

DELIVERABLE 17

Threats, opportunities and priority areas for conservation

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Acronyms

CCP: Community Fishing Councils

EKZNW/WA: Ezemvelo KwaZulu-Natal Wildlife / Wetland Authority

GSLWP: Greater St Lucia Wetland Part – recently renamed iSimangaliso Wetland Park (iSimangaliso translates as ‘a miracle’ or ‘amazing’ or ‘a marvel’).

MBREMP: Mnazi Bay-Ruvuma Estuary Marine Park

MPA: Marine Protected Area

TFCA: Lebombo Transfrontier Conservation Area

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1. Introduction

The design and management of MPAs requires an assessment of their socio-ecological and institutional context. This report forms part of the ‘Transboundary Networks of Marine Protected Areas for Integrated Conservation and Sustainable Development: Biophysical, Socio-Economic and Governance Assessment in East Africa’ (TRANSMAP). TRANSMAP is a multidisciplinary project aiming to provide knowledge to inform the development of transboundary networks of marine protected areas (MPAs) across Tanzania and Mozambique, and Mozambique and South Africa.

The East African coastline stretching from Somalia to South Africa has been recognised as an area of global importance for the conservation of marine and coastal biodiversity. At the same time, this region is experiencing rapid change, including increasing demand for fish and other marine products for local, regional and global markets, expansion of tourism and oil and gas prospecting. One of the greatest challenges in this region is reconciling multiple demands on the coastal zone. TRANSMAP aims to contribute to devising a cross-boundary conservation strategy that integrates ecological, social, economic and institutional criteria to meet both conservation and development objectives.

TRANSMAP comprises five interrelated objectives: (1) a synthesis of existing knowledge (baseline definition); (2) a biophysical assessment; (3) a socio-economic assessment; and (4) a governance assessment. Objective 5 integrates the results of the biophysical, socio-economic and governance assessments to inform proposals for the development of transboundary networks of MPAs. This report forms part of the project’s socio-economic assessment (Objective 3), which aims to improve understanding of key aspects of the social-ecological systems in the study areas, including:

- i. Coastal and marine resource use
- ii. The importance or value of such resources for the different users and stakeholders
- iii. Problems affecting coastal and marine resources and the benefits they provide
- iv. Possible management solutions to such problems, which are supported by stakeholders

The current report assesses the main drivers of environmental change, threats to resources and priority issues or areas for conservation in the four study areas encompassed by TRANSMAP. The sections that follow explain the methodology used in the research, and present the main findings.

2. Methodology

The methodology for this report consisted mainly of semi-structured interviews with key informants, focus groups and several stakeholder workshops in the study areas discussing threats to resources, management measures and the role of coastal and marine protected areas. Workshops were chosen as a methodology because of their potential to enable the research team to gain an overview of stakeholders’ perceptions of threats to resources in a relatively short period of time. The participation of representatives from different groups allowed exploring different views as well as to arrive at collective understandings as participants worked towards a consensus. However, workshops as a research method are also prone to certain bias as not all participants participate to the same extent and the more powerful ones may dominate discussions (Cooke and Kothari 2001, Chambers 2002).

3. Tanzania

3.1 Threats

The responses to a household questionnaire undertaken in the Mnazi Bay-Ruvuma Estuary Marine Park (MBREMP) as part of this research indicated that a majority of people perceive a decline in certain marine resources, in particular fish. A similar view emerged from focus group interviews undertaken in villages within the Marine Park and outside it. The workshop held in Mngoji, in April 2007, revealed a more complex picture. At the workshop, participants claimed that the status of coral reefs, mangroves and seagrasses was good, which contrasted to some extent with the perceived decline in fish catches. This suggests that despite improvements in key habitats supporting fisheries, actual fish catches may be decreasing. In order to further explain this issue, workshop participants were asked to explain the criteria or evidence for their assessment of these habitats.

The evidence suggested for coral reefs being in good condition included a ban on dynamite fishing, which in the recent past had caused widespread devastation; the prohibition of mining live coral and the promotion of alternatives; and the reduction of destructive fishing practices such as beach seine nets and use of poison. For mangroves, the evidence suggested included replantation activities and the establishment of management plans regulating use. Participants also mentioned that some marine species that had become rare or disappeared altogether from mangroves were returning. The expansion of seagrasses in some areas and the recovery of species associated with these habitats such as sea cucumber and shells were the key evidence suggested for good habitat condition.

This community assessment of the condition of coral reefs, mangroves and seagrasses suggests that the Marine Park is having a positive effect on resource conservation. However, the baseline workshop participants used for their assessment was a period in the recent past before the Marine Park was created when many habitats were suffering devastation and few measures were being implemented to protect them. This was particularly the case of coral reefs, which were being severely damaged by dynamite fishing and extraction for lime and construction.

