

# WATAMU MARINE

## PROTECTED AREA MANAGEMENT PLAN 2016 - 2026





**WATAMU MARINE  
PROTECTED AREA  
MANAGEMENT PLAN  
2016-2026**

Planning carried out by






WMPA Managers  
WMPA Stakeholders  
KWS Planning and Environmental  
Compliance Department

*In accordance with the*

**KWS PROTECTED AREAS  
PLANNING FRAMEWORK**



## Acknowledgements

	<p>The Watamu Marine Protected Area (WMPA) Management Plan was developed through a participatory planning process involving a cross section of WMPA stakeholders, under the coordination of a Core Planning Team that comprised of representatives from the marine protected area managers, KWS HQ planners and Coast Conservation Area Scientists and managers.</p>
	<p>Initial funding for the planning process was provided by the Regional Programme for the Sustainable Management of the Coastal Zones of the Countries of the Indian Ocean (ReCoMap) with co-financing from KWS.</p>
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	<p>Wildlife Conservation Society (WCS) provided technical assistance through provision of marine research information presented in the plan.</p>





## Approval Page

The Board of Trustees of Kenya Wildlife Service has approved the implementation of this management plan for the Watamu Marine Protected Area.

*On behalf of the*

**KENYA WILDLIFE SERVICE**

*Kitili Mbathi:*

**Mr. Kitili Mbathi**

**Director General**





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## List of Acronyms

<b>BMU</b>	Beach Management Unit
<b>BOA</b>	Boat Operators Association
<b>CBD</b>	Convention on Biological Diversity
<b>CBO</b>	Community Based Organization
<b>CCAs</b>	Community Conserved Areas
<b>CDA</b>	Coast Development Authority
<b>CFAs</b>	Community Forest Associations
<b>CITES</b>	Convention on International Trade in Endangered Species
<b>CMA</b>	Community Managed Area
<b>CMS</b>	The Convention on the Conservation of Migratory Species of Wild Animals
<b>CO2</b>	Carbon Dioxide
<b>CORDIO</b>	Coastal Oceans Research and Development in the Indian Ocean
<b>EAWLS</b>	East African Wild Life Society
<b>EIA</b>	Environmental Impact Assessment
<b>EMCA</b>	Environmental Management and Co-ordination Act
<b>GCRMN</b>	Global Coral Reef Monitoring Network
<b>GoK</b>	Government of Kenya
<b>ICM</b>	Integrated Coastal Management
<b>ICRI</b>	The International Coral Reef Initiative
<b>ICZM</b>	Integrated Coastal Zone Management
<b>IOSEA</b>	Indian Ocean and South East Asia
<b>IPAR</b>	Institute of Policy Analysis & Research
<b>IUCN</b>	International Union for conservation of Nature
<b>KCDP</b>	Kenya Coastal Development Project
<b>KFS</b>	Kenya Forest Service
<b>KIPPRA</b>	Kenya Institute for Public Policy Research and Analysis
<b>KMA</b>	Kenya Maritime Authority
<b>KMFRI</b>	Kenya Marine and Fisheries Research Institute
<b>KPA</b>	Kenya Ports Authority
<b>KWS</b>	Kenya Wildlife Service
<b>LMMA</b> s	Locally Managed Marine Areas
<b>MARPOL</b>	Marine Pollution
<b>MCS</b>	Monitoring Control Surveillance



<b>MOU</b>	Memorandum of Understanding
<b>MPAs</b>	Marine Protected Areas
<b>MTSG</b>	Marine Turtle Specialist Group
<b>NACOSTI</b>	National Commission for Science, Technology and Innovation
<b>NEMA</b>	National Environment Management Authority
<b>NGOs</b>	Non-governmental Organizations
<b>NMK</b>	National Museums of Kenya
<b>POPs</b>	Persistent Organic Pollutants
<b>SDF</b>	State Department of Fisheries
<b>SWOT</b>	Strengths, Weaknesses, Opportunities and Threats
<b>TAFIRI</b>	Tanzania Fisheries Research Institute
<b>UNCLOS</b>	United Nations Convention on the Law of the Sea
<b>UNEP</b>	United Nations Environmental Programme
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>WCK</b>	Wildlife Clubs of Kenya
<b>WCS</b>	Wildlife Conservation Society
<b>WIO</b>	Western Indian Ocean
<b>WIOMSA</b>	Western Indian Ocean Marine Science Association
<b>MPAMC</b>	Marine Protected Area Management Committee



## Executive Summary

This ten year management plan (2016-2026) for the Watamu Marine Protected Area (WMPA) is a collaborative initiative between Kenya Wildlife Service (KWS) and key stakeholders in the WMPA and is meant to provide an integrative framework for the marine ecosystem management. The Wildlife Conservation and Management Act, 2013, requires each wildlife protected area to be managed in accordance with an approved management plan. As a key tool for shaping the future, a management plan serves as a framework for planning and decision making in a protected area. Protected area management plans are developed in accordance with the Planning Framework provided under the Fifth Schedule of the Wildlife Conservation and Management Act, 2013.

The WMPA plan covers Watamu Marine National Park, Watamu Marine National Reserve, and half of Malindi Marine National Reserve and their adjoining areas of influence. This plan has been developed with the recognition of various interest groups that operate in the WMPA and their interests have been considered to gain the much-needed stakeholder support in the MPA management. This management plan development was achieved through funding from the World Bank through the Kenya Coast Development Project (KCDP). The planning process involved extensive stakeholder participation (Annex 5).

The plan sets out stakeholder and WMPA management agreed goals (purpose statements and objectives) that will be implemented in order to ensure these goals are achieved. The plan structure is set out according to the PAPF specifications and aims to ensure the plan can be easily understood by stakeholders and implemented by the WMPA management. At the heart of the plan is the zonation scheme and plan's four management programmes. Each of the four management programmes covers an essential aspect of the WMPA management.

### WMPA ZONATION SCHEME

WMPA zoning scheme aims to provide a framework for reconciling management needs of protecting natural resources as well as regulating different marine uses. This zoning is hoped to avoid conflicts among resource users (recreationists, fishers, conservationists).

This zonation is guided by the following principles:

- Protect the marine ecosystem, species, or habitat critical to the survival of the diverse species
- Reduce or eliminate conflict between resource users
- Manage resource users
- Provide a buffer between managed and unmanaged areas

- Reserve suitable areas for particular human uses while minimizing adverse impacts
- Reserve areas for specific purposes such as research and education

To achieve these, two zonation schemes have been used; - resource use and visitor use

### Resource Use Zones

**Closed zone** - designed for maximum protection of critical breeding areas of marine wildlife such as the sea turtle.

**No take zone** - This zone is designed for protection of natural values and processes, where removal or harm to plants or animals is prohibited. No take zone is open for recreation activities such as snorkelling and diving but closed to fishing.

**Artisanal fishing zone** - in this zone sustainable artisanal fishing activities take precedence over any other use and commercial fishing is not permitted.

**Influence zone** - this zone is utilized by different government sectors and communities and the activities permitted here depend on the different users.

### Visitor Use Zones

The Visitor use zones define the degree and type of visitor use to be managed spatially over the protected area. The three zones identified under visitor use are:

**High use zone** - This is the area that is highly visited by tourists for recreation and includes the beaches and marine area where diverse visitor activities including snorkelling and SCUBA diving are permitted.

**Medium use zone** - These are WMPA areas that are not highly visited and this zone covers the Watamu Marine National Reserve.

**Low use zone** - These are WMPA areas that are least visited by tourists.

### MANAGEMENT PROGRAMMES

The four management programmes are:

- Ecological Management
- Tourism Development and Management
- Community Partnership and Conservation Education
- Marine Protected Area Operations and Security

### **Ecological management programme**

The ecological management programme's purpose is "to conserve the WMPA's marine ecosystems and improve understanding of their health and functioning". In implementing the WMPA's ecological programme, the WMPA management will strive to ensure that: critical habitat components are maintained and restored; threatened species are conserved and monitored; and ecological components and processes to support adaptive management are understood. Under the ecological programme six WMPA conservation targets have been identified. These are:

- Coral reef ecosystem
- Sea grass beds
- Sandy beaches
- Sea turtles
- Waders (shore birds)
- Marine mammals (dolphins, whales)

The plan proposes for a collaborative approach by WMPA managers and the different stakeholder groups to address threats to the identified key conservation targets.

### **Tourism development and management programme**

The purpose of this programme is "to ensure sustainable tourism development in line with conservation principles and to enhance and market WMPA as a world class quality tourist destination rich in natural beauty and biodiversity". In implementing this programme, the WMPA management and stakeholders will ensure that: WMPA tourism product is developed and promoted as an activity that adds further value to the local communities and not as the only key source of livelihood; WMPA tourism players are coordinated and work in harmony with the MPA management; and tourism products are diversified and marketed. The plan identifies the importance of WMPA stakeholders to create a tourism forum and develop a marketing strategy for marketing the WMPA.

### **Community partnership and conservation education programme**

The purpose of the Community partnership and conservation education programme is to ensure

that "participation of WMPA adjacent communities in sustainable conservation and management of marine resources is strengthened for livelihood improvement". In implementing this programme, the WMPA management will strive to ensure: support to enhance community role in the management of the WMPA is strengthened; conservation education and awareness is enhanced; and human wildlife conflicts are minimized. Collaboration with the local communities in the management of WMPA will be strengthened to cultivate a sense of ownership and ensure successful implementation of the plan. The plan proposes establishment of a community consultative forum to provide a platform for stakeholder cooperation as key in ensuring sustainable utilization and management of the WMPA resources.

### **Marine protected area operations and security management programme**

The purpose of this programme is to ensure "operational systems and structures are efficiently and effectively supporting the achievement of WMPA's management programmes". This programme will strive to ensure conservation and human development are balanced; WMPA management is working with other stakeholders; a skilled and motivated workforce is maintained and the MPA's security is enhanced. WMPA infrastructure improvement is one of the actions identified as critical in improving the MPA visitor appeal, efficiency of MPA operations and increase in staff productivity.

### **PLAN MONITORING**

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



## PLAN FOUNDATIONS





## The Plan

The Wildlife Conservation and Management Act 2013, requires each wildlife protected area to be managed in accordance with an approved management plan. As a key tool for shaping the future, a management plan serves as a framework for planning and decision making in a protected area. Protected area management plans are developed in accordance with the Planning Framework provided under the Fifth Schedule of the Wildlife Conservation and Management Act, 2013. This framework provides guidance on the key elements needed for a successful protected area management planning process. In line with this framework, the WMPA plan has been developed in a highly participatory manner, incorporating and building on ideas from a broad cross-section of WMPA stakeholders. In addition, the plan adopts the MPA zoning scheme specified in the planning framework.

The WMPA covers Watamu Marine National Park, Watamu Marine National Reserve, and half of Malindi Marine National Reserve and their adjoining areas of influence. Prepared in consultation with WMPA's stakeholders, the WMPA management plan will guide the MPA's overall direction for the next 10 years and

will be reviewed in five years. The plan is expected to achieve the overall KWS functions as outlined under Section 7 of the Wildlife Conservation and Management Act, 2013.

The plan is designed to be a practical management tool supporting WMPA managers in carrying out their day-to-day activities. In order to achieve this, the plan sets out strategic goals and a series of prescriptions and management actions that need to be implemented in order to achieve these aims. The plan is partially built on the previous planning initiatives for Malindi and Watamu Marine Protected Areas mostly referring to the previous plans from 1982, 2001 and 2009 which were barely implemented.

### PLAN STRUCTURE

In order to fulfil the Plan's functions, the WMPA plan structure has been developed to be as simple as possible, and as such, easily understood by stakeholders and implemented by WMPA management. Table 1 summarises the plan's main sections.

**Table 1. Plan structure, functions and contents**

Chapter	Function and contents
<b>Plan Foundations</b>	<ul style="list-style-type: none"> <li>• Provides an introduction to the WMPA and its management</li> <li>• Introduces the plan, and describes the plan's structure and the framework used in the process leading to the plan's development</li> <li>• Sets out the Plan Purpose Statement, and Exceptional Resource Values (ERVs)</li> </ul>
<b>Zonation Scheme</b>	<ul style="list-style-type: none"> <li>• Meant to enable different types and intensities of use in different parts of the WMPA, and to help reconcile the sometimes competing and conflicting conservation and resource use needs</li> <li>• Sets out areas of the WMPA where different types of visitor use and tourism developments are permitted</li> <li>• Provides specific prescriptions on resource utilization by the community</li> <li>• Ensures that the PA management extends its mandate by increasing management presence and infrastructure development across the entire ecosystem</li> </ul>
<b>Management Programmes</b>	<ul style="list-style-type: none"> <li>• This section forms the bulk of the completed management plan and provides a framework to guide management activities in achieving a future desired state for specific aspects of the WMPA management. As a result, four programmes have been proposed. These are:               <ul style="list-style-type: none"> <li>o <b>Ecological Management Programme</b></li> <li>o <b>Tourism Development and Management Programme</b></li> </ul> </li> </ul>

Chapter	Function and contents
<b>Management Programmes</b>	<ul style="list-style-type: none"> <li>o <b>Community Partnership and Education Programme</b></li> <li>o <b>MPA Operations and Security Programme</b></li> <li>• Each management programme was developed in support of the Logical Framework Approach and has a programme purpose statement and guiding principles that define and frame the desired future state for the WMPA</li> <li>• Each contains management objectives that set out the specific goals that WMPA management aims to achieve, and,</li> <li>• Provides a set of specific management actions that management will implement to achieve these goals</li> </ul>
<b>Plan Monitoring</b>	<ul style="list-style-type: none"> <li>• Provides a framework for the assessment of positive and potentially negative impacts of plan implementation</li> <li>• Includes easily measurable and quantifiable indicators for assessing impacts, and potential sources of the information required</li> </ul>
<b>3-Year Activity Plans</b>	<ul style="list-style-type: none"> <li>• These provides the link between the 10-year management actions and the annual work planning and budgeting of WMPA management</li> <li>• Breaks down the programme's management actions into a series of tangible and explicit activities</li> <li>• It allocates responsibility for implementation, sets out the time-frame for activity implementation, and "milestones" for monitoring plan delivery</li> </ul>

## PARTICIPATION IN PLANNING

The development of this management plan involved a very high degree of stakeholder participation. Such design ensured that the eventual plan is both realistic and appropriate, and is built on 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 (CPT), Stakeholder Workshops, and Specialist Working Groups. The functions and membership of these participation forums are elaborated in table 2 below. Stakeholder participation in plan development is provided in Annex 5.

**Table 2. WMPA stakeholder participation and membership**

Chapter	Function and contents
<b>Core Planning Team</b>	<ul style="list-style-type: none"> <li>• The CPT provided overall guidance and oversight to the entire planning process.</li> <li>• Specific roles were to: <ul style="list-style-type: none"> <li>- Collect and synthesize information required for the management programmes,</li> <li>- Organize and facilitate planning events,</li> <li>- Ensure appropriate stakeholder participation throughout the process,</li> <li>- Write up planning event outputs into the final management plan.</li> </ul> </li> </ul>



Chapter	Function and contents
	<ul style="list-style-type: none"> <li>- Ensure the plan being developed is in line with the PAPF and appropriate to the WMPA.</li> <li>• Membership of the WMPA CPT consisted of : core people responsible for the management of the MPA i.e. KWS MPA managers and scientists, KWS Headquarters planners and relevant scientists, Beach Management Units, Beach Operators, KFS and NEMA area managers, Watamu Marine Association, KMFRI and AROCHA Kenya scientists</li> <li>• The team met at intervals throughout the process, and also kept in frequent contact through email and phone.</li> <li>• Members of the team were responsible for development of different sections of the plan</li> </ul>
<b>Stakeholder Workshops</b>	<ul style="list-style-type: none"> <li>• The 1st Stakeholders Planning Workshop was held at the beginning of the plan review process, and identified the MPA's values, key problems, opportunities and responsive interventions to be addressed by the plan. A stakeholder analysis was also carried out.</li> <li>• 2nd Stakeholder Planning (validation) Workshop was held at the end of the plan development process to enable stakeholders to review, comment on, and endorse the final contents of the draft management plan</li> </ul>
<b>Expert Working Groups</b>	<ul style="list-style-type: none"> <li>• Four Expert Working Groups were formed, each of which developed one of the four management programmes, and contributed to the WMPA Zonation Scheme</li> <li>• Each group developed the detailed contents of the management programmes (i.e. the purpose, guiding principles, objectives, the management actions and activity plan)</li> </ul>

## The Watamu Marine Protected Area

### AREA DESCRIPTION

Watamu Marine Protected Area comprises Watamu Marine National Park, Watamu Marine National Reserve and half of Malindi Marine National Reserve all of which were gazetted on 26th March 1968. In 1979, Malindi and Watamu MPAs were the first MPAs in Africa and third in the world to be designated as a single biosphere reserve under the UNESCO Man and Biosphere Reserve Programme.

The WMPA is located in the Indian Ocean on Kenya's territorial waters in Malindi Sub-County, Kilifi County. It is about 110 km north of Mombasa by tarmac road. By air, the WMPA can be accessed from Malindi Airport.

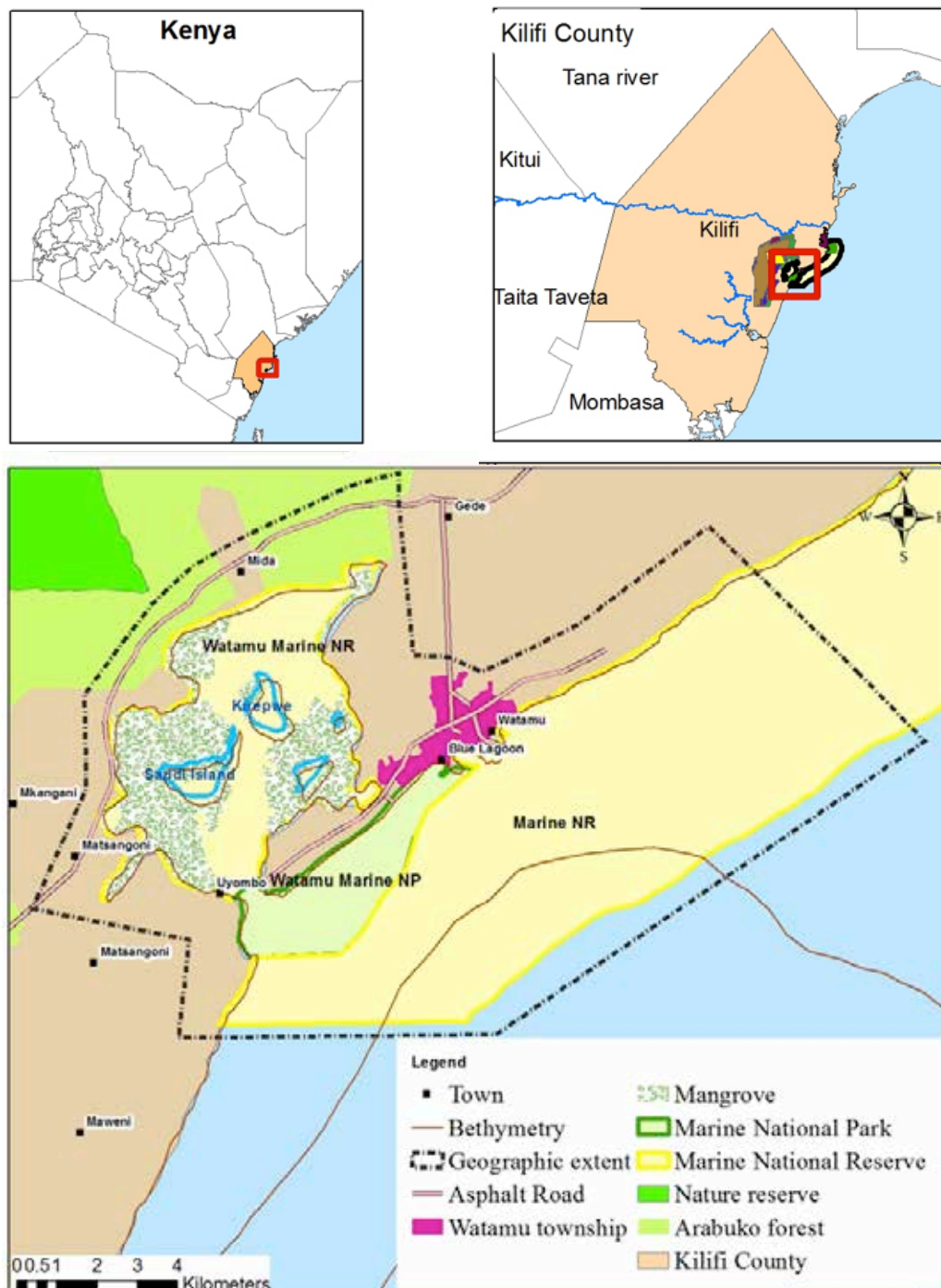


Figure 1. Watamu Marine Protected Area: Regional Setting

## WMPA PURPOSE STATEMENT

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

### ***The Purpose of the Watamu Marine Protected Area is:***

To preserve and maintain a representative area of the coral reef and mangrove ecosystems together with the beaches which typify the Kenyan coast, for the benefit of present and future generations

### ***Supplementary purposes of the WMPA are:***

- To promote public understanding, appreciation and enjoyment of the natural resources through interpretation/education and the provision of recreational opportunities;
- To provide opportunities for rational and sustainable use of resources in the WMPA and for the

improvement of the overall relationships between people and their environment;

- To undertake the development of the WMPA's natural resources in a manner which will generate revenue and therefore provide an economic justification for the use of scarce resources and land to fulfil the conservation objective; and
- To promote research on the coral reef in the WMPA for the purpose of supporting its management and education programmes.

## EXCEPTIONAL RESOURCE VALUES

The WMPA ERVs describe the area's key natural resources and other features that provide outstanding benefits to local, national and international stakeholders. They are especially important for maintaining the area's unique qualities, characteristics and ecology as well as building an understanding of the MPA features that are especially important for maintaining the unique character of the area in need of preservation. The following sections describe the WMPA ERVs and their importance to the area. These sections have been set out according to four categories of ERVs identified: Biodiversity, Scenic, Social and Cultural (see Table 3).

**Table 3. WMPA Exceptional Resource Values**

Category	Exceptional Resource Value
<b>Biodiversity</b>	<ul style="list-style-type: none"> <li>• Sea Turtle</li> <li>• Marine mammals</li> <li>• Sharks and rays</li> <li>• Bill fish</li> <li>• Important Bird Area</li> <li>• Seagrass</li> <li>• Intertidal habitats</li> <li>• Mangrove Forest in Mida Creek</li> <li>• Coral reef ecosystem</li> <li>• Sandy beaches, shoreline habitats</li> <li>• Lagoons, Swamps &amp; marsh habitats</li> </ul>
<b>Scenic</b>	<ul style="list-style-type: none"> <li>• Sandy beaches</li> <li>• Islands, channels &amp; tidal inlets</li> <li>• Coral reef</li> <li>• Rocky cliffs</li> </ul>
<b>Social</b>	<ul style="list-style-type: none"> <li>• Tourism</li> <li>• Source of livelihood for the local community</li> <li>• Man and Biosphere Reserve status</li> </ul>
<b>Cultural</b>	<ul style="list-style-type: none"> <li>• Historical sites e.g. ruins</li> <li>• The unique cultures of the local communities (Swahilis, Bajunis, Mijikendas)</li> </ul>

## BIODIVERSITY VALUES

### Coral reef ecosystem

Coral reefs are critical habitats in marine ecosystems and play a key role in primary production. They are among the most sensitive ecosystems and their health and dynamics can easily be altered if the environmental conditions fall out of acceptable range. The coral reef complex consists of both fringing and patchy reefs which are close to the shore. The reef contains a great variety of corals and together with the marine vegetation, particularly the seagrass meadows, provides an excellent habitat for a large number and variety of colourful reef fish, molluscs and other sea animals such as sponges, sea urchins and sea anemones. The coral reef is majorly dominated by coral genera belonging to four families: Acroporidae, Faviidae, Pocilloporidae and Poritidae.

WMPA coral reef ecosystem supports high diversity of reef fish offering an important habitat for breeding and recruitment. The reef fish support artisanal fishers with the main catch comprised of Lethrinidae (emperor fish), Siganidae (rabbit fish), Scaridae (Parrot fish) and Lutjanidae (snapper) families.

### Marine mammals

Marine mammals found in WMPA include dolphins and humpback whales among others. As top-level predators, they impact on local food webs and ecosystems as a whole and as such serve as important indicators of the health of marine environments. They also indicate exposure and effects of pollutants over spatial, temporal and trophic scales.

**Humpback whales:** Humpback whales have been sighted in Watamu area for the last 15 to 20 years. Reports indicate that the whales sighted in the area are part of a sub-population of East African humpback whales from the South West Indian Ocean. Each year they are sighted mainly in June as they make their annual migration from Antarctica. Over the years

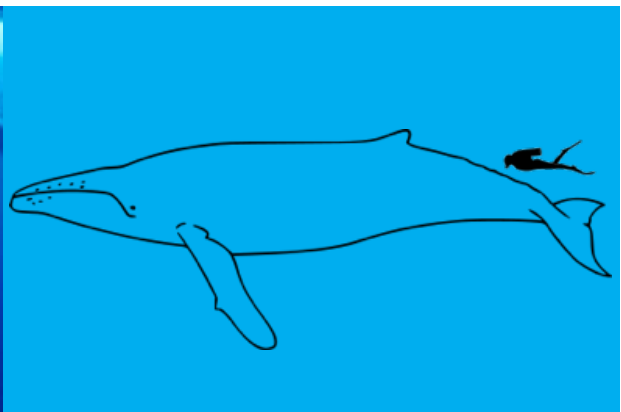
local NGOs including Global Vision International (GVI), Watamu Marine Association (WMA) and Kenya Marine Mammals Network (KMMN) have been working in collaboration with boat operators and sports fishermen to record sightings of dolphins and humpback whales through photographs. The highest number recorded to date was in 2013 whereby 25 whales were spotted per day by locals and sports fishermen between July and September in the Watamu Marine Reserve alone.

Literature shows that humpback whales from Antarctica travel around May/June to warm tropical inner reefs for protection to enable them to breed. They then make their return journey around October, swimming over 4000km to the cold food-rich seas of Antarctica which is their main feeding ground.

The Wildlife Conservation and Management Act 2013 has classified these marine mammals as vulnerable while CITES<sup>1</sup> and CMS<sup>2</sup> have listed the species in Appendix 1.

The annual sighting of the humpback whales and dolphins in Watamu Marine Reserve is a potential tourist attraction that should be promoted and marketed.

**Dolphins:** Visitors to the Kenyan coast can expect to see the Indo-Pacific bottlenose dolphins (listed as near threatened to extinction by IUCN), Indo-Pacific humpback dolphins and spinner dolphins. Dolphin watching is an established ecotourism activity in Watamu. It is popular with tourists and is an important source of income for local community members. Dolphins are facing a number of threats, including fishing net mortalities, loss of habitat, degradation of foraging areas and loss of their food due to commercial scale overfishing, and slaughtering of dolphins as a source of fresh red meat. Dolphin watching by tourists can also cause stress and disruption of their natural behavior if not properly managed.

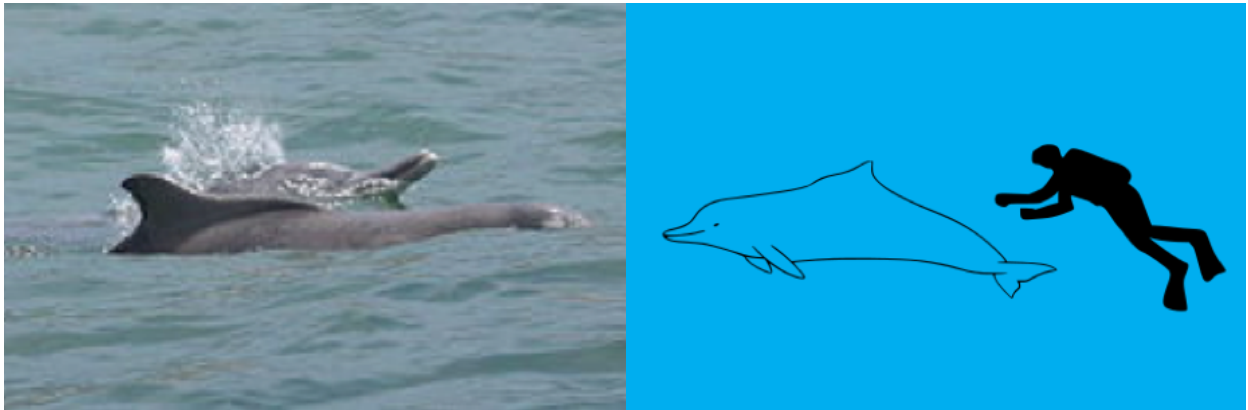


**Humpback whale and its size in relation to humans**

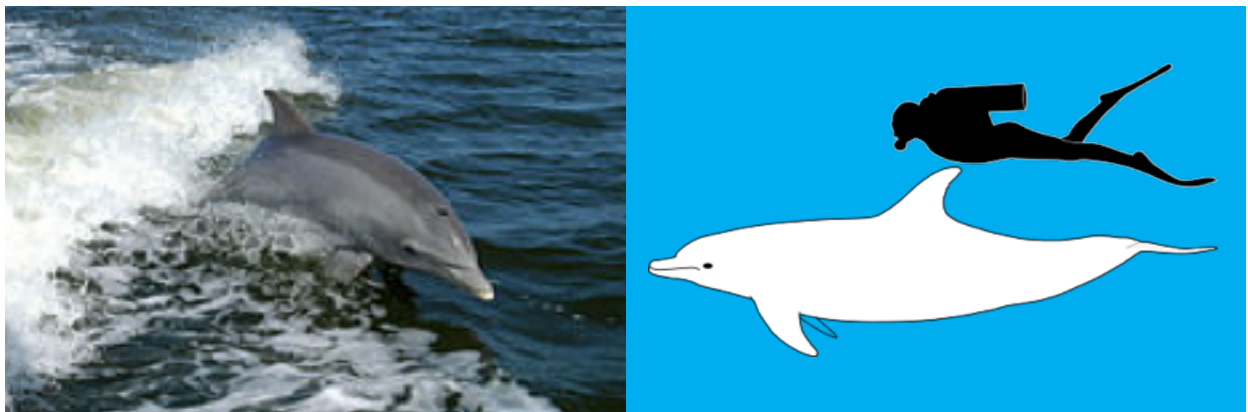
<sup>1</sup> CITES Appendix I

<sup>2</sup> CMS Appendix I

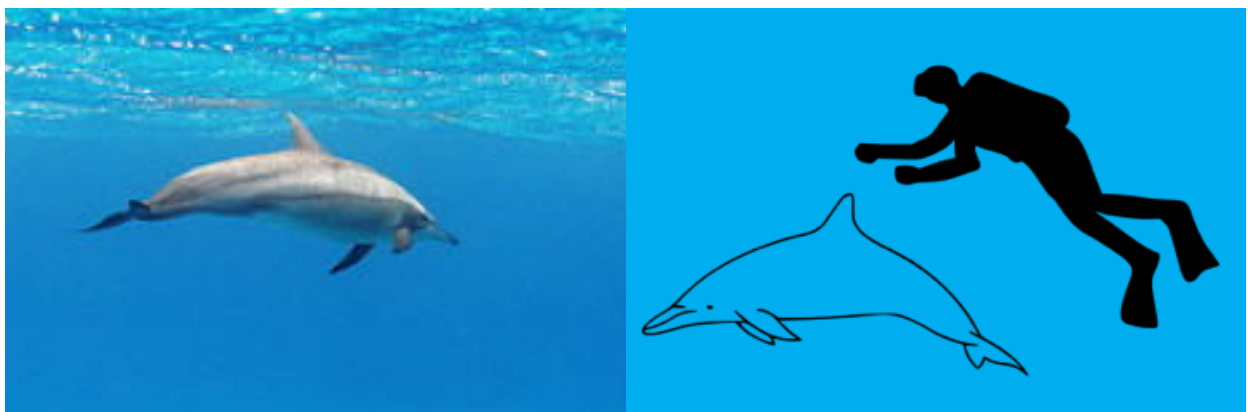




Humpback whale and it's size in relation to humans



Bottlenose dolphin and it's size in relation to humans



Spinner dolphin and it's size in relation to humans

## Billfish

There are five threatened Billfish species in the Kenyan Indian Ocean from Lamu to Shimon. These are: Blue marlin *Makaira nigricans*, (Vu, IUCN Red List category 2011), Black marlin (*Istiompax indica*), striped marlin, Sailfish (*Istiophorus platypterus*) LC, (IUCN RL, 2011) and swordfish. Bill fishing, particularly for the swordfish, is an important component of commercial sport fishing and subsistence fishing. Sport fishing could pose a threat locally, as these species are found primarily near shore and around islands. In addition, the Blue marlin population shows a decreasing trend, while the Sailfish is threatened by catching in long-lines and purse seines under sport and artisanal fisheries.

The African Billfish Foundation (ABF) is involved in studies on billfish migration patterns, growth rates and breeding stocks among others. The ABF aims to compile a socio-economic study on the value of sport fishing as a sustainable resource in the East African waters. ABF recommends that appropriate fishery statistics be compiled and analysed to accurately assess the condition of this species.



**Blue Marlin**

## Sharks and Rays

**Sharks:** There are five (5) shark species in the Kenyan marine. They include the Whale shark (*Rhincodon typus*), Grey nurse shark (*Carcharias taurus*), Oceanic blacktip shark (*Carcharhinus species*), Great white shark (*Carcharodon carcharias*), and Short-tail nurse shark (*Pseudoginglymostoma brevicaudatum*). The Whale shark and Grey nurse shark are listed as vulnerable under the IUCN Red List (2005-2009). They are found in Watamu Marine Protected Area where they inhabit both deep and shallow coastal waters and the lagoons of coral atolls and reefs. They are long distance migratory species and natives of the Kenyan coast.

The annual rates of population increase are very low, greatly reducing their ability to sustain fishing pressure. Populations in several locations have been

severely depleted by commercial fishing, spear fishing and protective beach meshing, requiring the introduction of specific management measures. The current main threat to this species in its ranges is likely the accidental (by catch) capture of juveniles by recreational line fishers.

**Rays:** Rays are closely related to sharks, they have flat bodies with eyes and mouths on their undersides. The Ray fish is listed as a threatened species in the Wildlife Conservation and Management Act, 2013. Electric rays have organs on either side of their heads that can deliver an electric shock to scare away predators and to shock prey. Stingrays, eagle rays and devil rays have spiny stingers on their tails that can inject a predator with venom. Hence, there is need to document the sightings of sting rays and electric rays and disseminate this information to swimmers.

Table 4. shows conservation status of elasmobranch in the Watamu area

**Table 4. List of sighted elasmobranch in the Watamu area**

COMMON NAME	SPECIES NAME	RISK STATUS
Blacktip Reef Shark	<i>Carcharhinus melanopterus</i>	NT
Whitetip Reef Shark	<i>Triaenodon obesus</i>	NT
Ribbon tailed Stingray	<i>Taeniura lymma</i>	NT
Reticulate Whipray (Ray)	<i>Himantura uarnak</i>	VU
Reef Manta Ray	<i>Manta alfredi</i>	VU
Blue spotted Stingray	<i>Neotrygon kuhlii</i>	DD
Marbled Electric Ray	<i>Torpedo sinuspersici</i>	DD
Giant Guitarfish	<i>Rhynchobatus djiddensis</i>	VU

\*NB: NT= Near Threatened, VU=vulnerable and DD=data deficient

## Sea Turtles

Sea turtles are recognized as flagship species in the marine environment. The government of Kenya has shown commitment to their conservation. Sea turtles are legally protected under the Wildlife Conservation and Management Act, 2013<sup>3</sup> and the Fisheries Act, Cap 378. Under the Fisheries (General) Regulations, section 51, Kenya's maritime zones are designated as marine mammal and turtle Sanctuary where these species are accorded total protection<sup>4</sup>.

Sea Turtles are widely distributed along the Kenyan coastline in areas mainly associated with seagrasses and coral reefs. There are five species of sea turtles within the Kenyan waters: the green turtle (*Cheloniemydas*), hawksbill turtle (*Eretmochelysimbricata*), loggerhead turtle (*Caretta caretta*), olive ridley turtle (*Lepidochelys olivacea*) and the leatherback turtle (*Dermochelys coriacea*). Of these, green, hawksbill and olive ridley turtles are known to nest and forage in Kenya, while the loggerhead and leatherhead turtles are occasional visitors. All the five sea turtle species are listed by the World Conservation Union (IUCN) as either endangered or critically endangered

(IUCN/SSC, 2008) and are listed under Appendix 1 by the Convention on Trade in Endangered Species of Wild Fauna and Flora (CITES) and Convention on Migratory Species.

Sea turtles play several important ecological roles in the marine ecosystem as they directly affect other marine species as consumers and indirectly through nutrient recycling within and between ecosystems. For example, the Green turtles primarily graze on seagrass beds and actually increase the productivity and nutrient content of the beds, thus benefiting other species in the food web (Bjorndal 1980). Over time, the grazed areas not only contribute to stabilizing sediments and recycling of nutrients but also offer food and shelter to a wide array of smaller herbivores, including fish. The Hawksbill turtles play the important role of keeping the balance of sponges and corals. The Leatherbacks play a key role in controlling jellyfish populations, which when in high numbers can wipe out fish populations by feeding on fish larvae of commercially important food fish.

<sup>3</sup>Sixth Schedule (S.47): Nationally Listed Critically Endangered, Vulnerable, Nearly Threatened and Protected Species

<sup>4</sup>Fisheries (General) Regulations, Section 51, Protection of marine mammals and turtles

(1) The maritime zones of Kenya are declared to be a marine mammal and turtle sanctuary.

(2) No person shall-

(a) Kill any marine mammal or turtle

(b) Chase any marine mammal or turtle with intent to kill;

(c) Harass any marine mammal or turtle so as to disturb its behaviour or breeding habits; or

(d) Take any marine mammal or turtle, alive or dead, including any marine mammal or turtle stranded on land.

(3) Where any marine mammal or turtle is caught or taken unavoidably during fishing, such marine mammal or turtle shall, whether it is alive or dead, be released immediately into the waters.

(4) Any person who contravenes this regulation shall be guilty of an offence and liable to a fine not exceeding twenty thousand shillings or to imprisonment for a term not exceeding two years or to both.

The WMPA boasts of a relatively large population of nesting turtles attributed to the presence of extensive sandy beaches. Watamu beach itself is a nationally important turtle nesting site, with an average of 40 nests in a year. Watamu has a number of stakeholders who are directly involved in turtle conservation. These include: Kenya Wildlife Service; Watamu Turtle Watch; Watamu Marine Association; Community Based Environmental Conservation (COBEC), Kenya Sea Turtle Conservation and Management Trust; and other community based groups.

Despite efforts towards conservation of sea turtles, there are still many threats to the species. These include illegal exploitation of eggs, meat and oil, incidental capture by fishermen, pollution, diseases, and beach development among others. Efforts to mitigate these threats will go a long way to ensure viable populations. The implementation of the National Sea Turtle Conservation Strategy is key to addressing threats to the species. There is a need to harmonize conservation measures with the National Sea Turtle Conservation and Management Strategy and outline the functions of the Site Committees under the strategy. In addition, there is need to implement the Kenya shoreline management strategy for the coast region in order to address the various issues facing the turtle habitats.

### Important Bird Area

WMPA is included in the Mida Creek, Whale Island and Malindi-Watamu Coast Important Bird Area (IBA). Other IBAs close to this WMPA include Arabuko-Sokoke Forest; Gede Ruins National Monument; Sabaki River Mouth; and the Dakatcha Woodland. Preliminary research on Mida Creek, suggests that, it is one of the most productive mangrove ecosystems on earth, with seven out of nine East African mangrove species found there. Sixty-five (65) species of aquatic birds are regularly recorded on the Creek and reach numbers of over 6,000 individuals. Crab-plovers *Dromas ardeola* are also found on the creek in numbers exceeding one thousand (1000), giving the site international importance.

### Diverse marine habitats

The major marine habitats at WMPA include mangroves, littoral zone, coral reef, intertidal rock, subtidal rock, beach, sand, intertidal seagrass, and mixed subtidal (Figure 2 and table 5). These habitats are described in the following paragraphs.

### Mangrove forest in Mida creek

Mangroves are distinctive ecological units and grow along coastlines in the inter-tidal zone between land and sea. Mangroves support coastal ecosystems by providing environmental services and critical ecological functions, affecting both inland and oceanic resources. Mangrove ecosystems exchange matter and energy with the adjacent marine and terrestrial ecosystems. These forests are nutrient-rich environments which support a variety of food chains and function as nursery and feeding ground for fish and invertebrates. Mangroves play a protective role against detrimental climatic impacts. They also support numerous species and serve to protect coastlines from storms by breaking the storm-waves and dampening the tidal currents, and the sediments they trap help to build the coastline against forces of erosion. In addition to protecting the coastline from natural hazards, mangrove forests provide goods and services that are of economic, ecological and environmental value to man. In many developing countries, the survival of coastal communities is largely dependent upon the sustainable harvest of seafood, and the cultivation of fish and crabs in mangroves.

