The One Mara Research Hub

Research supporting policy, practice, and communities

Executive Summary

ONE MARA RESEARCH HUB

Rationale for The One Mara Research Hub (OMRH)

Key stakeholders – Governmental Agencies, Conservancies, The Maasai Mara Wildlife Conservancies Association (MMWCA), Landowners, Non-Governmental Organizations (NGO's) and Donors – are coming together to protect the Greater Mara Ecosystem (GME) from multiple threats to its future existence, while seeking to retain what was historically a harmonic balance between wildlife, the environment, and people. A critical first step in this effort has been to push for evidence-based improvement in conservation practices and provide support to new and innovative ideas to preserve this iconic Ecosystem. That has led to the creation of the **One Mara Research Hub (OMRH).**

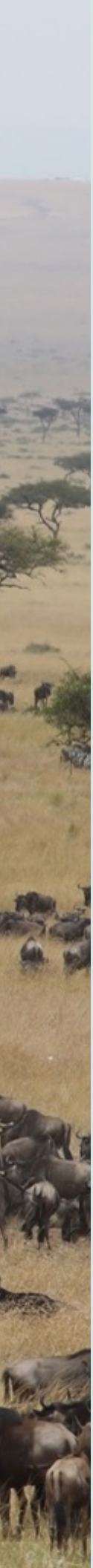
OMRH is a collaborative of key conservation research stakeholders in the GME who have come together to coordinate research with the aim of dramatically increasing the scale and pace of conservation interventions in this critical ecosystem. OMRH aims to facilitate multi-lateral information exchange and foster positive collaborations with respect to research and conservation in the GME.

It aims to promote and strengthen evidence-based decision making and collaboration, and connect groups, policy, research, and conservation activities to each other. In doing so, OMRH will provide stakeholders with one voice and direction with respect to research outputs.

This will then enable stakeholders to feed this critical information into an all-inclusive strategy for the management of the ecosystem.

Until the establishment of the OMRH, no organization working in the Mara was coordinating the research efforts of the entire eco-system, meaning that critical conservation data was not being shared consistently amongst stakeholders. Key findings often remained siloed despite best intentions and policy making has often been insufficiently 'evidence based'.

Effective conservation efforts can only be made with comprehensive information on wildlife and their migratory routes, people and settlements, livestock levels and impact, landscape changes, and natural resources essential to the effective functioning of the ecosystem. Conservation success requires collaboration and landscape-level data.



The Key Activities of the Research Hub Include:

Research coordination

- Assist in identifying existing knowledge gaps and facilitate collaboration
- Establish research and conservation priorities for the Greater Mara Ecosystem and encourage researchers in the ecosystem to contribute to those priorities
- Initiate, design, and monitor collaborative landscape-level conservation and research priorities through collaborative efforts
- Set and monitor the research agenda of the Ecosystem with input from relevant stakeholders including researchers and community members
- Develop a research framework (guidelines and best practices) for the Greater Mara Ecosystem
- Identify indicators to measure success and impact

Influence conservation policy and practice

- Provide an avenue for engagement with County and National governments in the development of policy documents such as the Narok County Spatial Plan and the proposed "Ecosystem Management Plan"
- Encourage local and international researchers to partner with conservation practitioners, businesses, government and/or community members to ensure their research is relevant and used by local stakeholders – as evidenced by the Norad Feasibility Study
- Encourage these researchers to help develop capacity of local researchers

Information Sharing

- Develop an online platform for sharing data, results, and information relevant to conservation and research within the GME
- Maintain meta-database/portal of:
  - research projects in the Mara (past/present/future)
  - existing datasets
  - grants & funding opportunities
  - network members, their affiliations, datasets, interests etc.