Despite the signs of improved condition in some key habitats, workshop participants also identified a number of threats to coastal and marine resources. These included:

- Increase in the number of resource users
- Use of destructive fishing gear/practices
- Overharvesting of some resources
- Climate change (increasing erosion, sedimentation)
- Coral mining (mostly outside the Marine Park)

The above threats were identified by most stakeholder groups, including local communities, Marine Park authorities and government officials dealing with natural resources. In addition, the Marine Park authorities identified the following:

- Population increase while resources stay the same

- Weak support from politicians for the Park
- Limited power of Park authorities to enforce laws
- Low level of environmental awareness among local communities
- Perception of communities that resources are endless (seen as gift of God that only Him can give or take)

The assessment of threats undertaken by different stakeholders at workshops is summarised in Table 1. The views of three different groups were explored, namely resource users; members of Village Liaison Committees in the Marine Park; and Marine Park authorities. Most threats were perceived across all stakeholder groups, except lack of political support for conservation and the limitations of the legal system to apply environmental law, which were emphasised by Park authorities. In their view, some politicians take the side of local communities and groups that are against the Park, instead of explaining its benefits. Politicians are unwilling to publicly support measures that are unpopular among certain segments of the population, fearing losing votes and popular support. Park authorities also consider that the legal system does not deal effectively with infractions in environmental law. These infractions are not taken seriously enough and the penalties applied are often too soft to discourage rule-breaking.

Table 1. Main threats identified by stakeholders, Tanzania

Resources	Main threats		
	<i>Resource users</i>	<i>Village Liaison Committees</i>	<i>Park authorities</i>
<i>Fish</i>	<ul style="list-style-type: none"> ▪ Beach seine ▪ Small mesh nets ▪ Spear gun ▪ Poison (kilumba) 	-	<ul style="list-style-type: none"> ▪ Population increase leading to increasing pressure on resources ▪ Illegal fishing (beach seine nets, small mesh nets, poison) ▪ Coral mining in the buffer zone ▪ Communities do not appreciate full value of resources ▪ Weak support from political leaders for the Park and its regulations ▪ Limited power of Park authorities to enforce law; environmental law not taken seriously
<i>Marine invertebrates (sea cucumber, shells, octopus)</i>	<ul style="list-style-type: none"> ▪ Unregulated collection ▪ Overharvesting ▪ Habitat destruction 	-	
<i>Mangroves</i>	<ul style="list-style-type: none"> ▪ Illegal harvesting ▪ Erosion ▪ Areas drying up (due to climate change) 	<ul style="list-style-type: none"> ▪ Increasing number of users / demand ▪ Illegal harvesting ▪ Climate change 	
<i>Coral reefs</i>	<ul style="list-style-type: none"> ▪ Beach seines ▪ Sedimentation (due to climate change) 	-	
<i>Beach/intertidal areas</i>	<ul style="list-style-type: none"> ▪ Certain areas getting shallower (due to climate change) 	-	
<i>Marine resources (in general)</i>	-	<ul style="list-style-type: none"> ▪ Use of poison ▪ Climate change ▪ Increase in number of fishers ▪ Destructive fishing gear 	

3.2 Opportunities

The recognition by local communities that the Marine Park is resulting in improvements to some marine habitats can contribute to strengthen wider community support for conservation efforts. This view emerged at the workshop organised as part of this research, which involved only two Park villages, Mngoji and Msimbati. This may not be representative of all Park communities, particularly since these villages have been amongst the most supportive of the Park since its creation.

Community support for the Park does not only depend on people recognising improvements in important marine habitats. Park communities depend on specific resources such as fish and marine invertebrates, which are generally declining despite improvements in the condition of supporting habitats. Given this trend, the Park needs to continue investing in the development of additional livelihood opportunities for local communities. If these opportunities prove economically attractive, people are more likely to accept restrictions on resource use.

3.3 Priority areas for conservation

In the area encompassed by the Marine Park, priority areas for conservation, from a spatial perspective, have already been identified by previous research and informed a zoning scheme that features in the Park's General Management Plan (URT 2005). However, in the community workshop organised as part of this research, some concerns emerged regarding the acceptability of the current marine no-take zones (core zones as specified in the General Management Plan) to fishers.

The no-take zones defined in the Park zoning scheme have not yet been enforced, but conflicts are already looming. Community consultations took place to define the no-take zones. However, some claim that there was insufficient participation by the groups most affected. The perception among fishers that catches are declining can, in some cases, create support for conservation measures. However, even in a context of declining catches, conservation measures such as no-take zones may not be acceptable to fishers. The immediate response of fishers to declining catches can be to increase fishing effort rather than to set aside areas for conservation. This applies particularly to contexts where there are few alternative fishing grounds. The enforcement of no-take zones in the Park could potentially further encourage fishing across the border in Mozambique, where there is yet no protected area. This would further increase fishing pressure in Mozambique, where catches are also declining.