Mida Creek holds substantial mangrove stands and is an important sea bird haven. Traditionally, mangrove forests provided the coastal human population with a variety of goods and services. Mangroves of Mida Creek are part of Watamu Marine Protected Area (WMPA). Total mangroves area in Mida is estimated at 1,746 ha and is dominated by *Rhizophora-Ceriops* type forest. The average stocking rate of mangroves in Mida is 3,511 stems /ha, with a volume of 92.7 m<sup>3</sup> / ha; of which 42% is merchantable. The major threats of mangroves in Mida have been identified as illegal logging as well as land encroachment.

The Mangrove Management Plan for Kenya states that mangrove forest cover has been lost either due to conversion pressure, over-exploitation or pollution during the last twenty years. Mangrove degradation at the Kenyan coast has occurred at an alarming rate as the result of growing subsistence needs as observed along the Watamu-Mida creek area. In Mida Creek, several agricultural land use practices in and around the creek influence the mangrove ecosystem, with signs of over-exploitation and degradation due to logging, settlement and selective harvesting. Recent biomass estimation in Mida Creek confirms the level of forest degradation due to illegal and poorly managed logging activities.



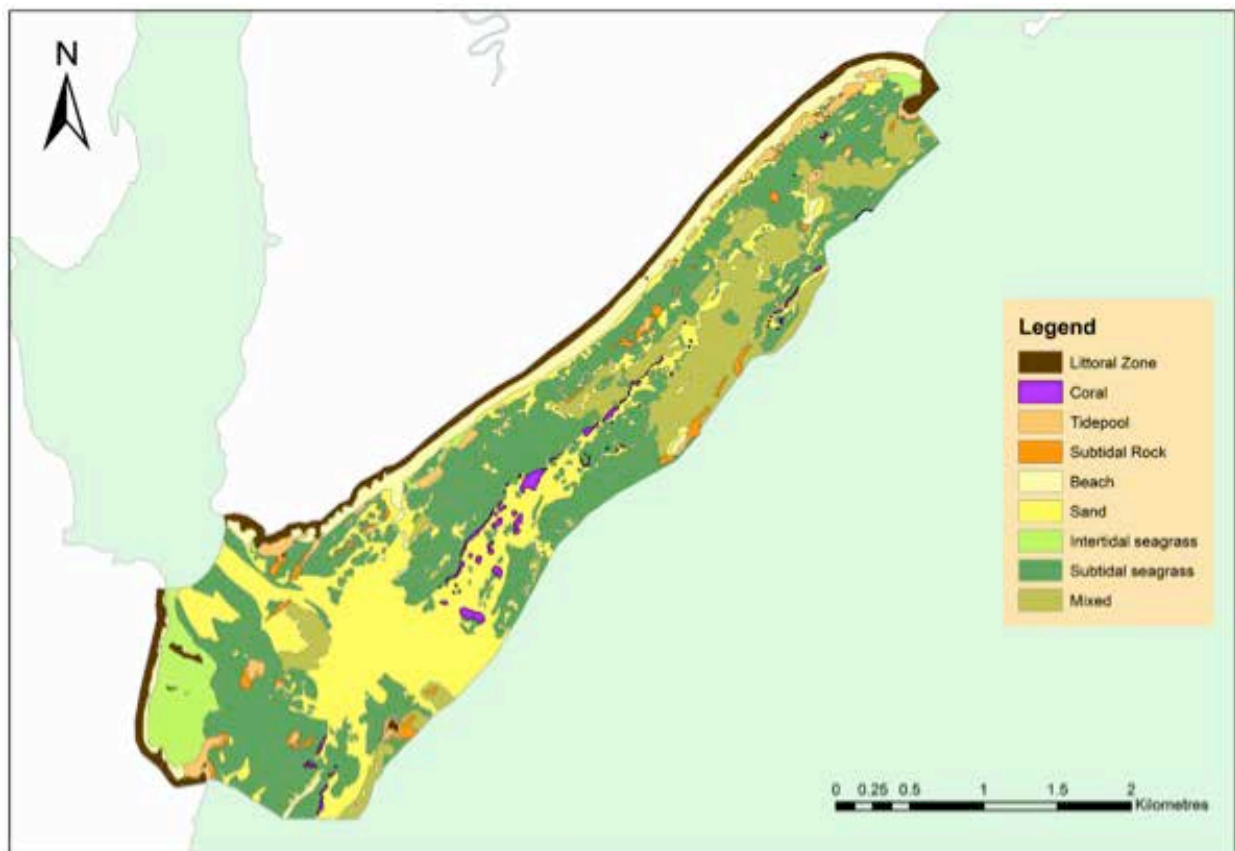


Figure 2. WMPA Habitat Map



**Table 5. Habitats in Watamu Marine National Park**

Habitat	Area in Km <sup>2</sup>	Percentage (%) of mapped area
Littoral	0.418	5.0
Coral	0.085	1.0
Tidepool	0.216	2.6
Subtidal rock	0.144	1.7
Beach	0.495	5.9
Subtidal sand	2.185	26.2
Intertidal seagrass	0.359	4.3
Subtidal seagrass	3.292	39.4
Mixed subtidal	1.154	13.8
<b>TOTAL</b>	<b>8.348</b>	<b>99.9</b>

**Coral Reef:** In lagoons, corals tend to grow in patches where good water flow regulates the temperature and nutrients. In Watamu, coral is mostly found along the seaward facing slope of channels running through the lagoon. Patch reefs, 10-50m long, are dominated by slow growing *Porites* heads separated by areas of sand and seagrass. Coral cover is low in the park, with areas directly east of Mida mouth having only 4% live coral cover to a maximum of 12% north of Coral Gardens and near Whale Island. In Watamu, coral reefs receive the most interest and attention, although being the least common habitat in the lagoon covering just over 0.085km<sup>2</sup> of seabed. One coral, *Anomastrea irregularis*, is listed as vulnerable in the IUCN red-list.

**Coral reef**

**Intertidal Rock:** Coral reef deposits from the Pleistocene are exposed at low tide. On Whale Island and to the north of the park, these exposed rocky areas form wave-cut platforms and cliffs. However, within the park this rock is mostly found along the beach edge in sheltered conditions. It erodes in a characteristic honeycomb structure with numerous rock pools formed at low tide harbouring a range of corals, fish and invertebrates. Being easily accessible from the beach and containing many interesting features, this habitat is the second most important for wildlife tourism, after coral reefs.

**Intertidal rock**

**Subtidal Rock:** The same Pleistocene deposits, mentioned above, continue below the tide-line to form rocky reefs. These areas, characterised by over-hangs and small caves, are an important fish habitat, with snapper, grouper, parrotfish and many other species congregating here. The most famous example of this habitat in Watamu is the grouper caves, in the mouth of Mida Creek.



*Sub-tidal rock*

**Beach:** Nearly half of the intertidal area of Watamu is the beach. This habitat may appear biologically uninteresting, but is used as a roosting site for birds from Mida creek as well as terns from the open ocean. The beach is also an active turtle nesting site for the endangered Green turtle and hawksbill turtle. It is also an important habitat for crabs and other associated beach animals whose ecology is poorly understood. The role of this habitat and the impact it receives from high human usage in Watamu is unknown.



*Beach*

**Sand:** Unconsolidated sediment fills approximately a quarter of the lagoon, often in the deeper channel bottoms running through the park. These areas appear to be important feeding grounds for stingrays and certain fish species, however the ecology and importance of Watamu's sandy areas is unclear.



*Sand and stingray fish*



**Intertidal seagrass:** Seagrass beds in the intertidal areas are a common feature of much of the Kenyan coastline, but are surprisingly absent from the lagoon in Watamu. The largest area is found to the south of Mida creek near Uyombo village. This habitat has a rich invertebrate fauna, with sea cucumbers, starfish and cowries, as well as many sandy pools where juvenile fish and intertidal specialists live.



*Intertidal seagrass*

**Subtidal seagrass:** Subtidal seagrass is the most extensive habitat in the park covering approximately 40% of the lagoon bed. Seagrasses are true plants with roots and flowers, rather than seaweeds. East Africa has the highest richness of seagrass species in the world with 12 species. 11 of these are found in Watamu, including the vulnerable IUCN red-listed *Zostera capensis*. The conservation importance of seagrasses is their role as a significant carbon sink in the ecosystem, stabilising loose sediments and providing habitat and feeding grounds for many other species. The importance of seagrass beds for carbon sequestration is increasingly recognised (Forqurean et al 2012), which represents a massive ecosystem service provided by WMNP.



*Subtidal seagrass*

**Mixed subtidal:** In some areas of the park it is not clear which habitat is dominant, with a complex mixture of seagrass, rock, rubble, macro-algae and small sand patches found together. These areas are often found in more exposed sites, where wave energy prevents seagrass dominating the benthos.

## SCENIC

### Sandy beaches

WMPA is renowned for its famous and vast stretches of white sandy beaches making it one of the most preferred tourism destinations. The sandy beaches are important recreational sites for the local tourists and provide alternative livelihood opportunities through provision of goods and services. The Sandy beaches provide habitats for highly specialized plants and animals like crabs and birdlife, especially during the low tides. This also includes sandy shores macro fauna like gastropods, nematodes, phychaetes, oligochaetes, ostracods, bivalves and amphipods.

Others include sea urchins, sea cucumbers and sea anemone.

Sandy beaches are in a dynamic equilibrium where the sediment out flux from a certain coastal section is balanced by the influx to the same section. If this balance is disrupted, it is likely to lead to a morphological response with deposition in some areas and erosion in other areas. The construction of seawalls for coastal protection changes the long shore hydrology causing erosion. Seawalls also obstruct turtles from reaching their nesting grounds, further threatening turtle populations.

### Rocky cliffs

These are rocky places (dead or living cliffs) where the action of marine waves has formed steep cliffs covered mainly in rocks and appear like nothing is growing on them. However, the area is found to harbour animal species like molluscs that are fed on by birds.

## SOCIAL

### Man and Biosphere Reserve

Watamu MPA is a member of the global network of biosphere reserves which are internationally recognized within the framework of UNESCO's programme on Man and the Biosphere (MAB). Biosphere reserves are areas of terrestrial and coastal-marine ecosystems which are internationally recognized for promoting and demonstrating a balanced relationship between people and nature. They are nominated by governments to promote solutions to reconcile conservation and sustainable use. Watamu MPA was designated as a Biosphere reserve in 1979.

Biosphere reserves have three functions:

- contributing to the **conservation** of landscapes, ecosystems, species and genetic variation;
- fostering economic **development** which is ecologically and culturally sustainable; and
- providing sites and facilities to support **research, monitoring, training and education** related to local, regional and global conservation and development issues.

Biosphere reserves are organized into three inter-related zones: a legally protected core area, established to ensure long-term protection and where minimal human activity is allowed; a buffer zone around or next to the core, where activities are compatible with conservation objectives of the core area; and an outer transition area where resources are managed and developed sustainably for the benefit of people who depend on the area. At Watamu MPA, the Marine National Park falls in the core area; the Marine National Reserve falls in the buffer zone; and the terrestrial part adjacent to the MPA (Watamu town and adjacent settlements) falls in the transition zone.

### Source of livelihoods

Provision of livelihoods is an important goal of protected areas. This is normally achieved through no-extractive services such as tourism in no-take areas, sustainable resources extraction in artisanal fishing zones, and spill-over of exploitable resources to surrounding areas. The main direct benefactors of these resources within the Watamu Marine Protected Area are boat operators, beach operators and fishermen.

**Mangroves:** Mida Creek supports 750 households who have settled there since 1936. According to an

economic survey on the value of mangrove ecosystem services, namely fish, firewood and charcoal, building materials, honey, fish breeding and nursery, shoreline protection, flood control, carbon sequestration, biodiversity, tourism and recreation, education and research, a total of US\$6.5million was recorded at Mida Creek area with shoreline protection contributing 44%, fish breeding and nursery at 28%, fish at 11% and tourism and education at 8%. Expanded on household basis, at an average of US\$1,130 in Mida Creek, mangrove ecosystem services are worth 2-4 times as much as annual county development spending. At aggregate level, mangrove values exceed the local revenues raised by Kilifi County by almost 25% and are more than twice as high as annual expenditure on the entire environmental and natural resource sector.

**Tourism:** Another key socioeconomic activity at WMPA is tourism, with numerous hotels, associated beach trade and boat tour operators to the Marine Reserve and Marine Park. Given the high density of tourism in this site, public access to recreational beaches has been restricted; some access points have been blocked altogether while others have narrowed considerably due to encroachment.

Tourism related activities depending on the beach and marine features include curio vendors, beach traders, boat operators, sport fishing, snorkeling and diving, while secondary activities include safari tour companies, entertainment spots and other service trades such as salons, and boutiques, among others. The tourism industry is one of the major employers for the local people, thus threats to its long-term sustainability is a serious concern to the locals and the government.

Marine dependent tourism relies heavily on the health of the marine ecosystem. The actions of tourists and tourist operators can however have a damaging effect on the system. For example, irresponsible snorkelling and scuba diving, which has been reported in Watamu Marine National Park, can cause damage to coral reefs. Increasing tourism numbers has also led to tremendous coastal development which can also harm the marine life. The tourism industry is a significant source of livelihoods for the people around WMPA and its dependence on the marine ecosystem means it will benefit from effective management of the area.

**Fishing:** Artisanal fishing, which is another important source of income in the area, is carried out within the Watamu Marine National Reserve and other areas surrounding the reserve. Fishermen around the protected areas benefit through spill-over when

fisheries resources in the no-take areas increase and replenish areas adjacent to Marine waters in the artisanal fishing zone. However, this depends on effectiveness of the no-take zone.

Fish markets are readily available through tourist hotels and local consumption. Fishing within these areas is managed and controlled by the Fisheries Department through the Beach Management Units (BMUs). Due to limited capacity, some of these BMUs are not effective in controlling fishing activities in the area and therefore in some instances there is disorder and overfishing. Even though the reserves are gear-restricted they are overly-exploited with both legal and illegal gears. Migrant fishermen sometimes conflict with locals mostly due to their destructive fishing methods. The different BMUs also conflict on fishing areas and fishing methods. Such conflict has been experienced in Mayungu BMUs.

## CULTURAL

### Historical sites & ruins

The ruins of Gedi is a historical and archeological site adjacent to the town of Gedi or Gede within the Arabuko sokoke forest. Gede town is one of the medieval Swahili-Arab coastal settlements and since the rediscovery of the ruins by the colonialists in 1920s, Gede has been one of the most intensely excavated and studied sites along the coast line. It's believed to have been one of the most important prosperous sites along the coast as early as 11th Century up to its abandonment in 17th century. This is evidenced by the houses architectural designs and the imported material culture including pottery, beads and coins. All the standing buildings which include mosques, a palace and numerous houses are made from stone, are story and distributed unevenly in the town. Gedi people's sea port was in Mida creek at a deep water

place called sita with ruins of big mosque in Kirepwe island and temple point areas that are estimated to be abandoned at least 600 yrs ago.

The ruins are important in assessing the site role within the region in association with other sites to provide insight into the development of the Swahili culture, organization of the Indian trade, introduction and spread of Islam and the political & economic ties between Swahili communities.

Gedi was made a historical monument in 1927 and declared a protected monument in 1929 after looters began removing Chinese architectural decorations. In 1939, GOK restored structures that were at greatest risk of collapse. Further site restoration was done in 1948-1959 by James Kirkman who was a park warden of the surrounding forest which was declared a park in 1948. From 1969, the stewardship of Gede was turned over to the National Museums of Kenya.

### *The great mosque of Gede and other ruins*





### The Culture of the local community

The uniqueness of local culture around Watamu MPA is coastal endemism of local community, Mijikenda pro-conservation Kaya taboo, Swahili resilience to foreign intrusion, and neighbour receptive culture.

**Three ethnic coastal endemic groups:** The Swahili people are the only Kenyan natives in Malindi town whose origins can be traced from the urban settings (Personal observation). Malindi town has been a Swahili settlement since the 14th century and traditionally a port city for foreign powers. Kilifi County has rich cultures and is also home to Mijikenda's nine communities (the most populous but in the rural being Giriama and Chonyi). However, in the Malindi and Watamu townships the Swahili, Arabs and Bajuni communities are the dominant groups.

Bajunis are indigenous Kenyan endemics in Lamu county and Malindi sub-county only but have cross border attachments in Somali. Theirs is coastal based subsistent livelihoods in fishing, trading and farming supported by long distance trading by their men

**Diverse cultural practices:** In Kilifi County, the rich traditional cultures span from housing, fishing, resource conservation, cuisine, religion, communication, dressing, matrimonial, rituals, gender, health. For example, housing, agriculture, cookery, protection is feminine role. Fishing is by males. Mijikenda ceremonies include birth, naming, age group knowledge and marriage and the literature part of the Mijikenda which include songs, dances, poems and storytelling.

### MANAGEMENT ISSUES OF CONCERN AT WMPA

**1. Encroachment on protected area.** There are two community encroachments to the marine park area in Watamu. The first encroachment is of the rocky platform at the far north of the park on the headland called Kibirijini, where fishermen are commonly observed using nets to catch fish at low tide. A second encroachment is the entire section of the park south of Mida creek, near Uyombo village where indiscriminate fishing takes place.

No permanent construction is allowed within 30m from highest water mark, which is part of the gazetted protected area. Nevertheless, encroachment on this area by developers occurs. Illegal developments along the beach include restaurants, building of unofficial sunbed venues, souvenir shops, sea walls and clearing of the vegetation by private home owners to extend their gardens.

Some plot owners claim ownership of the beach front facing their plots (30m above highest water mark) which is legally under KWS jurisdiction. In certain cases, the owners actually legally acquired this land prior to the establishment of the MPA, but the gazettelement did not take this into account by excluding these plots. This causes conflict as to the legal ownership of the land. Also, some beach front plot owners deny others the freedom of using those beaches.

**2. Poaching.** Although fishing in the park is illegal, some poaching takes place and this remains a management concern. In addition to illegal extraction of fish, beach sand, wood, shells, sea turtles, corals, and bird eggs (collected from whale Island) are also extracted from the MPA. Extraction of fish bait and charcoal burning also impact the mangroves of Mida Creek. In addition, turtle eggs are also poached.

In addition, trawling is a prohibited fishing method within five nautical miles off the coast in all Kenya waters. The marine reserve extends three miles out from shore and trawlers encroach on the area under jurisdiction of KWS. Trawlers target primarily prawns and most of the by catch (including turtles due to lack of Turtle Excluding Devices in the nets) is discarded. Park management has no legal authority to address the issue. The artisanal fishers have been accusing KWS of its inability to restrict trawlers from encroaching on their fishing grounds. They complain that their gill nets are destroyed by trawlers.

**3. Unsustainable fishing methods.** Controlled fishing using legal fishing gear is permitted in the reserve. However, marine life in the inshore waters is being decimated by unsustainable fishing methods. The number of fishers and fishing effort in the Reserve is increasing, resulting in declining catches and stocks. In addition, some fishers use small size mesh nets that catch young and juvenile fish. Similarly, trawling nets have a large by-catch, including threatened species such as sea turtles. Ring netting also occurs in the WMPA. Like trawling, it is a highly unselective fishing methods which lead to a lot of by-catch. As a commercial scale method of fishing it is not permitted by Kenya Wildlife Service. However, Fisheries Department issue licenses to the ring net operators, permitting them to fish without being monitored or regulated.

**4. Threats to species of special concern.** Marine turtles are severely endangered due to a reduction in their breeding grounds by development projects (hotels and residential houses). Local communities

also kill turtles on the nesting beaches and collect the eggs. Turtle nesting grounds outside the protected area, where the 30 meters above the highest water mark ends, have an even greater risk of being destroyed since there is no policing, human activities are not controlled, and the areas are outside KWS jurisdiction.

**5. Invasive species.** Sea urchins (*Tripneustes sp.* and *Echinometra matthaei*) at times proliferate, possibly due to an imbalance in the food chain. This results in increased bio-erosion of the reefs and loss of aesthetic appeal. The Indian House Crow is an invasive pest which is native to India. This crow is common along the coast including WMPA, and it is blamed for decreased bird diversity as it out-competes other indigenous bird species for food and also feeds on the eggs and young ones of indigenous birds. The aggressive nature of the Indian House Crow scares other birds from feeding sites making them to move to other alternative places. The bird preys on nestlings and eggs of other bird species. It also preys on small reptiles, insects and invertebrates impacting their populations. Other problems caused by Indian house crows are; nuisance (noise, droppings, entering dwellings, electric power failure, destruction of TV aerial reception), disease transmission e.g. cholera and salmonella, pest (destroys crops e.g. ripe paw paws and mangos, green maize and attacks poultry), and may cause air strikes due to the flocking nature<sup>5</sup>.

**6. Pollution.** Agricultural activities have a great impact on the marine environment. Use of fertilizers has promoted the colonization of coral heads by algae. The effects of herbicides and fungicides are yet to be determined. Also, untreated sewage from hotels and residential areas enters the sea directly or indirectly and solid waste from hotels causes visual pollution and affects the ecosystem. Further, occasional problems of disposing used oil during maintenance and service of boat engines are a source of marine pollution.

Non-biodegradable waste in the form of marine debris is a key threat to marine life.

This waste is mainly in form of plastic waste which can be ingested by marine wildlife such as the endangered sea turtles and cetaceans leading to their death. The turtles eventually die due to internal problems and starvation due to the gut being blocked. Plastics strewn on the beach also discourage tourists from visiting the area.

**7. Coral bleaching:** The single most significant impact to the park, and one which is best documented, was the mass-bleaching and mortality of coral in 1998. This extreme bleaching event led to 80% mortality of corals in WMNP. Since 1998 there have been at least two minor bleaching events in 2005 and 2013 and with increasing ocean temperatures the future of corals in Watamu and elsewhere is under threat. Mass-coral bleaching is also linked to climate change and so cannot be prevented on a local scale.

**8. Climate change:** Other potential natural threats are global warming which may result in sea level rise which could in turn lead to disappearance of the deeper reefs.

**9. Tourism impacts.** The actions of tourists and tourist operators can have a damaging effect on the ecosystem. Irresponsible snorkel and dive tourism in coral reef areas have long been recognised as a problem. Other unsustainable tourism practices include: coral destruction in coral gardens, feeding fish, animals picked up and handled during rock pooling, and boat operators chasing dolphins. Tourism also impacts the rocky intertidal where unofficial guides offer tours of the areas. Habitat destruction has also occurred near hotels, often arising from tourist activities such as destruction of turtle nesting habitat in dune vegetation for sun beds and curio shops. Physical damage of the coral reefs by trampling, anchoring and collecting of marine life also occurs. Some reefs have been unable to sustain the high pressure from tourism and fishing activities.

Behavioural changes have been noted in many species especially zebra and parrotfish, as well as the surgeonfish species. Due to feeding of the species, they are habituated to human presence and they associate humans with food.

**10. Visitor safety.** Before a boat is licensed, it has to undergo several tests by Fisheries Department, KPA, KRA, Tourism Department and KWS. However, despite this requirement, some non-seaworthy vessels are operating. Some glass bottom boats have neither KPA nor Tourism License and are also not insured. Most boats carry insufficient safety equipment, e.g. life-rings, life jackets and/or floats. Thus safety of visitors is not guaranteed while in KWS waters. In addition, unaccompanied and accompanied dogs are a nuisance to visitors

<sup>5</sup>Chongomwa, M. M. 2011. Mapping locations of nesting sites of the Indian house crow in Mombasa. Journal of Geography and Regional Planning Vol. 4(2), pp. 87-97, February 2011  
Available online at <http://www.academicjournals.org/JGRP> ISSN 2070-1845 ©2011 Academic Journals

on the beach. There have been incidents of dogs attacking people. Although the Wildlife Act is explicit on domestic animals in protected areas, there is misunderstanding between the management and the dog owners as to whether or not dogs are allowed.

**11.Speeding:** Over speeding has led to near accidents while overtaking or swerving to avoid hitting coral heads. This problem cannot easily be monitored and controlled because of the large number of boats and the limited capacity of KWS to patrol.

**12.Breaking of coral heads during low tide:** There is some breaking of coral heads by boats especially when a boat is tied to another moored boat. When the tides become lower, the tied boat may rest on a coral head and break it.

**13. Feeding of fish:** Feeding of fish changes the behavior of fish making them habituated and dependent on people for food.

**14. Skiing:** No regulations for this activity are in place and specific areas for these activities need to be designated and marked.

**15.Visitor harassment.** Licensed commercial activities along the beach include curio selling, safari selling and boat operators, who offer snorkelling trips, sailing and sea excursions. The Beach Operators occasionally harass tourists as they compete for customers.

**16.Resource use conflicts.** Conflicts between different resource users are as follows:

- Divers and artisanal fishers use the same areas whereas their activities are incompatible. Sport fishers fish in the marine reserve for bait yet the reserve is the key source of livelihood for artisanal fishers.
- Boat operators and hotels compete in the snorkelling business.
- The trawling companies over fish reducing fish catch by artisanal fishers.
- Boat operators and safari sellers compete for business from potential clients on the beach.
- The hotels complain that beach operators harass their clients
- Some institutions give authority and issue licences without consulting other concerned stakeholders, e.g. the Fisheries Department issue trawling licences without prior knowledge and advice to other concerned institutions.

**17.Public access to the beach.** People drive and park on the beach e.g. Garoda. There is need for control by KWS.

**18.Low flying aircraft** (Private planes) especially in December, are also a problem as they cause noise pollution

**19.Lack of conservation awareness.** There is lack of awareness of the benefits of a No-Take-Zone among stakeholders, especially fishermen. This has led to disengagement of this stakeholder group and non-compliance to protected area legislation.

**20.Beach clearing and levelling** is also a common occurrence. This increases the threat of beach erosion since the sand-binding vegetation is normally cleared.

**21.Non-adherence to the Code of conduct:** Dive schools do not always adhere to the agreed code of conduct. Dive operators are not using the appropriate flags while having divers/snorkelers in or underwater.

**22.Insufficient snorkelling sites:** There is a need to look for alternative sites for goggling/ snorkelling as there is heavy utilization at the coral gardens. There is need for education and awareness among the beach operators to reduced reef degradation.



## WMPA ZONATION SCHEME





## INTRODUCTION

Zoning is a key management tool for multiple-use MPAs. It allows areas to be set aside for particular activities such as protection of key habitats or nursery areas and breeding sites, research, education, anchoring, fishing and tourism. Zoning helps to reduce or eliminate conflict between different users of the MPA, to improve the quality of activities such as tourism, and to facilitate compliance. It is a tool used by managers to control the use of a conservation area by applying specific management policies and objectives to defined areas in order to meet the general objective outlined above. Zoning of the Malindi/Watamu marine parks and reserve is based on the distribution of the resources and the level of use to which they are put.

The WMPA zoning scheme aims to provide a framework for reconciling management needs of protecting natural resources as well as regulating different marine uses. The complexity of zoning the WMPA is compounded by the economic importance of the area; the high dependence on the resources by the local community, the range of users and interest groups whose use patterns frequently compete and displace each other; the need for equity and fairness in access to resources; and the unique and diverse ecological values of the area. Hence to avoid conflicts among resource users (recreationists, fishers, conservationists) there is need to establish zones with clear prescriptions.

Zonation is guided by the following principles:

- Protect the marine ecosystem, species, or habitat critical to the survival of the diverse species
- Reduce or eliminate conflict between resource users
- Manage resource users
- Provide a buffer between managed and unmanaged areas
- Reserve suitable areas for particular human uses while minimizing adverse impacts
- Reserve areas for specific purposes such as research and education

There exist spectrums of zonation schemes that can be defined within a multiple use area to allow a range of reasonable uses to occur in a coordinated way, and to provide for broad-area integrated management with many of the benefits. In coming up with the zonation scheme for the WMPA, two types of zonation have been proposed. These are Resource Use Zonation and Visitor Use Zonation. The following sections describe these zones in detail.

## RESOURCE USE ZONES

### Closed zone

The primary objective of the MPA is to conserve biodiversity. This zone has therefore been designed to give maximum protection to critical breeding areas of marine wildlife such as Marine turtles. The Watamu MPA zone includes the sea turtle nesting sites located in Watamu National Park's riparian area, 30m from the high water mark. In addition, whale island and turtle rock, which are bird breeding sites, are also found in this zone. Access to this zone will be authorised by the MPA Warden. These sites will be marked to enhance their protection. MPA management and conservation stakeholders will create awareness on turtle regulations to enhance protection of turtle nesting sites.

### No take zone

This zone is designed to protect areas considered of high ecological value in their pristine conditions and offer ideal and undisturbed sites for scientific research. This zone is highly protected where the removal or harm to plants or animals is prohibited. Conservation of natural values and natural processes takes precedence over recreation use in this zone. There is minimal management intervention in this zone so natural processes occur unimpeded. It is open to recreation activities such as snorkelling, diving, but closed to fishing.

The no take zone encompasses the entire Watamu Marine National Park with a buffer zone of 100m around it. This buffer zone is an extension of the fish breeding area protected by the Marine National Park. Kanani reef fish breeding area is also in this zone. This breeding area will be protected in collaboration with Watamu BMU and the State Department of Fisheries. Co-management arrangements in the Marine National Reserve will be explored to increase ownership by the local community. The protection of these critical fishing breeding areas will be consensual. Research to inform the regulations and fish breeding seasons will be carried out and the Turtle conservation groups will be involved in the identification, marking and protection of turtle nesting sites.

### Artisanal Fishing Zone

The Artisanal Fishing Zone (AFZ) has been set aside for the purpose of maintaining and sustaining controlled sustainable artisanal fishing activities, which take precedence over any other use in this zone. The AFZ is also open to recreation activities that are compatible with artisanal fishing practices. The AFZ covers Watamu Marine National Reserve and an area

of open sea about 5Km from the outer boundary of Malindi National Reserve that defines the extent of the artisanal fishing activities.

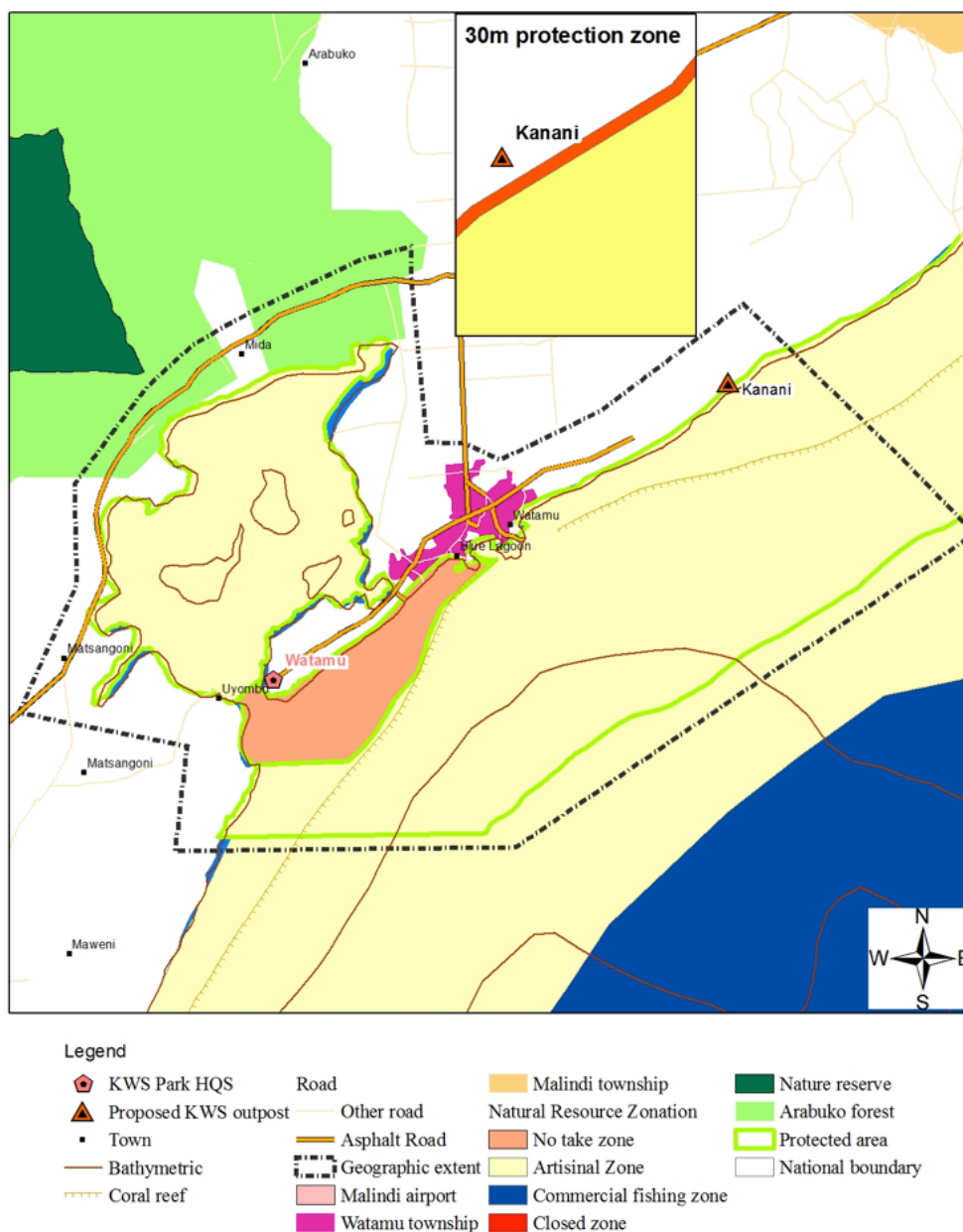
Activities not permitted in the AFZ include any form of commercial fishing and any destructive fishing methods as stipulated in the Fisheries Act, Cap 378. Ring net vessels and aquarium fishing activities are not allowed.

### Influence Zone

The influence zone covers areas that require specific zoning controls and management since it is under different management sectors. The activities permitted in this zone are dependent upon the specific nature

of the activities and management needs from the different management sectors. The IZ for WMPA encompasses the open waters of the Indian Ocean outwards of the Artisanal Fishing Zone. The IZ is utilized by different government sectors and the communities. Beach management units (BMUs) play a crucial role in sustainable exploitation of fisheries resources in the IZ.

In addition, the zone also covers the terrestrial area adjacent to the WMPA. Human activities in this area directly or indirectly affect the ecological integrity of the WMPA. This zone will therefore be the target for promotion of conservation education and outreach activities.



**Figure 3. Resource Use Zones**

## VISITOR USE ZONE (VUZ)

Visitor use zones enable the degree and type of visitor use to be managed spatially over the protected area. The inclusion of visitor use zones ensures that the overall zonation scheme will enable 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 utilization of the area for tourism.

The WMPA visitor use zones will ensure that tourism interests are incorporated more sustainably with other activities, such as fishing, within the MPA. On the other hand, tourism has had environmental impacts such as destruction of corals from snorkelling and diving activities. Hence, visitor use has to be regulated to reduce such impacts on critical habitats. Figure 4 shows categories of VUZ that have been proposed for WMPA.

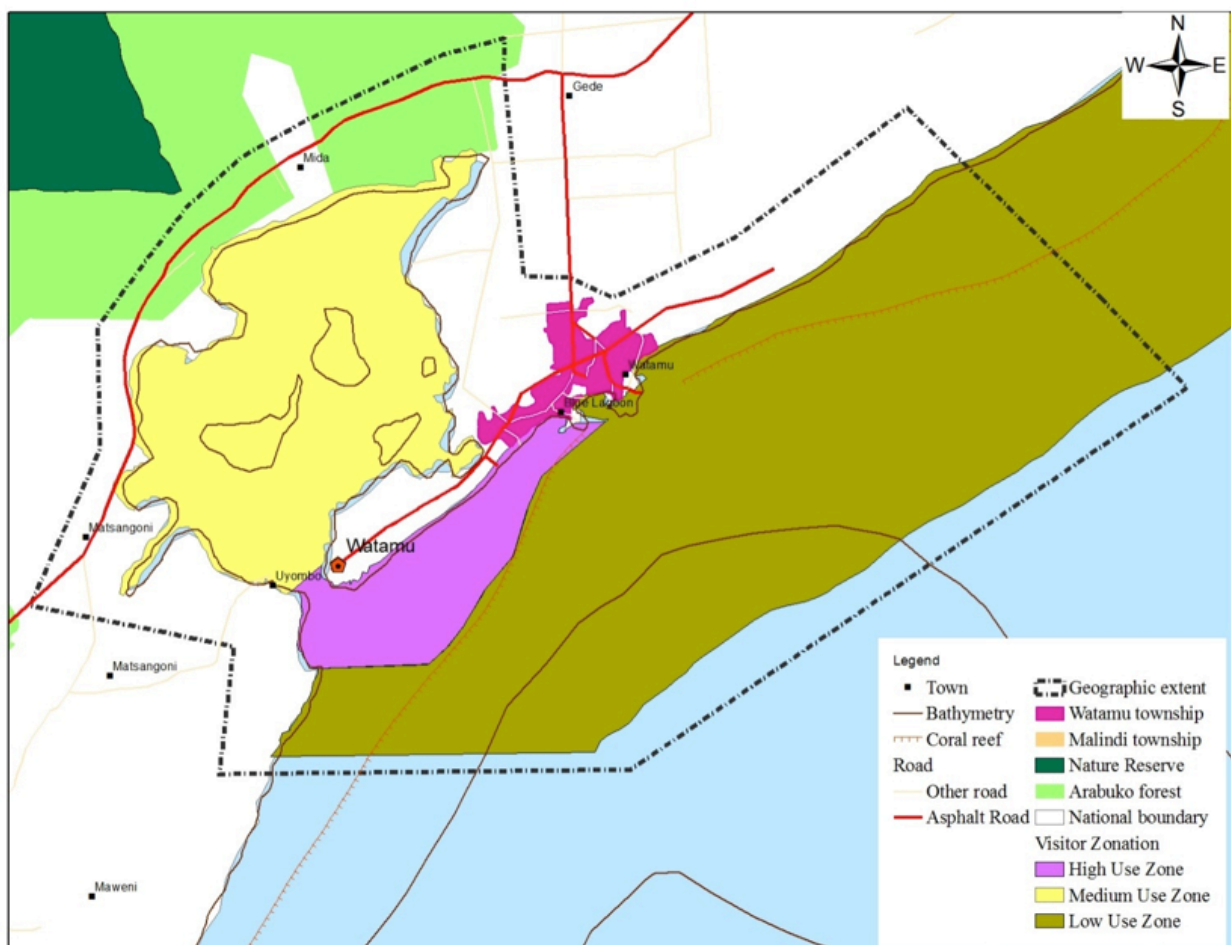


Figure 4 . WMPA Visitor Use Zones

### High Use Zone (HUZ)

The HUZ is the area within WMPA that is highly visited by tourists for recreation. The WMPA HUZ includes WMNP and north to Darakasi. The zone is characterized by the beaches which are open to the public for recreation activities such as walking and sunbathing; hence they are heavily used by visitors as well as residents. The marine part of this zone offers opportunities for marine recreation activities such as snorkelling and SCUBA diving among others.

### Medium Use Zone

This zone covers Watamu Marine National Reserve, which is popular with visitors, but it is not highly visited due to competing human activities such as fishing.

### Low Use Zone (LUZ)

This includes areas of the WMPA that are least visited compared to the HUZ. The zone covers part of Malindi Marine National Reserve that surrounds WMNP. Low visitor numbers are maintained by lack of tourist

attractions as well as the intense artisanal fishing activities in this zone.

Table 6 gives the management prescriptions for the different zones in the WMPA.