Communications

- Collect and share information related to conservation and research with Hub members
- Foster ongoing engagement with different partners; i.e., share research outputs with the wider community, engage partners, communicate funding opportunities, facilitate policy engagement meetings, correspond with members of the local scientific community
- Organize research meetings and symposia including:
  - Quarterly Advisory Council and monthly Management Committee meetings
  - Annual Conference
  - Thematic meetings
- Communicate outputs from above meetings to provide credible reference on status of the GME, and form science basis for policy development and decision making

Resource Mobilization

- Raise both cash and in-kind resources to support Hub operations, including a Hub Coordinator, a webpage and transport

Research Hub Advisory Council Membership

The following institutions participate in the Hubs Advisory Council

In addition, the following institutions are actively engaged as “stakeholders” and are invited to participate in Advisory Council meetings:

Background

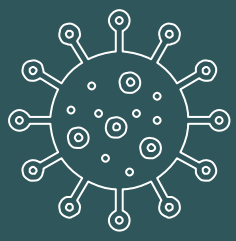
The Mara-Serengeti Ecosystem in Tanzania & Kenya contains an estimated 40% of Africa’s remaining large mammals and totals 100,000 km2. The Greater Mara Ecosystem (GME), which is the Kenyan portion of this landscape, is in and of itself a critical ecosystem, and immensely valuable for biodiversity.

The GME is one of Africa’s most important wildlife areas, globally emblematic for biodiversity conservation, and one of Kenya’s most important wildlife and tourism areas. In addition to hosting more than 95 species of mammals and over 550 species of birds, (approximately 25% of Kenya’s wildlife), the annual migration of over a million wildebeest from the Serengeti plains to the Mara is one of the most awe-inspiring natural spectacles on earth, drawing visitors from around the globe, and inspiring people to appreciate the natural world.

Threats to the Ecosystem

Due to landscape changes, fencing, and the closure of migratory corridors, the Mara Ecosystem has lost almost 60% of its wildlife over the last 40 years, and despite its importance, over half of the area remains unprotected, leaving animals vulnerable to habitat loss, fencing for agriculture, or alternative land use and human-wildlife conflict. Population growth in the region has resulted in unsustainable land subdivision and fragmentation. Fencing in the region is creating barriers to the movement of people, livestock and wildlife, blocking crucial migration routes for animals and further restricting access to natural resources. Pressure on space means that humans and wildlife are being forced to coexist on smaller land, which is increasing human wildlife conflict and the degradation of the ecosystem. As a prime example of the threat to this ecosystem, the last great Kenyan wildlife migration – the annual migration of the wildebeest south from the Loita Plains - has been decimated in the last four years.

Covid 19 Impact



The reality is that the future integrity of the GME remains seriously threatened despite ongoing efforts and best intentions, and the Covid 19 pandemic has further exacerbated this situation and reinforced the necessity for swift and coordinated action. The wholesale shutdown of travel due to the Covid 19 pandemic has had a crippling effect on conservation efforts in the region. Tourism to the community conservancies and neighboring National Park has plummeted. The sudden and unprecedented disappearance of wage income from tourism and related industries, tax revenue for local and national government, and income for landowners who rent their land back for conservation efforts, is placing enormous pressure on the ecosystems and surrounding communities.

This is happening for a few reasons. First, the community conservancies represented by MMWCA cover an area of 336,191 acres – almost the size of the National Reserve. This land belongs to 13,236 land owners, indigenous Maasai people, who lease it to conservancies for tourism operations, which in turn fund conservation efforts. But this conservation model, one of the most promising and innovative in Africa, is endangered due to the pandemic. The cessation in tourism – and consequently the loss of lease income, could force the local landowners to sell the land or convert it to farming, further jeopardizing conservation efforts.

Secondly, the pandemic has threatened the livelihood of thousands of people employed in the tourism sector of the local economy of the GME. Not including those employed in the National Reserve, over 1200 people are employed across the Mara community conservancies, with nearly 70% of staff drawn from the local community. These individuals support countless others with wage income. Facing unemployment people whose livelihoods rely on tourism may themselves turn to poaching or be forced to resort to illegal logging and charcoal making—further degrading habitat previously preserved for wildlife. In addition, habitat will likely be further fragmented by fencing and agriculture as people plant more crops to feed empty mouths.