In addition to promoting a wider participation of those affected by no-take zones in their definition, another way to make these areas more acceptable could be to experiment with a variety of arrangements, including relatively small permanently closed areas aimed at protecting particularly vulnerable areas combined with temporary closures to fishing in other areas for a specific period of time or season, or rotating no-take zones over a commonly agreed time-frame, for more resilient areas. The willingness of managers to experiment with these approaches may be limited by the lack of scientific evidence on their conservation effectiveness. While the benefits of permanently closed no-take zones have been demonstrated, the benefits of these other arrangements are largely unknown.

4. Northern Mozambique

4.1 Threats

As in Tanzania, most stakeholders perceive a decline in fish and marine invertebrates. The threats presented below emerged from household surveys where respondents were asked about changes in catches over the last 5 to 10 years, focus group interviews with resource users, semi-structured interviews with key informants, and stakeholder workshops. Table 2 provides a summary of the main threats to marine resources identified by the different stakeholders contacted as part of the research.

Table 2. Main threats identified by stakeholders, northern Mozambique

Local communities	Managers (government, NGOs)	Tourism investors
<ul style="list-style-type: none"> ▪ Increasing number of fishers ▪ Migrant fishers ▪ Destructive fishing practices ▪ Extraction of live coral ▪ Large-scale mangrove cutting ▪ Weak law enforcement ▪ Increasing demand and value of fish and other products 	<ul style="list-style-type: none"> ▪ Increasing number of fishers ▪ Oil and gas exploration ▪ Weak law enforcement ▪ Migrant fishers 	<ul style="list-style-type: none"> ▪ Destructive fishing practices ▪ Oil and gas exploration ▪ Lack of mooring buoys ▪ Sale of curios and crafts manufactured with rare/protected species (i.e. tortoise) ▪ Weak law enforcement

The increasing number of fishers constitutes one of the key threats to resources, and one which is recognised by most stakeholder groups. Several reasons were cited for this negative trend, including natural population increase; lack of other livelihood opportunities; increasing vulnerability of agriculture from wild animals and drought pushing more people into marine-related activities; growing demand and rising value of fish and other marine products; and influx of migrant fishers from other parts of Mozambique as well as from Tanzania.

Local communities consider migrant fishers, particularly those arriving from Nampula province, a threat to resources. According to them, these fishers use better fishing gear and fish more intensively. This enables them to catch more fish and reach fishing grounds that local fishers only can get to in good weather. Local fishers also accuse migrant fishers of using destructive fishing practices, including smashing corals to frighten fish into the nets and using dynamite fishing. By contrast, local fishers point out that they use mostly small dugout canoes and lack the more sophisticated fishing gear used by migrants. This causes resentment because they see outsiders profiting from their resources while they are unable to do so, at least on a similar scale, because they lack comparable means.

Although it was not possible to investigate this issue in great depth, there are different attitudes towards migrant fishers between and within communities. Most people suggest that one way to address the decline in fishing resources is to ban migrant fishers. However, the attitude towards migrant fishers in everyday situations is not necessarily confrontational. Attitudes also vary towards fishers from Nacala (in Mozambique) and Tanzania. Fishers from Tanzania are usually better accepted among communities close to the border. Some also buy fish from local fishers and culturally and linguistically, there is a close link between the two peoples. Fishers from Nacala appear to be less accepted, although this varies. For example, these fishers are increasingly setting camps on the mainland, where they have to get the permission of local leaders. In some areas, fishers from Nacala have married local women and integrated with local communities.

Weak law enforcement was identified as a key threat by all three stakeholder groups. The prevailing view among local communities is that there is little control over resource use, that resources are largely open access and that everyone can exploit these resources provided they have the means to do so. Among managers, particularly government agencies concerned with natural resources management, the problem of weak enforcement is mainly associated with the lack of means and resources to monitor the coastal area, which is vast and difficult to police. Many areas are sparsely inhabited and there are many islands, all of which serve as refuge and hideout for illegal activities of all kinds, including smuggling. Most stakeholders in Mozambique cite Tanzania as having a much better system of law enforcement. For this reason, they argue, many illegal activities that have been effectively controlled in Tanzania are being displaced to Mozambique, where there is comparatively much less and, some argue, virtually no control.

Oil and gas exploration was considered a potential threat to marine resources by managers and tourism investors. Both groups view conservation and the exploitation of oil and gas as completely incompatible. There are concerns not only for the physical damage to marine habitats from drilling, laying out pipelines, setting up infrastructure, increased navigation of large vessels, potential pollution to name but a few, but also for the potential impacts on local communities. Although this activity could bring some benefits for local communities in terms of improved infrastructure, particularly access roads, and perhaps some employment, there is also the possibility of communities losing access to fishing grounds. At the moment, stakeholders have little information about the likely impacts of oil and gas and any mitigation measures that can be used. As a result, there is enormous uncertainty and apprehension regarding this activity and its ecological and social impacts.