**Table 6. Allowable Activities and Uses in different zones of the WMPA**

Activity/Use/Facility	Closed Zone	No Take Zone (High Use)	Artisanal Fishing Zone (Medium and Low Use Zone)	Influence zone (Low Use Zone)
Commercial fishing	N	N	No beach seine; ring net <sup>6</sup> or any form of modified seine net	Y
subsistence fishing	N	N	Y	Y
Aquarium fishing	N	N	N	Y
Shell collection	N	N	N	Y
Sport fishing	N	N	Y (Fishing for Billfish, Blue Marlin, Tuna)	Y
Bird watching	Y	Y	Y (Roseate Terns, Waders in Mida creek; adhere to the Park Code)	Y
Curio vending	N	N	Y (only in curio vending designated areas; should be vetted by KWS)	N
Safaris sellers	N	Y (with authority from KWS; should be vetted by KWS)	Y (with authority from KWS; should be vetted by KWS)	N
Camel rides	N	Y	Y	N
Historical tours	N	N/A	Y (Kirepwe Island ruins and Temple point)	N
Scuba diving	N	Y (7 sites in the Park)	Y (17 sites in the Reserve-to be reviewed by stakeholders) No fishing allowed 100 meters from a dive site -marked with a buoy	N
Air safaris	N	Y (flying height should be in line with the KCA rules)	Y (flying height should be in line with the KCA rules)	Y
Research	Y	Y (collection of specimen should be authorised by KWS)	Y (collection of specimen should be authorised by KWS)	Y
Wind surfing	N	Y	Y	N
Sailing as a recreation	N	Y	Y	Y
Glass-bottom boat tours	N	Y	Y	N
Kite surfing	N	Y (with authority from KWS)	Y (with authority from KWS)	N
Sightseeing	N	Y	Y	Y
Reef Walking/Rock pooling	N	Y (Adhere to the Park code)	Y (Adhere to the Park code)	N
Barbequing	N	N	Y (allowed with authority from KWS)	N
Snorkelling	N	Y (adhere to the snorkelling guidelines)	Y (adhere to the snorkelling guidelines)	N
Dhow rides	N	Y	Y	N

<sup>6</sup> Results in overfishing and by-catch and habitat destruction affecting the overall ecosystem health



Activity/Use/Facility	Closed Zone	No Take Zone (High Use)	Artisanal Fishing Zone (Medium and Low Use Zone)	Influence zone (Low Use Zone)
Beach activities (swimming, sunbathing,)	N	Y	Y	N
Beach sporting activities	N	Y(with authority from KWS)	Y(with authority from KWS)	N
Social functions	N	Y (with authority from KWS)	Y (with authority from KWS)	Y(in an appropriate boat)
Sun beds	N	Y(in accordance with KWS sun bed guidelines)	Y(in accordance with KWS sun bed guidelines)	N
Boating (power)	N	Y	Y	Y
Boating (non-power)	N	Y	Y	Y
Natural and cultural values appreciation(birding, photography, wildlife viewing)	N	N	Y (only in curio vending designated areas; should be vetted by KWS)	N
	Y(with authorisation from KWS)	Y	Y	Y
	USE			
Filming (commercial)	Y(with authority from KWS)	Y(with authority from KWS)	Y(with authority from KWS)	Y



A vibrant underwater photograph of a coral reef. The scene is filled with diverse coral species, including branching corals in the foreground and various rounded, brain-like corals in the background. Several small fish, including a prominent black and white striped fish, are swimming among the coral. The water is clear, and the lighting is bright, highlighting the textures and colors of the marine life.

## ECOLOGICAL MANAGEMENT PROGRAMME



The purpose of the Ecological Management Programme is:

**To conserve the WMPA's marine ecosystems and improve understanding of their health and functioning**

The increase of human population in Kenya's coastline over the years has resulted to increased pressures in marine protected areas. The pressures are as a result of increase of management challenges in and around the protected areas. These challenges include for example overfishing and by-catches, pollution from fossil oil exploration, invasive species, tourism development, sea water level fluctuation, among others. As a result, the biodiversity and ecological integrity of the marine ecosystems are being threatened. KWS management aims to effectively rehabilitate fish stocks, sharks, sea turtle, large marine mammals (dolphins, whales) and coral reefs, take firmer charge of MMR, and resolve user conflict areas by protection and sustainable use.

This programme provides actions to assess and secure WMPA marine biodiversity and targeted resources, mitigate anthropogenic threats, adapt to climate change impacts, maximize research collaboration and information dissemination to guide management.

The following paragraphs set out the guiding principles that will guide WMPA Management in the implementation of the Ecological Management Programme and the achievement of the above Programme Purpose.

## **GUIDING PRINCIPLES**

In implementing the WMPA's Ecological Management Programme, WMPA Management will strive to ensure that:

- i) Critical habitat components are maintained and restored
- ii) Threatened species are conserved and monitored
- iii) Ecological components and processes to support adaptive management are understood

### **Critical habitat components are maintained and restored**

Restoration of a degraded habitat to a healthy, self-sustaining condition that resembles as closely as possible its pre-disturbed state is essential in maintaining habitat diversity. Habitat diversity in turn increases species diversity which enhances ecosystem resilience. Therefore, WMPA management will place

a high priority on efforts to restore natural habitats and the services they provide. Recognizing the importance of restoration in the overall toolbox of environmental stewardship, WMPA will support a variety of programs and projects that focus on maintaining and restoring critical natural habitats, hence improving the health of the whole ecosystem.

### **Threatened species are conserved and monitored**

The WMPA has several species of conservation concern including the sea turtles that are listed as threatened by IUCN. These species are threatened primarily by poaching and habitat loss or degradation. Under this management programme, management of threatened species will focus on minimizing human threats, population monitoring, and securing breeding and foraging areas.

### **Ecological components and processes to support adaptive management are understood**

Reliable information generated according to well established scientific principles and methods is critical if environmental and natural resource management are to operate effectively. Without reliable information on changes in the environment and on the causes of those changes, timely and adaptive management interventions on perceived biodiversity threats cannot be made leading to ecosystem deterioration. Ecological monitoring can represent an important source of information in the decision-making process. It can provide early warning when ecosystem changes are discerned and help control degradation. As such, this programme will focus on developing a robust ecological monitoring programme and related database to track key elements of the ecosystem and major threats to ecosystem functioning to inform adaptive management and for assessing management effectiveness.

## **TARGETING ECOLOGICAL MANAGEMENT ACTION**

This management plan has been developed using the Protected Area Planning Framework (PAPF) which prescribes the use of the Nature Conservancy's (TNC) Conservation Action Planning (CAP) process as a foundation for designing the MPA plan's Ecological Management Programme. Principally, the CAP methodology works on the rationale that, with limited human and financial resources available to MPA managers, it is impractical to attempt to manage and monitor every single aspect of the complex ecology of a protected area. The CAP methodology provides a tested mechanism for targeting ecological management, by identifying and developing an accurate definition and understanding of the protected

area's most important ecological features and their management needs, and the major threats to these features. In line with the PAPF, this programme also adopts the CAP framework.

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

### CONSERVATION TARGETS

Conservation Action Planning is designed to help develop and implement strategies to conserve key targets in conservation sites. The first step of the CAP process is the definition of a small number (usually about eight) of **conservation targets** which represent and encapsulate the unique biodiversity contained within the protected area, as well as any ecological features that require specific management actions (such as particularly endangered species or habitats). These are the basis for setting goals, carrying out conservation actions, and measuring conservation effectiveness. In theory – and hopefully in practice – conservation of the focal targets will ensure the con-

servation of all native biodiversity within functional landscapes and seascapes.

Each focal conservation target has certain characteristics or **"Key Ecological Attributes (KEAs)"** that can be used to help define and assess its ecological viability or integrity. These attributes are critical aspects of the target's biology or ecology that, if missing or altered, would lead to the loss of that target over time. The broad categories of size, condition, and landscape context can be used to inform the selection of specific key ecological attributes. Each key ecological attribute can either be measured directly, or will have an associated indicator that can be measured to represent its status. Common examples of KEAs include: essential habitat requirements of a particular species; keystone species for a specific habitat; or ecological connectivity requirements. The six WMPA conservation targets, the rationale behind their selection, important subsidiary targets (i.e., other ecosystem components that share KEAs and threats with the conservation target concerned), and each of the KEAs for each target are set out in Table 7 below.

**Table 7. WMPA Conservation targets, subsidiary targets, and KEAs**

	Conservation target	Rationale for	Artisanal Fishing Zone (Medium and Low Use Zone)	Influence zone (Low Use Zone)
Ecosystem	Coral reef ecosystem	<ul style="list-style-type: none"> <li>• Critical habitat for marine animals and plants</li> <li>• Targeted Fisheries</li> <li>• Highly threatened (Global warming, over exploitation, siltation)</li> <li>• High economic value</li> <li>• Recreation value-diving and other water sports</li> <li>• Spawning grounds</li> </ul>	<ul style="list-style-type: none"> <li>• Coral reef fish species</li> <li>• Turtles</li> <li>• Echinoderms</li> <li>• Sea shells</li> <li>• Number of visitors</li> <li>• Filter feeders (other than corals)</li> </ul>	<ul style="list-style-type: none"> <li>• Water quality</li> <li>• Diversity and abundance of coral community (coral, fish, sea urchins)</li> <li>• Coral community size structure</li> <li>• Coral recruitment</li> <li>• Extent of coral bleaching</li> <li>• Abundance and distribution of sea shells</li> <li>• Fish populations (Abundance, biomass, density, diversity)</li> </ul>



	Conservation target	Rationale for	Artisanal Fishing Zone (Medium and Low Use Zone)	Influence zone (Low Use Zone)
Habitat	Sea grass bed	<ul style="list-style-type: none"> <li>• Provide habitat and food for many marine animal species.</li> <li>• feeding, nursery and breeding grounds</li> <li>• Carbon sink</li> <li>• Sediment stabilization and reduce wave energy</li> <li>• Traditional uses e.g. weaving, compost</li> <li>• Foraging grounds</li> </ul>	<ul style="list-style-type: none"> <li>• Sea Turtle</li> <li>• Sea shells</li> <li>• Echinoderms (sea urchins, star fish)</li> <li>• Fish species</li> </ul>	<ul style="list-style-type: none"> <li>• Sea grass percentage cover</li> <li>• Shoot density</li> <li>• Water quality</li> <li>• Abundance and distribution of sea shells</li> <li>• Abundance of fish species</li> </ul>
	Sandy beaches	<ul style="list-style-type: none"> <li>• Critical nesting site for turtles</li> <li>• Economic value</li> <li>• Source of fresh water (sand dunes)</li> <li>• Buffer zone</li> <li>• Coastal development</li> </ul>	<ul style="list-style-type: none"> <li>• Sea turtles</li> <li>• Birds</li> <li>• Benthic fauna</li> <li>• Riparian vegetation</li> <li>• Number of visitors</li> </ul>	<ul style="list-style-type: none"> <li>• Coastal processes</li> <li>• Number of turtle nests and birds</li> <li>• Extent of riparian vegetation</li> <li>• Change in land use</li> </ul>
Species	Sea turtle	<ul style="list-style-type: none"> <li>• Classified as endangered</li> <li>• Affected by rapid coastal development</li> <li>• Susceptible to solid waste pollution</li> </ul>	<ul style="list-style-type: none"> <li>• Sea grass</li> <li>• Coral reefs</li> </ul>	<ul style="list-style-type: none"> <li>• Species diversity</li> <li>• Population structure</li> <li>• Nesting</li> <li>• Mortality rates</li> </ul>
	Waders (Shore birds)	<ul style="list-style-type: none"> <li>• Key indicator species for marine health</li> <li>• High tourism attraction</li> <li>• Important Bird Area</li> <li>• Important</li> </ul>	<ul style="list-style-type: none"> <li>• Intertidal zone</li> <li>• Mudflats</li> <li>• Mangroves</li> <li>• Sandy beaches</li> <li>• Number of visitors</li> </ul>	<ul style="list-style-type: none"> <li>• Species density and diversity</li> <li>• Population structure of key species</li> <li>• Condition index</li> <li>• Availability of food</li> </ul>
	Marine mammals (dophins, whales)	<ul style="list-style-type: none"> <li>• Tourism value</li> <li>• Measure of ecosystem health</li> <li>• Important migratory route</li> <li>• Threatened (whales)</li> </ul>	<ul style="list-style-type: none"> <li>• Sea grass beds</li> <li>• Number of visitors</li> <li>• Coral reef habitat</li> </ul>	<ul style="list-style-type: none"> <li>• Abundance</li> <li>• Distribution</li> <li>• Population dynamics and social structure</li> <li>• Habitat quality</li> <li>• Prey species</li> </ul>

### THREATS TO CONSERVATION TARGETS

The comprehensive definition of conservation targets and their KEAs enables the identification of the “threats” to these targets and attributes, and the subsequent prioritisation of these threats according to their significance. The PAPF defines a threat as any

factor, resulting either directly or indirectly from human activities, which has the potential to destroy, degrade or impair a conservation target during the 10-year lifespan of the PA plan. Table 8 shows the priority threats impacting or likely to impact on the WMPA conservation targets and their KEAs.

**Table 8. Threats to WMPA Conservation Targets**

TARGETS	Coral Reef Ecosystem	Sea grass	Sandy beaches and sand dunes islands	Sea turtle	Waders (Shore birds)	Marine mammals (dolphins, whales)
THREATS						
Over harvesting (poles, timber, firewood, oyster)						
Insect / parasitic infestation						
Climate change and sea level rise	High	Low		Medium	Low	
Management conflict						
Over abstraction of ground water and diversion						
Poor land use practices						
Siltation	Low	Low				
Encroachment						
Sand harvesting						
Destructive fishing practices (spear guns, seine net)	High					
Over fishing	Very High					
Pollution (nutrient input)	Low	Low	High	Medium		
Breakage of coral (tourism and boats)	Low					
Aquarium trade (coral, fish)	Low					
Sea urchin population explosion (T. gratilla)		Medium				
Removal of beach cast			High			
Beach alteration (coastal development)			Very high			
Beach erosion			High			
Land tenure system			Very High			
Habitat alteration/ destruction (nesting and feeding ground)				High	Medium	Low

TARGETS	Coral Reef Ecosystem	Sea grass	Sandy beaches and sand dunes islands	Sea turtle	Waders (Shore birds)	Marine mammals (dolphins, whales)
THREATS						
Incidental capture/ Entanglement in fishing nets				Medium	Low	Low
Poaching (meat, egg, oil, shell)				High		
Cultural beliefs				Medium		
Inadequate legal enforcement				Medium		
Disturbance from tourism activities (numbers and affecting feeding)					Medium	Medium
Use of poison baits by fishermen					Low	
Invasive species (rats at whale island, Indian crow)					Low	

## ECOLOGICAL MANAGEMENT OBJECTIVES AND ACTIONS

The identification and ranking of the threats to the WMPA's conservation targets and their KEAs provides the basis for the development of the Ecological Management Programme's management objectives and actions. Objectives have been developed to address the clusters of threats shown in Table 8. Three objectives have been developed addressing threats to the WMPA's threatened marine species (covering conservation targets: sea turtles and marine mammals); addressing crosscutting threats to the WMPA's most important habitats (covering conservation targets: coral reef, sea grass beds and estuarine); and addressing cross cutting threats. The four objectives developed for the WMPA's Ecological Management Programme are:

### MO 1. Conservation of WMPA's threatened marine species enhanced

### MO 2. Important WMPA habitats conserved

### MO 3. Threats to WMPA's critical components reduced

### MO 4. WMPA's ecological components and processes are understood

These management objectives and their subsidiary management actions are described in detail in the sections below. Under each management objective

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

## OBJECTIVE 1: CONSERVATION OF WMPA'S THREATENED MARINE SPECIES ENHANCED

The future desired state of the WMPA is that the ecosystem is conducive to the habitation of a rich biodiversity and provides ecological services to migratory sea turtles and large marine mammals (e.g. spinner dolphins and whales) as well as resident species of dolphins (e.g., Indo-Pacific bottlenose dolphins). However, relatively little information is known about the marine mammal species around Kenya. The available information on these species is based on data collected by the Kenya Wildlife Service (KWS), Kenya Marine and Fisheries Research Institute (KMFRI), Kenya Marine Mammal Network (KMMN), Turtle Conservation Groups (TCG), Watamu Turtle Watch (WTW), Community Based Conservation (COBEC) and information from stranded animals. Most of the major species of conservation concern are migratory species drawn to these ecosystems by specific ecological services. There is however, insufficient information on the ecological services offered to the large marine mammals.

The extent and nature of the marine environment provides a challenge for life studies on the large marine mammals. Enhancing reporting of opportunistic sightings of large marine mammals

can bridge this shortcoming. Opportunistic sighting surveys are defined as species data collection from non-scientific vessels and persons who regularly frequent the seas. This activity has been undertaken in many countries throughout the world where limited scientific research has taken place to bolster data collection from a wider, often multinational area. The Kenya Marine Mammal Network collected data in October 2012 to March 2013 and 196 sightings were reported from 13 collaborators. The reports came from Shimoni (South Coast) to Watamu (North Coast) and the most sighted locations were: Watamu (107 sightings) and Kwale (89 sightings). The data is however deficient in scientific information.

Some of the species of conservation concern have been in constant decline, facing real threats such as by-catch in fishing gears, loss of habitat, overfishing or whale/dolphin-watching activities. For these reasons, there is an urgent need to gain a more comprehensive data set for these species. The IUCN Red List assessment is a widely used system for quantifying threats to species and assessing species extinction risk. There is need to conduct an IUCN Red List assessment for the Watamu area.

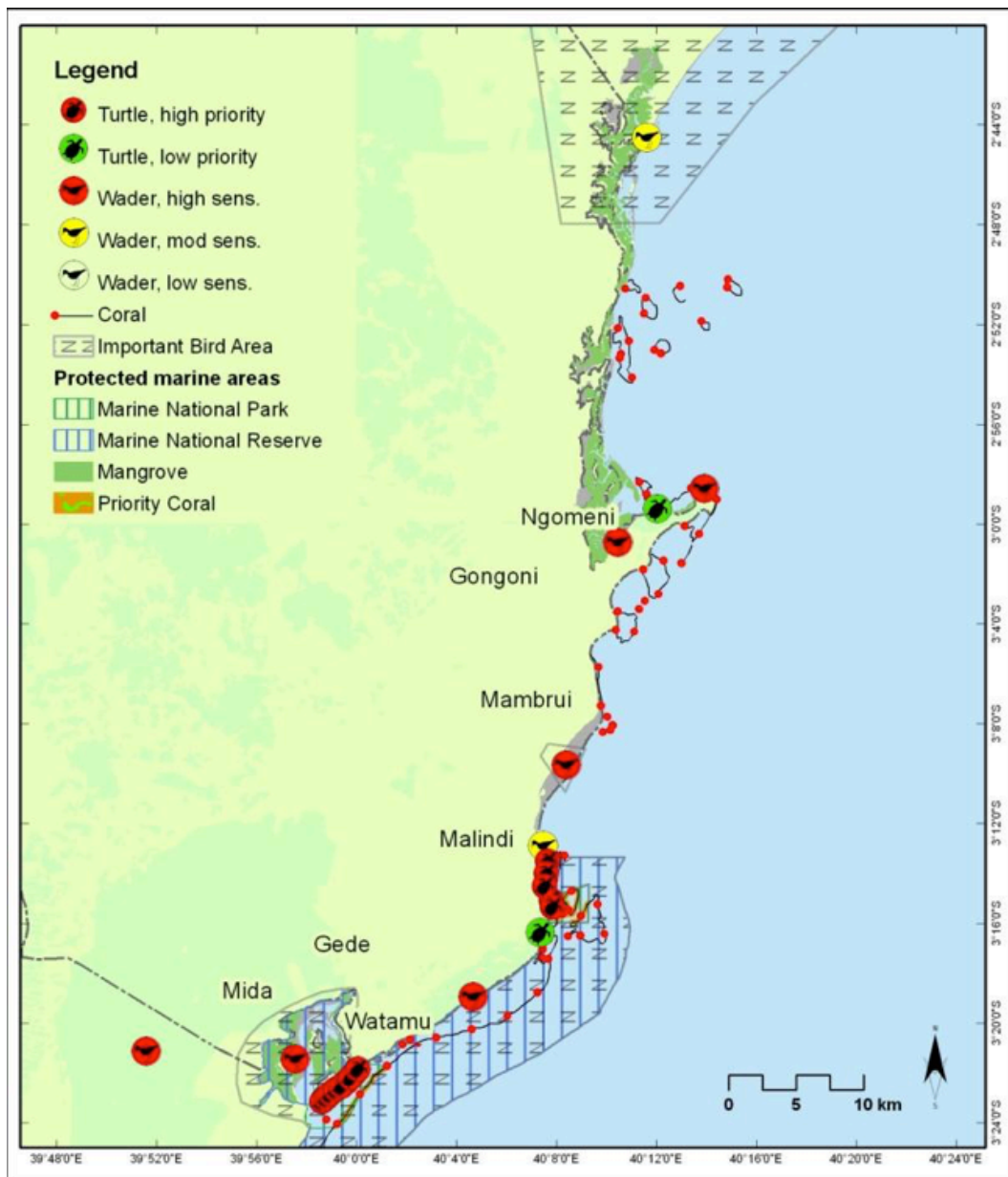


Figure 5. Distribution of key marine habitats, species and protected areas in Malindi District<sup>7</sup>

<sup>7</sup>NEMA, 2010. Kenya Shoreline Management Strategy. Volume III: S horeline Management Plan for Malindi District



The management actions that have been developed to ensure that the WMPA's conservation status is assessed and secured are described in the section below.

### **Action 1.1 Update the status of key species of conservation concern in WMPA for regular monitoring**

A number of endangered, vulnerable or endemic species are known to exist within the WMPA. There is therefore need to identify and list selected target species for effective monitoring to ensure their long-term survival in the WMPA. The monitoring activity should encompass the co-occurring species and habitats. In order to achieve this desired state, a series of management actions have been developed that include monitoring turtles by using tagging technique, aerial surveys of dugongs and the introduction of intervention measures for endangered species to ensure reduced mortality and enhanced survival.

Surveys of identified species of conservation concern will be initiated. These will encompass activities such as bird counts, turtle and bird nesting counts. In addition, the survey will set up a basis to develop and implement conservation strategies for all species of concern in the WMPA. It will include constituting species-specific conservation teams to monitor, protect and conserve these endangered species.

To reduce cases of destruction of turtle nesting sites, mortality of young ones, and the disturbance of birds nesting and roosting sites, the special conservation teams will be mobilised while the bird watching and turtle management guidelines will be developed and implemented. This will be accomplished through community partnership and collaboration, as well as an education and awareness campaign. The existing code of conduct with regard to species such as dolphins, turtles and whales will also require regular review, updates and enforcement for their effective implementation for the well-being of these species.

On the other hand, dolphins in the WMPA face a number of threats including the following: fishing net mortalities, loss of habitat, poaching for meat, degradation of foraging areas and loss of their food source due to commercial scale over-fishing. In addition, dolphin watching, if not properly managed, can cause stress and injury to dolphins and disrupt their natural behaviour. As such, WMPA management will work with other partners to ensure that threats to dolphin survival are minimised in the WMPA. Intervention measures that will be implemented will include sensitising local fishing groups and community based boat operators to the importance and value of dolphins in the marine ecosystem and as an eco-tourism asset and source of community employment and revenue;

promoting eco-tourism in the local community as an alternative to unsustainable fishing and destructive marine resource use practices; developing and enforcing the dolphin watching guidelines; and monitoring dolphin population and behaviour.

### **Action 1.2 Review environmental stressors and research gaps on threatened species**

The populations of many species, world over, are decreasing at an unsustainable rate, and the number of species listed as endangered from marine life such as whales, dolphins, manatees and dugongs, salmon, seabirds, sea turtles, and sharks are on the rise. The threats to marine species are difficult to perceive because marine animals are not as visible as animals on land. Unfortunately, marine creatures are equally, if not more, vulnerable to problems such as habitat destruction and overexploitation.

Rising sea levels and temperatures due to climate change is and will have detrimental effects on these species. It is known that one of the impacts of climate change will be the change in distribution and migration patterns of species. Identification through research of the migratory patterns and the general response of the ecosystem and species in case of an eventuality need to be conducted as a precautionary strategy. Research that has already been done on different species will be collated and periodic analysis of available data on endangered species will be ensured. For management and adaptation to climate change impacts it may be important to conduct an inventory of biodiversity, establishing the status of different species within the WMPA, and their patterns of distribution to include: marine mammals' abundance and distribution, birds' migratory patterns and species composition, as well as studies on sea turtles (sex ratio, sand temperature and hatching rates) and whale sharks.

An information database for these species will be developed to avoid duplication of research work. There are species-specific conservation and management strategies that have been developed in the past for endangered species such as the turtles. Through this action therefore, implementation of these strategies will be supported and achievements evaluated so as to guide the management on the best practices for these species.

### **Action 1.3 Support the implementation of existing national conservation strategies i.e. Sea Turtle Conservation Strategy, coral reefs and sea grass conservation strategy etc.**

KWS in collaboration with stakeholders has formulated several conservation strategies including the Na-

tional Sea Turtle Conservation Strategy that is intended to guide efforts in conservation and management of sea turtles and their habitats. Others include: coral and sea grass, and invasive species strategy among others.

In this regard, the main tools for the realization of these strategies include advocacy, communication, education, public awareness, targeted research and monitoring, and threat mitigation. Sea turtles of WMPA are faced with numerous threats that are impacting their survival. Some of these threats include the following: incidental capture in fisheries, illegal exploitation of eggs, meat and oil, loss and degradation of nesting and foraging habitats, sea turtle handling practices, pollution, predation and diseases. Most notable and critical of these threats has been the increased developments and lighting along the beach in the Watamu area.

Turtle nesting grounds outside the protected areas, where the 100ft (30m) above the highest water mark is not gazetted as protected land, have an even greater risk of being destroyed. This is because KWS has no direct jurisdiction over these unprotected sites, there is inadequate patrols and law enforcement, and human activities are not controlled. This has resulted in the loss and degradation of nesting and foraging habitats for the sea turtle. In order to address this issue, the WMPA management will work collaboratively with the Sea turtle Conservation task force and community based sea turtle conservation groups while implementing the activities in the sea turtle conservation strategy. In addition, there is need to develop new strategies to mitigate threats facing other key species within WMPA including; dolphins, whales, sharks, rays and dugong.

#### **Action 1.4 Prioritise research activities on key ecosystem functionality, and social environment impact in relation to the conservation of species of concern**

Information based on scientific methods is one of the guiding principles in decision making for conservation and management. Studies conducted within the WMPA are largely based on the ecology of the marine ecosystems, which have been conducted, by KWS, KMFRI, CORDIO-EA, WCS, Watamu Turtle Watch, Watamu Marine Association, and institutions of higher learning. An understanding of the interactions between natural and social environments of the WMPA is critical to effective management. Through their vast knowledge and experience in the area of concern, these institutions can be key players in identifying major management knowledge gaps.

A comprehensive review of all research will be undertaken to prioritize areas that may be needed to improve the understanding of marine environment and impacts of human activities on species of conservation concern. This will help guide the researchers in addressing ecological challenges on priority basis. Therefore, to ensure this happens, a scientific workshop will be organized to outline and review major research undertakings in the WMPA and identify gaps for further research. The WMPA management will first identify key marine experts and research institutions undertaking marine ecology research in the region. The recommendations from the workshop regarding previous research and research gaps will be disseminated.

#### **Action 1.5 Lobby for and contribute to the development of a National Marine Mammal Conservation and Management Strategy**

Approximately 34 of the estimated 76 species of cetaceans (dolphins and whales) and 4 species of sirenians (dugongs) worldwide are known to occur in the Western Indian Ocean (WIO) region. Few systematic studies on these marine mammals have been carried out along Kenyan coast, so whales, dolphins and dugongs have rarely been studied in WMPA. To enhance their conservation and management, it is paramount to develop a National Marine Mammal Conservation and Management Strategy which will adequately identify and address challenges facing them.

Considering that the marine mammals are trans-boundary species, there will be need for concerted efforts by all the stakeholders to come up with an action plan for the strategy. This will elevate the status of the marine mammals hence provide a link to the national, regional and international initiatives on marine mammal conservation. WMPA will initiate the process of developing the strategy that will incorporate all stakeholders. Currently, the KWS is the signatory of all the conservation conventions and hence coming up with national mechanisms in which to domesticate and implement these conventions will be important.

#### **Action 1.6 Promote sustainable alternative livelihood intervention and enhance biodiversity awareness**

Socio-economic valuation analyzes how societies progress, stagnate, or regress because of their local or regional economy or the global economy. A study, quantifying the value of WMPA is yet to be done, although the area is considered critical to the survival of the resident people, recreational and educational values for the entire mankind as a biosphere reserve. The valuation findings will enhance understanding of

the value of conserving the natural resources vis-a-vis development projects and policy decisions as regards resource use. In return, relevant policy decisions will be enhanced.

Lack of engagement in alternative livelihood among the fisher folks is often highlighted as being a driving force to human threats on important marine species including sea turtle, sharks, dolphins, and dugongs. The coastal communities have a high degree of dependence on fishing and associated activities, which often lead to, increased pressure on marine resources. Community conservation participation model has previously been successfully incorporated in natural resource management. The success of this model is hinged on the ability of the conserving community benefiting financially in the process. This model can be adopted for the conservation of large marine species with emphasis on turtles, dolphins and whales. Currently some local community groups are involved in turtle nest conservation and dolphin watch. Empowering them with tour guiding and business skills can enhance this engagement. There is also need to build their capacity with relevant tools and equipment (binoculars, infrared touches) as well as empower them financially.

## **OBJECTIVE 2: IMPORTANT WMPA HABITATS SUSTAINABLY CONSERVED**

The desired state of WMPA is to sustainably conserve critical habitat systems. These habitats include coral reefs, Sea grass, mangroves, sandy beaches, estuaries ecosystems and intertidal zones. Currently, the WMPA habitats ecosystems are home to various species ranging from tiny planktonic organisms (phytoplankton and zooplankton) that comprise the base of the marine food web to large marine megafauna like the sea turtles, dugongs, whales, sharks, and dolphins. In addition, many fish species dwell in these diverse marine systems. The intertidal areas are good foraging grounds for marine birds such as shorebirds, gulls, wading birds, and terns. Marine habitats also provide critical ecosystem services for humankind. WMPA human populations mainly depend on the marine environment for goods and services such as coastal protection, food, income and livelihoods.

In recent years, various natural and anthropogenic threats have led to increased loss and degradation of these critical habitats, with a general decline in ecosystem health. Some of the notable threats include; global climate change, resource overexploitation, destructive fishing practices, unsustainable tourism, physical alterations and habitat destruction, poor governance, pollution and limited scientific information. Studies indicate that, climate change, will fundamentally alter the structure of oceans and direct-

ly impact marine ecosystems and human societies. Recent assessments of the global climate have concluded that ocean temperature, sea level and acidity have been increasing. Further, summaries of recent climatic data indicate that the intensity and frequency of ocean storms are increasing as well.

In the past one decade, sea grass cover along Kenyan coast has shown massive decline. For instance, the most dominant sea grass species (*Thalassodendron cilatum*) showed 50% decline between 2001 to 2005 due to proliferation of the sea urchin (*Tripneustes gratilla*), which feeds preferentially on seagrass. Seagrass species in WMPA occurs in various habitats such as intertidal rock pools, sandy areas near the beach and in some sub tidal areas near the reef. Some of the known threats that affect seagrass communities in WMPA include sea urchin population explosion (*T. gratilla*) due to sedimentation, pollution – nutrient input, siltation and Climate change. Extensive exploitation with little regulation particularly use of destructive fishing techniques have also led to seagrass degradation.

To address these ever increasing threats to the delicate and highly diverse marine habitats, the following actions have been proposed.

### **Action 2.1 Assess the nature, extent of impacts of human activities and other natural factors on coral reef communities**

Since 1998 there has been much attention paid to understanding why coral bleaching occurs, but also how reefs can resist bleaching and recover after bleaching. Such resilience is a complex issue with much unknown, but the wide variation manifest in WMNP provides a valuable laboratory in which to examine how resilience and recovery vary over a small scale and how processes in reef health operate at fine resolution. Expanding the current monitoring into the remaining four patch reefs in the park, and others in the wider reserve, using the same basic metrics which have been used historically, as well as new metrics designed to understand resilience, should provide insights into the response of reefs to bleaching and ultimately climate change.

Globally, coral reefs and seagrass beds are being degraded by global warming through unusual selective pressures at individual organism level. For example, reefs are particularly sensitive to climate change because they bleach easily due to changes in sea surface temperature (SST). If the corals are exposed to prolonged duration of elevated SST for several weeks or months, they bleach and become more vulnerable to other threats, such as overfishing, pollution; sedimentation from storm surges and coastal developments. Corals can tolerate a narrow range of envi-

ronmental conditions and live near the upper limit of their thermal tolerance.

Some of the recommended interventions to this problem include setting up of artificial corals or transplantation of healthy coral to degraded reefs - this is helpful in areas experiencing slow growth rate, monitor and assess coral recruitment and growth, map coral reefs and seagrass systems, experiment on transplantation of sea grass in degraded areas, implement management plans for key identified community marine conservation areas in collaboration with BMU, SDF and KMFRI, develop guidelines for establishment of Community Conserved areas, zoning plans to designate areas for different uses and managing fisheries activities within the reserves such as removing aquarium fishers from marine reserve. These will increase ecosystems resilience and service provision.

### **Action 2.2 Strengthen legal and policy framework and enforce existing laws**

Kenya does not have a specific legislation or policy on protection of coral reef and seagrass systems. However, there are a number of sectoral laws and policies that touch on these habitats. These include EMCA 1999; Wildlife Act 2013; Fisheries Act 1991 and ICZM Action Plan among others. The new Wildlife Conservation and Management Bill 2013, Wetlands Policy and ICZM Action Plan have made more explicit provisions on protection of coral reefs compared to other sectoral law.

Some of the legal actions that should be taken by WMPA management are; advocate for Marine community conserved areas with coral reef and seagrass systems as stipulated in Wildlife Act 2013, advocate for collaboration with state department of fisheries to enforce mechanisms for monitoring, control and surveillance. Develop programs to reduce impacts of infrastructural development on coral reefs and seagrass systems in collaboration with key stakeholders, conduct training on development of policy briefs from research findings. Liaise with relevant stakeholders to lobby for inclusion of coral reef and sea grass beds issues in policy review fora. In addition, enforce regulations on water quality, fishing gears, tourism and ornamental fisheries in collaboration with stakeholders. Also, intensify enforcement of the code of conduct within WMPA.

### **Action 2.3 Increase stakeholder awareness through education/training and participation in conservation education and awareness**

Generally, information and interest on coral reef and seagrass systems is low compared to terrestrial ecosystems. Recognizing the value of an informed and

engaged public, this objective aims at promoting flow of information, creating awareness and raising the profile of these ecosystems in the public.

Review existing environmental education and awareness programmes and include critical ecosystems in awareness. Encourage and empower volunteer groups in coral reef and seagrass conservation. The service should train natural resources users such as CBOs, BMUs and CFAs in monitoring, law enforcement, and awareness creation. Environmental education and awareness materials will be created in different formats to convey important ecosystems information. Frequent training will be conducted for students, tour operators, government staff and local community visiting WMPA. Participation in media programmes will be aimed at as ecosystems information dissemination tool. Training manuals, coral reef and seagrass newsletters will be used created and disseminate Ecosystems information. To increase involvement and participation of stakeholders in conservation of critical systems such as coral reefs and seagrass systems stakeholders' forum will be created. Creation of awareness to stakeholders to understand regulations, laws related to coral reefs and sea grass beds will deter illegal activities that destroy these systems. The management of WMPA will mainstream indigenous knowledge in conservation and management of coral reefs and sea grass.

### **Action 2.4 Enhance research, monitoring and information management on coral reefs and sea grass system**

In common with many MPAs containing coral reefs, the reefs in Watamu have been the focus of most research and monitoring and little work has been done in other habitats. However, the park contains extensive areas of seagrass, rocky substrate, deep sandy substrate and other less common patch habitats, which house threatened species, unique biodiversity and important ecology. For example, many of the elasmobranchs, which made up half of the red-listed species recorded in WMNP, are found mainly over sandy areas, which though extensive are very poorly studied. The importance of seagrass beds for carbon sequestration is increasingly recognised, which may represent a massive ecosystem service provided by WMNP, as yet unrecognised.

Different stakeholders conclude their research and or monitoring but little information is available at a central depository. This is mainly due to weak regulation and information sharing mechanism. There is also limited expertise in some fields, e.g. seagrass, to design and conduct research. Other factors that attribute to the low capacity to conduct research include poor infrastructure and limited equipment. There is



need to collect, collate and synthesis available scientific data and information. Develop information resource centre (and database framework for research and monitoring will be developed. Some of the priority research areas to be undertaken include; research on diseases, pests and invasive species, research on issues of climate change in relation to corals and sea grass beds, research on sources of pollutants on sea grass beds and coral reefs and watersheds. Applied research on biological, social and economic aspects will also be undertaken. This information will then be packaged in useful products for stakeholders. At the same time, it's recommended that the management of WMPA should continue to monitor and evaluate the impact of climate change and determine potential mitigation and adaptation measure as well as monitoring recovery of degraded sea grass areas.

#### **Action 2.5 Manage watershed, water quality and reduce pollution**

Water pollution affects the ecological integrity of coral reefs and seagrass systems. The area is also facing rapid urbanization coupled with human population expansion. In addition, the coastal development and poor farming practices upland significantly contribute to increased pollution loads. This action focuses on reducing both land and sea based pollution on these marine ecosystems. The actions which should be undertaken in collaboration with key stakeholders includes, meetings with watershed communities (up-country and discussing way forward, in collaboration with key stakeholders develop watershed soil conservation programs upland, identify and document existing and potential land based sources of pollution, enforce in collaboration with NEMA and other relevant agencies and implement environmental management plans of development projects generated through the EIA process.

#### **Action 2.6 Control illegal activities within the ecosystem**

Protection and compliance will be enhanced within the ecosystem to control illegal mangrove poaching, charcoal burning and encroachment in the mangrove areas. Pollution from human activities and uncontrolled dumping within WMPA will be controlled especially in collaboration with NEMA.

#### **Action 2.7 Conduct capacity building and awareness on conservation and management of Mangrove ecosystem to KWS staff and other stakeholders**

Generally, information and interest on mangrove ecosystems is low compared to other aquatic ecosystems. Recognizing the value of an informed and en-

gaged personnel and public, this action aims at promoting flow of information, creating awareness and raising the profile of these ecosystems.

In collaboration with other relevant stakeholders training and awareness creation to KWS personnel, CFAs, BMUs and other relevant groups within WMPA on the importance of mangrove ecosystem will be paramount. Research and constant monitoring will be conducted to ensure sustainability and viability of the ecosystem.

#### **Action 2.8 Conduct research and monitoring on the Mangrove ecosystem**

In collaboration with other stakeholders research and monitoring gaps will be identified for sustainable management of the ecosystem, dissemination of research finding to managers and other relevant partners will be enhanced to bring synergy in management of mangrove ecosystem.

#### **Action 2.9 Control marine pollution**

Non-biodegradable marine debris (e.g. flip flops, plastic bags, nylon fish nets, polystyrene objects and hard plastic water bottles) pose a threat to the animals that depend on the oceans for food. These debris, when washed ashore, degrade some of the key turtle nesting beaches. In view of the foregoing, under this management action, the WMPA management will work closely with NEMA to ensure that all facilities, vessels and individuals observe waste disposal protocols as stipulated in the Environmental Management and Coordination Act (EMCA), 1999. A comprehensive system to identify all sources of pollution into the WMPA as well as assessing the impacts and extent of waste pollution on the marine ecosystems will be designed and implemented. WMPA management will work closely with the local community in carrying out regular beach cleaning campaigns to remove all non- biodegradable debris from the WMPA beaches. In addition, the WMPA management will work closely with Watamu Marine Association, local hotels and businesses to ensure that the weekly community beach clean-ups are maintained.

### **OBJECTIVE 3: THREATS TO WMPA'S CRITICAL COMPONENTS REDUCED**

Coastal and marine ecosystems in Kenya are facing a wide variety of threats from human activities on land and in the ocean. Global climatic and oceanographic events are also contributing to sea level rise, severe storm events, coastal erosion, and sea surface temperature, all of which can harm marine ecosystems. In WMPA, pollution in form of solid waste emanating from nearby tourist facilities and other shoreline de-

developments in the area is common which is affecting the aesthetic appeal of the environment besides affecting the health of large marine animals and posing environmental health risks.

Over exploitation of marine resources especially fisheries resources is high due increased fishing effort and limited alternative livelihoods for the fisher folk. The use of poor fishing methods characterised by use of small mesh-size nets and trawling in the near-shore have contributed to worsening of the state of fisheries the resources in the area. Turtles are also reported to be killed on the beach and their eggs collected for food by local communities. Coral reefs are facing physical damage through trampling and anchoring of vessels by boat operators while mangrove habitats are experiencing over-harvesting by the local community due to poor enforcement of relevant regulatory requirements. Conflicts amongst different stakeholder groups mainly hoteliers, beach curio dealers and boat operators is also common. This objective aims at remedying and minimizing the anthropogenic threats for the WMPA so as to keep a balance between the use of the resources and the health of the marine ecosystems. Some of the key anthropogenic threats for WMPA include; Inadequate public awareness, recreational overuse, entanglement and drowning in fishing gear, incidental take in sport and commercial fisheries, habitat degradation, disturbance and harassment of the marine mammals by tourists and illegal exploitation for meat, oil and eggs as well as for commercial trade particularly in carapace; incidental capture by fishing gear; beach nourishment which affects turtles by direct burial of nests; diseases (mainly *Fabropapillomatosis*); predation of eggs and hatchlings and loss of nesting and foraging habitats to near shore development along the beach, ingestion of marine debris, nest predation and damage from recreational vehicles on sand beaches.