Conservative estimates are that revenue from the tourism industry that funds conservation in Kenya will likely not recover for 12 to 18 months, jeopardizing the future of Kenyan conservation and unraveling the significant conservation progress that's been achieved in the past decade. In response to both the short and medium-term threats to the Ecosystem, the need for comprehensive conservation data is more critical than ever before and the best way to achieve success is to work collectively - and to do that it is critical that there is comprehensive eco-system wide data. The establishment of the 'One Mara Research Hub' has been a critical step in establishing that.

Research Hub Key Achievements to Date

To date the Research Hub has already had significant impact in shaping the future conservation agenda for the Greater Mara Ecosystem. Highlights include:

Shaping Policy

- A 7/2019 workshop on fencing resulted in a policy paper shared with the County government
- The Hub is involved in an ongoing initiative to develop and share data for Narok County Spatial Plan
- In 2019, the annual research fees as per the Narok County Finance Bill were increased to $800 for local researchers and $8,000 for international researchers. A joint letter signed by over 30 researchers objecting to the fee increase was submitted to the County and is concerns are expected to be incorporated in the final bill
- OMRH is fully participating in the MMWCA-led initiative to develop an "Ecosystem Measurement Plan", which, with the Narok County Spatial Plan, will provide a clear roadmap to conserving the GME

Organizing Research Across the Mara

- A database of over 100 researchers working in the Mara was developed and a survey conducted to better understand the activities of current researchers
- OMRH is currently developing an online portal to host the meta-databases of research findings from the ecosystem. The portal will be up and running by December 2020

Supporting Specific Conservation Goals

- OMRH received a grant from NORAD through Basecamp Explorer Foundation to carry out a Feasibility Study on livelihood improvement that incorporates ecology data
- Key findings of this study were communicated in a high-level stakeholder engagement meeting with County Officials and Members of the County Assembly Tourism and Environment Committee. It forms the basis for specific recommendations to secure wildlife corridors (including the Loita Plains Wildebeest Corridor)
- Over 700 datasets from key stakeholders were compiled into a report proposing categorization based on ecological significance and submitted to the County Government for consideration for the zonation of the County (March 2019)

Proposed Research Council Revenue Structure

Operating Costs for the One Mara Research Hub are approximately $250,000 per annum. If 50% of the annual operating costs can be raised through a sliding scale dues structure from members, OMRH can then fundraise for the reminder of annual operating costs through philanthropic donations to meet budget. The initial goal is to cover operating costs for 3 years. The proposal is that member institutions will be expected to contribute or raise 50% ("give or get") of the annual operating costs. Members will also be requested to actively engage their donors for funds for operations and for specific research activities in the Mara.

Critical Problem Areas

I Collaborative Ecosystem Management and Conservation

Wildlife Corridors (Loita Plains/Migration Route, Olderkesi to Loita Forest, Nyakweri, Pardamat). Urgent efforts need to be made to protect migratory corridors and dispersal areas, including the Mara Conservancies, to ensure migratory routes are preserved not only for wildebeest but across multiple species. This includes fencing, with a focus on the impact of fencing on specific corridors/ conservancies/conservation areas.

The National Reserve. Provision of data recommending effective ways of managing the Reserve and ensuring the Hub can play a potential role in any “World Heritage Site” proposal sponsored by the Narok County Government.

Protection of Unprotected Areas (Poaching, Human/Wildlife conflict). Poaching in the Mara ecosystem has been sharply reduced, but human/wildlife conflict, particularly for elephant and predators, remains a critical issue, and one the Hub is well suited to research and advise on.

Water (Mara River, Water Towers, Essential Forest Habitats). The Mau complex is a crucial source for the Mara River. The Loita forest is an important water tower, along with Nyakweri.

Ecosystem Wide Monitoring (Aerial survey data, animal numbers and movement monitoring, land use change, settlement growth, loss of forest cover, water supply, fencing, rainfall and temperature). With access to satellite data, and numerous “on the ground” monitoring activities, researchers that are part of the Hub are well positioned to provide comprehensive data.

Climate Change and Impact on the Ecosystem. A forward looking" perspective combining the impact of climate change, growth on human population and socio-economic development presents a significant opportunity for the hub.