4.2 Opportunities

The recognition by a wide range of stakeholders that marine resources are under threat from human pressures may be a powerful incentive for the adoption of conservation measures, including support for the creation of MPAs. Deliverable 18 of this project reports on some of the measures proposed by stakeholders in northern Mozambique to address threats and improve resources. These measures include a ban on destructive gear, rules for the exploitation of certain resources, fishing closures, control and limitation of outside fishers, and more effective law enforcement. All these measures can be developed and integrated as part of MPAs.

The perceived threat posed by migrant fishers can potentially be a driver for community-managed conservation areas, particularly where Community Fishing Councils (CCPs) have been formed. Access to these areas would be restricted to local communities. Access could be granted to outsiders through licenses issued by the CCP. However, the capacity of CCPs to operate effectively is currently limited in most areas. Efforts must be made to strengthen these institutions and clarify their roles and responsibilities in relation to government. It may also be necessary to ensure the transparency of CCPs, including the procedures through which members are selected.

4.3 Priority areas for conservation

Given the current limitation of government authorities in terms of means and resources to enforce fisheries law, co-management whereby local communities take responsibility for managing certain areas within a framework supported by fisheries legislation should be a priority for conservation. This would contribute to improving and extending the management of fisheries resources in a cost-effective

way, within and beyond any MPAs that may be created. The inclusion of co-management through CCPs in the fisheries legislation is an important step in this direction. However, as highlighted above, these institutions need to be developed and their capacity strengthened. The view that the government should assume responsibility for law enforcement is still strongly engrained in local communities, and the wide acceptance of community-based alternatives will take time to develop.

5. Southern Mozambique

5.1 Threats

The threats to resources in southern Mozambique were explored through participatory workshops, semi-structure interviews and focus groups. In general, stakeholders are concerned with the growing pressure on coastal and marine resources and identified a number of threats. The main threats to resources from the perspective of local communities, managers (mainly district and local government), and tourism investors are summarised in Table 3.

Table 3. Main threats identified by stakeholders, northern Mozambique

Local communities	Managers (district, local government)	Tourism investors
<ul style="list-style-type: none"> ▪ Trawlers ▪ Oil discharges from ships ▪ Pollution ▪ Lack of rain ▪ Lack of law enforcement ▪ Increase in fishers/fishing boats 	<ul style="list-style-type: none"> ▪ Poverty ▪ Lack of livelihood alternatives ▪ Uncontrolled expansion of tourism ▪ Building in fragile areas ▪ Recreational fishing 	<ul style="list-style-type: none"> ▪ Uncontrolled tourism development ▪ Building on primary dunes ▪ Land speculation ▪ Inappropriate rubbish treatment ▪ Pressure on dolphins and coral reefs ▪ Recreational fishing ▪ Charcoal making ▪ Farming in wetlands

Local communities (Santa Maria and Ndelane)

Artisanal fishing and collection of marine invertebrates from the intertidal sand and mud flats (or gleaning) are an important source of livelihood for the communities located around Maputo Bay. Local communities focused on threats that affected these particular resources. In interviews and a household survey conducted in this area in August and October 2005, respectively, a decline in fisheries and marine invertebrates was widely perceived. This decline was still being felt in May 2007, when the research team organised a workshop to discuss threats to resources, management measures and MPAs as one potential resource management approach for the area.

With regards to fishing, evidence of a decline in catches was indicated by statements such as 'nowadays catching any fish requires a lot of effort - we have to roam the entire sea'. Communities consider the trawlers operating in Maputo Bay as a major reason for this decline and threat to the fisheries. Pollution was another key threat identified at the community workshop, and it was mentioned both by fishermen and gleaners (mostly women collecting clams, razor shells and crabs). Two sources of pollution were indicated, oil discharges from ships and pollution from MOZAL, an aluminium smelter located upstream from one of the rivers that discharges into Maputo Bay. This

study could not find any scientific studies that confirmed pollution by MOZAL, but the perception of this industry being a source of pollution for the bay is widespread among coastal dwellers. People also mentioned the effects of the oil spill from Katina P, a Greek tanker that sunk in Maputo Bay, in April 1992. Despite this accident having occurred over a decade ago, its disastrous effects are still remembered and people argue that fish catches never recovered ever since.

Local communities considered drought as a major threat to marine invertebrates. Lack of rain was also said to affect fish. This view is particularly strong among women, many of whom collect marine invertebrates by hand. They argue that the abundance of marine invertebrates is associated with rain. During long periods of drought, some species become less abundant because, arguably, like crops, they also need rain to develop. Another threat to both fish and marine invertebrates is the increase in the number of fishers and gleaners. People mentioned that boats come from as far as Costa do Sol, near Maputo city, to fish in their areas. This trend is likely to continue as there is a growing market for fish and shellfish in Maputo as the city develops and expands.

Communities also considered weak law enforcement part of the threats to resources. People cited several examples of what they referred to as 'lack of control'. One of these examples is the use of small mesh nets by trawlers. They argue that the law prescribes a minimum mesh size but point out that compliance with this rule is checked at the port and landing site in Maputo. Once the boats are out at sea, the crew attaches a fine mesh net to the cod-end of the nets, which fishes everything in its path. People suggested that in the past there were seasonal restrictions on fishing, but not nowadays, apart from prawn fishing which in many cases is not respected.