### **Action 3.1 Promote synergy and integration with other stakeholders**

There are several government agencies and departments both at National and County level that need to be involved in management of the WMPA owing to their legislative mandates that they have over certain issues facing the area. For instance, issues facing mangroves management require the involvement of KFS while tackling agriculture related issues along the shoreline require involvement of State Department of agriculture. Non-state actors including the private sector, NGOs and CBOs also exist in the area. Despite the presence of many players with specific roles that affect the WMPA and the surrounding area poor coordination of the stakeholders' efforts in and around the MPA has remained a challenge. As a result, there exists overlaps and duplication of activi-

ties around the WMPA. Coordination and integration of the stakeholder's efforts presents a cost-effective mechanism to tackle the issues facing the WMPA. An integrated approach to management of the WMPA will therefore be embraced.

### **Action 3.2 Develop and enforce resource use zones**

The marine reserve component of WMPA is an area with high number of resource users such as: artisanal fishers, sports fishers, commercial fishers (ring net fishers) and trawlers; tour operators including boat owners, hoteliers, dive clubs water sports and conservationists. The presence of many competing uses in the marine reserve has resulted in resource use overlaps sometimes leading to conflicts among the users. Some of the overlaps include diving and snorkeling sites, and fishing sites both in the protected areas (reserve) and the surrounding area. In order to bring order and sanity amongst the conflicting uses and ensure sustainable use of the marine reserve resources the prescriptions provided in the zonation scheme will be enforced.

### **Action 3.3 Promote alternative livelihoods for the local fisher folk**

The communities living close to the WMPA depend on marine resources for their livelihood. Fishing is the main livelihood activity. However, with increasing number of fishermen, over exploitation and degradation of habitats is evident while catch per unit area has diminished over the years. This has in return caused high levels of poverty amongst fisher folks. One way to reduce this pressure is to initiate viable alternative livelihoods which will reduce pressure on the marine resources, enhance conservation as well as generate income to households.

### **Action 3.4 Strengthen law enforcement efforts in the WMPA**

As reported earlier in the management plan the WMPA is experiencing illegal activities such as illegal harvesting and subsequent selling of shells and ornamental fishes; Illegal exploitation of sea turtles for meat, oil and eggs; beach encroachment by shoreline developments among others. There is need to ensure these illegal activities are addressed through strict law enforcement.

### **Action 3.5 Promote proper waste management measures**

Pollution in form of solid waste emanating from nearby tourist facilities and other shoreline developments in the WMPA is common and is affecting the aesthet-

ic appeal of the environment besides affecting the health of large marine animals and posing environmental health risks. In order to address environmental pollution in the WMPA it is important that measures are put in place to prevent and control pollution from occurring. KWS will work with the County Government and other relevant stakeholders to implement a waste management programme in the WMPA.

### **Action 3.6 Promote community awareness and participation in WMPA management**

Low community awareness on the importance of the WMPA is a major issue that need to be addressed. Low level of awareness and understanding on the importance of the area resources, and linkage between the environment and livelihoods and economic development has contributed to environmental degradation in the area. This is evidenced by proliferation of illegal activities such as poaching; use of illegal fishing gear; disturbance and harassment of the marine mammals by tour operators and tourists; and poor waste disposal among others mainly in the marine reserve. Community awareness and participation is an essential social tool for the management of change in conservation and sustainable development. Promotion of awareness and education among local communities and other stakeholders with a view to highlighting the value of resources found in an area can result in change of negative community attitudes and perceptions towards the environment. In addition, such awareness and education activities can enable local communities reduce negative impacts of their actions on the environment.

### **Action 3.7 Control invasive species**

The crown of thorn star fish, *Acanthaster planci* is listed under the Seventh Schedule of the Wildlife Conservation and Management Act, 2013 as an invasive species. It preys on hard, or stony coral polyps and over harvesting or collection of its predators or habitat destruction leads to increased abundance resulting to over-use of the coral polyps. Outbreaks of a density of over 140/ha is considered alarming and action should be taken (injection with sodium ions, injection with vinegar, removal control or bury them under rocks/debris) at a density of 1,000/ha.

The Indian House Crow is listed as an invasive species under the Seventh Schedule of the Wildlife Conservation and Management Act, 2013. It is found along the coast line including WMPA where it has continued to impact negatively on other bird species and local biodiversity. To protect local biodiversity as well as minimize negative interactions between the Indian House Crow and people in the WMPA, the Indian House crows will be controlled through several methods in-

cluding destruction of their nests, trapping, and creating awareness on waste management as reducing the birds' access to rubbish, which is their main food source, is the most effective and friendly method of controlling the Indian House crow's population.

### **Action 3.8 Establish shoreline setbacks and coastal erosion hazard data**

The landward boundaries of the WMPA are defined by a line 30 metre above the high-water mark. The Survey Act Cap 299 requires that a setback of 60 metres from the High Water mark is reserved. The intent of shoreline setbacks is to establish a coastal-hazard buffer zone to protect beach-front development from high-wave events and coastal erosion. Adequate setbacks allow the natural erosion and accretion cycles to occur and help maintain lateral beach access. Furthermore, setbacks provide open space for the enjoyment of the natural shoreline environment. However, the alignment of the legally prescribed setbacks have been shifting over the years because of coastal erosion shifting the high water mark land ward while in some areas the high water mark has shifted seawards. Hence, in addition to delineating the WMPA landward boundary based on status on the status of land tenure when the WMPA was established and to provide adequate environmental open space for coastal processes, WMPA scientists will design and conduct a study that will analyse coastal erosion trends using remote sensing and cadastral survey data to provide data on a property scale. Historical erosion rates will be determined on a parcel by parcel scale and used to project the future erosion hazard area along the shoreline. The output erosion-hazard information will be used to identify areas prone to high rates of coastal erosion and help determine the causes of and methods to address coastal erosion. They will also provide a scientific basis for assessing and regulating proposed structures and activities within the projected shoreline erosion hazard zone.

### **OBJECTIVE 4: WMPA'S ECOLOGICAL COMPONENTS AND PROCESSES ARE UNDERSTOOD**

The future desired state at the WMPA is where ecological as well as socio-economic research is carried out and research findings disseminated to support management decision making.

There is a long history of ecological research and monitoring in the WMPA, which has made significant contributions to the global understanding of the area's marine ecology and biodiversity. The available information however is not easily accessible at the WMPA and what is available is also not readily usable by WMPA managers. The information is also biased

towards the ecological aspect. Additionally, there are still some areas, habitats and species that have not been studied. Research and monitoring are essential for management to be effective and for the evaluation of the impacts of diverse ecological processes. Long term data collection is important to have a complete understanding of some drivers that act over long temporal scale.

This management objective has been designed to strengthen research and monitoring as well as information dissemination for effective MPA management. Management actions that will be implemented to achieve this objective focus on obtaining and collating information that is available, generating information that is unavailable, interpreting the information and communicating to all stakeholders in WMPA. Additionally, there will be appropriate management interventions developed for managers that subsequently allow the implementation of the research findings. This will enhance evidence-informed management action.

Information needed from research will be diverse ranging from information on species and habitats, visitors and community issues. The first management effectiveness assessment of the Watamu Marine Park and Reserve revealed that research information is not made readily available to managers and that the WMPAs has no storage and retrieval systems for this information.

To understand ecological components and processes, the following actions will be implemented:

**Action 4.1: Conduct an assessment of all research studies and monitoring programmes that have been conducted in the past**

Many studies have been done in the WMPA. These studies are focused on coral reefs, mangroves, sea-grass, fisheries and the effects of siltation from the Sabaki River. Species inventories of fish, coral, marine and terrestrial invertebrates, birds, and marine and terrestrial mammals can be collated from current publications but this information needs to be updated. In addition, most of these species have not been adequately catalogued for mapping purposes making it difficult to estimate the range and extent of these species.

It is important to review all the past research and monitoring assessments on various biodiversity subjects or resources and help in designing a comprehensive plan for future assessment within WMPA. In addition, adequate reviewing will facilitate detection and identification of research gaps as well as areas that have been widely and numerous studied. Reviewing of

the research areas will also guide in determining the merits for research funding in areas where such funds are available. This will also assist in the connectivity of research to be carried out with the research that has already been done to attain an overall relevance and purpose.

Additionally, there is a need to invite all scientists who have carried out research in the WMPA to converge and help interpret the collected information. This will make it readily usable to managers. A monitoring strategy that takes into consideration key species, habitats and processes will be developed and be implemented in the park operations.

**Action 4.2 Conduct research on habitats and species**

There are several researches that have been carried out in the WMPA but these are still limited or biased to be used for management in the WMPA. Most research from the WMPA has been concentrated in the coral gardens and a few other patch reefs. While repeated studies in one site are extremely useful for studies examining change over time, this information does not help us to understand how the various habitats and organisms in the ecosystem are interconnected. Before you can start to understand how habitats and organisms are interconnected, you must first know all habitats and organisms that are present and how they interact at the small and large scale. There have also been limited studies on social issues that impact the ecological integrity of the WMPA. For effective management of the WMPA, socio-economic and even political factors around and within the area cannot be disconnected from the ecological factors. These, as well as emerging issues such as climate change and ecological and social resilience need to be well-understood.

There is need to develop a research plan to collect data on areas, critical habitats and species that have not been studied. This will establish the status of the WMPA resources and user groups and fill research gaps identified. Research findings can be used in the planning phase by helping define the major issues. It is also essential to establish a long term monitoring plan for specified ecological and socio-economic indicators based on research activities undertaken and collated. Through long-term monitoring managers can confidently state factors that are affecting the WMPA. This will help provide information for adapting the management plan. As this is a long-term phase, it is important to develop effective long-term working relationships and administrative structures. Additionally, Technologies such as GIS and remote sensing can be utilized in mapping habitat and species distributions as well as resource use.



### **Action 4.3: Review current monitoring capacity and train WMPA staff and communities in ecological monitoring and reporting.**

The WMPA currently has scientists and rangers trained to conduct ecological and socio-economic monitoring within the marine and coastal ecosystems. There are also many stakeholders who conduct research and monitoring. However, there is need for capacity building for the staff involved in the management of marine resources. This will enable them to acquire the required knowledge in ecological, biological and social issues and basic methodologies for carrying out monitoring. This will also ensure building of local expertise and continued local research and monitoring to inform evidence-based management. Constant review of training needs is crucial in the development of a widely knowledgeable workforce that is necessary to effective and adaptive management. Conversely, there is need to conduct certification and experiential programmes for relevant staff and stakeholders. This can be achieved through advocating for professionalism of MPA management. Interpretation and implementation of research findings for management will enhance development of a networking mechanism for managers, rangers and other key stakeholders in the region. This can be done in liaison with WIO-COMPASS.

### **Action 4.4: Intensify collaboration for research, monitoring and management of MPA.**

In the past, outcomes from research and monitoring assessment have not been optimally used for management of WMPA due to institutional and coordinative issues. There is a need to improve coordination in order to obtain important information, expertise and avoid replication. Overall coordination with other agencies and other stakeholders is required to enable collective decisions that will affect the management of the area. Additionally, this will help in sharing costs of monitoring and logistics. Coordination will also ensure all the three levels of monitoring are achieved. These monitoring levels are: Community monitoring - This is the lowest level with lower details; this can be carried out continuously as it is inexpensive to conduct. Management monitoring - This covers more details and requires more training than the first level and can be carried out periodically. Research/Scientific monitoring - This is expensive and requires expertise and experience. It is mainly designed to answer specific questions.

To enhance production and collaboration among these groups, scientists and managers should try to achieve a common understanding and support for the goal and objectives of the program and a mutual understanding of the respective pressures and reward systems under which scientists and managers operate. It is also important to establish national, regional and global networks to link up with and learn from other MPA managers around the world and assist others manage their MPAs.

### **Action 4.5: Develop an integrated information management system**

Research and monitoring are aimed at generating crucial information that guides the mitigation of threats, adverse impacts and develop management interventions achievable in thematic forum of policy, research and management. The system should be practical and easy to use as well as able to link up to other clearing house mechanisms. This requires the concerted and focused analysis and interpretation and dissemination of the collected information. The Annotated Bibliography of MPAs provides a meta-database of available information, though these manuscripts, articles or reports are not readily available in the WMPA. Hence there is a need to establish linkages and synergies that will enhance circulation of information between research institutions and other stakeholders. There should be a physical resource centre with a digital library with all studies undertaken in the area, well-interpreted and usable by all stakeholders. There should also be a resident researcher who will be the custodian of all the information. Training of managers and stakeholders in the use and retrieval of information is paramount for its viability.

### **Action 4.6: Evaluate the management plan at specified intervals**

Evaluation of the management plan is an important measure of success of management goals which assists in adaptive management. This will be based on the objectives set in the planning phase and information generated through research and monitoring. Monitoring should be a vital component of the evaluation as it helps identify areas where management has been successful as well as identify areas that require more or different action. It is desirable to involve people from outside the WMPA managers with appropriate skills and knowledge.

## TOURISM DEVELOPMENT AND MANAGEMENT PROGRAMME



## PROGRAMME PURPOSE AND STRATEGY

**To ensure sustainable tourism development in line with conservation principles and to enhance and market WMPA as a world class quality tourist destination rich in natural beauty and biodiversity**

The community living adjacent to the WMPA depends largely on marine resources for their livelihood, key among them being fishing and tourism related activities along with subsistence farming. With an ever-growing population and tourism expansion the demand for marine resources and services is increasing at an advanced rate. In order to maintain the quality and health of marine resources and to provide consistent quality goods and services for sustainable tourism, sound management of these resources is required.

To ensure that tourism follows a truly sustainable path and that it contributes to the sustainable management of the WMPA will require enhanced cooperation and concrete partnerships among the players of the tourism industry, all government levels, local communities, protected area managers and planners and the tourists themselves.

To sustain economic growth and ensure future benefits for the community which depends on the WMPA for livelihood and income, it is necessary to develop tourism marketing plans aimed at attracting national and international visitors in line with sustainable tourism growth. The major tourist attractions in the area include: historical sites, scenic views, beaches, water sporting, ruins, culture, the Marine Park, and educational centres.

## GUIDING PRINCIPLES

**WMPA tourism product is developed and promoted as an activity that adds further value to the local communities and not as the only key source of livelihood**

The WMPA communities have benefited from tourism through a number of ways. Tourism provides employment directly to the residents, and funding local activities through dissemination of revenue via the MPA. The Community have also benefited from tourist spending outside of the MPA, such as for lodging, food and handicrafts. However, it is important that the community does not become over-dependent on tourism. The WMPA community is too dependent on tourism to an extent that school dropout rates are very high. Overdependence can erode cultural values and will make the community vulnerable to fluctuations in tourist demand. In addition, local residents should not be led to expect unrealistic levels of em-

ployment. Sustainable tourism will generally not be an economic bonanza for the entire community, but will simply generate some jobs for a portion of the community.

**WMPA tourism players are coordinated and work in harmony with the MPA management**

This management plan seeks to promote an integrated approach to product development and marine environment planning and management dealing with all aspects of the tourism industry. Generally, there is lack of consistent co-ordination and open dialogue between tourism players (hoteliers, dive operators, tour operators, safari sellers, curio sellers, tour guides, boat operators, beach boys) and park management bodies.

Tourism agencies and the MPA management agencies are often excluded from the development of tourism products, marketing and promotions by the above stakeholders. A lack of coordination also extends to the advocacy of conservation organisations operating in the WMPA. Consequently, the MPA management needs to assist in coordinating and integrating the needs and future planning of tourism players.

## Tourism Products diversified and marketed

WMPA was awarded Biosphere Reserve status in 1979 by UNESCO, in recognition of its valuable ecosystems and rich biodiversity. One of the main aims of a Biosphere Reserve is to put in place management mechanisms to ensure conservation of biodiversity through empowerment of communities and stakeholders to ensure sustainable management and equitable economic benefits.

Tourism is the largest source of income in the WMPA for both business and community sectors. This is due to the world rated natural attractions on offer, including stunning white sandy beaches, beautiful lagoons and islands, and coral gardens with tropical reef fish. Main ecotourism activities include water sports such as swimming and sunbathing, scuba diving, snorkelling, alley cat creek fishing and kite surfing. There are also glass bottom boat tours, dolphin and whale watching tours.

Whilst these tourist activities are first class, opportunities exist to diversify activities and develop marketing potential. In recent years community-based ecotourism enterprises have emerged and are becoming increasingly popular with visitors. Hence under this management programme, tourism products will be diversified to enhance visitor experience.

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

The above guiding principles are intended to help in the development and implementation of the three management objectives of the Tourism Development and Management Programme. These objectives are outlined below.

**MO 1. Tourism administration and management enhanced**

**MO 2. Tourism support infrastructure developed and maintained**

**MO 3. Tourism products and services diversified**

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

**MANAGEMENT OBJECTIVES AND ACTIONS**

**OBJECTIVE 1: TOURISM ADMINISTRATION AND MANAGEMENT ENHANCED**

The WMPA tourism industry is faced with a myriad of administrative and management problems and challenges that have been left unresolved. These include: poor collaboration and networking by the different groups in the tourism industry which has led to conflicts in resource use and access in the WMPA; poor tourism infrastructure such as inadequate and lack of world class boats for visitors; visitor harassment; unplanned tourism and urban development's; negative visitor impacts on the MPAs; among others.

Tourism is a dynamic industry that involves diverse players with different interests, needs and opinions. A holistic approach to management of tourism is needed to guarantee sustainability and maximise quality tourism products within the WMPA to achieve maximum benefits. This includes developing systems for marketing, communication, tourism products, and conflicts resolutions among others to enhance the tourism industry in the area. This can help cushion the negative tourism impacts that occur in times of terrorism activity and unpredictable political unrest, factors which affect Kenya as a favoured tourist destination.

The following actions will be undertaken to meet this objective:

**Action 1.1 Facilitate formation of WMPA tourism stakeholder forum**

There exists no formal channel for airing and addressing tourism issues in the WMPA. There is need for the WMPA tourism stakeholders to come up with a Tourism Stakeholder Forum that will consist of representatives from all tourism stakeholder groups operating within WMPA. This will provide a formal channel for addressing tourism issues within the area while enhancing synergy among resource users and management. Among the stakeholders to be included in the forum are the Ministry of Tourism, Boat Operators Association, Hoteliers, Safari sellers, Curio sellers, Divers, Ecotourism groups among other Community Based Organizations and Associations operating within the area.

The forum will develop its working mandate, structure, regulation and constitution, which will govern its operation. It will also enhance networking and sharing of information by various stakeholders hence being abreast with the emerging challenges and opportunities. The forum will provide a mechanism for bridging the gap between the tourism sector and local community groups where conflicts can be resolved; and common areas of collaboration and partnership can be promoted. This forum will hold regular meetings with hotels and community groups to promote good management and business practices.

**Action 1.2 Monitor and manage visitors impacts**

Visitor impact management is ever more important as the number of tourist increases with the highest concentration being in major ecologically sensitive sites. Congestion and overcrowding within coral gardens is singled out as a major problem that is causing the degradation of habitats during the high season (October to February) when park visitation usually intensifies. In particular, damage to corals resulting from tourist trampling during snorkelling excursions has resulted in coral gardens degradation over the years.

Currently there are adequate mooring buoys installed within the coral gardens. Boat operators should be encouraged to utilize the buoys while anchoring. There is also need to control the number of boats visiting the coral gardens at any particular time to minimise crowding.

Unsustainable collection of marine curios such as shells by unregistered beach operators is a consistent concern and measures need to be put in place to control such practice.



The following activities need to be undertaken to address this issue:

- Increase the number of mooring buoys to increase anchoring capacity within the park.
- Conduct research on visitor carrying capacity for the MPA. This is to help guide management in determining the number of visitors to be allowed to either snorkel at the coral garden or dive at the specified areas at a given period of time. This will minimize the pressure on the coral gardens.
- Limit the number of boats visiting the coral gardens at any given time by developing a register system for boats entering the park.
- KWS enforcement officers to enhance patrol and enforce snorkelling guidelines and best practices.
- Conduct research on carrying capacity in terms of new tourism development within the MPA and projected impacts on natural resources.
- Establish a code of conduct to guide the operations of the boat operators, beach operators, hotels and tourists (refer to existing WMA Tourism Codes of Conduct).
- KWS and expert stakeholders to assess and establish new snorkelling sites to reduce pressure on the existing ones. This could include use of shipwrecks and fish aggregation devices (FADs) to enhance visitor experience.
- Conduct a pre-dispatcher lecture to clients by KWS officer before heading to the park.
- KWS with other expert stakeholders develop customer care and information training, education packages and guidelines for boat and tour operators
- Research and mitigation strategies for these conservation threats are required to combat degradation and species declines.
- Exclusion/Rested zones on reef will be designated to allow regrowth. These zones will be monitored and re-opened after 2-3 years.

**Action 1.3 Liaise with relevant authorities to train Rangers, Customer Care Staff and Tourism Police Unit (TPU) officers on basic visitor handling and guiding practices**

WMPA local community has been in conflict with the Tourist Police. Principally, the TPU is charged with

provision of security for the tourist and the local community as well as maintaining law and order. However, there have been concerns that the TPU is not well versed with the tourism issues. They have been accused of giving tourists wrong information as well as meddling with the working of organized community groups. Through this action, the warden will follow up with the senior officers of the TPU to address this problem. The TPU will also be sensitized on issues of handling visitors and be availed with visitor information on a regular basis to keep them informed on current issues in the tourism industry. KWS Warden will hold regular meetings with TPU Senior Officer and develop training on product knowledge and best practice for TPU officers.

**Action 1.4 Register and regulate boat operator and beach operator activities and their associations**

There are registered and long established beach operator organisations in the WMPA. However, there are many more unregistered operators known as "beach boys" who generally harass tourists, are unruly and create a bad image for registered operators and for coastal tourism. Standard regulations and best practice guidelines need to be developed for all boat operators to increase professionalism and to provide a quality tourism product and enhance business.

It is therefore paramount to ensure that all beach and boat operators are licensed and belong to registered associations and work with badges and uniforms. This will enhance order along the beach, boost the positive image of the operators and create trust with the visitors. In addition, all vessel owners will be urged to register their vessels with Kenya Maritime Authority (KMA) and employ skilled crew. Liaison with the relevant authorities to allocate beach operators designated areas for their operations will be undertaken to ensure good organization and order along the beach.

**Action 1.5 Ensure safety of park visitors and boat operators**

To ensure visitors safety, boats operating within any MPA need to be licensed and comply with the Kenya Maritime Authority (KMA) regulations. Most of the boats operating within WMPA are not licensed and lack safety equipment. Before boats are licensed by (KMA) they must be certified as seaworthy. KWS will work closely with KMA to enhance the standards as well as conduct regular inspections to enhance adherence to the set rules and regulations.

### **Action 1.6 Develop and gazette Navigational Regulations for the WMPA**

Jet skis, skiing and racing/speed boats have been associated with disturbance of birdlife. These water sports also distract other resource users including fishermen using dugout canoes. The loud noise associated with these water sports is unpleasant.

There is need to develop navigational regulations for the WMPA to govern vessels operations within this area. There exists a code of conduct for boat operators operating in the MPAs that include speed limits but speeding is still occurring in the Marine Reserve. Through this action, the existing regulations will be enforced and where possible reviewed to come up with new navigational regulations that will eventually be gazetted.

### **OBJECTIVE 2: TOURISM SUPPORT INFRASTRUCTURE DEVELOPED AND MAINTAINED**

The planning of infrastructure and services for visitors should be based on the understanding of carrying capacity, environmental impacts and of the tourists/visitor needs. Tourism infrastructure and services should stimulate use of the conservation area by people. They should help enhance visitor understanding of key values in the conservation area. Some of the key challenges on infrastructure development and services in the WMPA include; unplanned tourism and urban development, blocking of beach access roads by private land owners, inadequate ticketing bases for Watamu MPA, poor waste disposal facilities and sanitation facilities.

The following actions have been developed to address issues on tourism infrastructure development in the WMPA.

### **Action 2.1 Develop infrastructure to support local tourism enterprises**

The WMPA lacks basic infrastructure that support the boat operation business to enable them offer quality services to tourists. There are neither ablution facilities on the beach nor solid waste collection facilities. Solid waste both bio-degradable and non-biodegradable is a menace within WMPA. There is need to collaboratively develop proper sanitation, waste disposal and management systems for beach operators and other users. The MPA management in collaboration with other stakeholders will seek to address sanitation issues and construct an ideal ablution block in the mainland.

### **Action 2.2 Upgrade and maintain the parking area**

The parking area at the gate is small for the heavy traffic experienced during the high season. The parking is also inappropriate for bus parking. Hence, WMPA management will upgrade the parking area by increasing parking space and providing bus parking spaces.

### **OBJECTIVE 3: TOURISM PRODUCTS AND SERVICES DIVERSIFIED**

WMPA has diverse ecological and cultural attributes that offer great opportunity for diversification of tourist products. WMPA is unique due to its exceptional and abundant marine resources/attractions, as well as historic monuments. This gives it an advantage to develop distinctive products with high potential to attract more tourists from different market sources. Very little has been done to exploit existing opportunities and provide unique visitors experience.

Tourists themselves are becoming increasingly sophisticated in their demands in terms of having meaningful travel experience, including such aspects as cultural authenticity, contacts with local communities and learning about flora and fauna, special ecosystems and natural life in general and its conservation. All these are opportunities existing in the WMPA that needs to be harnessed and explored further to add value to the tourism product that is being offered.

The following actions have been proposed aimed at promoting and diversifying tourism products in the WMPA.

### **Actions 3.1 Identify and explore possibilities to introduce artificial reefs**

Coral cover in Watamu has been reducing over the years partly due to the impacts of climate change. As part of adaptive park management, there is need to explore potential for establishing artificial coral restoration sites. These artificial reef sites can provide protection to natural reefs in several ways, including: increasing the amount of hard-bottom habitat, reducing stresses on existing reefs. To enhance visitor sites, there is need to explore opportunities of installing artificial reefs and fish aggregation devices for tourism, since they can be used as snorkelling sites. This will reduce pressure from visitors on degraded reef areas.

The park management will engage a research scientist to come up with an artificial reef experiment. Park management in consultation with the research department and local marine scientists will also identify a suitable place to install the artificial reef (e.g. a ship wreck).

### **Actions 3.2 Assess current marketing methods and scope and develop a Marketing Strategy for the WMPA**

A marketing strategy needs to be developed to target both national and international visitors. This can be achieved through promoting sustainable tourism at various platforms such as national, regional and international travel fairs, Magical Kenya Travel expo, and in conferences. Several hotels and organisations have created marketing materials but most are carrying out individual promotions of their business and not the entire tourism products within WMPA. The strategy should create a tourism forum and explore best approaches to gain maximum marketing potential and publicity for the WMPA. This forum could meet quarterly to review their activities and outcomes.

Inadequate promotion materials are still a hindrance to marketing of the WMPA. Marketing promotion materials could include brochures, videos and documentaries, maps, pamphlets, magazines, directories, information in specific websites, face book etc.

This extensive marketing strategy will be achieved in collaboration with Ministry of Tourism, Kenya Tourism Board, Ecotourism Kenya and national media houses.

### **Actions 3.3 Link with KWS HQ Marketing to ensure WMPA is included in the KTB national marketing strategy.**

WMPA is easily accessible by air via Malindi airport and by road from Mombasa. Despite its proximity to Malindi and Watamu towns and availability of diverse accommodation, the MPA receives relatively low visitation compared to Kisite-Mpunguti MPA. Private companies and hotels do most of the marketing for the MPA and little marketing is done by KWS.

The Kenya Wildlife Service website contains limited information on marine parks and reserves. This also applies to the information in any other national marketing strategy, which focuses on the terrestrial attractions. There is need to familiarise the marketing members involved in marketing in tours to discover the unique and scenic features found in this area for them to be able to synthesise the information and market WMPA more effectively. The WMPA will liaise with KWS Marketing and Business Development Department when embarking on marketing of WMPA. This is as well as taking advantage of the various marketing strategies produced within KWS, KTB and at national level on tourism development countrywide. Efforts to market WMPA as a dolphin watching tourism destination has been successful through collaboration between KWS and the Watamu Marine Association.

### **Actions 3.4 Conduct a capacity building exercise for all groups dealing with ecotourism to meet required standards**

Communities living adjacent to the MPAs benefit from a wide range of tourism-related opportunities such as providing boat services, managing tourist attractions such as boardwalks, tour guiding, Safari selling, etc. By working closely with the different community groups, individuals and other organizations, the MPA management will contribute to the enhancement of community livelihoods and reduce pressure on the MPAs.

Among these groups and individuals are non-professionals in the field especially with the local community practicing ecotourism and hence, there is need to assess their capacity to manage and handle visitors in a professional manner. The MPA management will identify and put a database of all people practicing ecotourism activities or any form of tourism in the WMPA. Conducting regular capacity building exercises among the stakeholders will ensure that they conduct their business and treat visitors to their satisfaction enhancing visitor experience. Some recommended aspects needed to enhance the capacity of such groups include:

- Establishment of a revolving fund that can be utilized for maintenance and development costs for the boat operators
- Increasing the capacity through training in small business management, interpretative and marine guide skills and visitor handling.
- Training officials of the groups in leadership
- Enhancing the ability to increase business through marketing. This can be addressed through production of marketing materials including brochures and fliers to be posted in hotels and tourism offices, as well as hosted at easily accessible websites.
- Supporting the development of an investment plan to cater for the low season when business is slow.
- Supporting the development and implementation of a monitoring and evaluation plan that includes tracking revenues, compliance to regulations and maintenance of standards.

### **Actions 3.5 Embark on domestic tourism marketing campaign using appropriate methods**

The performance of any industry is judged by how it is able to sustain itself. Tourism is no exception. Globally, domestic tourism is regarded as the backbone of sustainable tourism development, and international tourism as the off-shoot. This is because International Tourism depends on Domestic Tourism products and attractions. This is quite unlikely in Kenya where all along tourism marketing has basically been targeting international tourism. The trend has however changed over the recent past and the government through Domestic Tourism Council is investing on its promotion. As a result, WMPA should be incorporated in the national marketing strategy for domestic tourism.

It is therefore very important to step up advertisement campaigns to promote domestic tourism for the WMPA. This can be done using local media, TV, national broadcasters and more specifically vernacular radio stations to target the locals. On the other hand, most of the Kenyans who come to coast for their holidays hardly know anything about marine protected areas and other unique marine features in the areas apart from the beaches. There is need to liaise with marketing agents to enhance marketing of the area. There is also need to partner with the Kenya Tourism Board to make facilities more affordable for domestic tourists especially during low season.

### **Actions 3.6 Market WMPA as an ideal site for corporate team building, fun and adventure activities**

Kenya companies and corporate incentive travel through team building and group work is the ideal way of bringing company staff together and cultivates morale and teamwork. It is an activity that has become very popular and is being practiced in different areas. An outdoor team building package could be developed and activities conducted in the scenic Watamu beach area. The activities could include: group orientation, development training session and team work tug of war, beach football, beach volleyball, canoeing, swimming, and much more.

### **Actions 3.7 Promote, enhance and market cultural events and historical sites in liaison with stakeholders**

WMPA is rich in culture, which is not adequately tapped and marketed as tourism product. Cultural cuisine can be used in hotels to display the Swahili cultural foods. Though the area celebrates cultural week once in a year, little is known about it. There is a need to form cultural groups within the area which,

will help market their culture. The Ministry of Tourism is highly supportive of cultural promotions and already has supported the Magarini residents to develop a cultural centre in their town.

The existing historical ruins within WMPA need to be developed to ensure that they are of tourism standard as well as providing interpretation to enhance value addition. The locals need to be trained as guides and highly sensitized on the importance of preservation of the ruins to retain their value as historical tourism product. The National Museums of Kenya in partnership with the stakeholders should also be sensitized on the history and cultural aspects of the ruins to be in capacity to pass the accurate information to the visitors.

### **Actions 3.8 Identify potential homes stays and promote their adoption in WMPA**

There is need to diversify tourism products and avenues to allow maximum spending by the tourism, with benefits trickling down to the community. Home stays or philanthropic travel can be explored as an option as it allows direct benefit for the local community from the tourism. Unlocking community development through the concept of 'destination communities', where the economic generosity of the philanthropic travellers could allow the community to benefit from this industry, e.g., by assistance in education, medical facilities and entrepreneurial training is currently gaining popularity in Kenya.

Currently, there is no policy within the country to regulate such activity. However, the Tourism Department has already initiated the process of developing policy. The WMPA has a high potential for home stays. Hence, there is a need to sensitize the community to start developing their homes to meet the required standards. Once the concept have been initiated, it will be necessary to identify means tour operators can be incorporated to include their tour itineraries to include interaction between tourists and the community, thus promoting social, conservation, education and empowerment programmes.

### **Actions 3.9. Establish youth and women development programmes**

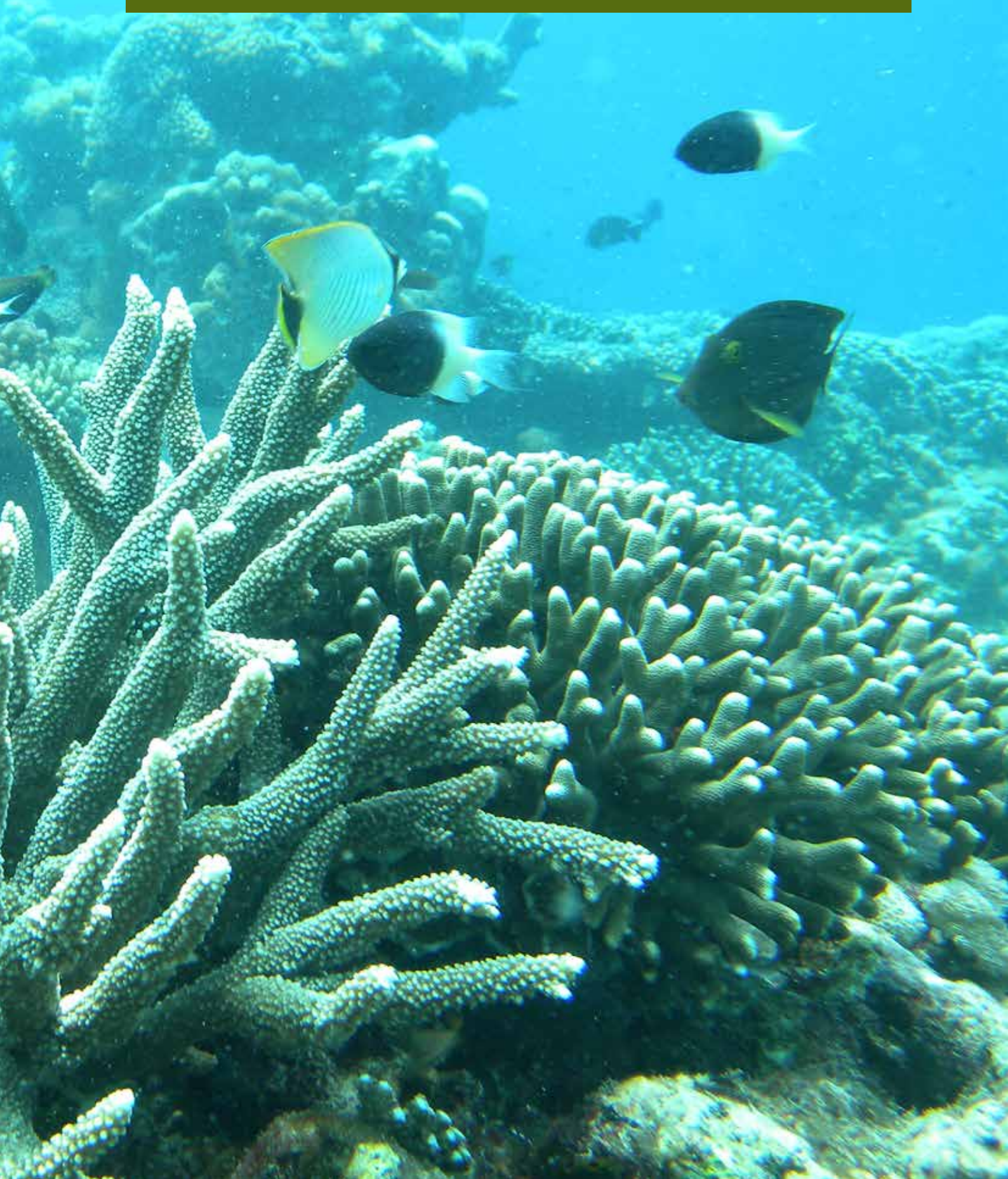
Youth in Watamu is highly influenced and impacted by the vices associated with tourism; hence, education is affected. There is need for leaders, local administration, community groups and organisations as well as parents to partner in addressing the issue. This can be tackled by identifying investment opportunities in tourism which the youth can engage in. These opportunities should be compatible with the WMPA scenic values and applicable regulations.







## COMMUNITY PARTNERSHIP AND CONSERVATION EDUCATION PROGRAMME





## PROGRAMME PURPOSE AND STRATEGY

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

### **Participation of WMPA adjacent communities in sustainable conservation and management of marine resources is strengthened for livelihood improvement**

Many coastal inhabitants depend on marine resources for their livelihoods, with coral reefs playing a particularly important role. Besides providing construction materials, ornamental objects and medicinal products, at least half of the fish caught off the Kenyan coast are reef-associated. In Marine Protected Areas (MPAs), access for such goods and services from the reefs therein are either prohibited or restricted. To ensure adherence to the rules and regulations, KWS personnel undertake regular patrols in marine parks and reserves. Community resource management works on the principle that conservation will only flourish if it is embedded in local communities and is voluntary rather than enforced (Western 1994). Therefore, people living in or adjoining regions of protected areas such as WMPA have influence towards the successful management of protected areas or otherwise.

The Community Partnership and Education Management Programme aims at winning the support of community towards the management of WMPA. This can be achieved through a number of ways including awareness creation of a clear communication mechanism or forum among the stakeholders and empowering the community to realize benefits from the marine resources on a sustainable basis. The stakeholders forum will then create a platform for information sharing and populate contacts database for all the community stakeholders for regular updates of emerging issues. The communities need to know that their efforts towards ensuring sustainable utilization of resources in the WMPA is recognized and highly appreciated by the management. Additionally, it is necessary to explain and teach management procedures, and empower local communities to manage and reconcile their activities in a sustainable way as well as utilize resources in a harmonious manner.

In the recent past, landmass adjoining WMPA is steadily experiencing increased pressure from human settlement and tourism development. The illegal acquisition and construction of riparian zone affects access to beach and beach landing sites for fishermen and nesting beaches for sea turtles. This condition further adds to the strain of marine resources especially mangrove materials for construction pur-

poses and fishery resources to meet the fish protein demands. Habitat degradation also seems to intensify with increases in human settlement and coastal development.

This programme sets out actions which WMPA management will implement in the next 10 years. In implementing these actions WMPA management hopes to realize an empowered local community that derives its socio-economic benefits within the MPAs while at the same time conscious of conservation for resources therein. The following sections set out the strategic principles that will guide WMPA management in implementing the community partnership and education program in achieving the program purpose.

## GUIDING PRINCIPLES

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

### **Support to enhance community role in the management of the WMPA is strengthened**

Local communities living adjacent to WMPA have historically borne many of the costs associated with the area's conservation, through reduced access to previously utilized natural resources including fish resources (figure 6), shell collection, removal of other marine life for medicinal use, harvesting of mangrove products and access to areas of cultural importance. There has been a misperception that key benefits accruing from the area's utilization, especially from tourism, have mainly benefited KWS or tour operators/hoteliers whose owners are urban based or foreigners. This situation, combined with a lack of community awareness of the national and global importance of WMPA and the exceptional biodiversity it contains, has resulted in the lack of community support for the area's continued existence and KWS management activities. It has also led to resentment by some communities' quarters towards WMPA existence and value. This in turn has exacerbated the community-related challenges that WMPA managers have to deal with, increasing both the complexity and costs of the WMPA management.

As such, alongside efforts to develop open and constructive relations with neighbouring communities (discussed above), a major thrust of this programme will be to rectify this situation and improve overall community support for the WMPA conservation through diversification of livelihood sources without necessarily extracting natural resources.

