ K&D Safaris				✓				✓
Said, Mohammed	Research Scientist, ILRI			✓					
Sairowua, Jacob Ole	African Conservation Centre					✓			
Samuels, Warren	Director, Film Safaris				✓				
Sapalan, Peter	Administrator, Governors' Camp	✓				✓			
Saunders, Howard	V.Chairman, Campfire Conservation Ltd	✓			✓			✓	✓
Seipai, Parmois	Administered Officer, Mara Conservancy					✓	✓		
Seiyio, Shadrack	Trans Mara Group Ranches					✓			
Seur, David	Game Warden, C.C. of Transmara		✓						
Shapi, Khalid	Mombasa & Coast Tourist Association				✓				
Siara, William Ole	Community Projects Officer, Cottars1920s				✓			✓	✓
Silantoi, Samson Ole	Naroosura (Osiligi)					✓			
Silvester, Peter	CEO, Royal African Safaris				✓			✓	

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Name	Position/Organisation	Stakeholder Planning Workshop	Core Planning Team Meetings	Ecology Working Group Meetings	Tourism Working Group Meetings	Community Working group Meeting	PA Operations Working Group Meetings	Mobile Camp Operator Meetings	Direct Stakeholder Consultations
Sindiyo, James	Chief Warden, MMNR - CCN		✓		✓				
Sitati, Noah	Lecturer, Moi University/WWF			✓					
Sofat, Suresh	Chairman, Somak Travel Limited								✓
Sogirian, John	Assistant Warden, Mara Conservancy						✓		
Sonkoi, Eric Ole	Loita Development Foundation					✓			
Stogdale, David	MD, Heritage Hotels				✓				
Suntu, Joseph	Foreman Roads, Mara Conservancy						✓		
Tikani, Edward	Principal Admin. Officer, C.C. of Narok			✓	✓		✓		
Tira, John Ole	Siana Group Ranch					✓			
Tongoyo, Gabriel	Olkinzey Group Ranch					✓			
Tunai, Samuel	Director, Mara Conservancy	✓							
Vohra, J.S.	MD, Sarova Hotels				✓				
Waithaka, Eutyclus	CEO, Kenya Association of Air Operators	✓							
Wakibara, James	Principal Ecologist, Serengeti National Park			✓					
Wambulwa, W.	County Clerk, County Council of Transmara		✓						
Waruhiu, Lilliane	Sales & Marketing Manager, Private Safaris				✓				

## Appendix 4: Certificate of approval

### CERTIFICATION

Certificate: I certify that the Maasai Mara National Reserve Management Plan 2023 - 2032 has been prepared as per the Wildlife Conservation and Management Act, 2013 and County Government Act, 2012

Approved by

Order paper No .....034..... Date .....21/2/2023.....

Sign .......... Date ...21/2/2023.....

Hon. Davis Solia Dikir

Speaker, Narok County Assembly

Endorsed by

Sign .......... Date 21/2/2023

H. E. Patrick Keturet Ole Ntutu

Governor, Narok County Government