Managers (local government)

A prevailing view among district government officials is that local people are one of the main threats to resources. The common view among this group is that poverty drives local people to exploit resources unsustainably. People depend heavily on natural resources and have no other livelihood opportunities, leaving them no choice but to exploit resources until exhaustion. One common view is that local people need to be educated about the need to conserve resources.

The uncontrolled expansion of tourism and the activities of tourists themselves are seen as a threat to coastal ecosystems. Government officials were particularly concerned with the uncontrolled expansion of construction of tourism facilities, particularly building on fragile areas such as sand dunes. Recreational or sports fishing was seen as a threat because of the scale of this activity and the resources targeted. The vast majority of sports fishers are South African. While many fish from the beach, others bring semi-rigid boats, some equipped with fish detection sonar. Fishing using boats is not only undertaken with fishing rods but also with spear guns. The capture of bottom and reef fish is prohibited but this is not always respected. Fishers also bring cooler boxes to conserve fish on ice. There are reports of fish being filleted, placed in cooler boxes and taken back to South Africa for sale. Thus, some recreational fishing is being undertaken on a large scale for commercial purposes.

Tourism developers

Tourism developers also considered the uncontrolled expansion of tourism, lack of long-term planning and poor waste and water management as major threats. Building on dunes and other fragile areas was identified as a major problem. This problem occurs not only in Ponta do Ouro, but all along the coast. Ponta do Ouro has a zoning plan that specifies particular areas where building is not allowed.

However, this plan clashes with the Tourism Development Plan and is easily overruled when major tourism interests are at stake, as one representative of the tourism sector claimed. Land speculation is another important problem. Land has become a valuable commodity and an emerging market has developed for it, despite the Mozambican legislation restricting private sales of land. The same representative of the tourism sector noted that in many cases, negotiations between investors and local communities over land rights often benefit community leaders only, not communities at large.

Poor water and waste management are serious problems, particularly in Ponta do Ouro which has expanded considerably but lacks a centralised water supply, sewage treatment and rubbish collection system. Essentially, each business pumps water from individual or shared boreholes and has its own absorption facilities for waste. There is a real problem of water contamination given the proximity of water sources and absorption tanks. Businesses are also responsible for collecting and disposing their own rubbish, which is currently being taken to a local landfill where some is also burnt. Investors said that the system is completely inadequate and overflowing, constituting a serious environmental hazard.

Recreational activities also lack management plans and strict regulations, constituting a further threat to marine resources. While local operators have developed guidelines and a code of conduct for recreational activities, there are not widely respected. For dolphin watching, local operators have developed guidelines in order to minimise disturbance to the dolphins. However, local operators complain that the area is sometimes visited by outside operators who do not obey these rules. A similar situation occurs with diving. Local diving operators claim they make huge efforts to ensure their clients do not cause damage to the reefs. However, they argue that non-local operators do not share similar concerns and lack the local knowledge about diving conditions to avoid divers accidentally damaging corals. There are also concerns with regards to the carrying capacity of some dive sites. Over long weekends in South Africa or in peak school holiday periods, all the 6 diving centres plus visiting operators dive at the same time. Although there are many dive sites, operators tend to converge to the most popular ones. Recreational and sports fishing were also considered a threat, essentially for similar reasons cited by government officials.

Finally, tourism investors saw some activities undertaken by local people as a significant threat to resources, particularly charcoal making and farming in wetlands. Matutuíne is an important charcoal producing area to supply markets in Maputo. Charcoal is a popular fuel in Maputo, particularly among the poor and demand is high. Farming in wetlands by local communities was another threat mentioned by tourism investors. Areas surrounding wetlands are fertile and moist all year round and are sought by communities to grow water-loving crops such as vegetables. Extensive periods of drought have made these areas also important for conventionally rain-fed crops such as maize and cassava, resulting in the natural vegetation around wetlands being cleared for agricultural plots.

5.2 Opportunities

There are enabling policy conditions for the development of a transboundary marine conservation approach in the region. The government of Mozambique considers the country's environmental assets as an important comparative advantage for the development of tourism and supports the designation of protected areas as part of the overall tourism development strategy. Compared to more remote parts of the country, southern Mozambique is relatively accessible and can benefit from the national and international tourism that flows through South Africa. There is also the Lubombo Spatial Development

Initiative (Lubombo SDI), a regional initiative involving South Africa, Swaziland and Mozambique, aimed at stimulating regional economic growth.