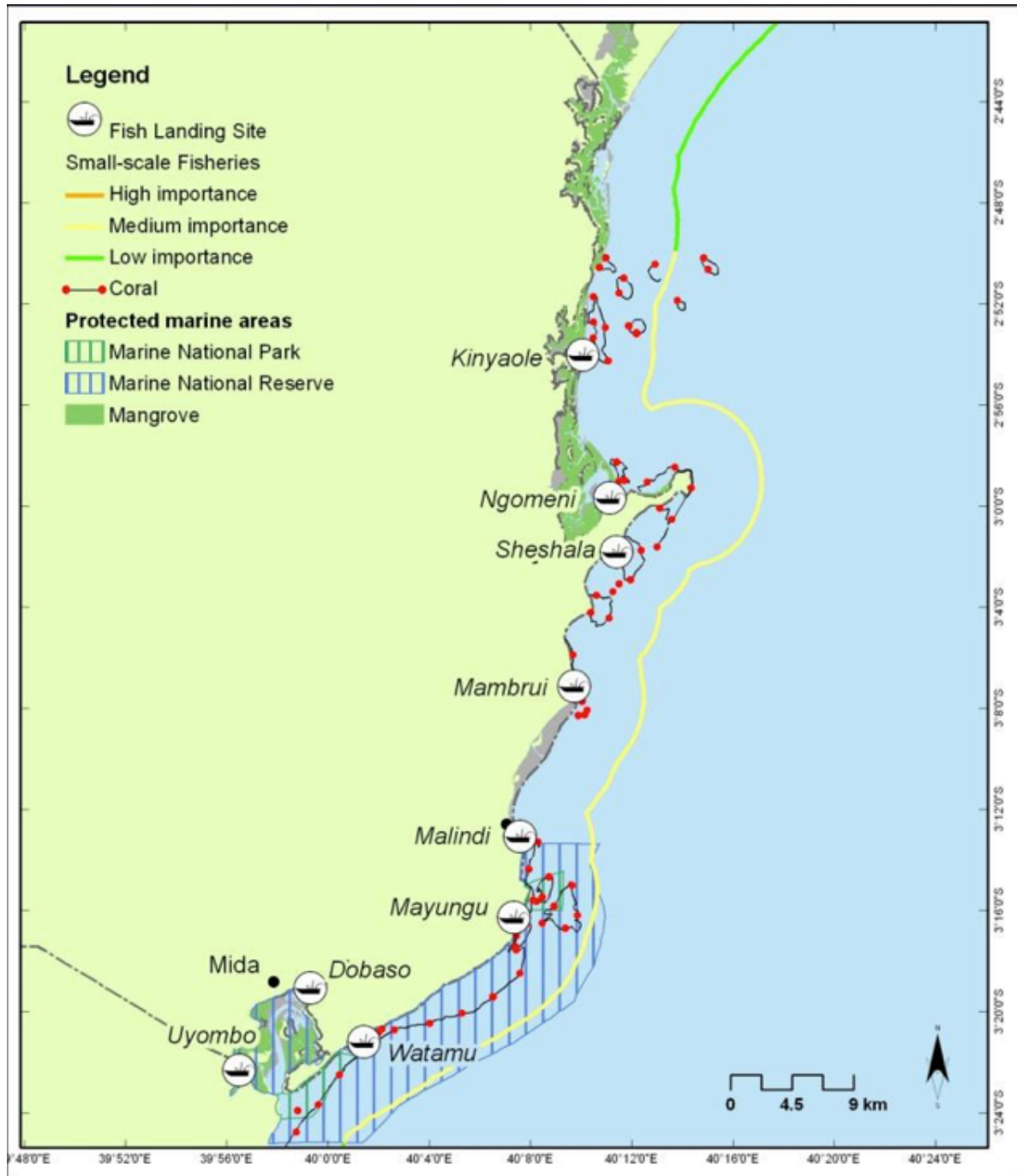


Figure 6. Fishing activity and fish landing stations along the shoreline in Malindi District<sup>8</sup>.

### Conservation education and awareness is enhanced

Conservation education and awareness is enhanced. Public awareness of the importance of the WMPA is critical to continued support for conservation in the area. Conservation agenda in the ecosystem is facing serious threats from other competing resource use practices. The local community should be made aware of the opportunities and benefits from con-

servation of the ecosystem, otherwise conservation might lose out in the long run. As community livelihood activities taking place around WMPA increasingly impact on conservation pursuits or conservation concerns impact on community activities, good relations between WMPA managers and communities are essential to ensure that both parties can raise issues of mutual concern before they escalate into serious problems, and can work together when livelihood and conservation goals align.

<sup>8</sup>NEMA, 2010. Kenya Shoreline Management Strategy. Volume III: Shoreline Management Plan for Malindi District



Past experience indicate that while law enforcement is an effective way of combating illegal activities within a protected area, the development of good relations with surrounding communities is an essential complement to this approach. It can result in a reduced need for law enforcement activities in the first instance if carried out effectively. It is therefore vital that WMPA managers proactively engage neighbouring communities, to ensure that WMPA-community interactions do not simply focus on damage mitigation and conflict resolution, and that KWS' interests are not seen as being restricted to dealing with problems that impact on the management of the protected area, rather than addressing the concerns raised by communities themselves, or capitalising on potential synergies between community and KWS activities. As a guiding principle KWS will strive towards developing open and constructive relations between WMPA managers and neighbouring communities, in order to strengthen KWS-community collaborations and increase communities' support and contribution to the WMPA's conservation. The wildlife conservation and management Act, 2013, currently provides for game farming and consumptive utilisation of some wildlife species including formation of conservancies. This is an area which can be explored by the resident communities bordering the WMPA in collaboration with KWS.

### **HUMAN-WILDLIFE CONFLICTS ARE MINIMIZED**

Wildlife continues to negatively affect adjoining community of WMPA through incessant crop raiding, human injury and property destruction in the terrestrial part of the WMPA's influence zone. To gain support for conservation in and around WMPA through reduction of resentment for wildlife, effective measures to curb HWC will be put in place and appropriate compensation done as prescribed in the Wildlife Conservation and Management Act 2013. These will also include undertaking vibrant campaigns to educate the residents on the new Wildlife Act, 2013 and conflict mitigation measures.

The above guiding principles are intended to help in the development and implementation of the three management objectives of the Community Partnership and Conservation Education Management Programme. These objectives are outlined below.

#### **MO 1. Community participation, collaboration and benefit sharing mechanisms strengthened**

#### **MO 2. Conservation education and outreach programmes strengthened**

#### **MO 3. Human-wildlife conflicts and natural resource use conflicts reduced**

The following sections describe these management

objectives and provide an outline of the management actions needed to achieve them.

### **MANAGEMENT OBJECTIVES AND ACTIONS**

#### **OBJECTIVE1: COMMUNITY PARTICIPATION, COLLABORATION AND BENEFIT SHARING MECHANISMS STRENGTHENED**

The future desired state at WMPA is where resident communities derive maximum benefits accruing from natural resource use and management and that the benefits trickle down to the household level. Unfortunately, the local community frequently bear a disproportional share of the costs associated with conserving the protected area, compared with the benefits generated. These costs include exclusion from fishing grounds, as well as other opportunity costs incurred where areas traditionally used for livelihood or cultural activities are no longer available to them. This imbalance has often resulted in resentment and poor relations between MPA managers and the adjacent communities who are not directly involved in the management of MPA. This has in turn led to increased misunderstanding in the management of MPA, and has in some instances impacted on the conservation of the key values that the area was created to protect. In pursuit of alternative livelihood sources, some segments of WMPA community are involved in enterprises development where majority of such enterprises are tourism based. This is rather risky considering that tourism associated business is very vulnerable to local and international uncertainty. In addition, tourism enterprises do not involve a large section of the community and thus, benefit spin-offs are more localized.

To reverse this trend, options of dedicating some income from wildlife conservation towards socio-economic development of communities is necessary because incomes reaching households directly is considered critical to convincing the community to support wildlife conservation efforts. In addition, there is an urgent need to diversify enterprises in order to increase benefits from natural resource use as a way of reducing impacts of a tourism slump.

This objective is therefore designed to enhance the participation of the local residents in conserving the WMPA as well as enhancing benefits accruing from natural resource use and management and ensure that the benefits trickle down to the household level while at the same time creating a forum where communities and other stakeholders can exchange, share and deliberate on issues of community concern. To realize this, eight management actions have been designed as set out in the following sections;

### **Action 1.1 Collaborate with local communities in the management of WMPA**

Involvement of local community in the management of WMPA will cultivate a sense of ownership and eventually the success of the implementation of this management plan. Additionally, cordial relation between local community and protected area management will serve to reduce inherent conflicts within the MPA especially those involving misunderstanding among multiple uses of resource.

To ensure that this is realised, the community will be involved in the implementation of this management plan as they were involved during its development. This will be achieved by having clear definitions of community and management authority roles and responsibilities, through formal agreements. The management will also train villagers as 'specialists' in a variety of skills who can then train or advice a larger number of villagers. This is an effective way of getting villagers on board and will save time and money. On the other hand, the elected community representatives will be recognized throughout the plan period and placed in the forefront of public activities related to the protected area (planning workshops, meeting with donors, other institutions and media). In addition, a collaborative relationship characterized by commitment to mutual goals, shall be jointly developed with structured and shared responsibility, mutual authority and accountability for successful sharing of resources and rewards. Efforts will be made to ensure that partnership processes are inclusive and represent the diversity of the WMPA communities.

### **Action 1.2 Support implementation of community projects and formulate conservation benefit sharing mechanism**

Like any other community adjacent to protected areas, KWS through WMPA management has a long history of assisting communities by funding community projects. This not only helps KWS to fulfil its corporate social responsibility, but also increases community support for WMPA management and the ongoing conservation of the area. These projects have included the building of schools infrastructure (buildings/sitting materials), the development of water projects, and support for tourism based activities through provision of beach rest beds, change rooms and janitorial facilities. However, a number of community development projects have failed in the past, often due to poor community participation and engagement, either because projects were not well aligned with community needs, or because community members lacked the skills necessary for their successful implementation. In addition, the Wildlife Conservation and Management Act, 2013 recognises the need for con-

servation benefit sharing based on formulated regulations and guidelines by the Cabinet Secretary (CS) in-charge of wildlife conservation.

To address this situation, KWS will also continue to provide ongoing material, technical and other support to ensure the successful implementation of other ongoing projects such as sun beds, the community board walk at Mida Creek as well as supporting an additional community board walk at Uyombo.. The organisation shall also support a Participatory Rural Appraisal (PRA) exercise in collaboration with community representatives from target communities to identify appropriate projects that have strong community support, as well as the capacity-building needs for their successful implementation. Once appropriate projects have been identified and agreed with the target communities, KWS through community social responsibility will provide additional support and training to community members in developing project proposals, which can then be submitted for funding. In addition, the local community will enter into agreements with the protected area management for the purpose of benefit sharing and related transactions as prescribed in the act. In this regard, the county wildlife conservation and compensation committee will fast-track this process for the benefit of the resident community.

### **Action 1.3 Establish a community consultative forum as a platform for stakeholder cooperation**

Currently, WMPA do not have a forum where community members can share their views about resource utilization or management of WMPA. Coordination across sectors and institutions is also a major challenge. However, there is need to champion for the formation of a consultative forum where the community could put forward their concerns of interest in regard to resource use in WMPA to the Warden and stakeholders. The same forum can also be used in handling community problems related to WMPA or resources therein especially internal conflicts that exists within registered associations and between stakeholders.

In order to ensure control of the committee members, there is need to specify roles and responsibilities of each member group(s) from inception with regular reviews to accommodate emerging issues. This also takes care of the temptation of some groups lord-ing over others in matters where everyone has equal rights. The tenure rules for resources are often unclear, with varying degrees of open access, traditional user rights and government regulation. The legislative framework and policies vary and sometimes contradict each other with a common feature being lack of government capacity to enforce the rules that exist

and often a lack of understanding on how to implement the new policies that encourage community involvement in resource management.

To ensure involvement, participation, dialogue between all actors in the management and decision-making processes and to avoid conflicts among government institutions that license for particular activities to the resident community, representatives of such groups will be incorporated in an established and registered Marine community consultative forum (MCCF). The WMPA management will be the secretariat for the forum and as such will be taking the role of convening and keeping recordings of meetings. In addition, the forums will guide implementation of laws that provide for participatory natural resources management through development of the best practice guidelines for all.

#### **Action 1.4 Carry out a social-economic study to determine viable community based income generating activities to be promoted in WMPA**

Other than eco-tourism ventures, WMPA is endowed with a variety of natural resources that can be exploited to alleviate poverty that afflicts the community. However, information on the nature and extent of natural resources that can be exploited to generate income for the community is still patchy; hence few resources are being exploited. On the other hand, the quest to experience unique mix of Giriama and Swahili culture is one of the reasons why tourists visit WMPA. However, the fact that culture has been commercialized has reduced its authenticity in some cases and damaged cultural presentation. It is therefore necessary to identify what defines and represents true Swahili or Giriama culture.

In order to discern the natural and cultural resource potential of WMPA, a socio-economic study will be carried out to catalogue spatial distribution of exploitable natural and cultural resources and hence appropriate eco-tourism activities. This will include identifying areas with bee keeping potential, plants that have medicinal value, more areas that have eco-tourism potential and areas with ingredients of nature based business. In addition, authentic Swahili and Giriama cultural sites will be identified and described. Giriama or Swahili culture and cultural artefacts will also be identified to prevent presentation of other cultures as their culture. To expedite the study and ensure that detailed information on natural resources is available to support decision making, KWS will collaborate with other research NGOs to fund the study. Priority will be given to initiatives that are in line with community aspirations and expectations and in so doing diversify tourism options to relieve pressure on reefs.

#### **Action 1.5 Explore potential markets for community products**

Past experience show that products of most projects carried out within and around WMPA compete on the minimal market share available for them. Also, most projects in WMPA are initiated prior to checking if there will be market available for the products or services produced. In addition, project success depends largely on meeting customers' needs and desires. There is need therefore, for project members to know the scope of their customers, their requirements, location and financial capabilities. It is also important for WMPA's communities to understand that community projects cannot be sustained by donors alone for ever.

To correct this anomaly, there is need for market research to be undertaken before products or services are produced. Market assessment should ideally be carried out to determine whether initiated projects will be beneficial to the community. Like any other business players, communities also need to understand those challenges and opportunities associated with business project they wish to undertake. This will help them to plan in advance how to enter, participate and thrive in specific markets for their products/services.

#### **Action 1.6 Enhance the capacity of local communities in project management**

Local communities in WMPA have minimal capacity to effectively handle management of community owned project. This has resulted into many community projects failing once the donor exits.

To address this problem, WMPA management in collaboration with other conservation groups will enhance capacity of community project leaders through training in marketing, business management, and accounting skills. This will help to increase participation within community projects hence ensuring transparency and accountability in the running and management of the project. In addition, the management of community projects will be strengthened by having a legal constitution for each community group which can then be used to guide and govern their operations. Members will also need to form management committees that will handle various segments of project implementation.

#### **Action 1.7 Diversify funding opportunities for community projects**

Poverty is a cause and effect of environmental degradation in the WMPA. Most of the people in the area are involved in fishing, mining, agriculture, tim-

ber and logging (including mangrove forests) activities. However, the WMPA community seems to be unaware of the existence of alternative funding opportunities for their projects besides KWS and other traditional donor agents. Such alternative funding sources include community development fund (CDF), local authority transfer fund (LATF) and youth and women empowerment fund. Financial institutions also remain behind in promoting community support systems through micro-credit support for small-scale fishing - to acquire appropriate fishing gear. Development of income-generating schemes which encourage alternative and sustainable land use e.g. organically-produced agricultural products, medicinal herbs as cash crops, reinvigorating the jewelry industry based on products from the biosphere reserve and nature-based tourism remain at its lowest thrust.

To address this, WMPA management will take a lead role in sensitizing the local community on availability of these funds to support their development. Even in incidences where the community could be aware of these funds existence but unable to produce a proposal, WMPA management could chip in soliciting for technical assistance for some group members in proposal writing skills or alternatively assist in writing up a proposal on behalf of the local community groups. Successful funding of such proposals will assist in securing self-sufficiency for low-income community groups and also fosters good working relations between WMPA management and local communities, thus a window to advance conservation interests and hence capacity building and empowerment of user groups. In addition, the WMPA is recognised as a UNESCO Biosphere Reserve and the convention concerning the protection of world cultural and natural heritage provides seed funds to initiate local efforts to protect objects of cultural and natural heritage, which are of value to present and future generations. This is an opportunity which can be explored for the benefits of the local people.

#### **Action 1.8 Enhance employment opportunities for local community members**

Provision of employment to the members of WMPA-adjacent communities in various tasks necessary for the successful management of the WMPA is one of the most direct ways to improve the linkages between the conservation of the area and community well-being. Whenever possible, priority should be given to WMPA community member for any job opening especially in those areas that do not require more professional skills.

To further enhance relationships with surrounding communities, WMPA management will liaise with KWS HQ to ensure that these and other casual work-

ers already engaged within the WMPA are wherever possible employed as permanent employees thereby allowing them to enjoy the improved security and benefits associated with this type of employment. In addition, as and when necessary for specific tasks in the WMPA, casual employees will continue to be sourced from the local communities. In addition, to reduce demand and seek alternatives to local use of available resources (fish, mangroves, coral reefs), it's the WMPA management in collaboration with all stakeholders will identify best alternative livelihoods to support the resident communities while sensitizing them on the impacts of the current levels of resource use. The management will also continue to strengthen enforcement of the existing protective legislation, regulations and guidelines including community based enforcement.

#### **OBJECTIVE 2: CONSERVATION EDUCATION AND OUTREACH PROGRAMMES STRENGTHENED**

Improved conservation education and awareness is one of the KWS strategic objectives. The perceptions and attitudes of users and other stakeholders of MPAs can enhance or limit their management. KWS has devolved the conservation education and outreach programme to the park level through public awareness in *barazas* and sensitization forums for students. However, conservation education and outreach activities haven't been consistently implemented.

The desired 10 years' outlook is that: WMPA balance nature conservation with socio-economic development and poverty alleviation, by engaging with local communities and using a knowledge-based approach (Amer et al, 2015). This means that biosphere reserve sustainably regulates ecological functions and provides ecosystem goods and services for all actors such as fisheries, tourism, settlements, agriculture, among others. Conservation education is required to influence people's attitude and skills to attain the above state. In order to achieve this purpose, the following management actions will be implemented:

#### **Action 2.1 Create public conservation awareness on the importance of WMPA**

Tackling threats and challenges facing the MPA require concerted local and international stakeholders' efforts. Already, there exists a Strategic Adaptive Management (SAM) programme being implemented by KWS and it is disseminating information to the public. For the public to understand and appreciate the outstanding ecological and socio-economic significance of the WMPA (Informed by research and SAM), KWS Management will intensify publicity status of WMPA resource values and ongoing interventions. A nature school will be designated and developed



within Watamu area. Moreover, WMPA managers, users, researchers will be mobilized to produce and disseminate films and informative articles on WMPA exceptional resources such as turtles, coral reefs, fish communities, resource economics for local, national and international public. Further to electronic platforms, an interactive WMPA conservation education web page will be included in the KWS web site. This web page will also be linked to the web sites of the other WMPA stakeholders to increase internet visits.

WMPA management will continuously coordinate support and participation of stakeholders in ecosystem awareness events inclusive of World Environment Day, World Wetlands Day, Ocean Day, International Beach Cleaning Day, Public Service week and Agricultural Society of Kenya (ASK) shows. During these events, the community will be enlightened on the unique WMPA natural resources, and issues and challenges facing their conservation through exhibitions, drama and lectures.

### **Action 2.2 Design and implement a conservation education outreach programme**

Target stakeholders' samples will be designated on basis of social strata of the WMPA neighbouring communities. The strata include: the elite group comprising of the wealthy and educated, the middle class of less wealthy and formally college educated members and lastly the majority poor and generally of lower education. The perceptions of the poor lowly educated class on biodiversity conservation are very different from the elite and middle class who are more accommodative of biodiversity. This might be attributable to the fact that leaders and formal career members are in the elite and middle-class strata and are exposed to intense conservation awareness programme. In addition, the conservation and awareness education activities in the WMPA focus mainly on the school going children with elderly receiving minimal attention.

To gain conservation support across all the social strata in WMPA ecosystem, the management will develop educational materials and activities targeting various groups. In the case of school children, this will include giving biodiversity lectures and video shows in local schools. Local schools will also be encouraged to visit the Parks and learn about ecological principles and dynamics. The schools will also be sensitized to form wildlife clubs that will be used to liaise with KWS in organizing environmental activities such as Park cleaning, drama, and essay competition, to enhance conservation awareness amongst school children. In addition, in order to encourage school children to visit the park, KWS will avail transport to local wildlife clubs at a modest fee and where possible with free

boat rides.

On the other hand, the other adult groups will be reached through seminars and workshops specifically targeted at a particular group (the youth, elders, and women). In addition to this, sponsored study tours to areas experiencing similar challenges such as Kisite-Mpunguti MPA will be organized for these groups to help them appreciate challenges facing conservation in WMPA and Kenya at large.

### **Action 2.3 Strengthen KWS – Honorary wardens and other stakeholders working relationships**

Collaboration and engagement of local institutions and honorary wardens by WMPA management is not satisfactory. These stakeholders especially honorary wardens, Judiciary and Kenya Police Services require more understanding of the policies, laws and regulations that guide conservation and management of biodiversity in order to effectively execute their conservation support roles. The honorary wardens (5 in Malindi Sub-county) apparently haven't positioned themselves as per their mandate in Section 12(5) WCMA 2013, probably due to lack of knowledge, skills and capacity. In addition, the Wildlife offence charges don't end up successfully with Judiciary and perhaps local legal machineries require sensitization on the significance of Wildlife Act 2013 (WCMA 2013) provisions.

In this regard, the WMPA management will sensitize its advisory committee on KWS roles, resource conservation requirements, Wildlife Act 2013 to influence the conduct of key partners. Other partners especially Judiciary will be separately sensitized in special seminars involving site visits and demonstration of field experiences by security patrol teams.

### **OBJECTIVE 3: HUMAN-WILDLIFE CONFLICTS AND NATURAL RESOURCE USE CONFLICTS REDUCED**

The future desired state at WMPA is one where natural resource use conflicts and conflict between people and wildlife in and around WMPA is minimized.

Currently resource use and human wildlife conflicts in terrestrial areas adjacent to WMPA is an ongoing problem. As human populations around continue to increase, settlements expand and land use intensifies, as a result growing number of incidences of human-wildlife conflict (HWC) are recorded. Human-wildlife conflict in WMPA takes a number of dimensions including the following: crop and property damage by wildlife especially baboons and monkeys, livestock killing by python and baboons, and the stone fish poisoning. On the other hand, reduced

abundance and distribution of fish stocks has stirred resource use conflicts among multiple users in WMPA namely fishers, including; sport fishers, artisan fishers, commercial fishers and dive operators especially in reef areas. Misunderstanding on the 30m and 60m high water mark riparian reservation has continued to confuse various user groups to an extent that conflicts arise during law enforcement.

This objective therefore seeks a desired future state where natural resource use conflicts and HWC incidences around WMPA are minimised, understanding of existing legislations is enhanced, and rules and regulations to improve overall WMPA community and other stakeholders relations are implemented. In order to achieve this objective, the following management actions will be implemented:

### **Action 3.1 Assess and adopt innovative problem animal control techniques**

HWC data is currently available but it is not stored or organised in a format that enables easy analysis of the nature, spatial distribution and trends in HWC around WMPA. The natural habitats which include coastal forest patches harbour problem animals, such as baboons which often raid adjacent farmlands causing losses to farmers. These Problem animals are often controlled through scaring but this is only a temporary solution as the crop raiding often recurs. A wide variety of problem animal control (PAC) techniques have been developed and tested, with varying degrees of success, across Kenya and in a number of other African countries. These techniques include the use of banger sticks to scare away animals, applying pepper mixed with grease to ropes or fences, and/or the inter-planting of chilli peppers with other crops to discourage elephants and/or other wildlife from eating them.

To make the best use of these new techniques and to capitalise on the lessons learnt elsewhere in Kenya and Africa, WMPA management will liaise with CCA research unit in identifying and assessing potential new PAC techniques, including wildlife scaring methods, which could be effective around the WMPA. Once potential methods have been identified, and a study visit undertaken to see them in action, necessary equipment or resources will be acquired, and pilot trials carried out in appropriate communities. Finally, building on the success and lessons learnt from these pilot trials, communities will be equipped and then trained on the implementation of the most successful PAC techniques. In addition, to address the issue of HWC information management and facilitation of monitoring of HWC cases, a computerised GIS-based database for recording and mapping the location, type and severity of HWC incidences around

the WMPA will be developed. New database will enable WMPA management to pinpoint priority HWC hotspots and where mitigation methods should be focussed. This information will in turn be used to support planning and implementation of the proposed activities under this action. Once the equipment needed to implement the system has been identified (in consultation with the CCA Research Section) and acquired, WMPA staff will be trained in their operation. In addition, the local community will be consulted and engaged on the best approaches to deal with HWC hotspots.

### **Action 3.2 Enhance collaboration with the County Wildlife Conservation and Compensation Committee (CWCCC)**

According to the Wildlife Conservation and Management Act, 2013, each county shall have a Wildlife Conservation and Compensation Committee whose mandate is registration and establishment of wildlife user rights, ensure that benefits derived from use of wildlife resources are distributed according to the Act while at the same time deal with human-wildlife conflicts issues as prescribed by the Act. Compensation for death, injuries and property damage or crop destruction by wildlife is well addressed in the Act and the committee is expected to address the issue accordingly. However, there is lack of awareness on the wildlife compensation procedures as stipulated in the Act.

To address this problem, the CWCCC is currently being formed and about to operate. It is therefore expected that most of the HWC issues will be addressed to the satisfaction of the people as per the law. The committee will spearhead continuous sensitization campaign to educate the local community on wildlife compensation requirements and develop proactive conflict resolution methods that will protect people, property and wildlife. This will include highlighting cases that can or cannot be compensated, the process and steps involved, and the government agencies involved in each step of the compensation process. In addition, the WMPA community and education programme will organize meetings aimed at intervening and pre-empting planned retaliatory attacks on wildlife. There is need to sensitize the community about the existence of this committee and also fast track implementation and operationalization of this committee in Kilifi County.

### **Action 3.3 Construct new and strengthen existing ranger outposts**

Delays in responding to HWC incidences are one key factor that fuels poor relations between local communities and WMPA management. Although WMPA

does have designated number of outposts, they are either inactive or non-functional altogether owing to personnel shortage. Other shortfalls associated with outposts include lack of work tools to facilitate effective service delivery. This situation, combined with the large areas that staff have to cover, and the often limited or poor transportation infrastructure, is currently under review.

In response, a number of new outposts will be developed during the lifespan of this plan, including appropriate new outposts at several hotspots e.g. Kanani.

### **Action 3.4 Enhance incidence reporting for HWC**

With challenges of network coverage in some areas around WMPA, some cases of HWC are not reported or experience delays in reporting.

In this regard, WMPA management will facilitate rapid reporting system of HWC by providing serviceable hotlines contacts to the adjacent communities. In addition, honorary wardens will be used in relaying such reports to WMPA management for appropriate response. WMPA management will also liaise with existing government structures on the grassroots especially the provincial administration in monitoring and sharing information on HWC in their respective areas of jurisdictions to facilitate timely response.

### **Action 3.5 Identify and document resource use conflict areas within WMPA**

Reduced abundance and distribution of fish stocks has stirred resource use conflicts among multiple users in WMPA namely fishers, including; sport fishers, artisan fishers, commercial fishers and dive operators especially in reef areas. Unsustainable fishing practices are also one of the major challenges affecting management of marine resources in the WMPA. Consequently, the livelihoods of many members of the fishing folk are at stake. For instance, dynamite fishing, use of beach seines, small-mesh size nets, spear guns in coral reefs, and ring-nets in shallow inshore waters, which are fishing methods preferred by migrant fishermen is a source of conflict between these fishermen and local the indigenous fishermen. In addition, there is overfishing in the inshore waters as local fishermen lack suitable fishing boats that can be used to fish in deep waters.

In this regard, there is need to identify and document all the conflicts on resource use within the conservation area to facilitate design and implementation of an effective intervention measure to resolve such conflicts. Some of the identified conflicts include the use of ring nets within the reef, use of explosive-dy-

namite to fish, and crop raiding by wildlife. Under this management action, therefore, WMPA management in collaboration with the local community will identify and document all the conflict areas to help design viable solutions. This will also include participatory mapping of all the conflict hot spots to have insights on the local distribution patterns of the conflict areas.

### **Action 3.6 Liaise with state department of fisheries to formalise access of migrant fishermen to Kenyan fishery**

There are migrant fishermen, mainly from the Island Pemba and main land Tanzania, who often fish in the WMPA. These fishermen are more experienced in fishing, hence most of the time they are contracted by local fish dealers to fish in Kenyan waters. Since these fishermen use ring nets and dynamite fishing they are able to land more fish than the local fishermen creating tension. In addition, the government of Tanzania subsidizes fishing activities of the Pemba fishermen by hiring out cheap boats enhancing efficiency of their fishing operations.

To ensure that conflicts between local and foreign fishermen is minimised, WMPA management will collaborate with the Fisheries and Immigration Department to ensure that there is vigilance in the fishing permitting system. This collaboration will be extended to monitoring whether both local and foreign fishermen have paid the requisite fishing licensing fees and enforcement of the law regarding illegal fishing methods.

### **Action 3.7 Liaise with the fisheries department to establish a vibrant conservation area Fisheries Management Committee**

Taking cognizance of multiple players in fishery resource management in WMPA, it will be desirable for the MPA management to put in place a functional MPA Management Committee (MPAMC), with members drawn from relevant government agents, tourism players (sport fishers), NGOs, community representatives, security agents, research and other conservationists' representatives. MPAMC primary role will be to advise on WMPA management issues related to fisheries, lobby for controlled and planned development of tourism facilities including proper waste disposal and resolve resource based conflicts to ensure sustained utilization of marine resources within WMPA. In regard to inherent resource based conflicts involving either dive operators or fishers on one hand and sport fishers and artisanal fishers on the other hand, MPAMC would purpose to provide objective measures to address such conflicts to the approval of both conflicting group(s) as much as possible. It is important however, to clearly define terms of

reference for MPAMC from inception (in light of prevailing legal provisions) with room to improve over time and circumstances. The MPAMC will hold regular meetings, with WMPA managers taking lead in convening meetings as secretariat to the forum. The MPAMC will be expected to propose appropriate management measures to address issues in WMPA relating to fishery resource management. The forum will also be expected to monitor implementation of management actions geared towards solving various fishery related challenges.

They will for example explore delineation of several points along the reefs and mark them out with marker buoys as dive/snorkelling spots and remainder sites as fishing areas. These points should however be agreed by both fishers and dive operators. In conflicts involving sport and artisanal fishers, MPAMC could encourage sport fishing companies to register as BMU members and contribute to BMU kitty. Additionally, instead of fishing in Marine Reserves for baits (thereby conflicting with artisanal fishers), they could purchase fish baits from artisanal fishers ("chuchungi" fish) and fish only in deep sea waters (instead

of fishing in Marine Reserves). There's also need for MPAMC to evaluate the concern that the sport fishers are themselves commercial fishers given that they land substantial amount of fish when they are supposed to catch, tag and release. Given their somewhat huge landings, the local fishers are denied market opportunities for their catches since sport fishers supply the local hotels with (high) quality catches. This being a long-standing area of conflict between artisanal and sport fishers, MPAMC needs to explore appropriate way of dealing with it for the benefit of fishery resource conservation.









## MPA OPERATIONS AND SECURITY MANAGEMENT PROGRAMME



## PROGRAMME PURPOSE AND STRATEGY

The purpose of the WMPA's Operations and Security programme is to ensure that:

### **Operational systems and structures are effectively and efficiently supporting the achievement of WMPA's management programmes**

As discussed elsewhere in this management plan, the WMPA faces an increasingly complex array of management challenges and issues, originating from within and outside the WMPA's boundaries. Some of these threats, such as siltation resulting from discharge from storm waters require national level strategies and involvement of multiple stakeholders to address. In addition, with the increase in local population and lack of alternative livelihoods, increased pressure on WMPA's Natural Resources, specifically fisheries, is bound to intensify during the plan period. Targeted and complementary management responses will be vital if all these emerging management issues are to be adequately addressed, as set out in the management objectives and actions included in each of the plan's management programmes. However, delivering these management responses effectively will call for strengthening operational management through providing a conducive working environment and supportive management systems and structures. In particular, the co-management approach advocated in this plan will require strong collaboration mechanisms between KWS and the local community. The Protected Areas operations and Security Management Programme provides the means for strengthening the WMPA's management systems, structures and human resources to support the implementation of the three other management programmes, and the overall achievement of the WMPA's Purpose Statement.

The following sections set out the principles that will guide WMPA Management in the implementation of this programme.

## GUIDING PRINCIPLES

*In implementing WMPA's Operations and Security Management Programme, WMPA Management will strive to ensure that:*

### **Conservation and human development are balanced**

UNESCO's designation of both WMPA and MMPA as a single Biosphere Reserve reflects the global community's recognition of the area's importance in demonstrating a balance on how conservation and human development can be achieved in the same area. Given the shared importance of WMPA and MMPA, their management strategies must be coordi-

nated to achieve biosphere reserve goals.

### **WMPA management is working with others**

The local community will be at the heart of the delivery of many of the objectives set out in this Plan. This is in recognition of the community's significant role in the use of natural resources within WMPA. Due to diversity of allowable uses and users, there is need for consensus building on many of the conflicting uses for management objectives to succeed. Hence, WMPA management will work with communities, partners, government agencies to complement capacities and build consensus on natural resource management.

### **A skilled and motivated workforce is maintained**

Effective management of a protected area requires a skilled, motivated and properly resourced workforce—that is committed to achieving the PA's management objectives and realisation of its long-term vision. Under this management programme, therefore, KWS will aim at recruiting and retaining qualified MPA staff with requisite skills in marine conservation and management. The workforce will be equipped with essential working tools to ensure that they are motivated to and can deliver the MPA's management objectives.

### **MPA's Security Is Enhanced**

Threats to personal security and safety, more than any other factor, adversely affect the attractiveness of a tourism destination to visitors. When visitors perceive a protected area as insecure, both domestic and international visitors avoid it. It is therefore paramount that WMPA has high security standards to make it a destination of choice when compared to other protected areas. Consequently, under this management programme, WMPA management will collaborate with partners in establishing a robust security management system, including a public relations component, to ensure that security of visitors is not compromised.

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

### **MO 1. A competent and motivated workforce deployed and maintained in WMPA**

### **MO 2. Stakeholders collaboration enhanced**

### **MO 3. Infrastructure, vehicles and equipment to support MPA administration enhanced and maintained**

### **MO 4. MPA Security operations enhanced**

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

## MANAGEMENT OBJECTIVES AND ACTIONS

### OBJECTIVE 1: A COMPETENT AND MOTIVATED WORKFORCE DEPLOYED AND MAINTAINED IN WMPA

Competent, motivated and adequate human resource is an important ingredient for success of any management entity. This management plan seeks to ensure that such human resources are available at WMPA. During the plan period, staffing to optimal levels, staff appraisals, capacity building, and strategic placement of staff will be undertaken as stipulated in the human capital manual. In addition, staff innovations and creativity will be encouraged. Appropriate documentation of staff reports will be prepared and used as suggested by the KWS human Capital policy document. These reports will form the basis for staff promotions, transfers and training. Newly deployed staff will be expected to have the relevant skills required for their work.

The desired future state of WMPA, that this objective aims to achieve, is improvement of staff numbers, efficiency, welfare, morale and output. The actions below elaborate issues and problems that affect competency and adequacy of human resources in WMPA as well as activities to be undertaken to mitigate the issues and problems.

#### Action 1.1 Deploy appropriate staff

Transfers are very common and irregular in KWS which affects productivity and continuity of park operations. High staff turnover was identified as a drawback to effective management as it interrupts operations while at the same time impacting negatively on the productivity of the affected employees. At times, transfers are justified as being due to low staffing numbers, lack of integration with the entitled community among others. In some cases the staffs transfers are not consultative with the area management or affected staff and do not match the relevant and required staff competences. It is important to note that marine staff have specialized skills and expertise that is unique to the marine environment. Such set of skills and expertise is acquired over a long period of time to enable certification by international organizations such as WIOMSA. However, some of these skill sets are not recognized by organization as being specif-

ic for conducting effective park operations. This has resulted to negative perception of transfers by the affected staff and the stations.

To ensure continuity and productivity during the plan implementation period, the implementation of this action will ensure that staff transfers for both the affected staff as well as the recipient stations are done in consultation with all parties involved. Efforts will be made to ensure that replacements have relevant skills required for effective management of a marine protected area. In addition, Area level managers will be required to advise Human Capital appropriately on transfers. This plan proposes that personnel be retained at the park for at least 3 years as stipulated in the Human Capital manual. Furthermore, staff appraisals will be undertaken to ensure that personnel with specialized training and expertise on various marine ecosystems and are also certified by international marine bodies have the details provided and kept in their personal file. This will ensure that that staff deployment is guided by the specified and prerequisite competences as outlined in their personal file.

#### Action 1.2 Train staff in relevant skills

To enhance the staff skills and enhance their productivity, there is need to upgrade their skills. To achieve this, it is necessary to liaise with the area Wardens and Human Capital in the Coast Conservation Area (CCA) to provide short courses according to the prescriptions provided in the KWS Training Needs Assessment Report. Skill upgrading courses can be conducted in service through training of trainers (ToT). Possible training should be done "on-the-job" by the respective officers in charge of sections, while more specialized training should be carried out through competent institutions. Emphasis of the training must be on gaining practical and applicable field knowledge, rather than theoretical knowledge. More emphasis should be placed on the following training courses for all staff; computer courses, customer care, GIS and remote Sensing courses, MIST, data entry, emergency response, environmental impact assessment, environmental auditing, preparation of protected area management plans, evaluating effectiveness in implementation of a protected area management plan, range practice. Skill upgrading is essential in maintaining good performance of the all personnel in the park. Boat operations and range practices for rangers should be carried out at least thrice a year. Ranger competitions are seldom carried out these days. However, they used to act as motivational tool and enhanced experience.



### Action 1.3 Improve prosecutorial capacity of WMPA

WMPA management spends considerable financial and human resources to curb illegal activities taking place within the area under their jurisdiction. However, whenever arrests are made they often do not lead to conviction of perpetrators, or when convictions are achieved they attract very low penalties. This is attributed to poor prosecution expertise, weak drafting of charges, lack of support from police, weak investigation by KWS officers, poor evidence handling, interference with the scene of crime, improper filling of cases, long judicial processes, lack of knowledge by the police, judiciary, prosecutors and the community on the importance of the marine protected area, and political interference.

To deal with these challenges, the park management will work in liaison with other arms of government (e.g., the police, directorate of public prosecution, the judiciary and other external experts) to develop training programmes that will equip the relevant staff with the right skills. The above arms of government as well as the community will be sensitized on the value of marine ecosystems and threats that are in existent. This could be done through organising open days, workshops & tours at the protected area for target groups to appreciate the parks, have a real-life experience of the marine environments and associated challenges of managing it.

### Action 1.4 Enhance staff motivation

Motivation of staff is key to effective and productive workforce. Staff motivation can be achieved using different approaches that include ensuring staff are provided with working tools (e.g., uniforms, working tools & equipment), enhancing sporting activities, awarding outstanding staff, team building among others. The park management will embrace these approaches to enhance staff motivation.

Currently the park is experiencing a shortfall of marine patrol uniforms. Staffs were last issued with uniform kits five years ago and the kit is worn out. There is also need for patrol uniform for the beach patrol and boat patrol teams. The uniforms include patrol shorts, t-shirts, tanga shoes and caps. Procurement of the uniforms should be done at Coast Conservation Area level in liaison with the HQ. It is also noted that procurement of equipment and uniforms is centralized in KWS HQs as an institutional policy. This centralization has made prompt access to these services and goods challenging and hence affecting productivity. The area management is therefore required to streamline the process of requisition of these goods from KWS Headquarters to enable timely and efficient disbursement and allocation of the same to

staff. Furthermore, uniforms for the staff at the coast need to be designed and customized to make them more user, customer and climate friendly. This action should be implemented together with the report on coast guard training that was initiated during the exchange programme with the Brazilian Coast Guard Service.

Sporting activities are important as they build team work among the staff, enhance morale, better health and encourage socialization. KWS has introduced sporting activities as part of improving employee interaction and several teams on various activities have been formed. This action is aimed at improving the work environment and productivity in addition to building external networks. Currently there are various teams that participate in the annual inter area sports competition between different areas. The CCA has identified sportsmen and sportswomen to compete with other regions on the following sporting activities; competitive swimming, beach volleyball, football, table tennis, darts, badminton and athletics. During this plan period the development of good sporting facilities and equipment in WMPA will be prioritized to improve staff welfare, collaborations and interactions. However, the impediment is shortage of sporting facilities and materials. In addition to construction of an indoor sporting house, there will be need to start and form teams to participate in competitions. There is also need to procure the relevant sporting materials and facilities to encourage fair competitions.