Species Specific Impacts and Mitigating Proposals. The Hub, through its individual members, can continue to provide data across a range of species.

Impact of the Conservancies. There is a need to continue to assess the impact of the conservancies on pastoral livelihoods, wildlife populations and their habitats.

Disease Transmission. Specifically data relating to transmission of diseases from wildlife to domestic animals and vice versa.

II Community Partnership and Livelihoods

The following themes will form part of an ecosystem management plan:

Education/ Vocational Training	Alternative livelihoods/ Job creation	Healthcare Provision and Sanitation
Agriculture (focus on livestock management)	Energy Provision	“Urbanization” of the Mara/Settlement planning

Case Study:
The Norad Feasibility Study

In May 2020, OMRH received a grant of EUR 46,000 from the Norwegian Agency for Development Cooperation (NORAD) through the Base Camp Explorer Foundation Kenya to carry out a 6-month feasibility study of the GME. The aim of the study was to identify locations where priority conservation areas might be established. Research was conducted by representatives from: University of Hohenheim, Biostatistics Unit; University of Groningen in Germany; Conservation Ecology Group, the Netherlands; One Mara Research Hub; and Kenya Wildlife Trust, Kenya.

Methods Used in Norad Study:

- Analysis of wildlife and livestock population trends through DRSRS aerial survey data
- Analysis of 75 surveys from 1977 – 2018 including species larger than Thomson's gazelle
- Mapping of distribution of fencing using remote sensing with ground-truthing
- Analysis of Sentinel-2 imagery of fences absent/present
- Analysis of human population distribution from population surveys from 1962-2019
- Analysis of views and socioeconomics of Mara population from survey results from 388 respondents (250 Maasai Households) interviewed in July 2019 and July 2020
- Scenario studies for the restoration of the Mara-Loita migration - using historical hotspots and constraints

Key messages from the Norad Study:

The GME is an inseparable part of the Greater Serengeti-Mara Ecosystem under joint responsibility of Kenya and Tanzania

The Mara-Loita mass migration of wildlife has declined significantly in the last 5 decades, and this decline has accelerated in the last 5 years to near-extinction

Rapid, unplanned, land use change has resulted in extensive fencing particularly in the Loita Plains

Mass Migrations are an essential component of a healthy Ecosystem:

- Migrations support diversity of species and distribution of nutrients
- Migrations sustain predators such as lions and scavengers such as vultures
- Migrations generate ecotourism revenues that support local people
- Migrations have intrinsic value – as a unique local, national and international heritage

Human Population is a driver of fencing, habitat deterioration and loss

Fencing is one of the major drivers of the marked decline in migrations

Increased livestock numbers are displacing and outcompeting wildlife

The capacity of people and wildlife to respond to climate change is severely limited

Climate change is increasing wildlife and human vulnerability

Climate change projections will impact the ecosystem:

- There is a likelihood of severe and catastrophic upcoming droughts & warming trend which will require a change in land use and management in region
- Rainfall is not projected to change much until 2100 but is likely to become more variable
- Worst case scenario: average maximum temperature in Narok by 2100 will be 28 °C from 24 °C in 2020.
- Worst case scenario: average minimum temperature in Narok by 2100 will be about 18 °C from 11 °C in 2020 and 7 °C in 1960.

The formation of conservancies in the Mara (Est. 2005) has had mostly positive effects on people's lives and attitude towards wildlife

Half of the households in the region receive income from land rent from conservancies

Income from land rent from conservancies is considered important by communities

Conservancies have not yielded much effect to date on levels of education and employment

There is evidence of willingness to rent out additional land for conservancies in Loita Plains and Siana

There are emerging opportunities for new policies (spatial land use planning, ecosystem management) and investments for a sustainable future for both people and wildlife in the region. Priorities include:

- Develop and implement a science-based, spatial, land-use plan and ecosystem management plan
- Continue to monitor the ecosystem through aerial and social surveys
- Develop sustainable livestock management strategies that are less vulnerable to climate change, and deliver fewer negative impacts on wildlife than the current practices
- Restore the Mara-Loita migration
- Invest in conservation compatible education and training to diversify livelihoods (away from "livestock-only") and reduce over-reliance on natural resources
- Develop national funding mechanisms for sustaining the coexistence of wildlife and people to decrease reliance on international donors and international tourism revenue
- Pursue World Heritage status for the Greater Mara Ecosystem
- Pursue scenarios for restoring the Loita Plains calving areas for migrant populations through conservancy-style protected areas and new possible corridors: Ol Kinyei corridor, and Maji Moto corridor

Case Study: Narok County Spatial Plan

In August 2020, OMRH contributed data and recommendations specific to wildlife and associated environmental and anthropogenic factors to the Narok County Spatial Plan (NCSP). These inputs are intended to show where important wildlife species habitats, space requirements for wildlife, environmental resources necessary for their survival, and movement patterns and threats can be used for policy formation. A summary of conclusions and recommendations:

Forests

- The Mau and Loita forests are crucial ecological areas in Narok County. The Mau is a major water tower for the county and country. The Loita forest has a large elephant population whose range extends from Tanzania to Nairage Enkare in the North East of Kenya
- Both forests are under encroachment which threatens important wildlife habitats, biodiversity and ecosystem services such as water and other forest products
- As encroachment increases, so does human-wildlife conflict
- Land-use planning must focus on protection of crucial wildlife habitats and ecosystem services, while considering human needs and possible impacts

Wildlife Movements

- Mass migrations of wildlife (wildebeest, zebra) are mostly confined within protected areas. However, portions of these migration happen outside of protected areas, and coincide with human settlements, causing human wildlife conflict
- Large mammals such as elephants and lion which are residents in the county also traverse in areas that coincide with human settlements, also causing increased human wildlife conflict

Human Activity

The establishment of community conservancies surrounding the MMNR has resulted in a more holistic and sustainable land use management. However, there has been a significant increase in the human population in Narok County in the past few decades, including in areas of ecological significance such as forests, and areas surrounding the national reserve, and conservancies.

This has resulted in:

- Increased competition of land-use between livestock and wildlife
- Increased development of the road network, housing, business, and tourism facilities
- The MMNR bed capacity now exceeds carrying capacity for the area
- There is risk of exceeding bed capacity in community conservancies
- Landowners are actively selling land parcels for profit
- Increased fencing is occurring to secure land-owners land parcels, and for security measures to curb human-wildlife conflict
- Fencing is leading to increasing habitat fragmentation

Classification of Conservation Areas

As part of the study, World Wildlife Fund (WWF) also provided data identifying Critical Ecological Significant Area (CESA's), aimed at informing the inclusion of an ecological component in the spatial planning process. The CESA categories are below:

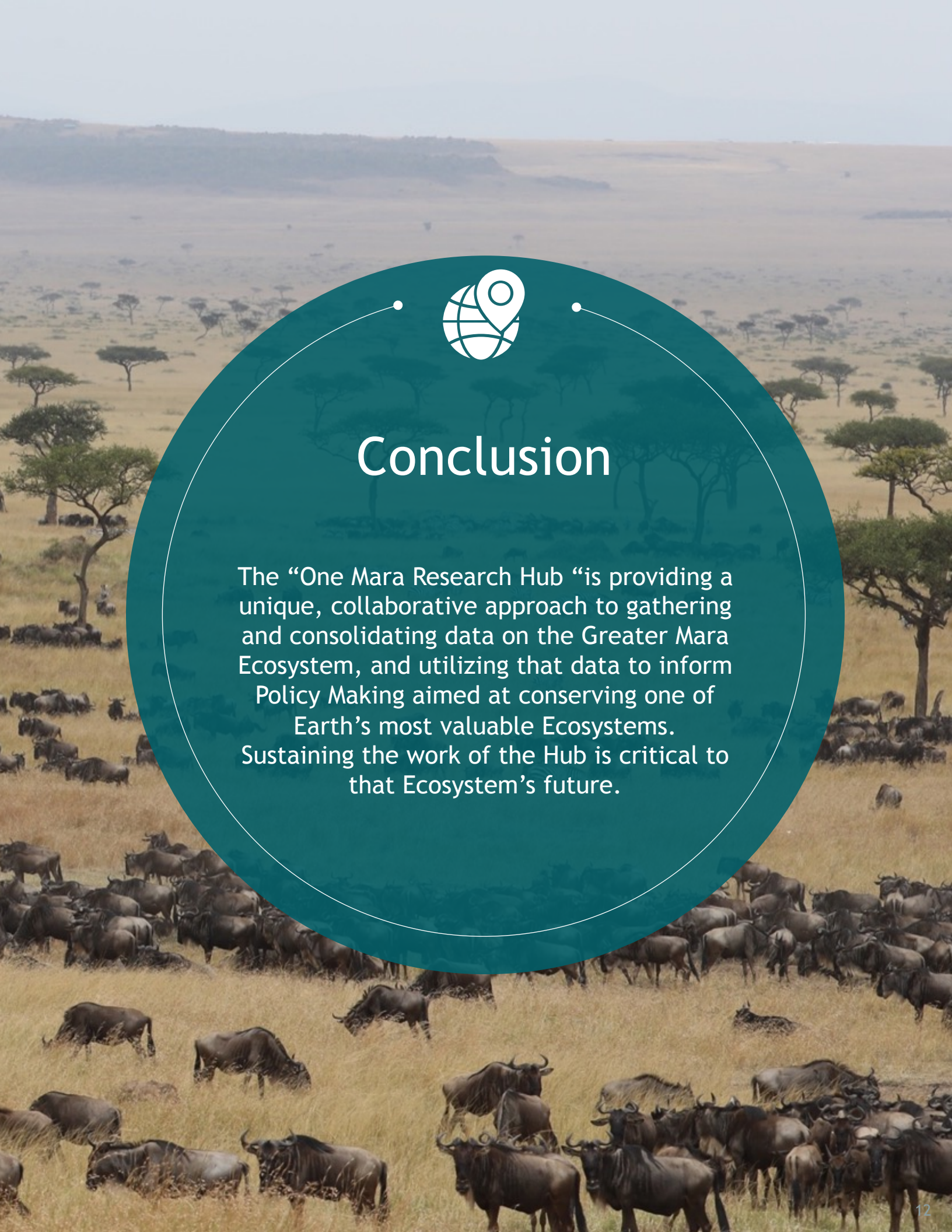
Protected Areas (PA): legally protected areas such as nature reserves and gazetted forests. Ecotourism is appropriate in these areas, along with limited facilities and infrastructure. Sustainable resource use is acceptable if it is within management plans, is strictly controlled, and subject to appropriate monitoring and evaluation.

Critical Ecologically Significant Areas One (CESA1): wetlands, sacred forests and conservancies. These areas need to be kept in a natural or semi-natural condition, and only appropriate activities such as ecotourism and sustainable resource use (including grazing) should be allowed.

Critical Ecologically Significant Areas Two (CESA2): other important ecological features such as the remaining forests. These areas need to be kept in a natural or semi-natural condition, and only appropriate activities such as ecotourism and sustainable resource use (including grazing) should be allowed.

Ecological Support Areas One (ESA1): key intact supporting areas, or areas important for services or ecological infrastructure. These areas include aquifers and river buffers. These need to be kept in a functional state. Urban, industrial, mining, large scale arable agriculture and large-scale infrastructure, as well as impacting activities such as dredging should be avoided in these areas.

Ecological Support Areas Two (ESA2): additional supporting areas, or areas important for services or ecological infrastructure, but which have been already significantly impacted. These include river or wetland buffers which have been converted to agricultural fields. These areas need to be managed to maintain their remaining ecological functioning and avoid further loss. Existing land use (e.g., fields) needs to be kept stable, intensification should be avoided, and where possible areas should be rehabilitated.



Conclusion

The “One Mara Research Hub “is providing a unique, collaborative approach to gathering and consolidating data on the Greater Mara Ecosystem, and utilizing that data to inform Policy Making aimed at conserving one of Earth’s most valuable Ecosystems. Sustaining the work of the Hub is critical to that Ecosystem’s future.