While not specifically aimed at conservation or tourism, the Lebombo SDI has focused on nature-based tourism as a key economic investment area. It was accompanied by the establishment of the Lebombo Transfrontier Conservation Area (TFCA) linking several existing protected areas in South Africa, Swaziland and Mozambique. While primarily focused on terrestrial conservation, this initiative also aims to promote regional collaboration for marine conservation and tourism development. A new MPA is planned for Southern Mozambique under the TFCA, which will link with the Greater St. Lucia Wetland Park in South Africa (GEF 2005).

The extension of the Maputo Elephant Reserve to include a marine component is also being considered. A three nautical mile extension from the east coast into the ocean to protect coral reefs, and a 1 nautical mile extension to the North into Maputo Bay to protect mangroves and prawn reproduction areas have been proposed (MITUR 2002). Under the TFCA, a much larger area is under consideration for marine conservation, extending from Inhaca to Ponta do Ouro, although the exact area is yet to be defined.

Tourism development in coastal southern Mozambique is expected regardless of whether a MPA is established or not. If well-planned and accompanied by complementary measures, a large multiple-use MPA could have a positive impact on local communities and the environment while still contributing to national economic growth. Examples of such measures include regulations protecting the access of local communities to the coast and its resources, which is currently threatened by tourism development that excludes local people from areas frequented by tourists; support to enable local communities to negotiate more effectively with prospective investors; and promotion of partnerships and joint-ventures between private investors and communities. Co-management of natural resources, including the bay and lake fisheries, could also be promoted as part of a multiple use MPA. In addition, areas off-limits to development could be established to protect more sensitive habitats.

An MPA, however, can also lead to the further marginalisation of local communities if it is planned and managed primarily to meet conservation and tourism objectives and ignores the livelihood needs of local communities. Both government and tourism investors tend to see local people as an obstacle instead of as aids to environmental management and conservation. Local communities, on the other hand, do not have a clear understanding of what their roles in management might be. It is therefore important to raise awareness in terms of responsibility for resource depletion as well as role in resource stewardship among local communities and other stakeholders. Local communities need to be seen as an opportunity rather than a constraint to resource management.

5.3 Priority areas for conservation

Spatial priority areas for conservation include the Ponta do Ouro area, which requires urgent attention to prevent the further expansion of building in ecologically fragile areas, particularly primary dunes, and manage the increasing use of natural resources for recreational uses such as scuba diving, sports fishing, dolphin and whale watching and quadbiking. Research is needed to establish the carrying capacity of scuba diving for different dive sites (this will depend on site specific condition). Research also needs to be conducted on the impacts of sports fishing, since there are reports of this activity being undertaken in a quasi-commercial scale and capturing bottom fish. This research could inform

what types of management measures are required, which could include, for example, closures of certain areas, closed seasons or bag limits.

The Machangulo Peninsula includes a large diversity of coastal and marine habitats, and has been largely neglected by conservation efforts. The eastern side includes coral reefs, rocky shores and beaches, and a vast complex of sand dunes and wetlands. The coast on the side of Maputo Bay is fringed by extensive mangroves. A large tourism development is currently being implemented on 11,000 hectares of the peninsula, along approximately 20 kilometres of coast on the Indian Ocean side. This investment involves the construction of private exclusive chalets on the dunes overlooking the ocean. This initiative is called 'Machangulo Nature Reserve' and one of its explicit objectives is conservation. This private initiative is partly fulfilling the gap left by the lack of interest of government and environmental NGOs in Machangulo.

Although the above investment claims to have conservation objectives, it is mostly a commercial venture aimed at profit-making. It will have unavoidable impacts on the environment, resulting, for example, from construction on the dunes, opening of access roads and paths in the coastal vegetation, pumping of freshwater to supply the chalets, and the tourism activities themselves. Although these impacts are addressed in a mandatory environmental impact assessment, it is important that their mitigation is monitored by relevant authorities. There would also be much added value in the company establishing partnerships with universities and conservation NGOs to undertake research and implement specific conservation measures.

6. South Africa

6.1 Introduction

The perceived and actual threats to resource condition and sustainable resource use, opportunities and priorities for conservation differ in different parts of Greater St Lucia Wetland Part¹ (GSLWP). Therefore, this discussion takes place according to seven zones defined by researchers with experience in the area which loosely correspond to current zonation, habitat, adjacent coastal communities and types and mixes of resource use. Table 4 shows the zones and their coordinates and Figure 1 shows the place names and spatial location. The northern-most zones (from the South African border to Mabibi) are where most subsistence use takes place, while most recreational use takes place at Sodwana Bay, Cape Vidal and St Lucia.

The bulk of the information in this document was gleaned from the responses of researchers and managers to a questionnaire developed as part of this study. Additional information was obtained from the livelihood questionnaires undertaken as part of this study in two locations (Mabibi and Khula / St Lucia), tourist questionnaires undertaken in two locations (Sodwana and St Lucia) and key informant interviews and discussions (see also D16).

¹ GSLWP has recently been renamed as iSimangaliso Wetland Park, but the old name is retained here for consistency with other reports within the TRANSMAP project.