Currently the WMPA has awards committee set up to monitor and evaluate the output of the personnel and awards exceptionally performing staff. An initiative that can be started in the immediate term is that of recognizing staff excellence through the award of appreciation letter for exceptional performance at the field station level by the warden in charge. This letter can also be considered as part of staff appraisal documents. This action will also initiate a staff or employee of the year reward scheme in order to motivate staff to engage positively in their duty stations. All staff should also have name identification tags and a commentary box at the reception to accompany the same. An inventory needs to be developed that captures awards and certificates given to personnel who have experience in MPA operations, clean disciplinary record, exceptional customer service as well as those with exemplary performance should also be developed. This will assist in motivating and encouraging the personnel to work at their best. Other reward mechanism that will be used in the implementation of this action include; exchange programmes, recommendation for in service training opportunities to improve performance and holiday scheme. Recommendation for staff awards from field should be honored by HQs.

In order to improve staff performance and output, team building is vital. Through team building the personnel can interact and learn more about each other's strengths and weaknesses, collective team goals, mechanisms for enhancing achievement of goals and proper work ethic. Team work also enhances staff appreciation for emotion intelligence hence assisting staff in developing trust and understanding of the different personalities among the teammates. It also improves the productivity in the long term as well as ways of capitalizing on collective output. This action will emphasize on various team building approaches including; staff campaigns, parties, competition, holidays and retreats. During the team building sessions, the management of WMPA can articulate to staff their vision, talents status of various activities, and assessment of activity implementation and performance among others.

### **Action 1.5 Improve Staff Welfare**

Entertainment of staff is a key ingredient that motivates staff and enhances their performance as it offers an opportunity for relaxation. Entertainment at WMPA as in other KWS protected areas is achieved through provision of DSTV and boat tours of staff families.

Apart from entertainment, timely payment of staff dues can also boost staff morale. Hence, efforts will be made to ensure that all staff allowances (medical, leave and field) are paid on time. Other actions that will be taken to enhance staff motivation include providing better housing facilities and working environment, promotion of teamwork, enhancement of rewards and recognition to staff, provision of staff welfare van, provision of appropriate working tools and promotion of social cohesiveness among all cadre of staff.

## **OBJECTIVE 2: STAKEHOLDERS COLLABORATION ENHANCED**

The future desired state at WMPA is where there is close collaboration between KWS and other stakeholders involved in the management of the MPA. Threats to WMPA stem from resource use by the local community. The scale and intensity of the impacts of resource use is increasing. Although some of the resources being used are outside the direct mandate of KWS (e.g., fish and mangroves) these issues cannot be left unaddressed. As such, activities under this programme will pursue partnerships and collaborations with other institutions and organisations such as National Government Agencies, County Government, BMUs, KMFRI, KFS, Department of Fisheries, and NGOs to address issues that are of mutual concern in and outside the core protected area.

The development and strengthening of stakeholders collaborations for WMPA is paramount towards the attainment of the overall purpose of this management plan. Operational collaboration with key stakeholders in decision making, communication and implementation of activities within and around the WMPA is also vital. As such to ensure a safe and secure environment for conservation, visitors and tourism investments in the area, this programme will strengthen collaboration with key stakeholders. Liaising and seeking support from other stakeholders in the implementation of specific integrated biodiversity programmes is very crucial in protected area management. The establishment of strong stakeholder forums that encourage the effective participation of members can ultimately ease decision making, enhance communication and interaction and reduce resource use conflict. The objective aims to achieve, ensue and strengthen extensive collaboration and networking between and among stakeholders who operate within the WMPA.

This objective has been designed to ensure synergy in conservation and protection of natural resources in WMPA and the adjacent areas. In order to attain the overall purpose of this objective, the actions below will be implemented.

### **Action 2.1 Establish a functional Park Management Committee**

Unless successful collaboration is achieved amongst different WMPA stakeholders, the implementation of this management plan will be seriously undermined. Good coordination, collaboration and networking with other stakeholders will ensure constructive engagement and working relationships in the running of the MPA. At the moment, there is no clear and systematic mechanisms of monitoring and evaluating Park activities to address challenges.

To ensure smooth and sustainable implementation of the management plan, establishment of a Park Management Committee, chaired by KWS is an important ingredient. This committee will be hosted by the KWS Warden-in-charge and it will be meeting on a quarterly basis. Members of this committee will include representatives from KWS, KFS, FD, TPU, County Government (ministry of tourism), Ministry of tourism (national Government), NEMA, BMU, Boat operators, Divers, Hotelier, KMA, Safari sellers (beach operators), Curio sellers, and the physical planner. Key responsibilities of the Park Management Committee could include: overseeing Implementation of the management plan, assisting in conflict resolution, developing oversight rules to govern the MPA operations, fundraising for projects, and handling conflict between divers and artisanal fishers as well as between sport fishermen and artisanal fishermen. The establishment of this

consultative platform will provide a forum for easier communication and decision making.

### **Action 2.2 Build strong relations with local Beach Operators, Conservation NGOs, Research Institutions, Hoteliers**

While WMPA management plays a primary role in enforcing the law, compliance will greatly be improved if the stakeholders actively take part. This calls for a common strategy and focus among different stakeholders to ensure sustainable utilization of the natural resources are undertaken in a way that permits both derivation of socio-economic benefits and conservation of the same. Generally, there exists mistrust and suspicion among the different stakeholders, which has led to un-coordinated duplication of activities. Such a scenario is prone to outbreak of conflicts between and among the resource users.

On the other hand, non-government agencies take interest in conserving marine resources, advocate for their responsible utilization and research. It is therefore fitting for all stakeholders to enter into a formal agreement with appropriate government agencies to enable them voice their concerns thereby making respective agencies appreciably accountable to the public in line with their mandates. In this regard, during the plan period, all stakeholders with interest at WMPA will be identified. Consultative meetings, joint trainings and team building activities will be undertaken to enhance awareness and bonding of the stakeholders as well as share information about WMPA. To ensure that formal relationships towards the management of the resources in the park, reserve and adjacent areas is enhanced, MoUs will be developed and signed to clearly outline the roles of KWS and the other stakeholders.

### **Action 2.3 Work with State Department of Fisheries to enhance management of fisheries resources**

The Fishing Act of 1991 mandates the Fisheries Department (FD) to control fishing in open waters (seas, ocean, dams and rivers). The Act gives authority to the Fisheries Department to issue fishing licenses to fishermen. In this regard, all fishing regulations (fishing seasons, fishing gears, fishing sites) has been vested to the FD. As such, KWS has minimal role in controlling fisheries resources. Since the key resources within WMPA are the fisheries, then it is paramount for KWS to work closely with FD to ensure these resources are sustained for tourists viewing as they form a key attraction (especially the coral fish) to tourists into the PA.

The conservation efforts of fisheries as well as their utilization have been uncoordinated. For example,

the FD has been licensing fishing activities in WMPA (especially so, in the reserve) without consulting KWS, which manages the operations of WMPA including fishing activities. This in many occasions has led to multiple conflicts among fisher folks (those in support versus those against specific fishing gear like the ring nets) on one hand and environmentalists and BMUs/FD on the other hand. While the ring nets yields are high thus economically viable fish compared to other fishing gears, their impacts on fish stocks and fishery habitat is detrimental since they break the corals besides collecting seagrasses in the course of their operation. The FD has no capacity to monitor whether the licenses they issue are being used as stipulated therein. However, KWS has capacity to monitor fishing activities in the MPA especially in the marine reserve, therefore the two institutions can develop a mechanism of working together to complement each other and to effectively monitor fisheries resource use by stakeholders.

To facilitate achievement of both conservation and sustainable fisheries utilization, it is necessary to promote and enhance wider stakeholder collaboration geared towards ensuring that activities by FD and KWS are coordinated and integrated towards achieving the fisheries program purpose. During the plan period, KWS will develop and sign an MoU with the FD that identifies areas of collaboration and formalizes their working relationship. It is envisaged that once the MoU is in place, the two organizations will be holding constant consultative meetings to iron out outstanding issues as well as organise to train fishermen on the need to control overfishing among other programmes. Further both agencies will work together to reduce incidences of illegal and destructive fishing methods (including inshore prawn trawling and ring netting) and over fishing that threaten coral reefs and sea grass habitats.

### **Action 2.4 Collaborate with County and National Government conservation agencies in enhancing management of the MPA**

Several players have varied roles and interests in marine natural resources. The National Government, County Government and other conservation agencies for example have mandates over different marine natural resources with Ministry of Fisheries overseeing fisheries resources, KWS over wildlife, Tourism over tourist related activities, NEMA over environmental issues and Maritime Authority with oversight role over marine safety and resource utilization within territorial waters. Active participation of WMPA management in county administrative meetings will no doubt increase its visibility besides providing opportunity for it to lobby for support from appropriate government agents in their course to push for their fishery related

interests. Since County running is partly implemented through a number of committees formed to address specific issues of economic, social, environment, or administrative nature, WMPA management will endeavour to associate itself with any one or more of such committees.

Under formalized arrangement, it is also expected that responsible government agencies will recognise and support the effort of other non-governmental players in supplementing their roles which such agencies would have laboured to perform perhaps costly had they to undertake themselves. This is particularly so in areas of sensitizing the rural folk on environmental conservation. Additionally, participative management of natural resources inspires ownership of these resources thus likely successful conservation efforts.

### **Action 2.5 Develop joint funding proposals**

Over dependence on KWS budgetary allocation results in poor funding of MPA activities, leading to poor services provision and deterioration of infrastructure. To address this funding shortfall, the management of WMPA will develop alternative sources of external funding to supplement what KWS shall allocate for the implementation of the activities specified in Management Plan. This calls for creativity and brainstorming in acquiring alternative funding. Stations are currently allowed to source for their own funding through the resource mobilization department at KWS Headquarters to enhance recurrent and capital budgetary requirements proposed in the annual work plans. Developing viable proposals is one way of fund raising for projects. In case KWS through the management of the WMPA cannot undertake a task, an external organisation can be approached for assistance in developing joint partnership proposals. Donor community will also be able to use the contents of the management plan to choose interventions and projects they wish to fund, therefore, this document acts as fundraising tool.

### **Action 2.6 Develop and implement a participatory beach management plan**

Unplanned and uncontrolled beach development, is affecting public access, turtle nesting sites and restricting available fish delivery points. To address this problem, a beach management plan will be developed through a participatory approach involving all WMPA stakeholders. This plan will clearly designate areas where different beach activities can take place to minimise conflicts between different beach users. It is worth noting that the Beach Management Plan Development process had been initiated in the year 2012 but stalled. Under this management action, the WMPA management will restart the process in col-

laboration with other key stakeholders e.g. marine resource users, the County Commissioner, County Government of Kilifi and local conservation NGOs.

### **OBJECTIVE 3: INFRASTRUCTURE, VEHICLES AND EQUIPMENT TO SUPPORT MPA ADMINISTRATION ENHANCED AND MAINTAINED**

Improvements to the MPA infrastructure is needed to ensure that appropriate operations in the protected area support the realisation of the protected area purpose. This could be achieved through the maintenance and development of all infrastructure and associated facilities in order to improve the MPA's visitor appeal, efficiency of operations and increase staff productivity. The aim is to achieve a situation and environment where transportation, office equipment, MPA management facilities, buildings, communication and protected area utilities issues are maintained and to ascertain appropriate protected area operations and security.

Furthermore, good communications network is vital to both within an MPA and between the MPA staff and stakeholders, and others outside MPA boundaries. Radios, telephone and internet are the main forms of communication available to the MPA. Efficient operations and security are dependent on secure and clear communications between stakeholders.

This objective aims at achieving the above by ensuring that improvements to the MPA's infrastructure are given due consideration through implementation of the following actions:

#### **Action 3.1 Appropriate transport equipment procured**

WMPA is an active area with numerous activities that range from research and monitoring to security, tourism, education and problem animal control. Therefore, acquiring and maintaining appropriate transport equipment is crucial for the successful management of the MPA. Vehicles and boats are currently used to transport personnel either for law enforcement, general administrative duties and staff welfare. However, the vehicles and boats are at times either not adequate or unserviceable. Hence, under this action WMPA management will liaise with KWS Headquarters to ensure that adequate transport is provided.

#### **Action 3.2 Ensure prompt repair and maintenance of transport equipment**

Lack of proper and regular maintenance, wear and tear, is the major causes of transport equipment failure. Basic maintenance rules for any equipment for the usage either at sea or on land (i.e., boats or vehi-



cles) includes; regular cleaning and servicing engines. Currently, at the WMPA, the boats receive regular maintenance as when resources become available while the services of a mechanic for engine maintenance are outsourced which sometimes is very expensive and time consuming. In comparison, fuel is available and in regular supply. Therefore, it is recommended that coxswains be sent for further training on engine maintenance as well as upgrading navigation and diving skills. This will decrease the costs of repairs related to minor defects. The same applies to the drivers. In the long term there will be need to consider the need for a maintenance workshop with basic equipment for provision of basic maintenance service to all MPA vehicles and boats.

### **Action 3.3 Construct additional staff houses and office blocks**

The MPA has a number of residential buildings that are not sufficient to accommodate the current and expected optimum staff levels in the WMPA. A lot of staff including security personnel has to seek accommodation outside the MPA headquarters. This could increase the costs related to transportation of personnel, staff productivity and time wastage in case they are required for an emergency security operation. There is therefore need for urgent development of infrastructure to address the inadequate housing for the staff, as well as offices.

### **Action 3.4 Procure and maintain scuba and snorkelling gear**

There is need to procure adequate snorkelling and diving equipment for use by visitors and MPA staff for recreation, underwater guiding and for a range of management activities such as installation and maintenance of mooring and boundary buoys, or even finding items that have been lost overboard. The main items required for diving are: masks, fins and snorkels, wet-suits and booties, cylinders, regulators, pressure gauges and octopus rigs, dive computer, knife, decompression tables, compass, surface marker buoy (SMB), safety sausage, torches, glow sticks and goody bags, dive slate (plastic sheet), and pencil are useful for both snorkelling and diving, and are essential if scientific data is being collected.

### **Action 3.5 Procure and maintain office equipment**

A professional and well-organized office creates efficiency of operations, increases staff productivity, moral, a good impression and healthy environment. The MPA office is the focal point for day to day operations that dictates the effectiveness of implementation. Standard procedures for maintaining up-to-date records of all management activities and a comfortable

and efficient working environment should be created. While equipment that is obsolete should be disposed through procedures defined in the Public Procurement and Disposal Act. Correct maintenance procedures for ICT equipment should be emphasized including training more MPA staff on basic IT skills and seeking technical back stopping services from computer specialists who have been outsourced. Ideally, the WMPA should have an employee specialised in information technology (IT) skills. Currently the whole region relies on one staff serving the entire CCA and has a limited budget, hence cannot efficiently perform his duties. In case the employee is indisposed or on leave, there is a vacuum.

### **Actions 3.6 Install VHF radios in all boats and vehicles in WMPA**

Marine radios are generally more expensive but essential for boat navigation, security, and marine emergency and rescue operations. However, radio transmission services in marine environments often suffer from damage of equipment due to corrosion, geographic range or electrical failure due to water. This hampers security and park operations and communications as equipment remain unserviceable. Additionally, secure communication can no longer be guaranteed. This action will improve and develop VHF communication systems on protected area utilities for successful protected area operations. All MPA boats and vehicles should be fitted with standard VHF radios as prescribed in the KWS Park Operations Manual. MPA vehicles also need to be equipped with radios and relevant antennae. The new VHF units should have non-corrosive materials and be waterproof. Therefore, waterproof plastic cases for handheld units can be provided for use in the boats, before the marine models are purchased. Training should also be provided for staff to obtain proficiency certificates in the use and maintenance of radios from Manyani Law Enforcement Academy. Most radios do not require much maintenance, but annual service by a qualified technician is recommended.

## **OBJECTIVE 4: MPA SECURITY OPERATIONS ENHANCED**

This objective addresses issues related to security of WMPA and its surroundings. To ensure the maintenance of security, well-motivated and equipped security force is a prerequisite while the provision of adequate funds to facilitate and support operations is paramount. The focus of this objective is therefore to ensure that, the security department of WMPA is well motivated and equipped to undertake the tasks at hand. At the same time, the objective recognizes the need for enhancing collaboration with other key security agencies operating in the area (e.g., regular

police, Kenya Maritime Authority (KMA), Tourist Police Unit (TPU) and the Administration Police as well as other informal security organs that encourage community policing).

The major areas of concern for WMPA security operations are: visitor safety, wildlife safety, coral damage, speeding, lack of equipment, prevention of all illegal activities (illegal fishing logging of mangroves; wildlife poaching) and encroachment into MPA boundaries. The major issue affecting visitor safety and regarded as an impediment to quality of tourism in the MPAs is visitor harassment by beach operators. Kenyan beaches have a public status and access by all guaranteed by law. This unregulated scene has virtually allowed everyone to interact freely with visitors. Such interaction has often resulted in harassment by unlicensed curio vendors, safari sellers, boat operators or idlers. The limited capacity of tourism police and other law enforcement agencies has further complicated the issue. This situation has been augmented by unemployed citizens and has turned to the beach as their only source of livelihood. At times, during sale of wares to visitors, some of the vendors and idlers have indulged in aggressive competition for attention by customers. This chaotic fight for clients has contributed to harassment, mugging, and at times personal items that belongs to visitors are stolen.

Coral damage at particular scenic sites is an anthropogenic threat to the marine environment thus a potent concern to the management of the WMPA. The mandate of the MPA management is to protect that marine environment including its habitat and species. Competition for anchor space for fishing vessels in the Marine Park and Reserve does exist with most vessels concentrating on the few mooring buoys that sparsely dot the MPA. Discharge of oil by vessels is also common on the anchorage sites.

For effective protection of wildlife, visitors and property, there is a need to strengthen the security department of the WMPA to enable them to execute their duty with ease. The MPA require additional rangers given the MPA's complex issues and the quality of service they are required to deliver under this management plan.

#### **Action 4.1 Establish good institutional framework for beach operators**

This action aims at ensuring that all cases of visitor harassment in and around WMPA are significantly reduced or eliminated. An effective and reliable linkage between the different stakeholders within the WMPA and its management is crucial for the maintenance of high state of security throughout the area. The key players already identified include boat owners and boat operators, safari sellers, curio sellers, mas-

sage personnel, and hoteliers. The plan advocates for the development of a code of conduct suited to each group, proper identification and registration of members including introduction of tools such as tags and shirts with a logo for ease of identification and management. It is envisaged that the registration of members will induce ownership and mobilization. Currently, groups have amorphous membership, ambiguous objectives and are subordinate to the interests of founders leading to disorganization in management, lack of accountability and exclusion of future members. In addition, most of the groups have not evolved; lack wide spread membership and governance instruments that would encourage accountability, transparency and inclusion. In order to streamline and provide a solution to these issues the management of WMPA can approach this problem by providing training and capacity building for beach operators. This will sensitize members on group dynamics, group weaknesses and strengths and areas of improvement. The different groups should also be empowered to enforce their rules and regulations.

#### **Action 4.2 Conduct regular joint patrols**

Since the MPA encompasses a very large area, patrolling the entire geographical scope is a challenge and a heavy burden on the budget for fuel and maintenance of vessels, not forgetting the inadequate number of security personnel. The security force of WMPA has the responsibility to protect wildlife, visitors and property and as such needs to be strengthened to enable it to execute its mandate. To effectively conduct this task, including administration and reduction of prevalent illegal activities, there is need for collaboration with other relevant institutions to facilitate widespread monitoring and enforcement. Such collaboration with agencies and communities can assist in improving surveillance, intelligence gathering and general security. Joint regular patrols and operations by TPU and KWS can be organised between agencies so as to increase chances of successful execution. This could be conducted at intervals and intensified during high seasons of visitation. The Jacaranda area has been identified as a hot spot for a variety of these illegal activities and thus should be considered as a priority.

#### **Action 4.3 Provide appropriate equipment to security personnel**

Currently, WMPA security staff lack essential field equipment which include binoculars, night vision goggles, marine torches, first aid kits, diving kits, and GPS (water proof). The provision of this equipment will enhance their daily night activities. Additionally, all security patrol equipment need to be maintained as prescribed in the standard operating procedures.

There is also need for additional equipment such as tents, sleeping bags, water bottles, uniforms, boots and more sophisticated equipment such as cameras (water proof, rucksacks, computers, and dicta-phones. This equipment aids in gathering evidence, enabling rangers to remain on patrols for longer hours or to enhance the effectiveness of nocturnal operations, water and ground operations. Additional specific equipment for specialized operations is needed to strengthen communications between patrols, bases and MPA Headquarters.

#### **Action 4.4 Improve prosecution of wildlife and visitor harassment related offences**

WMPA management expends considerable financial and human resources in an effort to curb illegal activities and visitor harassment taking place within the area. When arrests are made they do not usually lead to eventual conviction of perpetrators, or very low penalties are accorded to them in case they are convicted. This can be attributed to failures from the KWS management, the judiciary, and political interference.

Poor drafting of charge sheets by KWS staff has occasionally led to dismissal of cases on the grounds of improper charges. Lack of awareness amongst the magistrates on the impacts of wildlife offences on wildlife populations and the effects of visitor harassment on tourism has contributed greatly to dismissal of cases, or awarding of minimal penalties. This action will ensure that WMPA management improves collaboration with the police, prosecutors, and the judiciary to advance prosecution rates and create awareness on the impacts of wildlife related offences on the economy. Furthermore, the KWS staff will also be trained on drafting of charge sheets and court procedures.

#### **Action 4.5 Fast track acquisition of appropriate documents for KWS property**

Currently, the Jacaranda Hotel has been constructed close to the marine reserve. Some plot owners bordering the MPAs claim ownership of the beach front facing their plots (30m above highest water mark) which is legally under KWS jurisdiction. In certain cases, the owners legally acquired this land prior to the establishment of the MPA but the gazettelement did not take this into account or the high-water mark has moved with the increase in sea water level. This has caused conflict as legal ownership of the land is disputed. In some cases, owners have denied people free access to the beach as stipulated under the law. To avoid such incidents, the service shall fast track acquisition of all legal documentation relating to ownership (i.e., title deeds) for such property.

#### **Action 4.6 Install additional moorings and buoys at anchorage sites in WMPA**

Buoys are used for a variety of purposes in the MPA which include marking the marine park boundary and zones and marking specific locations (e.g., coral gardens, diving sites). Moorings are particularly important to protect sea bed and corals from anchor damage. By mooring boats, the need to drop and haul anchors is eliminated. Within the WMPA competition for anchorage space for tourist boats in the Marine Park and Reserve exists, with most vessels flocking and concentrating in one area. This is commonly seen during the high season. Increasing the number of buoys will reduce overcrowding at popular dive sites and coral gardens where anchoring is prohibited and the number of buoys limited.

#### **Action 4.7 Ensure proper maintenance of mooring and buoys**

The mooring and buoys are used to mark the park boundary, diving sites and coral gardens. However, mooring buoys are sometimes cut off by illegal fishermen whereas the buoys of poor quality are damaged by marine life and fishermen. Therefore, it is important to routinely check their conditions for maintenance purposes. Sometimes the buoys are covered by algae, thereby their colour is changed and cannot be seen from far; this calls for mechanical removal of the algae.

To ensure that the mooring buoys perform the required tasks effectively, a proper maintenance schedule and monitoring programme will be important. Consequently, the maintenance and monitoring schedules will reduce the damages and negative impacts of both the buoys and the sites. Specification of each mooring should be recorded and regular maintenance will include visual inspection (using SCUBA) and immediate replacement of worn out parts, a pull test on the system and cleaning from fouling.

The monitoring programme will involve the following: monthly inspections of all buoys and pick up lines, cleaning of pickup lines from algal growth or replacement if necessary; cleaning, waxing and polishing buoys; and checking for cracks and replacing where needed. On a quarterly basis the mooring lines, shackles and protective sheaths should be inspected for wear and tear and replaced as needed, especially the contact area between the two. On biannual basis the anchor mounting and surrounding the area should be inspected and checked for signs of movement and the buoy should be replaced through-line and pick-up line if the system is regularly used. Annually, the pins in the mooring line shackle should be replaced while after two years the mooring line should be replaced if needed.

**Action 4.8 Delineate MPA boundaries**

The riparian zone defined by 30m above the High Water mark keeps on changing due to receding sea in some areas or cliff erosion in others, which makes it difficult to have a fixed 30m zone from the high water mark. This has been exploited by private developers and beach operators resulting to establishment of facilities in the riparian zone. As such, claims of illegal development on beaches, sand dunes and ecologically sensitive areas have been on the increase. Investors have developed and changed use of these areas to lodges, homes and hotels without authority from relevant government departments. Hence to remove ambiguity on the MPA boundary, the 30m High Water Mark (HWM) will be surveyed and marked to prevent encroachment. In addition, the 60m setback from HWM for permanent structures along the open coasts will be enforced as specified under the Survey Act 1989<sup>9</sup> and the EMCA wetland regulations.

**Action 4.9 Ensure compliance with environmental regulations (i.e., audits to existing facilities)**

Some infrastructure in the WMPA and adjacent areas has been developed without Environmental Impact Assessments as required under the EMCA, 1999. Environmental Audits also have to be conducted on existing facilities to reduce cases of environmental degradation. There is need for the WMPA management and Park Management Committee to establish a mechanism that will provide for regular inspections on facilities to ensure that environmental laws are adhered to.

**Action 4.10 Ensure that all boat operators, sport fishers, and fishing vessels are duly licensed and compliant**

Currently, the management of WMPA is not involved in licensing of either tourism vessels or fishing boats. This activity is done by the Fisheries Department or the Kenya Maritime Authority who have statutory powers of enforcement and regulates compliance. Yet fishing and tourism activities have an impact on the reserve while KWS has the mandate for visitor safety and protection of the MPA from illegal activity. In cases of sea accidents KWS is the only institution with the capacity to respond immediately and efficiently.

Most vessels operated by tourism operators are not insured nor do they have safety equipment making them unseaworthy. All boat operators carrying tourists need insurance, as well as a tourism trading license, which should be monitored by WMPA management.

**Action 4.11: Enhance security for WMPA visitors**

The future desired state for WMPA is that a good system that guarantees security to all visitors is in place. The presence of many unregistered beach operators poses a security threat to visitors as it is difficult to establish the culprits. Incidences of visitors being robbed by persons purporting to be beach or boat operators have been reported in the past, with such reports being more common during the high season.

To address the above issues, the park management will liaise with tourism police to increase visitor safety; increase tourism security patrols during the high season; establish a communication link with BMU operators; establish radio communication with tourist facilities in the WMPA; establish a 24-hour hotline number for visitors and BMU operators; and train security teams on terrorism and disaster preparedness. Such efforts will ensure improved security of visitors during the plan period.

**Action 4.12 Establish and maintain security database for WMPA**

The future desired state for WMPA is that all security data is stored and maintained in a digital format. Currently, data is stored in an analogue manner in papers, which makes it difficult to acquire information on security related incidences. The major reason for keeping the security data in an analogue form is the lack of a computer designated for such a purpose as well as lack of security personnel assigned to undertake database maintenance and management. In view of the above, this plan envisages that a functional security database will be put in place with a security personnel assigned to maintain it during the plan period.

Further, an appropriate security database will be designed and all data keyed in and routinely updated. A database computer will be procured and one security personnel deployed and trained on how to use and update the database. At the end of each year, mapping and modelling of security hotspots in WMPA and adjacent community areas will be undertaken.

**Action 4.13 Strengthen law enforcement efforts in WMPA**

WMPA is experiencing a number of illegal activities. They include illegal harvesting and subsequent selling of shells and ornamental fishes; illegal exploitation of sea turtles for meat, oil and eggs; and beach encroachment by shoreline developments among others. There is need to ensure these illegal activities are addressed. The following activities will be implemented to tackle the issues:

<sup>9</sup> Coast foreshore reservation. The Survey Act Chapter 299. Section 110 (1). Where unalienated Government land fronting on the area coast is being surveyed for alienation, a strip of land not less than 60 metres in width shall normally be reserved above high-water mark for Government purposes: Provided that, if the interests of development require, the Minister may direct that the width of this reservation shall be less than 60 metres in special cases.



- Strengthen patrol and law enforcement operations in the area by enhancing staff number, equipment, etc
- Implementation of intelligence network and anti-poaching operations in the WMPA and the adjacent
- Form and operationalise a cross-sectoral enforcement committee to enforce relevant laws in the marine reserves
- Empower BMU units to enforce fisheries regulation in the marine reserves
- Create linkages with local law enforcement agencies e.g. the police service

#### **Action 4.14 Ensure adequate law enforcement in conflict areas**

WMPA is protected by a host of laws and policies that are considered adequate to at least guarantee effective management of the MPA. This has placed the governance of the MPA on different agencies with overlapping mandates that operate therein. The presence of such overlaps has been the main cause of conflicts between these agencies. As a result, weak or inadequate law enforcement at WMPA has been witnessed.

This regulatory framework can only adequately serve the conservation of the area when enforced by the various agencies that have jurisdiction. Laws and regulations can be used as good arbitration mechanisms for conflict resolution among disputing parties. The challenge of adequate resources (i.e., staff and equipment) has been identified as a bottleneck resulting in weak law enforcement. The overlapping mandate of different agencies has also at times resulted to in-action and gaps in enforcement. For law enforcement efforts to bear fruit, especially in high conflict areas, there is need to establish constructive and productive relationships with all agencies and stakeholders. It is crucial to ensure that a good working relationship exists between the different players and the MPA management.

WMPA currently experiences conflicts between different resource users namely: the boat operators and hoteliers; divers and fishers; fishers and sport fishing clubs/hotels; subsistence and commercial fishers; beach/boat operators and hoteliers; registered boat operators and other beach operators; and, among boat operators themselves. This action will ensure that collaboration among agencies is promoted for effective resolution of conflicts.



## PLAN MONITORING





## THE PLAN MONITORING FRAMEWORK

The plan monitoring framework set out in the following tables has been designed to provide guidance for the assessment of the potential impacts resulting from the implementation of each of the four management programmes. The framework sets out the

desired positive impact of each programme's objectives, as well as any potential negative impacts that may possibly occur. The framework also includes easily measurable and quantifiable indicators for assessing these impacts, and potential sources of the information needed (see tables).

**Table 9. Ecological Management Programme Monitoring Plan**

Objective	Potential Impacts (Positive and Negative)	Verifiable Indicator	Sources and means of verification
<b>Objective 1: Conservation of WMPA's threatened marine species enhanced</b>	- Sufficient scientific information to support management of threatened marine species is available	- Sea turtle nesting sites - Status of coral reef	- Turtle nesting monitoring data - Coral reef degradation monitoring data
<b>Objective 2: Important WMPA's habitats conserved</b>	- Increased support for marine conservation efforts - increased health of coral reefs and sea grass beds - Increase in area under conservation land use	- Resource use conflicts - Status of coral reefs and sea grass beds - A new gazetted protected area	- Security data base - Coral and seagrass monitoring data - Gazette notice
<b>Objective 3: Threats to WMPA's critical components reduced</b>	Threats to the shoreline are understood and minimised	- Shoreline setbacks established - Status of marine pollution	- Management reports - Research and monitoring reports
<b>Objective 4: WMPA's ecological components and processes are understood</b>	Ecological research and monitoring is being carried out	Research studies and ecological monitoring carried out	Research and monitoring reports

Table 10. Tourism Development and Management Programme Monitoring Plan

Objective	Potential Impacts (Positive and Negative)	Verifiable Indicator	Sources and means of verification
Objective 1: Tourism administration and management enhanced	Reduced visitor impacts	- Evidence of visitor-caused destruction to coral reef	Research reports
	Increased collaboration between KWS and WMPA tourism stakeholders	tourism stakeholder consultative meetings	Meeting minutes
	Increase in visitor satisfaction	Visitor complaints	Visitor satisfaction surveys
Objective 2: Tourism support infrastructure developed and maintained	Enhanced visitor satisfaction	New visitor facilities and their maintenance status	Management reports and visitor satisfaction surveys
	Degradation of wildlife habitat	Area developed	Management reports
Objective 3: Tourism products and services diversified	Increased visitation and visitor satisfaction	Marine park visitation	Park visitation data
	Pressure on marine resources	Degradation of marine habitat	Research and monitoring reports

Table 11. Community Partnership and Conservation Education Management Programme Monitoring Plan

Objective	Potential Impacts (Positive and Negative)	Verifiable Indicator	Sources and means of verification
Objective 1: Community participation, collaboration and benefit sharing mechanisms strengthened	Local communities are benefiting from the WMPA	Benefits of consumptive and non-consumptive utilisation of resources	Management reports
Objective 2: Conservation education and outreach programmes strengthened	Increased community support for the WMPA	Resource use conflict incidents	Management reports
Objective 3: Human-wildlife conflicts and natural resource use conflicts reduced	Enhanced relationships between WMPA management and local communities	Human-wildlife conflict incidences	Community Wildlife Service records
	Reduced costs of wildlife to WMPA adjacent communities	Incidents of human-wildlife conflict in terrestrial areas under WMPA's management	Community Wildlife Service records
	Reduced illegal natural resource use in the WMPA	Number of local community members arrested for illegal natural resource use in the WMPA	Security Section Records



**Table 12. MPA Operations and Security Management Programme Monitoring Plan**

Objective or Sub-objective	Potential Impacts (Positive and Negative)	Verifiable Indicator	Sources and means of verification
<b>Objective 1: A competent and motivated workforce deployed and maintained in WMPA</b>	Improved efficiency of WMPA staff	Staff performance against 3-Year Activity Plan	WMPA annual reports
	Improved staff morale	Number of poor morale related incidences	WMPA annual reports
<b>Objective 2: Stakeholders collaboration enhanced</b>	Enhanced management collaboration between KWS, the County Government, Conservation NGOs and the beach operators	Percentage of joint responsibility of 3-year activity plan achieved	Quarterly and annual reports
	Increased stakeholder support for management of the WMPA	Number of management committee meetings or other stakeholder collaboration events held	Meeting minutes or quarterly and annual reports
<b>Objective 3: Infrastructure, vehicles and equipment to support MPA administration enhanced and maintained</b>	Efficient and effective management	Response time to management issues e.g. security issues	WMPA quarterly reports
<b>Objective 4: MPA Security operations enhanced</b>	Increased safety of visitors, and wildlife and staff	Number of security incidents related to visitors, KWS assets, revenue or KWS staff	Security Section records

## PLAN ANNEXES



## ANNEX 1. THREE-YEAR ACTIVITY PLANS (2016 – 2019)

The following pages set out the first 3-Year Activity Plan for implementation of the WMPA management plan. The activity plan details the activities, responsibilities, timeframe necessary for the delivery of each management action over the first 3-year timeframe of this management plan.

### 1. Ecological Management Programme

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
Objective 1: Conservation of WMPA's threatened marine species enhanced													
1.1Update the status of key species of conservation concern in WMPA for regular monitoring													
1.1.1Fill data gaps on the area’s IUCN red list	WMPA Management & CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
1.1.2 Collate available information on opportunistic sightings and enhance scientific data quality	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.1.3 Conduct a monitoring and conservation program for the Key species of conservation concern in collaboration with the local community	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.1.4 Conduct endangered species education and awareness campaign especially among the resident community	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.2 Review environmental stressors and research gaps on endangered and threatened species													
1.2.1 Collate all research work and findings done for WMPA and identify research gaps through a stakeholders forum	SRS-CCA	X	X	X	X								
1.2.2 Collect and collate marine species-specific research works	SRS-CCA	X	X	X	X								
1.2.3 Conduct periodic analysis of data on endangered species	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.2.4. Generate information on the migratory patterns of species of conservation concern and establish the role of the ecosystem	WMPA Management & CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
1.2.5 Advocate for ecological research based on an ecosystem approach	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.2.6 Update and periodically populate a geo-referenced biodiversity data base system	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.2.7 Assess the impact of climate change on species of conservation concern	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.2.8 Develop a geo-physical monitoring system for WMPA	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.2.9 Identify marine and land-based activities with impact on the marine environment	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
1.3 Support the implementation of existing national conservation strategies i.e. Sea Turtle Conservation Strategy, coral reefs and seagrass conservation strategy etc													
1.3.1 Secure sea turtle habitats through active enforcement of legislation and community participation	WMPA Management & CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
1.3.2 Develop and educate fishermen on turtle handling techniques & guidelines, especially when entangled or hooked by fish nets	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.3.3 Collect and collate existing information on nesting and foraging grounds	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.3.4 Advocate for conservation and protection of sea turtle nesting beaches i.e. gazettelement of key turtle nesting sites	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.3.5 Advocate for the use of turtle excluder device	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.3.6 Conduct regular beach cleaning	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.3.7 Implement all existing key species strategies in collaboration with other stakeholders	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.3.8 Develop conservation and management strategies for all key species of conservation concern in WMPA	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.3.9 Monitor the abundance of crown of thorn star fish, <i>Acanthaster planci</i> upon which action is taken to manage the species	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.4 Prioritise research activities on key ecosystem functionality, and social environment impact in relation to the conservation of species of concern													
1.4.1 Identify key marine experts and research institutions undertaking marine ecology research in the region	SRS-CCA	X	X										
1.4.2 Organize a workshop to review major research undertakings and inform future research scope	WMPA Management & CCA Scientists					X							
1.4.3 Identify gaps for further research	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.4.4 Disseminate research priorities to relevant institutions	SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.5 Lobby for and contribute to the development of a National Marine Mammal Conservation and Management Strategy													
1.5.1 Initiate the process of developing the marine mammal conservation strategy	WMPA Management & CCA Scientists	X											
1.5.2 Develop an action plan for the formulation of the strategy	SRS-CCA		X										



MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
1.6 Promote sustainable alternative livelihood interventions and enhance biodiversity awareness													
1.6.1 Promote community based marine ecotourism	WMPA Management	X	X	X	X	X	X	X	X	X	X	X	X
1.6.2 Undertake capacity building on tools and equipment and	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.6.3 Conduct socio-economic valuation of WMPA	SRS-CCA/ Warden WMPA	X											
Objective 2: Important WMPA habitats sustainably conserved													
2.1 Assess the nature, extent of impacts of human activities and other natural factors on coral reef communities													
2.1.1 Identify and map coral reef and sea grass ecosystems	WMPA Management & CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
2.1.2 Experiment on transplantation of sea grass in degraded areas	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.1.3 Implement management plans for identified community marine conservation areas in collaboration with BMU,SDF and KEMFRI	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.1.4 Develop guidelines for establishment of Community Conserved areas	SRS-CCA/ Warden WMPA	X											
2.1.5 Protect corals with artificial reefs (reef balls) and coral planting in degraded sites	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.1.6 Remove aquarium fishers from marine reserve	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.1.7 Implement zoning plans	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.2 Strengthen legal and policy framework and enforce existing laws													
2.2.1 Enforce fishing gear regulations in collaboration with state department of fisheries	WMPA Management NEMA, KMFRI and fisheries department	X	X	X	X	X	X	X	X	X	X	X	X
2.2.2 Enforce regulations on water quality, in collaboration with NEMA, KMFRI,		X	X	X	X	X	X	X	X	X	X	X	X
2.2.3 Enforce tourism regulations and park rules on anchoring	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.2.4 Enforce Code of conduct	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.2.5 Regulate ornamental fisheries in the reserve	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.2.6 Implement seasonal closures within the reserve in collaboration with state Department of Fisheries	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.2.7 Lobby for inclusion of coral reef and sea grass issues in policy forums	SRS-CCA/ Warden WMPA												

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
2.3 Increase stakeholder awareness through education/training and participation in conservation education and awareness activities													
2.3.1 Train boat operators on code of conduct		X	X	X	X	X	X	X	X	X	X	X	X
2.3.2 Train natural resource users, CBOs, BMUs and CFAs in monitoring, law enforcement, and awareness creation in collaboration with key stakeholders	WMPA Management & CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
2.3.3 Conduct coral reef and seagrass ecosystems management training and certification programs for institutions and local communities.	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.3.4 Develop training manuals, coral reef and seagrass and package information in useful products for stakeholders	SRS-CCA/ Warden WMPA					X							
2.3.5 Install sign boards on park habitats and boats code of conduct	SRS-CCA/ Warden WMPA					X	X						
2.3.6 Create a stakeholders forum	SRS-CCA/ Warden WMPA					X							
2.3.7 Highlight marine ecosystem issues through media	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.3.8 Train Personnel on research and monitoring techniques both at technical and community level so that they can monitor their systems and predict changes	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.4 Enhance research, monitoring and information management on coral reefs and sea grass ecosystems													
2.4.1 Centralize data and information depository	WMPA Management & CCA Scientists			X									
2.4.2 Monitor coral reef and sea grass beds		X	X	X	X	X	X	X	X	X	X	X	X
2.4.3 Develop maps of marine environment and habitats within WMPA	SRS-CCA/ Warden WMPA				X	X	X	X					
2.4.4 Undertake research on diseases, pests, invasive species and issues of climate change in relation to corals and seagrass beds	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.4.5 Develop a coordinated framework for research and monitoring	SRS-CCA/ Warden WMPA				X								
2.4.6 Conduct an inventory of WMPA critical ecosystems status and level of resource exploitation	SRS-CCA/ Warden WMPA					X	X						
2.4.7 Undertake applied research on biological, social and economic aspects	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
2.4.8 Conduct research on sources of pollutants on sea grass beds and coral reefs and watersheds	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.4.9 Maintain catch records from reserve (request from BMU, Fisheries)	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.4.10 Continue to monitor and evaluate the impact of climate change and determine potential mitigation and restoration measure	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.4.11 Monitor recovery of sea grass areas degraded by urchins	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
<b>2.5 Manage watershed to improve water quality and reduce pollution</b>													
2.5.1 Organize meetings with watershed communities (upcountry)	WMPA Management & CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
2.5.2 Identify and document existing and potential land based sources of pollution	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.5.3. Enforce, in collaboration with NEMA and other relevant agencies, implementation of environmental management plans of development projects generated through the EIA process	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
<b>2.6 Control illegal activities within the ecosystem</b>													
2.6.1 Map illegal activities (mangrove poaching, charcoal burning, pollution) hotspots	SRS-CCA/ Warden WMPA	X	X	X									
2.6.2 In collaboration with NEMA enforce waste management regulations	Warden WMPA												
<b>2.7 Conduct capacity building and awareness on conservation and management of mangrove ecosystem to KWS staff and other stakeholders</b>													
2.7.1 Share information on importance of conservation of mangroves with staff and stakeholders	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.7.2 Train KWS staff and stakeholders to assist in monitoring of mangrove ecosystem	SRS-CCA/ Warden WMPA				X	X	X	X	X	X	X	X	X
<b>2.8 Conduct research and monitoring on the mangrove ecosystem</b>													
2.8.1 Identify research and monitoring gaps	SRS-CCA/ Warden WMPA	X	X	X									
2.8.2 Implement a monitoring program focused on the mangrove ecosystem in collaboration with stakeholders	SRS-CCA/ Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
<b>2.9 Control marine pollution</b>													
2.9.1 Work closely with NEMA to ensure that all facilities, vessels and individuals observe waste disposal protocols	Warden WMPA, SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
2.9.2 Design and implement a comprehensive system to identify sources of pollution as well as assessing the impacts and extent of waste pollution on the marine ecosystems	Warden WMPA, SRS-CCA			X	X								
2.9.3 Carrying out regular beach cleaning campaigns	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
<b>Objective 3: Threats to WMPA's critical components reduced</b>													
<b>3.1 Promote synergy and integration with other stakeholders</b>													
3.1.1 Form stakeholder coordination committee					X								
3.1.2 Establish theme-based marine reserve integrated resources management and coordination forums for e.g. enforcement committee; conflict resolution committee; etc.	WMPA Management & CCA Scientists				X								
3.1.3 Draw MOUs and agreements with stakeholders to facilitate implementation of highly technical activities in management of the marine reserve	Warden WMPA			X									
3.1.4 Implement collaborative activities in and around the WMPA	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
3.1.5 Build stakeholder capacity on integrated approach to marine ecosystem management	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
<b>3.2 Develop and enforce resource use zones</b>													
3.2.1 Map resources users in the marine reserve, their needs and impacts associated with their activities	WMPA management & CCA scientists	X	X	X									
3.2.2 Undertake rezoning of resource use in the marine reserve	SRS-CCA/Warden WMPA				X	X							
3.2.3 Enforce various zones identified in the marine reserve	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
3.2.4 Monitor resource user activities to ensure compliance with zone use prescriptions	SRS-CCA/Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
3.2.5 Develop and implement conflict resolution mechanism to mediate conflicts	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
<b>3.3 Promote alternative livelihoods for the local fisher folk</b>													
3.3.1 Assess fishing effort and viability of the artisanal fishery in the marine reserve area of WMPA	WMPA Management & fisheries dep	X	X										
3.3.2 Raise fisher community awareness on fishery status		X	X	X	X	X	X	X	X	X	X	X	X



MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
3.3.3 Upscale successful livelihoods sources within the WMPA such as Kipepeo community project and Mida creek board walk among others	Warden WMPA									X	X	X	X
3.3.4 Identify and implement new alternative livelihood options such as ecotourism, beekeeping, butterfly farming, etc	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
3.3.5 Build capacity and empower fisher community to embrace alternative livelihood options	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
3.3.6 Promote community support systems through micro-credit support to enable diversification of livelihood sources	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
<b>3.4 Strengthen law enforcement efforts in the WMPA</b>													
3.4.1 Strengthen patrol and laws enforcement operations in the area by enhancing staff numbers; equipment, etc	WMPA Management	X	X	X	X	X	X	X	X	X	X	X	X
3.4.2 Implement intelligence network and anti-poaching operations in the WMPA and the adjacent areas addressed	WMPA Management	X	X	X	X	X	X	X	X	X	X	X	X
3.4.3 Form and operationalize cross-sectoral enforcement committee to enforce relevant laws in the marine reserve	WMPA Management	X	X	X	X	X	X	X	X	X	X	X	X
3.4.4 Empower BMU units to enforce fisheries regulations in the marine reserve	WMPA Management	X	X	X	X	X	X	X	X	X	X	X	X
3.4.5 Create linkages with local law enforcement agencies e.g. the police service	WMPA Management	X	X	X	X	X	X	X	X	X	X	X	X
<b>3.5 Promote proper waste management measures</b>													
3.5.1 Create awareness on good solid waste management practices	WMPA Management & CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
3.5.2 Map sources of pollution into the WMPA	CCA Scientists, NEMA WMPA Management									X	X	X	X
3.5.3 Install solid waste receptacles at strategic points along the beach				X	X								
3.5.4 Undertake water quality monitoring	CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
3.5.5 Promote solid waste based enterprises targeting composting and recycling	CCA Scientists, NEMA	X	X	X	X	X	X	X	X	X	X	X	X
3.5.6 Undertake joint enforcement of Waste and Water Quality Regulations, 2006 with NEMA	CCA Scientists, NEMA	X	X	X	X	X	X	X	X	X	X	X	X

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
3.5.7 Promote best practices in solid waste and effluent management in and around WMPA	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
<b>3.6 Promote community awareness and participation in WMPA management</b>													
3.6.1 Hold regular public awareness meetings for various resource user groups and general public	WMPA Management	X	X	X	X	X	X	X	X	X	X	X	X
3.6.2 Produce and disseminate education and awareness materials	WMPA Management				X	X							
3.6.3 Engage both print and electronic media to create awareness about WMPA	WMPA Management & CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
3.6.4 Organise workshops and seminars to share best practices on environmental conservation	WMPA Management & CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
3.6.5 Strengthen and encourage access to the WMPA information centre by stakeholders including the local community	WMPA Management	X	X	X	X	X	X	X	X	X	X	X	X
3.6.6 Develop and implement an environmental award scheme to recognize best environmental practices around WMPA	WMPA Management									X	X		
<b>3.7 Control invasive species</b>													
3.7.1 Monitor the crown of thorn star fish and take control measures when density exceeds 1,000/ha	CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
3.7.2 Control Indian House crows through several methods including destruction of their nests, trapping, and creating awareness on waste management	CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
<b>3.8 Establish shoreline setbacks and coastal erosion hazard data</b>													
3.8.1 Design and conduct a study to analyse coastal erosion trends using remote sensing and cadastral survey data to provide data on a property scale	CCA Scientists					X	X	X	X	X	X	X	X
<b>Objective 4: WMPA's ecological components and processes are understood</b>													
<b>4.1 Conduct an assessment of all research studies and monitoring programmes that have been conducted in WMPA in the past</b>													
4.1.1 Collect and collate all the available information	WMPA Management												
& CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X	
4.1.2 Disseminate the available information to WMPA managers	CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
4.1.3 Identify research gaps	CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
4.2 Conduct research on habitats and species													
4.2.1 Carry out research in unstudied and understudied issues and sites	CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
4.2.2 Create habitat, species distribution maps and resource use patterns	CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
4.2.3 Establish long-term monitoring plan	CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
4.3 Review current monitoring capacity and train WMPA staff and communities in ecological monitoring and reporting													
4.3.1 Review the skills of the WMPA staff and stakeholders	CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
4.3.2 Continuously build capacity of local WMPA staff and stakeholders	CCA Scientists/ KMFRI	X	X	X	X	X	X	X	X	X	X	X	X
4.3.3 Certify skills of trained staff	CCA Scientists/ KMFRI	X	X	X	X	X	X	X	X	X	X	X	X
4.4 Intensify collaboration for research, monitoring and management of MPA													
4.4.1 Establish good relations with the scientific community	CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
4.4.2 Involve the local community in the research and monitoring activities	CCA Scientists/ KMFRI	X	X	X	X	X	X	X	X	X	X	X	X
4.4.3 Ensure all researchers carrying out research in the area submit reports to the WMPA managers	CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
4.4.4 Establish national, regional and global networks	CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
4.5 Develop an integrated information management system													
4.5.1 Establish a resource center where all the information (manuscripts, publications, articles and reports) on the WMPA is availed	CCA Scientists											X	X
4.5.2 Establish a position of a resident researcher who will be trained to be the custodian of the resource centre	CCA Scientists												X
4.5.3 Train managers of the WMPA and other stakeholders in the use and retrieval of information	CCA Scientists												X
4.6 Evaluate the WMPA's management effectiveness													
4.6.1 Undertake an evaluation of the management programmes based on information generated through research and monitoring	WMPA Management & CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
4.6.2 Adapt the management programmes based on the evaluation results.	CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X
4.6.3 Involve external reviewers	CCA Scientists	X	X	X	X	X	X	X	X	X	X	X	X

## 2. Tourism Development and Management Programme

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
Objective 1: Tourism administration and management enhanced													
Action 1.1 Facilitate formation of WMPA tourism stakeholder forum													
1.1.1 Identify main stakeholders and organize workshop with identified tourism stakeholders to deliberate on the need for establishing a tourism stakeholder forum	Warden WMPA			X									
1.1.2 Organize a workshop to constitute a tourism stakeholder forum interim committee and develop terms of reference for the committee including development of vision, mission, objectives, guiding principles and draft constitution of the forum	Warden WMPA					X							
1.1.3 In liaison with interim committee, organize meetings to help the interim committee execute its mandate	Warden WMPA							X	X	X	X	X	X
1.1.4. Organize stakeholder workshop to review/adopt draft constitution and elect stakeholder committee	Warden WMPA								X				
1.1.5 In liaison with committee, organize meetings to develop a strategic plan for the forum	Warden WMPA								X	X	X	X	X
1.1.6 Support implementation of the strategic plan	Warden WMPA									X	X	X	X
1.2 Monitor and manage visitors impacts													
1.2.1 Install additional buoys and Moorings within Watamu Marine National Park	Warden WMPA, SRS-CCA			X	X	X	X	X	X	X	X	X	X
1.2.2 Conduct visitor carrying capacity and impact assessment for the MPA and develop impact monitoring and mitigation plan	Warden WMPA, SRS-CCA			X	X	X	X	X	X	X	X	X	X
1.2.3 Set and enforce standards (code of conduct) for boat operators and tourists	Warden WMPA, SRS-CCA			X	X	X	X	X	X	X	X	X	X
1.2.4 Support / facilitate implementation of impact monitoring and mitigation plan	Warden WMPA, SRS-CCA			X	X	X	X	X	X	X	X	X	X
1.2.5 Identify and create new sites to reduce pressure on the existing ones	Warden WMPA, SRS-CCA			X	X	X	X	X	X	X	X	X	X
1.3 Liaise with relevant authorities to train rangers, customer care staff and TPU officers on basic visitor handling and guiding practices													
1.3.1 Organize meetings with tourist police to sensitize them and share information on visitor handling and best practices	Warden WMPA				X	X	X	X	X	X	X	X	X



MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
1.3.2 Organize workshops bringing together wardens, tourist police, local communities, organized groups and tour operators to deliberate on their strengths, opportunities and challenges in the tourism sector and forge better working relationships.	Warden WMPA				X	X	X	X	X	X	X	X	X
1.3.3 Train selected TP on visitor handling	Warden WMPA				X	X	X	X	X	X	X	X	X
<b>1.4 Register and regulate boat operator and beach operator activities and their associations</b>													
1.4.1 Review and enforce standards for boat operators in relation to registration of vessels, working through organized groups	Warden WMPA, AD CCA				X	X	X	X	X	X	X	X	X
1.4.2 Organize meetings with boat operators to sensitize them on the standards and consequences for non-compliance	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.4.3 Liaise with KMA to carry out regular inspection to ensure compliance to the above standards	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.4.4 Lobby for gazettelement of the standards	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
<b>Action 1.5 Ensure safety of park visitors and boat operators</b>													
1.5.1 Ensure all boats carry sufficient safety equipments, e.g. life-rings, life jackets and/or floats	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.5.2 Liaise with the KMA to have all boats in the WMPA inspected for seaworthiness	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.5.3 Conduct impromptu checks on visitor boats operating in WMPA to authenticate if they are seaworthy	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.5.4 Discontinue the operations of all boats that are found to be unseaworthy from operating in the MPAs	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
<b>1.6 Develop and gazette Navigational Regulations for the WMPA</b>													
1.6.1 Organize security boat patrols to curb speeding	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.6.2 Conduct stakeholder meeting to review the existing code of conduct with regard to speeding	Warden WMPA			X									
1.6.3 Liaise with the KWS HQs to have the new regulations gazetted	Warden WMPA				X	X							
1.6.4 Avail the new regulations to all boat operators and other tourism players in the WMPA	Warden WMPA					X	X	X	X	X	X	X	X

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
Objective 2: Tourism Support infrastructure developed and maintained													
2.1 Develop infrastructure to support local tourism enterprises													
2.1.1 Carry out infrastructural development needs assessment within the MPA	Warden WMPA	X	X										
2.1.2 Design, procure and install / construct priority infrastructure such as visitor information centre, public water and sanitation facilities, waste bins etc.	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.1.3 Rehabilitate access roads	Warden WMPA	X	X	X	X								
2.1.4 Develop ablution facilities at the beach	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.1.5 Design and rehabilitate basic water, sanitation and hygiene facilities	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.2 Upgrade and maintain the parking area													
2.2.1Develop designs of the parking area	Warden WMPA					X	X	X	X				
2.2.2 Construct the parking area	Warden WMPA								X	X	X	X	X
Objective 3: Tourism products and services diversified													
3.1 Identify and explore possibilities to introduce artificial reefs													
3.1.1 Carry out feasibility study	Warden WMPA, SRS CCA	X	X	X	X	X	X	X	X	X	X	X	X
3.1.2 Carry out environmental impact assessment	Warden WMPA, SRS CCA	X	X	X	X	X	X	X	X	X	X	X	X
3.1.3 Introduce artificial reefs if practicable	Warden WMPA, SRS CCA	X	X	X	X	X	X	X	X	X	X	X	X
3.2 Assess current marketing methods and scope and develop a marketing strategy for the WMPA													
3.2.1 Develop a marketing strategy	Warden WMPA, SRS CCA			X	X	X	X	X	X	X	X	X	X
3.2.2 Participate in tourism promotion expositions				X	X	X	X	X	X	X	X	X	X
3.3 Link with KWS HQ Marketing Section to ensure WMPA is included in the KTB national marketing strategy													
3.3.1 Develop / review marketing strategy for WMPA	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.3.2 Develop marketing tools (brochures, video materials maps, pamphlets, magazines, directories, internet)	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.3.3 Liaise with KWS marketing section to lobby for inclusion of WMPA in KTB marketing strategy	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.4 Conduct a capacity building exercise for all groups dealing with ecotourism to meet required standards													
3.4.1 Carry out training needs among tourism stakeholders	Warden WMPA		X	X									

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
3.4.2 Train identified groups/ associations to enhance their capacity for example in small business management, interpretative and marine guide skills and visitor handling	Warden WMPA				X	X	X	X	X	X	X	X	X
3.4.3 Assist organized groups to establish a revolving fund that can be utilized for maintenance and development costs	Warden WMPA				X	X	X	X	X	X	X	X	X
3.4.4 Train officials of the groups in leadership skills	Warden WMPA				X	X	X	X	X	X	X	X	X
3.4.5 Enhance the ability to increase business through marketing e.g. through production of marketing materials including brochures and fliers	Warden WMPA				X	X	X	X	X	X	X	X	X
3.4.6 Support organized groups to develop investment plans to cater for the low season when business is slow	Warden WMPA				X	X	X	X	X	X	X	X	X
<b>3.5 Embark on domestic tourism marketing campaign using appropriate methods</b>													
3.5.1 Develop a domestic tourism marketing strategy, plan and tools for marine parks/reserves	Warden WMPA, AD CCA			X	X	X	X	X	X	X	X	X	X
3.5.2 Partner with mobile phone operators to market marine parks through mobile phones.	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.5.3 Establish and roll out a staff MPA marketing campaigns	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.5.4 Make use of print and audio visual media to promote marketing of WMPA	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.5.5 Market and popularize Malindi-Watamu Tourism Circuit connecting Watamu MPA, Mida Creek and Board Walk, Sudi Kirebe Islands, Arabuko Sokoke Forest, Gede Ruins, Malindi MPA, and Sabaki River Mouth	Warden WMPA			X	X	X	X	X	X	X	X	X	X
<b>3.6 Market WMPA as an ideal site for corporate team building, fun and adventure activities</b>													
3.6.1 Form a steering committee to come up with modalities for the identification and establishment team building sites for the WMPA	Warden WMPA		X	X									
3.6.2 Develop a marketing strategy to popularise the identified sites for team building	Warden WMPA				X	X	X						
3.6.3 formulate a three day package for team building in the WMPA	Warden WMPA					X	X						
3.6.4 Recruit a team building officer for WMPA	Warden WMPA							X					

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
3.7 Promote, enhance and market cultural events and historical sites in liaison with stakeholders													
3.7.1 Develop calendar of cultural events within WMPA	Warden WMPA, NMK			X	X	X	X	X	X	X	X	X	X
3.7.2 Market the cultural events widely	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.7.3 Identify important cultural cuisine and market them in hotels within WMPA	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.7.4 Sensitize local communities on the importance of forming and marketing cultural centres	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.7.5 Create awareness, develop and promote the historical ruins to locals and the WMPA managers	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.7.6 Liaise with National Museums of Kenya for rehabilitation of Historical Ruins	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.7.7 Train selected locals as tour guides	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.7.8 In liaison with National Museums, sensitize local community on value and conservation of the ruins	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.8 Identify potential home stays and promote their adoption in WMPA													
3.8.1 Carry out an assessment to determine the potential of WMPA for home stays	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.8.2 Sensitize local communities on the potential of home stays	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.8.3 Lobby with Tourism Department to develop standards for home stays and sensitize local communities on the same	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.8.4 Liaise with established tour operators to include home stays in their tour itineraries	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.9 Establish youth and women development programmes													
3.9.1 Collate information on potential nature-based/ tourism related enterprises in WMPA	Warden WMPA	X	X										
3.9.2 Sensitize youth on potential nature-based / tourism related enterprises in WMPA	Warden WMPA			X	X	X	X	X	X	X	X	X	X
3.9.3 In liaison with relevant funding agencies, sensitize youth on procedures for accessing funding support	Warden WMPA, SRS-CCA			X	X	X	X	X	X	X	X	X	X



### 3. Community Partnership and Conservation Education Programme

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
Objective 1: Community participation, collaboration and benefit sharing mechanisms strengthened													
1.1 Collaborate with local communities in the management of WMPA													
1.1.1 Develop clear definitions of community and WMPA management roles & responsibilities through formal agreements	Warden WMPA, PMC						X	X					
1.1.2 Train local residents as specialists in a variety of skills to act as trainers of trainers (TOT)	Warden WMPA, PMC				X	X							
1.1.3 Recognise elected community representatives and place them in the forefront of public activities related to WMPA management	Warden WMPA, PMC				X								
1.1.4 Develop a structured collaborative relationship with shared responsibilities, mutual authority and accountability for successful sharing of resources & rewards	Warden WMPA					X							
1.2 Support implementation of community projects and formulate conservation benefit sharing mechanism													
1.2.1 Continue providing material, technical and financial support to ensure successful completion of ongoing CSR projects	Warden WMPA				X	X	X	X	X	X	X	X	X
1.2.2 Support a PRA exercise	Warden WMPA						X						
1.2.3 Formulate conservation benefit sharing mechanism	Chairperson-CWCCC							X					
1.2.4 Based on the PRA findings, train local communities on development of project proposals	Warden WMPA								X	X	X		
1.3 Establish a community consultative forum as a platform for stakeholder cooperation													
1.3.1 Create awareness on existing forums among resident community	Warden WMPA	X	X	X									
1.3.2 Form, register and operationalize a Watamu Community Consultative Forum	Warden WMPA					X							
1.3.3 Develop best practice guidelines & regulations that provide for participatory natural resource management	Warden WMPA						X						
1.3.4 Invigorate existing forums	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.4 Carry out a social-economic study to determine viable community based income generating activities to be promoted in WMPA													
1.4.1 Conduct a socio-economic study to catalogue spatial distribution of exploitable natural and cultural resources	Warden WMPA						X						
1.4.2 Diversify tourism options to relieve pressure on the reefs	Warden WMPA							X					

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
1.5 Explore potential markets for community products													
1.5.1 Carry out market research before community business products and services are produced	Warden WMPA								X	X			
1.5.2 Undertake evaluation studies on the challenges & opportunities of proposed community business projects	Warden WMPA										X		
1.5.3 Identify potential market for community products	Warden WMPA												
1.6 Enhance the capacity of local communities in project management													
1.6.1 Train community leaders on project planning and implementation	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.6.2 Train community leaders on project business management & leadership skills Develop legal constitutions for community groups to guide and govern their operations	Warden WMPA, DFO	X	X	X	X	X	X	X	X	X	X	X	X
1.6.3 Ensure proper book keeping and regular audits as per group constitution	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.6.4 Form management committees to handle segments of project implementation	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.7 Diversify funding opportunities for community projects													
1.7.1 Sensitize local communities on existing alternative funding opportunities in WMPA	Warden WMPA					X							
1.7.2 Solicit for technical assistance on proposal writing on behalf of the local community groups	Warden WMPA						X						
1.7.3 Develop project proposals for durable financial mechanisms through support from UNESCO's Man and Biosphere programme	Warden WMPA, SRS-CCA							X					
1.7.4 Promote community support systems through micro-credit support for the youth and the vulnerable groups	Warden WMPA								X				
1.8 Enhance employment opportunities for local community members													
1.8.1 Give special consideration to local community youth while recruiting staff in WMPA	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.8.2 Source casual employees from the local communities	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.8.3 Strengthen enforcement using community based groups like scouts	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.8.4 Identify best alternative livelihoods	Warden WMPA, SRS-CCA	X	X										

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
Objective 2: Conservation education and outreach programmes strengthened													
2.1 Create public conservation awareness on the importance of WMPA													
2.1.1 Develop publicity materials on WMPA resource values	Warden WMPA	X	X	X	X								
2.1.2 Create awareness on threats to WMPA and ongoing interventions	Warden WMPA	X	X	X									
2.1.3 Create an interaction electronic platform to disseminate information on the WMPA	Warden WMPA					X	X						
2.1.4 Participate on World Conservation Events	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
2.2 Design and implement a conservation education outreach programme													
2.2.1 Develop stakeholder specific education and awareness materials	Warden WMPA						X						
2.2.2 Lobby school communities to form and strengthen WCK clubs and visit WMPA as an education and entertainment destination	Warden WMPA			X	X	X	X	X	X	X	X	X	
2.2.3 Deliver conservation lectures and video shows in local schools	Warden WMPA			X	X	X	X	X	X	X	X	X	X
2.2.4 Avail transport to local wildlife clubs at a modest fee and where possible with free boat rides	Warden WMPA			X	X	X	X	X	X	X	X	X	X
2.3 Strengthen KWS – Honorary wardens and other stakeholders working relationships													
2.3.1 Sensitize honorary wardens on KWS roles, WMPA resource conservation requirements, Wildlife Act 2013	Warden WMPA, AD-CCA							X	X	X	X	X	X
2.3.2 Provide Judiciary, Kenya Police Service, Public with special (sensitization) seminars involving field - based demonstration visits	Warden WMPA				X								
2.3.3 Use honorary wardens to relay reports to WMPA management for appropriate response	Warden WMPA				X								
2.3.4 Liaise with existing government structures in the grassroots especially the provincial administration in monitoring and sharing information on HWC in their respective areas of jurisdictions to facilitate timely response	Warden WMPA				X	X							

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME												
		FY 2016-17				FY 2017-18				FY 2018-19				
		1	2	3	4	1	2	3	4	1	2	3	4	
Objective 3: Human wildlife conflicts and natural resource use conflicts reduced														
3.1 Assess and adopt innovative problem animal control techniques														
3.1.1 Carry out research on new PAC techniques	Warden WMPA, SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X	X
3.1.2 Liaise with CCA research unit in identifying and assessing potential new PAC techniques	Warden WMPA, SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X	X
3.1.3 Undertake an exposure/ study visit to familiarise with these techniques	Warden WMPA					X	X	X	X					
3.1.4 Acquire the necessary equipment	Warden WMPA						X	X						
3.1.5 Carry out pilot trials	Warden WMPA								X	X				
3.1.6 Equip the communities and train them on the most successful PAC techniques	Warden WMPA						X	X						
3.1.7 Acquire and develop a computerised GIS-based database for recording and mapping the location, type and severity of HWC incidences around the WMPA (in consultation with the CCA Research Section)	Warden WMPA, SRS-CCA					X	X	X						
3.1.8 Train WMPA staff on G.I.S data collection and management	Warden WMPA, SRS-CCA					X								
3.1.9 Map out the HWC hotspots using G.I.S	Warden WMPA, SRS-CCA						X	X	X					
3.1.10 Confirm and amend the indentified HWC hotspots through a participatory process involving extensive consultation with the local communities around the WMPA	Warden WMPA, SRS-CCA							X	X					
3.2 Enhance collaboration with the County Wildlife Conservation and Compensation Committee (CWCCC)														
3.2.1 Carry out a sensitization campaign to educate the local community on the wildlife compensation requirements highlighting cases that can and cannot be compensated	Warden WMPA, Chairper-son-CWCCC		X	X										
3.2.2 Sensitize the community about the existence of the CWCCC as provided for in the Wildlife Act 2013.	Warden WMPA, Chairper-son-CWCCC				X	X	X	X	X					
3.2.3 Fast track implementation and operationalization of this committee in WMPA	Warden WMPA									X	X	X	X	
3.2.4 Conduct continuous consultation, dialogue and awareness over wildlife problems in WMPA	Warden WMPA, PMC									X	X	X	X	



MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
3.3 Construct new and strengthen existing ranger outposts													
3.3.1 Develop new outposts at several hotspots like Kanani and any other priority HWC hotspots	Warden WMPA			X	X	X	X						
3.4 Enhance incidence reporting for HWC													
3.4.1 Provide serviceable hotlines contacts to the adjacent communities	Warden WMPA						X						
3.4.2 Establish and maintain a human wildlife conflict database	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
3.4.3 Liaise with existing government structures in the grassroots especially the provincial administration in monitoring and sharing information on HWC in their respective areas of jurisdictions to facilitate timely response	Warden WMPA			X	X	X							
3.5 Identify and document resource use conflict areas within WMPA													
3.5.1 Carry out participatory mapping of all the conflict hot spots	Warden WMPA, SRS-CCA			X	X	X	X						
3.5.2 Identify and document all the conflicts areas to help design viable solutions	Warden WMPA, SRS-CCA					X	X	X	X				
3.6 Liaise with State Department of Fisheries(SDF) to formalise access of migrant fishermen to Kenyan fishery													
3.6.1 Work with SDF to monitor activities migrant fishers		X	X	X	X	X	X	X	X	X	X	X	X
3.7 Liaise with the Fisheries Department of to establish a vibrant conservation area fisheries management committee (FMC)													
3.7.1 Review fishing regulations & guidelines to reflect the intended sustainable conservation of fish resources within the park & national reserve as per the Wildlife Act, 2013	Warden WMPA												
3.7.2 Define the terms of reference for FMC from inception (in light of prevailing legal provisions)	FMC/ Warden WMPA							X	X				
3.7.3 Explore delineation of several user zones within WMPA with marker buoys in consultation with the fishers and dive operators	Warden WMPA, FMC								X	X			
3.7.4 Encourage the sport fishing companies to register as BMU and contribute to the BMU kitty	Warden WMPA, FMC									X	X		
3.7.5 Explore appropriate ways of dealing with conflicts between sport fishers and artisanal fishers for the benefit of fishery resource conservation	Warden WMPA, FMC												X

#### 4. MPA Operations and Security Management Programme

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
Objective 1: A Competent and motivated workforce deployed and maintained in WMPA													
1.1 Deploy appropriate staff													
1.1.1 Employ staff currently on temporary basis on permanent and pensionable terms	Warden, Human Capital-KWS HQ	X	X	X	X								
1.1.2 Deploy staff according to their competencies		X	X	X	X	X	X	X	X	X	X	X	X
1.2 Train staff in relevant skills													
1.2.1 Carry out staff appraisal to identify the weakness and strength	Warden, Human Capital-KWS HQ	X	X	X	X	X	X	X	X	X	X	X	X
1.2.2 Liaise with KWS HQs training office to train staff on the required skills	Warden, Human Capital-KWS HQ	X	X	X	X	X	X	X	X	X	X	X	X
1.2.3 Conduct in house short courses on marine skills for newly posted personnel	Warden, Human Capital-KWS HQ	X	X	X	X	X	X	X	X	X	X	X	X
1.2.4 Encourage staff to acquire extra skills in the marine conservation field	Warden, Human Capital-KWS HQ	X	X	X	X	X	X	X	X	X	X	X	X
1.3 Improve prosecutorial capacity of WMPA													
1.3.1 Deploy a KWS staff trained in prosecution procedures to WMPA	Warden WMPA	X	X	X	X								
1.3.2 Collaborate with stakeholders and surrounding communities to improve prosecution of wildlife crime	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.3.3 Train staff on court procedures and the Wildlife Act, 2013	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.3.4 Make follow ups of court cases	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.4 Enhance staff motivation													
1.4.1 Provide appropriate working tools (e.g., uniforms)	Warden, Human Capital-KWS HQ	X	X	X	X	X	X	X	X	X	X	X	X
1.4.2 Recognise outstanding staff formally	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.4.3 Establish recreation facilities	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.4.4 Facilitate sporting and other team building activities e.g. competitive swimming, beach volleyball	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
1.5 Improve Staff Welfare													
1.5.1 refurbish the staff canteen	Warden, Human Capital-KWS HQ									X	X	X	X
1.5.2 Enhance staff welfare budgetary allocations	Warden WMPA, AD-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.5.3 Provide adequate and better housing facilities and working environment	Warden WMPA, AD-CCA	X	X	X	X	X	X	X	X	X	X	X	X
1.5.4 Promote teamwork and creation of good working environment	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
1.5.5 Buy a TV decoder	Warden WMPA	X											
1.5.6 Provide a staff welfare van (29 seater)	Warden WMPA, AD-CCA									X	X	X	X
<b>Objective 2: Stakeholders collaboration enhanced</b>													
<b>2.1 Establish a functional WMPA Management Committee</b>													
2.1.1 Identify relevant committee members and officially launch the committee	Warden WMPA	X	X										
2.1.2 Develop and review comprehensive terms of reference the committee	Warden WMPA		X										
2.1.3 Hold consultative meetings on monthly basis to review management progress	Warden WMPA			X	X	X	X	X	X	X	X	X	X
<b>2.2 Build strong relations with local Beach Operators, Conservation NGOs, Research Institutions, Hoteliers</b>													
2.2.1 Identify the relevant stakeholder groups	Warden WMPA	X	X										
2.2.2 Develop and sign MOUs with stakeholder groups	Warden WMPA			X	X	X	X	X	X	X	X	X	X
2.2.3 Hold consultative meetings, training and teambuilding activities	Warden WMPA			X	X	X	X	X	X	X	X	X	X
2.2.4 Organize and hold workshops and conferences to disseminate research findings	Warden WMPA/ SRS-CCA			X	X	X	X	X	X	X	X	X	X
<b>2.3 Work with State Department of Fisheries (SDF) to enhance management of fisheries resources</b>													
2.3.1 Develop a framework for collaboration between WMPA management and SDF	Warden WMPA			X	X								
2.3.2 Develop and sign an MOU	Warden WMPA/SDF					X							
2.3.3 Hold monthly, quarterly, yearly meetings with SDF	Warden WMPA/SDF					X	X	X	X	X	X	X	X
2.3.4 Engage and train fishers in the net exchange program	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
<b>2.4 Collaborate with County and National Government conservation agencies in enhancing management of the MPA</b>													
2.4.1 Attend County and National Government meetings to lobby and increase awareness of WMPA issues	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
<b>2.5 Develop joint funding proposals</b>													
2.5. 1 Develop joint funding proposals	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
<b>2.6 Develop and implement a participatory beach management plan</b>													
2.6.1 Reestablish the core planning team	Warden WMPA		X	X									
2.6.2 Organise planning meetings and workshops	Warden WMPA				X	X	X	X	X	X	X		

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
2.6.3 Prepare the beach management plan with clear prescriptions on resource use along the beach	Warden WMPA											X	X
<b>Objective 3: Infrastructure, vehicles and equipment to support MPA administration enhanced and maintained</b>													
<b>3.1 Appropriate transport equipment procured</b>													
3.1.1 Liaise with KWS HQs to procure additional patrol boats and vehicles	Warden WMPA/AD-CCA									X	X	X	X
<b>3.2 Ensure prompt repair and maintenance of transport equipment</b>													
3.2.1 Undertake routine maintenance of all boats and vehicles	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
3.2.2 Liaise with KWS HQs to acquire relevant licenses for vehicles and boats	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
<b>3.3 Construct additional staff houses and office blocks</b>													
3.3.1 Undertake routine maintenance of residential and non-residential buildings	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
3.3.2 Liaise with KWS HQs to develop a site plan at the park HQs	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
3.3.3 Conduct EIA for all facilities to be constructed	Warden WMPA/SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
3.3.4 Liaise with KWS HQs to raise funds required for construction of the facilities	Warden WMPA/AD-CCA	X	X	X	X	X	X	X	X	X	X	X	X
3.3.5 Supervise construction of all park facilities	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
3.3.6 Carry out environmental audits for all park facilities	Warden WMPA/SRS-CCA	X	X	X	X	X	X	X	X	X	X	X	X
3.3.7 Liaise with KWS HQs to procure office equipment and furniture	Warden WMPA/AD-CCA	X	X	X	X	X	X	X	X	X	X	X	X
3.3.8 Undertake routine maintenance of office equipment	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
3.3.9 Liaise with the Mombasa IT office and KWS IT Department to ensure that internet connectivity is maintained	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
<b>3.4 Procure and maintain scuba and snorkelling gear</b>													
3.4.1 Undertake an inventory of all scuba and snorkeling equipment	Warden WMPA	X											
3.4.2 Develop a proposal and budget in liaison with the procurement office to procure additional scuba and snorkeling equipment	Warden WMPA									X	X	X	X
3.4.3 Undertake routine maintenance of scuba and snorkeling equipment	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
3.4.4 Train staff on use of scuba and snorkeling equipment	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
3.4.5 Construct and equip the scuba and snorkeling store	Warden WMPA									X	X	X	X



MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
3.5 Procure and maintain office equipment													
3.5.1 Procure modern office equipment	Warden WMPA												
3.5.2 Ensure office equipment is regularlymaintenaned	Warden WMPA												
3.6 Install VHF radios in all boats and vehicles in WMPA													
3.6.1 Carry out an inventory of all radios in the park	WMPA-Security; Wardens	X											
3.6.2 Liaise with KWS HQs to acquire and install new digital radios in radio room, vehicles and boats	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
3.6.3 Liaise with KWS HQs to acquire digital hand held radio sets	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
3.6.4 Liaise with communication workshop in Mombasa for routine maintenance of all fixed and hand held radios	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
Objective 4: MPA security operations enhanced													
4.1 Establish good institutional framework for beach operators													
4.1.1 Develop suitable codes of conduct for each stakeholder group	WMPA-Security; Warden	X	X	X	X								
4.1.2 Register members and develop mechanism for identification e.g. use of tags and/or shirts with a logo for easy recognition and management.	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.1.3 Providing training and capacity building to beach operators.	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.2 Conduct regular joint patrols													
4.2.1 Liaise with other relevant institutions to facilitate widespread monitoring and enforcement.	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.2.2 Undertake joint regular patrols and operations (e.g., between TPU and KWS)	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.2.3 Engage multiagency security teams in sharing of intelligence information	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.2.4 Arrest and prosecute any violator of the MPA regulations and laws	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.2.5 Conduct high profile patrols along the beach to disrupt any intended illegal missions	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.3 Provide appropriate equipment to security personnel													
4.3.1 Undertake an inventory of security	Warden WMPA	X											
4.3.2 Identify additional equipment required by security teams	Warden WMPA		X										

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
4.3.3 Provide security equipment (e.g., tents, sleeping bags, water bottles, uniforms, boots, water proof camera, night vision goggles, night scope, rucksacks, computers and Dictaphones etc).	Warden WMPA/AD-CCA	X	X	X	X	X	X	X	X	X	X	X	X
<b>4.4 Improve prosecution of wildlife and visitor harassment related offences</b>													
4.4.1 Engage the judiciary and the police on matters pertaining to court procedures and penalties	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.4.2 Organize orientation tours to MPA for the police, prosecutors and judiciary to create awareness on the impacts of wildlife offences on the economy	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.4.3 Train KWS staff on drafting of charge sheets and court procedures.	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
<b>4.5 Fast track acquisition of appropriate legal documents for KWS property</b>													
4.5.1 Undertake an inventory of KWS property including registration status	Warden WMPA	X											
4.5.2 Liaise with KWS lands office for acquisition of the title deeds	Warden WMPA		X	X	X	X	X	X	X	X	X	X	X
4.5.3 Survey and fence KWS properties	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.5.4 Design and install signage in all KWS properties	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.5.6 Initiate some developments within undeveloped properties	Warden WMPA/AD-CCA	X	X	X	X	X	X	X	X	X	X	X	X
<b>4.6 Install additional maintain moorings and buoys at anchorage sites in WMPA</b>													
4.6.1 Carry out a site survey (depth, seabed conditions, tidal range, currents, waves and wind factors)	Warden WMPA					X	X						
4.6.2 Disseminate information on positions of buoys to resource users such as boat operators, tourism police, provincial administration, SDF and other relevant institutions	Warden WMPA							X	X	X	X	X	X
4.6.3 Offer guidance and training on the use of mooring buoys for all boat operators, visitors and institutions	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.6.4 Procure moorings and buoys with long lasting material	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.6.5 Develop a monitoring and maintenance schedule of mooring buoys	Warden WMPA	X											
4.6.6 Replace unserviceable mooring buoys	Warden WMPA		X	X	X	X	X						
4.6.7 Undertake routine manual cleaning	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
4.7 Ensure proper maintenance of moorings and buoys													
4.7.1 Conduct monthly checks on moorings and buoys state	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.7.2 Conduct regular maintenance of moorings and buoys	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.8 Delineate MPA boundaries													
4.8.1 Survey and mark the WMPA boundary	KWS Survey section	X	X	X	X								
4.8.2 Sensitize stakeholders on MPA boundary	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.9 Ensure compliance with environmental regulations													
4.9.1 Collaborate with NEMA in conducting environmental inspections in the tourism facilities along the sea shore	Wardens and NEMA	X	X	X	X	X	X	X	X	X	X	X	X
4.9.2 Ensure that no permanent developments are installed in the 60m sea shore setback	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.9.3 Ensure that all proposed developments along the sea shore are subjected to EIA	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.9.4 Ensure that facilities along the sea shore adhere to their environmental management plans and they conduct annual environmental audits	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.9.5 Monitor effluents from existing facilities and compare results with gazetted standards	Warden WMPA/SRS-CCA/NEMA	X	X	X	X	X	X	X	X	X	X	X	X
4.9.6 Hold consultative meetings with facility managers to emphasise on need to comply with EMCA, 1999	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.10 Ensure that all boat operators, sport fishers, and fishing vessels are duly licensed and compliant													
4.10.1 Undertake an inventory of the status of all boat operators, sport fishers and fishing vessels	Warden WMPA	X	X										
4.10.2 Develop MoUs between KWS and other licensing agencies and beach operators to ensure a mechanism for monitoring compliance is in place	Warden WMPA	X	X	X	X	X	X	X					
4.10.3 Undertake regular inspection of all vessels and fishing equipment	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.10.4 Hold training workshops for boat operators, sport fishers, and fishing vessels owners to sensitize them on Maritime laws and regulations	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.10.5 Liaise with other security agents to enforce maritime laws and regulations	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X

MANAGEMENT ACTION AND ACTIVITIES	PERSONS RESPONSIBLE	TIME FRAME											
		FY 2016-17				FY 2017-18				FY 2018-19			
		1	2	3	4	1	2	3	4	1	2	3	4
4.11: Enhance security for WMPA visitors													
4.11.1 Liaise with tourism police to increase visitor safety	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.11.2 Increase tourism security patrols during high seasons	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.11.3 Establish a communication link with BMU operators	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.11.4 Establish radio communication with tourist facilities WMPA	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.11.5 Establish a 24-hour hotline number for visitors and BMU operators	Warden WMPA	X	X	X	X								
4.11.6 Train security teams on terrorism and disaster preparedness	Warden WMPA	X	X	X	X								
4.12 Establish and maintain a security database for WMPA													
4.12.1 Design, update and use appropriate database for WMPA management	WMPA-Security	X	X	X	X	X	X	X	X	X	X	X	X
4.12.2 Procure database computer and accessories	Warden WMPA	X	X	X	X								
4.12.3 Deploy and train WMPA database staff	Warden WMPA	X	X	X	X								
4.12.4 Model and map security hotspots	WMPA-Security/ SRS-CCA					X	X	X	X				
4.13 Strengthen law enforcement efforts in WMPA													
4.13.1 Enhance staff numbers and operation/patrol equipment	Wardens	X	X	X	X	X	X	X	X	X	X	X	X
4.13.2 Implement intelligence gathering and anti-poaching measures in the WMPA and adjacent areas	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.13.3 Form and operationalise a cross-sectoral enforcement committee to enforce relevant laws in the MPA	Warden WMPA	X	X	X	X								
4.13.4 Empower BMU units to enforce fisheries regulation in the marine reserve	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.13.5 Create linkages with local law enforcement agencies e.g. Police Service, Kenya Navy etc.	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.14 Ensure adequate law enforcement in conflict areas													
4.14.1 Establish a security collaborative forum	Warden WMPA	X	X	X	X	X	X	X	X	X	X	X	X
4.14.2 Carry out joint security operations		X	X	X	X	X	X	X	X	X	X	X	X



## ANNEX 2. ACTION PLANS FOR WMPA's PRIORITIES

The priority actions that will be implemented in the first three years of plan implementation are presented in the following tables.