This is in contrast to the approach followed in Mozambique and Tanzania where there was the opportunity for more focussed groups meetings and interviews. The information in this section is therefore in a somewhat different format to that for the other countries. Here the threats have been associated with the issues of concern of conservation authorities and of users. Brief sections on opportunities and priority areas follow.

Table 4. Zones of similar resources and resource use in GSLWP

	From	X Coordinate	Y Coordinate	To	Approximate distance	Description
Zone 1	RSA border	32.89	-26.86	13 N	8.3 km	Includes Kosi estuary and adjacent communities as well as the new sanctuary
Zone 2	13 N	32.87	-26.93	Boteler Point	9.2 km	Includes Bhanga Nek and the associated recreational use component
Zone 3	Boteler Point	32.86	-27.01	Dog Point	10 km	The Maputaland Marine Sanctuary
Zone 4	Dog Point	32.84	-27.10	Red Cliffs	73 km	A large zone including Sodwana Bay and the lodges such as Thonga Lodge, Manzimnyama, Rocktail Bay etc.
Zone 5	Red Cliffs	32.62	27.71	Leven Point	23 km	The St Lucia Marine Reserve Sanctuary
Zone 6	Leven Point	32.59	-27.92	Cape Vidal	23 km	The previously exploited area (before the beach ban) north of Cape Vidal and the southern part of the St Lucia Marine Reserve
Zone 7	Cape Vidal	32.56	-28.13	Cape St Lucia	47 km	A large zone including St Lucia estuary, including a number of different users & zonation. Previously not incorporated into St Lucia Marine Reserve (which ended at Vidal) –subsequently incorporated in terms of World Heritage Site Act but not the Marine Living Resources Act.

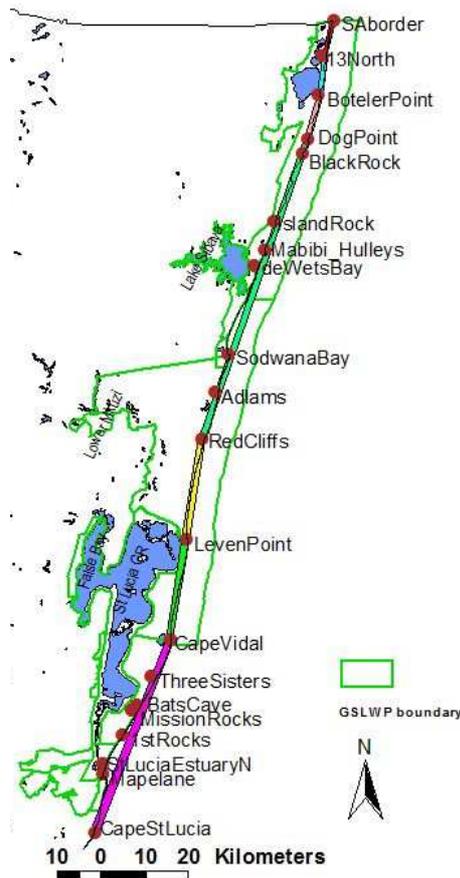


Figure 1. Map of northern KZN showing the boundary of GSLWP, the zones defined for this report and relevant place-names.

6.2 Threats

6.2.1 Zone 1 (SA Border to 13N)

Table 5 lists the main uses and issues of concern for Zone 1 (SA Border to 13N – about 8 km) grouped by habitat, invertebrates, fish and (where relevant) vegetation.

In Zone 1 there is recreational fishing and there are tourism operations run by Ezemvelo KwaZulu-Natal Wildlife / the Wetland Authority² (EKZNW/WA) and by communities. Tourism developments totalling approximately 200 beds are planned for the Kosi area. There is also traditional trap- and spear-fishing (regarded as currently at sustainable levels). Some gill-netting takes place under a permit system, but there is a problem of illegal gill-netting and jigging and some tourism activities which are regarded as a threat to sensitive dune areas. There is extensive mangrove use (for the making of traps) and harvesting of incema (reeds), often with sickles. The mangrove is heavily used and some estuarine fish species being potentially over-exploited. The sandy beaches are mainly within a sanctuary and most resources/habitats are in good condition or sustainably used. Some rocky shore areas are heavily exploited and some more resident fish species are locally overexploited. The

² Greater St Lucia Wetland Park is jointly managed by Ezemvelo KwaZulu-Natal Wildlife (EKZNW) and the Wetland Authority (WA). They have different, complementary roles and responsibility as discussed in D16. For the purposes of this report, they are treated as a unit.

subtidal soft and reef habitats as well as the open waters are in good condition, but there is some threat from poaching by foreign vessels. The dynamics of the Kosi system have been affected by increased sedimentation and drought.

Population growth in the area is fairly high despite the high HIV/AIDs and malaria prevalence in the area. With increasing population and few other opportunities, pressure on resources is increasing and local users are demanding more access and fewer restrictions. The situation is exacerbated by a lack of recognition, by some in the communities, of the right of authorities to place any restrictions on use and activities.