### 1. Ecological Management Programme Action Plan

Management Action	Responsibility	Milestones
<b>Action 2.3 Increase stakeholder awareness through education/training and participation in conservation education and awareness</b>	SRS-CCA and Park Warden	At least three community awareness meetings carried out annually
<b>Action 3.4 Strengthen law enforcement efforts in the WMPA</b>	Park Warden	Infringement of MPA rules reduced by 50% by the end second year of plan implementation
<b>Action 3.6 Promote community awareness and participation in WMPA management</b>	SRS-CCA and Park Warden	Park-Community working collaborative mechanism developed by the end of second year of plan implementation
<b>Action 3.8 Establish shoreline setbacks and coastal erosion hazard data</b>	"	Erosion hazard data collected quarterly
<b>Action 4.6: Evaluate the management plan at specified intervals</b>	"	Management plan evaluated every three years

### 2. Tourism Development and Management Programme Action Plan

Management Action	Responsibility	Milestones
<b>Action 1.1 Facilitate formation of WMPA tourism stakeholder forum</b>	Park Warden	A tourism Stakeholder's Forum is functional by the end of second year
<b>Action 1.2 Monitor and manage visitors impacts</b>	SRS and Park Warden	A visitor impact monitoring system is in place by the end of third year
<b>Action 1.4 Register and regulate boat operator and beach operator activities and their associations</b>	Park Warden	All boat and beach operators in WMPA registered by the end of the first year
<b>Action 2.1 Develop infrastructure to support local tourism enterprises</b>	Park Warden	Beach toilets constructed by the end of the second year

### 3. Community Partnership and Conservation Education Programme Action Plan

Management Action	Responsibility	Milestones
<b>Action 1.1 Collaborate with local communities in the management of WMPA</b>	Park Warden	Train selected local community members in aspects of MPA management by the end of year three
<b>Action 1.2 Support implementation of community projects and formulate conservation benefit sharing mechanism</b>	"	Conduct a participatory Rural Appraisal by the end of the second year
<b>Action 1.3 Enhance community consultative forum as a platform for stakeholder cooperation</b>	"	Register a Marine Community Consultative Forum (MCCF) by the end of the first year
<b>Action 1.8 Enhance employment opportunities for local community members</b>	"	At least all unskilled labour is sourced from the local community
<b>Action 2.1 Create public conservation awareness on the importance of WMPA</b>	"	At least one community baraza is organized quarterly
<b>Action 2.3 Design and implement a conservation education outreach programme</b>	"	A community outreach strategy is developed by the end of year two
<b>Action 3.2 Enhance collaboration with the County Wildlife Conservation and compensation Committee (CWCCC)</b>	"	Hold quarterly meetings with the Kilifi CWCCC
<b>Action 3.7 Liaise with the fisheries department to establish a vibrant conservation area Fisheries Management Committee</b>	"	A fisheries related MPA management committee established by the end of year

**4. MPA Operations and Security Programme Action Plan**

Management Action	Responsibility	Milestones
<b>Action 1.1 Deploy appropriate staff</b>	Park Warden & KWS HQs	Staff with relevant skills deployed by the end of year three
<b>Action 2.1 Establish a functional MPA Management Committee</b>	"	A functional MPA management Committee established by end of year one
<b>Action 2.2 Build strong relations with local Beach Operators, Conservation NGOs, Research Institutions, Hoteliers</b>	"	Formal collaborative mechanisms between KWS and other relevant stakeholders developed by end of year three
<b>Action 2.6 Develop and implement a participatory beach management plan</b>	SRS-CCA and Park Warden	Beach management plan developed by end of year three
<b>Action 3.4 Procure and maintain scuba, and snorkelling gear</b>	Park Warden	Relevant marine gear procured by end of year two
<b>Action 4.2 Conduct regular joint patrols</b>	"	Joint Patrols conducted every two months
<b>Action 4.5 Fast track acquisition of appropriate documents for KWS property</b>	Park Warden and KWS Lands Department	Title deeds for all KWS properties in Killifi processed by end of year three
<b>Action 4.6 Install additional moorings and buoys at anchorage sites in WMPA</b>	Park Warden	Moorings and buoys installed by end of year one
<b>Action 4.8 Mark the MPA boundaries</b>	"	MPA boundaries marked by end of year one

## ANNEX 3: TECHNICAL REPORT ON MALINDI BEACH EROSION REPORT



### Prepared by the Technical Advisory Committee

Dr. Mohamed Omar	-	Kenya Wildlife Service
Dr. Judith Nyunja	-	Kenya Wildlife Service
Dr. Maarifa A. Mwakumanya	-	Pwani University
Michael Mbaru	-	Kenya Maritime Authority
James Kamula	-	National Environment Management Authority
Dr. Charles Magori	-	Kenya Marine and Fisheries Research Institute
Co-opted members-		
Jacqueline Bernard	-	Kenya Wildlife Service



## 1. BACKGROUND

In 2014, KENIAKU Ltd was licensed by NEMA to construct an environmentally friendly Seawall for erosion control purposes in front of its beach resort facility in Malindi. The construction of the Seawall, however triggered shoreline erosion on the downstream areas adjacent to the wall resulting in degradation of the beach and destruction of vegetation. The erosion has been increasing every year according to reports received from beach users in the area.

In order to address the beach erosion threat, KENIAKU applied for an EIA license from NEMA to extend the Seawall. The license was issued in 2015 and one of the license conditions required that the KENIAKU sort approval from Kenya Wildlife Service (KWS), Kenya Maritime Authority (KMA) and the County Government of Kilifi before construction of the Seawall. While it has been confirmed that KMA was not consulted, KWS has since objected to the construction citing shoreline management issues associated with the existing wall and the sheer neglect of laws governing the shoreline and management of conservation areas (i.e. the Wildlife Act, EMCA, Fisheries Act etc).

Following consultations between KENIAKU, KWS, NEMA and Pwani University, the Technical Advisory Committee (TAC) was constituted to assess the shoreline situation in Malindi and advice on strategies to address the shoreline erosion and safeguard investments and ecology of the Malindi beach. The TAC comprised of experts from Pwani University; NEMA; KMA; KWS; and KMFRI. The specific objectives of the TAC were to:

- i. Review and evaluate the current status of the beach in Malindi and establish the main drivers of shoreline change including wave hydrodynamics on the beach
- ii. Evaluate the short term strategies to mitigate against beach erosion and shoreline change that is threatening both investments and ecology of the beach
- iii. Evaluate the mid-term and long-term strategies to mitigate against beach erosion and shoreline change in Malindi
- iv. Identify strategies of funding the mid-term and long-term mitigation measures;
- v. Present the strategies to stakeholders
- vi. With the guidance of NEMA, the TAC shall provide recommendations on licensing the immediate strategy for implementation

- vii. Compile a technical report outlining the three recommended strategies within two weeks.

## 2. METHODOLOGY

The methods used by the TAC to collect information on the shoreline erosion issues were:

- Site visit and assessments – A rapid assessment on the hydrodynamics and sediment dynamics along the Malindi shoreline was conducted
- Stakeholder consultations – The TAC held consultative meetings with the property owner, representatives from Malindi residents, boat operators and fishermen.
- Literature review – Several information sources were reviewed and synthesized to provide background information on the coastal erosion problem in Malindi; and, justification for the proposed interventions.
- Information synthesis and report compilation – The TAC compiled all the information to produce the advisory report with recommendations.

## 3. FINDINGS

### 3.1. Hydrodynamic Characteristic of the Beach

As the characteristic of beaches globally, the beach in Malindi experiences both accretion and erosion with some sites creating new land surfaces while other places are eroding to an extent of threatening development structures. Our main findings for the beach at the Billionaire Resort indicate that: -

- The beach is sheltered by a fringing reef and is exposed to ocean waves and tidal current surges. The beach is comprised of sand and coral rock shores which have been severely eroded.
- The site is experiencing a loss of about 8-10 meters per year, creating the current eroded beach as evidenced by the presence of short (10m) and steep (320) beach at one point and long (70m) and gently sloping (080) eroded beach at another.
- The threatened shoreline is known for recreation and nesting sites for turtles and urgent measures are required to protect property developments and preserve the beach for turtle nesting.
- The high rate of erosion necessitated the property owner to construct a Seawall of about 600m long and about 4 m high to protect the property (Photo 1). Consequently, it is observed that the areas adjacent to the Seawall are severely eroded

threatening the existing developments, the public beach and the Marine park offices. The property owners placed sand bags on the beach to protect against the erosion which has also not worked.

- It is observed that the high rate of erosion in this section of the shoreline is attributed to the high waves exacerbated by the construction of the vertical seawall of gabions.
- The mean wave height (0.89m) and mean energy dissipated (990.74 joules) are high compared to other parts of Casuarina Point. This is mainly due to the vertical sea-wall which deflects wave energy, transferring the same to adjacent areas. With the high and intense wave energy on the shoreline, vertical walls will not withstand the exerted energy and instead it will erode adjacent areas, compounding the erosion problems and related conflicts on the shorelines.

### 3.2. Stakeholder Concerns

Malindi residents and other stakeholders were consulted to give their understanding of the situation and how it has evolved, how it is or has affected them, the historical perspective and their recommendations. The main comments from the stakeholders include: -

- The Billionaire's beach wall has influenced the front and adjacent beaches. During the South East monsoon winds, waves washes up against the beach wall and reflect back towards the ocean with too much energy causing the beach in front of the wall to erode excessively fast.
- These wave actions have created an artificial 3 meter high cliff which is obstructing the public from accessing the beach, forcing them to pass through the sea waters during high tide. Attempts by the boat owners to access the beach over the cliff are met with hostile resistance from the Billionaire Resort management. Mr. Ayub Chai for the Billionaire club, however clarified that there is no restriction on access by the public and this can be resolved easily.
- The erosion is rapidly destroying the recreational beach area which besides being a hub for both international and domestic tourists in Malindi is also greatly utilized by schools on education tours. The beach in addition provides space for local beach traders. The current state of the beach does not provide sufficient space for recreation and the beach users are scrambling for the remaining beach area.

- The strong waves created as result of the beach Seawall have caused destruction to four boats belonging to the local community. The boats which are normally anchored close to the shore are strongly lashed against the beach wall during high tide and this greatly impact on their livelihood through loss of income.
- Increased concentration of sediments on nearby seagrass beds and subsequent reduction of foraging and nesting habitats for fish and other marine species has affected the locals' livelihoods due to decreased fish catches from the marine reserve.
- Malindi Marine Park beach had previously provided important habitat for sea turtles. The beach wall has blocked natural replenishment of sand resulting in degradation of the sea turtle nesting grounds. Sea turtles sightings have decreased and they stopped nesting at the beach. The last one sighted tried to get a suitable nesting site in between the sacks placed on the eroding beach but left without establishing a nest.
- Stakeholders expressed discontent with the manner the government was managing the shoreline. They questioned why construction of the beach wall was approved despite encroaching on a public beach. The government was accused of being partial and exhibiting double standards in implementation of the law, with harsh penalties on poor locals while approving destructive actions of the well to do.
- In conclusion, the stakeholders recommended that;
  - (i) An urgent redress of the shoreline erosion is called for with an integrated approach where all stakeholders are involved especially the County physical planners, the marine scientists and the policy makers
  - (ii) The structural design of the protection measure should consider the ecological and socio-economic implications.
  - (iii) Science should inform any shoreline protection design suitability, viability and sustainability.
  - (iv) In the short term, the existing wall should be modified to allow gradual dissipation of wave energy on the shoreline.
  - (v) In the medium and long term, groynes and offshore artificial reef can be constructed to cover the entire Casuarina littoral cell, with support from the investors and the Government

## 4. RECOMMENDATIONS

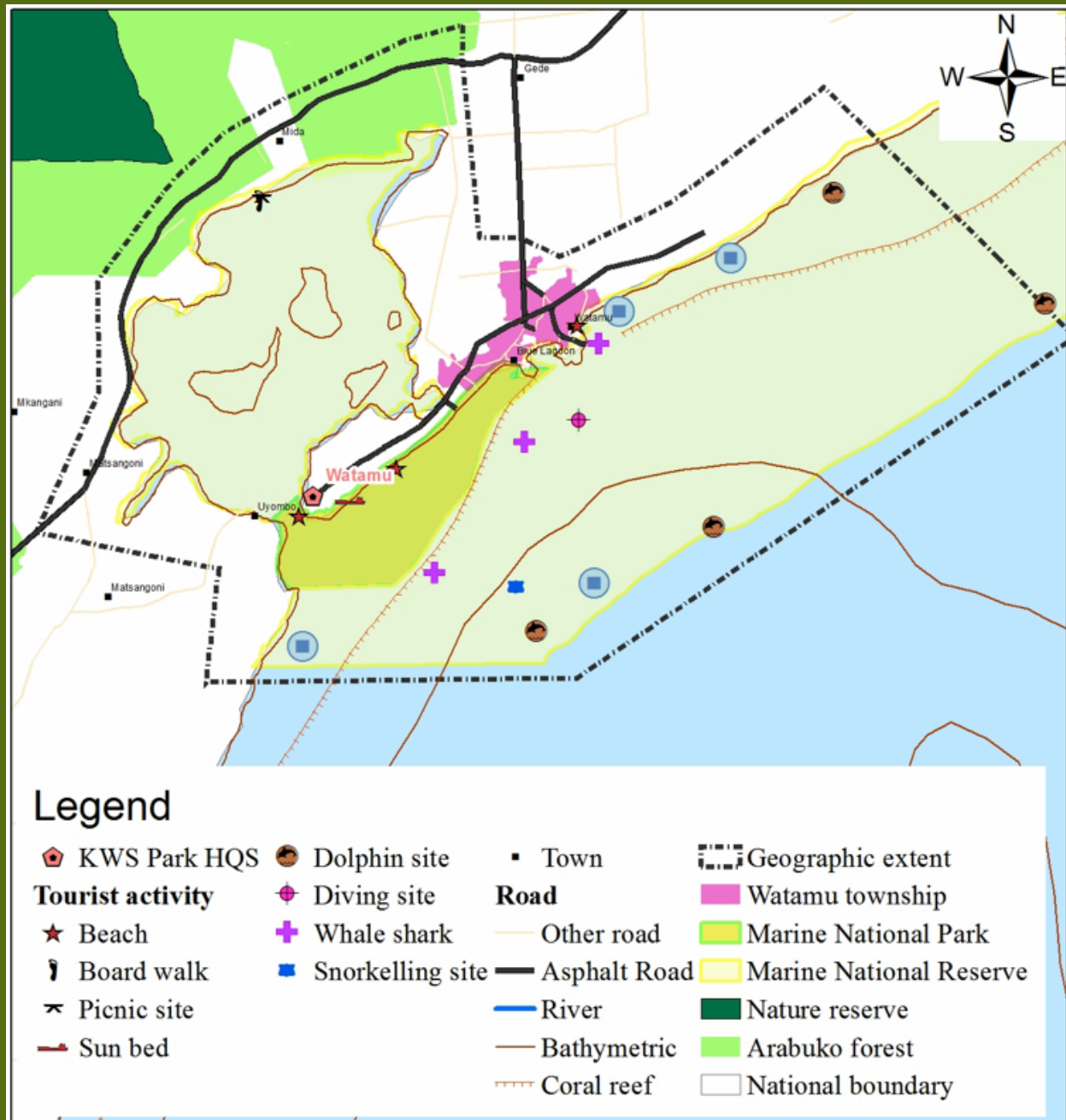
### 4.1. Short Term Strategies

- The current vertical sea wall design was identified to be the major cause of increased wave action and energy hence the erosion. In order to minimize the wave action and energy on the shoreline, it is recommended that the current seawall design be modified or redesigned to a slopping design to minimize shoreline erosion. The gradient for the redesigned sloppy wall should take cognizance of the beach profile, wave and wind dynamics during the South East and North East monsoon. This needs to be done immediately within the coming week.
- The proposed extension of the seawall should be withheld as implementation of the above recommendation on redesigning is done since the redesigned wall is anticipated to have an immediate positive impact by minimizing the current shoreline erosion, and improved sand deposition.
- The impacts of the redesigned wall should be monitored continuously and modifications carried out where necessary to address any emerging erosion incidences.
- KENIAKU Ltd to provide resources for redesigning the sea wall and monitoring the beach.
- KENIAKU Limited to apply for variation of EIA license for the current sea wall to allow for redesigning of the wall and implementation of the modification based on immediate observations.
- Access to the beach by beach users should be guaranteed.
- The beach area is a recognized sea turtle nesting site and the redesigning of the sea wall should allow for turtle nesting.

### 4.2. Medium and long term Management Strategies

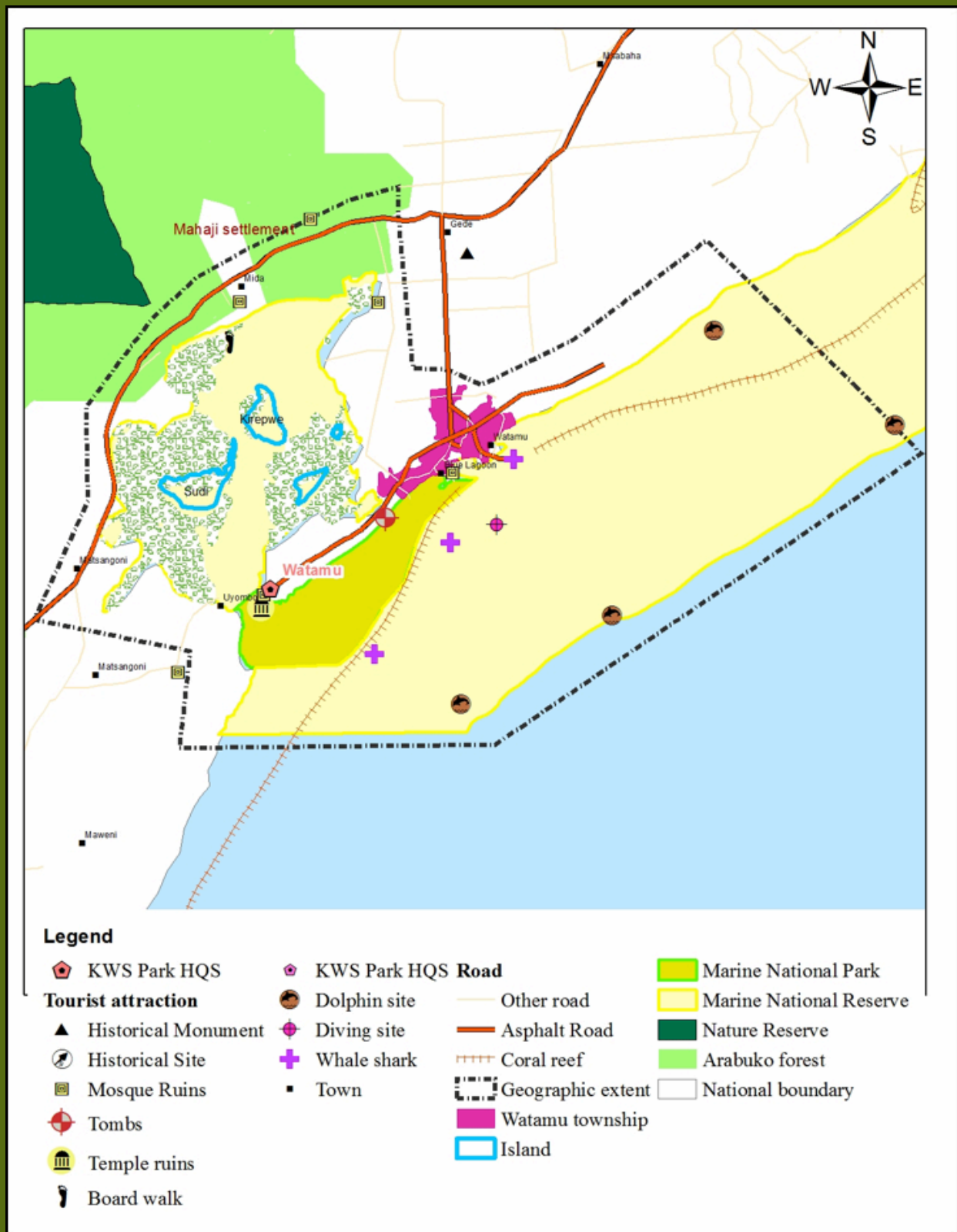
- Ensure shoreline projects are subjected to EIA before construction.
- Strengthen enforcement of the 60m set-backline rule for any new structures, including seawalls when licensing such structures.
- Where sea wall construction is licensed, ensure the design is environmentally friendly. Vertical design should be strictly prohibited.
- Avoid licensing development of permanent structures such as houses and seawall in areas experiencing active morphological processes (e.g. ongoing beach accretion in Malindi).
- Strengthen compliance monitoring for licensed developments to ensure developers comply with license conditions.
- Shoreline developments close to ecologically sensitive areas such as sea turtle nesting sites should take into account turtle nesting beaches when doing coastal defence planning for such developments.
- Educate property owners along the shoreline on the potential risks (environmental and economic) associated with beach encroachment and non-compliance with regulatory requirements.
- Support implementation of the Kenya shoreline management strategy.

## ANNEX 4: MAPS

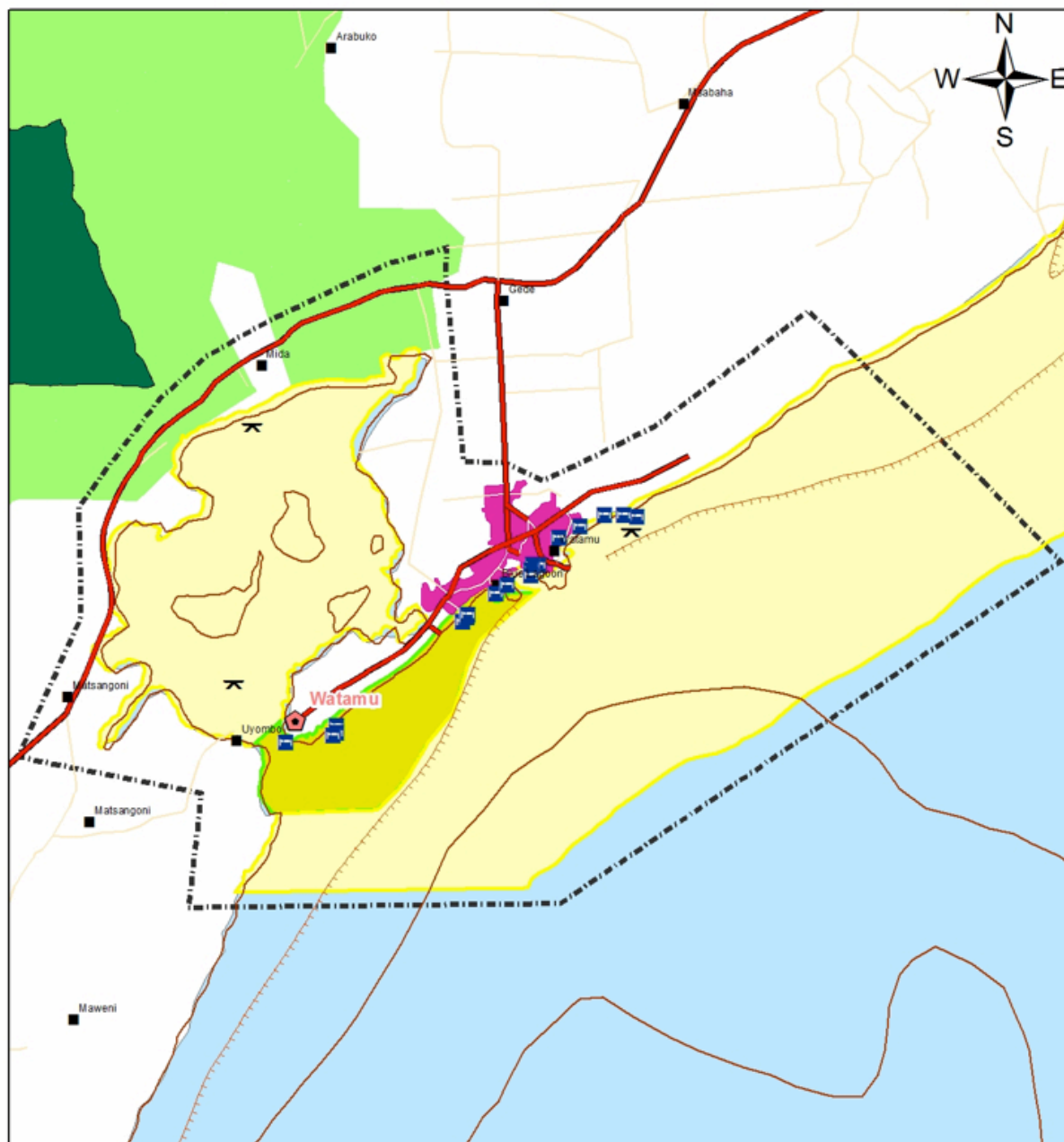


Map 1. Tourist attractions - facilities





Map 2. Tourist attractions - Historical ruins



### Legend

#### Tourist facility

- Hotel
- Picnic site
- KWS Park HQS
- Town

#### Road

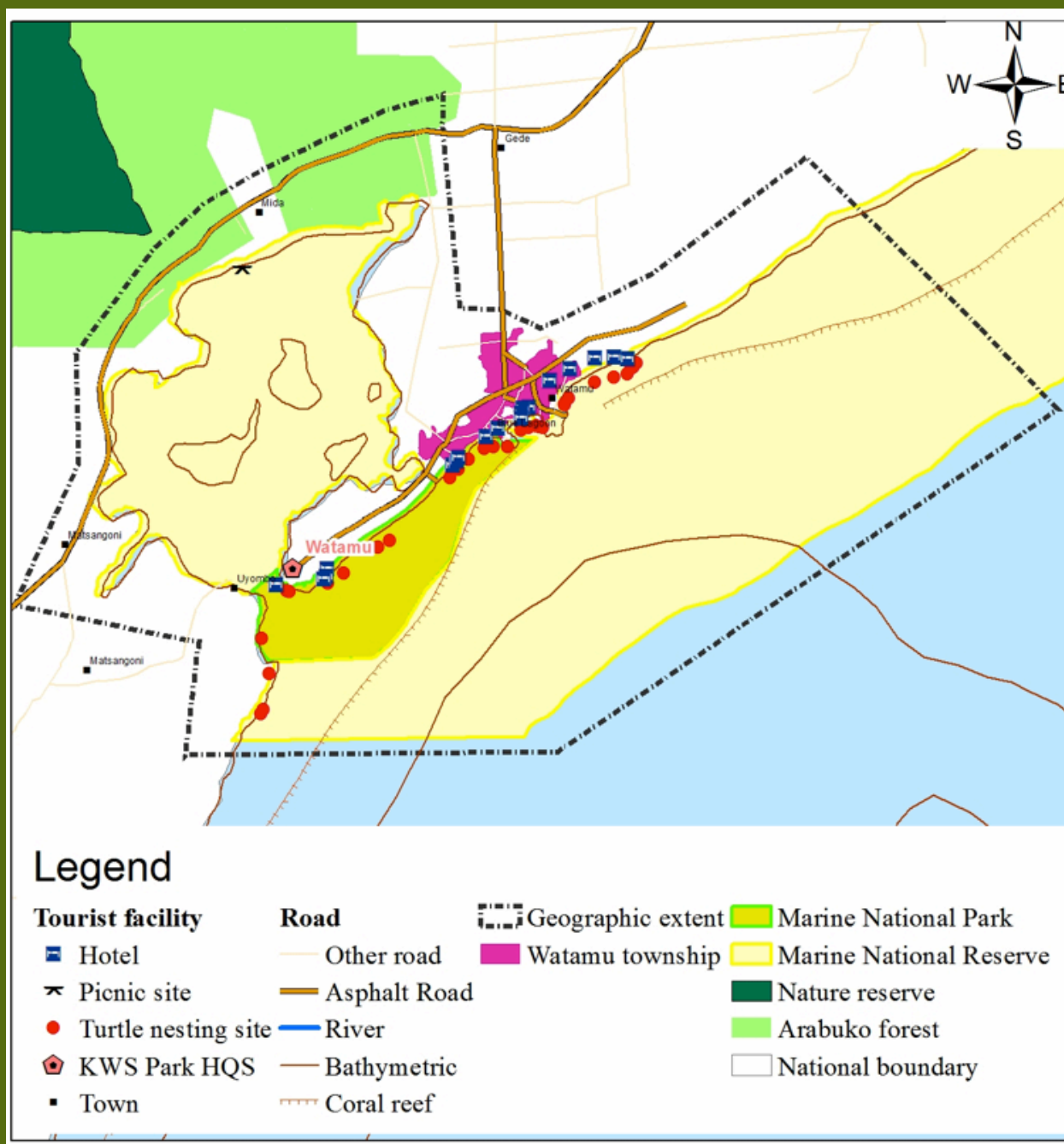
- Other road
- Asphalt Road
- River
- Bathymetric
- Coral reef

#### Geographic extent

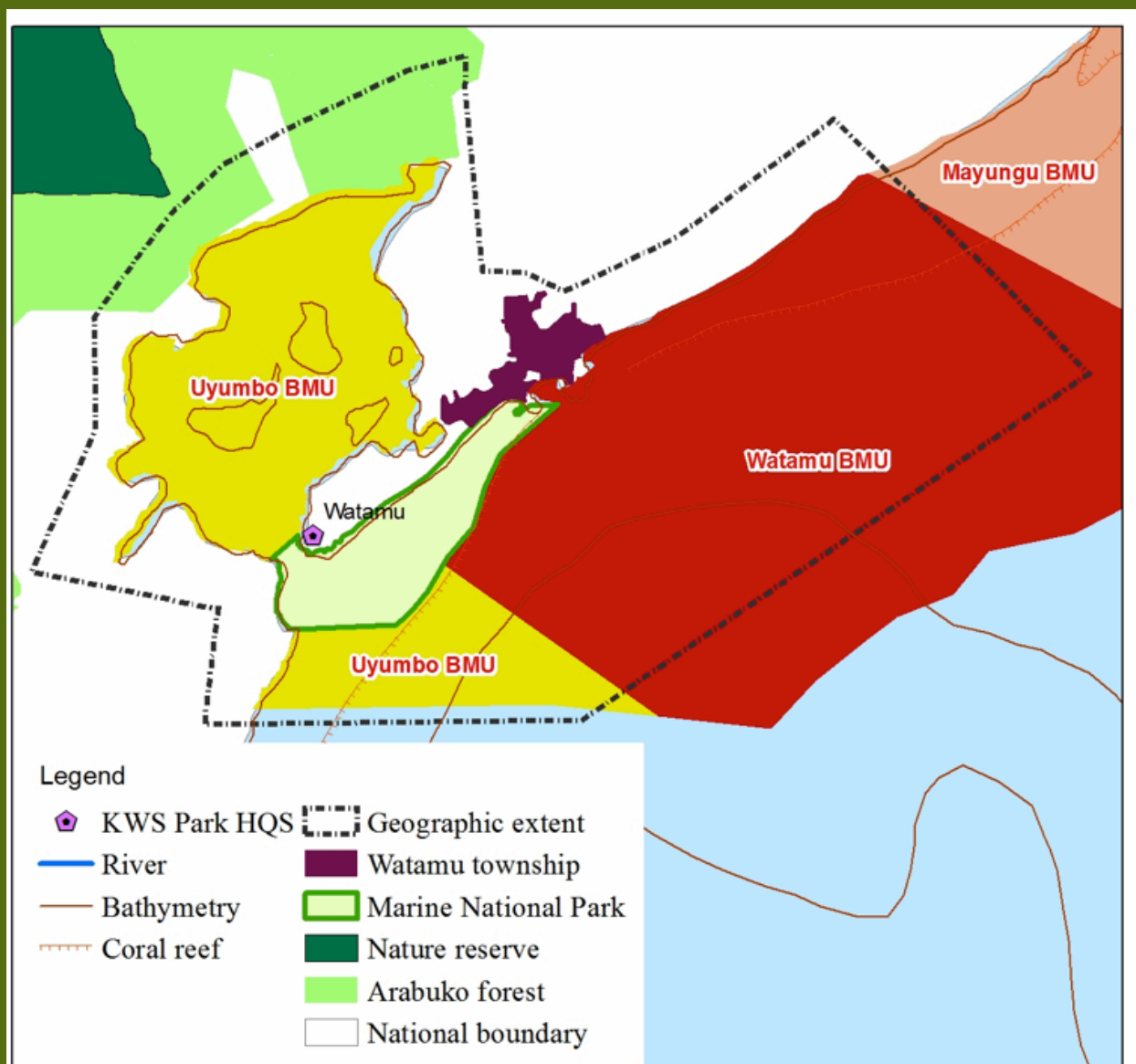
- Watamu township
- Arabuko County Council forest

- Marine National Park
- Marine National Reserve
- National Reserve
- Arabuko forest
- National boundary

Map 3. Tourist facilities - Accommodation



Map 4. Turtle nesting sites



Map 5. Beach Management Units

**ANNEX 5. STAKEHOLDER PARTICIPATION IN PLAN DEVELOPMENT**

Name	Position and Organization	Workshop		Working Groups				
		#1	#2	Ecology	Tourism	Community	Sec/PAOPs	Zoning
Ibrahim Shetwe	Watamu BMU							
	X	X						
Gladys N. Kimani	Local Ocean Trust	X	X					
Mohamed Shee	WABO	X	X					
Daniel Musau	Umoja	X						
Abdi Mdahidi	WABO	X	X					
Athman S. Mwambire	Hon. Warden	X	X					
Salim Ali	Hon. Warden	X	X					
Steve Trott	WMA	X	X		X			
Fadhil Omar	WEMA	X	X					
Benjamin Kelliher	Tribe Water-sports	X						
Eric Ochieng	Medina Palms	X	X					
Max Cheli	Medina Palms	X						
Shebawan D Mohamed	WABO	X	X					
Aggrey Odindo	UON	X						
Geoffrey Wambua	UWABO	X						
Ali H. Mwarora	NMK (Gede)	X						
Ferdinanrd Maitha	Temple Point	X						
Ken Ombok	TBBC	X						
Maria Mutua	Gede Forest	X						
Charo Ngumbao	Gede CFA	X	X					
Blessington C. Maghanga	KFS – Gede	X						
Casper Vande Geer	Local Ocean Trust	X	X					
Patrick Changawa	CWCC	X	X					
Rongei Kipkosgei	Arocha Kenya	X						
Lydia Kazingu	Arocha Kenya	X						
Luca Sasallini	Garoda Resort	X						
Federico Bertoni	Kobe Resort	X						
Steve Curtiis	Diving Aqua Ventures	X						
Abdul Mohamed	BMU	X	X					
Amina Mzee	BMU	X	X					
Fatuma Ali	Shella Women Group	X	X					
Elizabeth Mwangi	Shella Women Group	X	X					
Ebo Masha	Jacaranda	X						
Anderson Kingi Kea	CFA Gede	X						



Name	Position and Organization	Workshop		Working Groups				
		#1	#2	Ecology	Tourism	Community	Sec/PAOPs	Zoning
Stephen M. Mweni	CFA Gede	X	X					
Allan M. Majalia	Arocha Kenya	X						
Salim Tunje Gambo	MEMO	X	X					
Jackline Mutwiri	Assistant Research Scientist, KWS HQ	X				X		
Israel Makau	Research Scientist, KWS HQ	X	X			X		
Bernard Ngoru	Senior Scientist, Ecosystem and Landscape Research KWS HQ	X				X		
Apollo Kariuki	Ag. Head – Planning & Environmental Compliance, KWS HQ	X	X	X				X
Shadrack Ngene	AD Parks & Reserves – External Linkages, KWS HQ	X	X	X	X			
Jacquiline Bernard	CCA Research scientist, KWS	X	X	X				
Salim Rashid	KWS- Mombasa	X						
Edison Mutie	KWS-Malindi	X						
Mohamed Bakari	KWS-Malindi	X						
Erick Aduda	WMPA Assistant Warden II, KWS	X	X		X	X	X	
Rotich Isaack	KWS	X						
Judith Nyunja	CCA Senior Research Scientist, KWS	X		X				
Moses Michil	KCDP Accountant, KWS	X					X	
Adan H Kala	KWS- Mombasa	X						
Kitsau Ngala	KWS	X						
Joseph Kavi	MMPA Warden III, KWS	X	X		X	X	X	
Juma M Mbuja	KWS	X						
Mercy Ngatuu	KWS	X						
Mkulu Hemed Kilalo	KWS	X	X					

Name	Position and Organization	Workshop		Working Groups				
		#1	#2	Ecology	Tourism	Community	Sec/PAOPs	Zoning
Josephine Mutiso	CCA Assistant Research Scientist, KWS	X		X				
Tumu Gunda	Turtle Bay		X					
Richard Bennet	Mida Butterfly Farm		X					
Yassin Shahib	WEMA		X					
Hous J. Loeuger	Temple Point		X					
Ravis R. Rohra	Temple Point		X					
Halima Mohamed	BMU		X					
Skektia Hemed			X					
Shombo K. Mwakamsha	W.S.S.S		X					
Helen Curtis	Aqua Ventures Kenya Association of Diving Schools		X					
Benson Baya	Chief MIDA		X					
Stanley Baya	Arocha Kenya		X					
Denis Ombuna	Arabuko Sokoke Warden III, KWS		X				X	
Mohamed Heri	Shimba Hills Senior warden, KWS		X		X			
Lucy K Kivunzi	CCA Secretary, KWS		X				X	
Jane A.Ochieng	CCA Human Capital Officer, KWS		X				X	
Dr. Joseph Kamau	Senior Scientist, KMFRI			X				
Jillo Katelo	KMMPA Assistant Research Technologist, KWS			X				
Dr. Mohamed S. Omar	Head – Wetlands and Marine Conservation, KWS HQ			X				
James Kamula	Coast Region Senior Marine Officer, NEMA			X				
Bernard Ochieng	Shimba Hills Assistant Research Scientist, KWS			X				

Name	Position and Organization	Workshop		Working Groups				
		#1	#2	Ecology	Tourism	Community	Sec/PAOPs	Zoning
Peter Musembi	Marine Research Scientist, KWS			X				
Moses Kenana	Senior Scientist, KWS			X				
Albert Gamoe	CCA Senior Warden, KWS			X	X			
John Wambua	KMMPA Warden I, KWS				X			
Sammy Towett	Tourism Officer, KWS HQ				X			
Esther Gitau	MMPA Senior Warden						X	
Joseph Mukeka	GIS Modeller, KWS HQ							X
Peter Hongo	GIS Technician, KWS HQ							X



















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