Subsistence and recreational users were not interviewed in this area as part of this study, the views expressed above and in Table 5 are based on the expert knowledge of researchers and managers in the area.

Table 5. Use and issues of concern in Zone 1 of GSLWP

Resource /habitat	Use	Conservation concerns	User concerns	Condition
Kosi estuary	<i>Controlled use:</i> Recreational fishing, limited gillnetting & tourism. <i>"Informal use":</i> artisanal trap fishing hand spearing, <i>Illegal use:</i> Gillnetting & jigging	Increased use of natural resources in area due to increased human population but also commercialisation of resources & use of modern methods & materials	Local communities demand greater access to resources & markets & improved infrastructure. Recreational users concerned about over-exploitation & lack of regulation.	Heavily utilized, increasing sedimentation, system stressed
Estuarine inverts	Subsistence/small-scale harvesting of sand prawns for bait & limited mangrove crabs for food	Sandprawn utilisation appears sustainable & of relatively little impact. The methods of harvesting sesamid crabs are destructive on vegetation	Users concerned at bushpigs digging up large numbers of target species during dry spells but no sign of stock reduction due to this.	Sand prawn stock probably sound, mangrove crabs recovering
Estuarine fish	Recreational line fishing, artisanal trap fishing, legal & illegal gill netting, main species include pouter, spotted grunter, river bream, Natal stumponose, mullet, etc.	Increasing number of traps & demand for access to other resources. Some species overexploited, impaired nursery function as relatively few recruits reach ocean.	User conflict, demand for greater access, concern for overall estuarine health. Anger at national phase out of legal estuarine gillnetting.	Some species showing signs of over-exploitation e.g. perch, river snapper, many showing signs of heavy utilisation.
Estuarine vegetation	Harvesting of mangroves, incema & reeds	Increasing demand for use driven by commercialisation & improved access to area & markets.	Degradation of reeds through the use of sickles & reduction in "quality" of incema, also due partly to use of sickles.	Mangroves heavily used for traps & incema beds extensively harvested commercially.
Sandy beaches	Zoned mostly as a sanctuary area. Recreational shore angling (at Kosi mouth only), subsistence line-fishing & invertebrate collection	Ship-borne pollution	Inequitable allocation of resources	Dynamic but generally good
Turtles	Research monitoring	Status of turtles worldwide, harvesting of turtles & eggs in Mozambique. Vigilance needed to protect SA turtles & nests.	Local people want to harvest turtle eggs for traditional use.	Loggerheads increasing, leatherbacks appear stable
Inverts	Subsistence harvesting of mole crabs, ghost crabs	Lack of areas closed to all use.	Fear of restrictions on access if permits are introduced.	Dynamic but use appears to be sustainable 'though stocks are at well below "pristine" levels. Effort levels declining.
Fish	Recreational linefishing (Kosi mouth only) & subsistence line-fishing, main species include Natal stumponose, large spotted pompano, giant kingfish, etc.	Overall use levels of fish are probably fairly low so no known specific concerns yet identified.	Fear of restrictions on access if permits are introduced.	Recruitment fluctuations but status of most species appears sustainable

Resource /habitat	Use	Conservation concerns	User concerns	Condition
Rocky shore	Snorkelling, shore angling (Kosi mouth only), subsistence line-fishing & invertebrate collection	Oil pollution. Subsistence harvesting in sanctuary area	User conflict between subsistence & recreational use, access limited	Dynamic with sand inundation, generally good, some areas heavily harvested
Inverts	Subsistence harvesting of mussels, red bait, limpets, oysters, etc	Continuing overuse in some areas, possible shifts in community structure, but overall use effort declining	Fear of restrictions on access if permits are introduced.	Some exposed rocky areas heavily utilized (13N, 15N & Kosi mouth)
Fish	Recreational (Kosi mouth only) & subsistence linefishing, main species include blacktail, grey grunter, stone bream, speckled snapper, etc.	Some extremely resident species e.g. speckled snapper & potato bass have probably been locally overexploited	Inequitable allocation of resources	Recruitment fluctuations, some resident species may be locally over-exploited
Subtidal soft	No use allowed	None?	None?	Good
Inverts	No harvesting allowed	None?	None?	Good
fish	No harvesting allowed	None?	None?	Good
Subtidal reefs	No current use	Poaching by foreign vessels	Boat access?	Reef condition good
Inverts	No harvesting allowed	Poaching by foreign vessels (deep water rock lobster trapping)	None?	Probably good
Fish	No harvesting allowed	Impact of pelagic gamefishing on reef fish community structure, illegal linefishing from Mozambique	Access?	Good
Pelagic/ water column	No harvesting allowed	Pollution, poaching	Access limited	Good
Fish	No harvesting allowed	Poaching by foreign vessels (deep water rock lobster trapping) & also ski-boats bottom fishing from Mozambique	Access	Good
mammals	No use allowed	Pollution, ship strikes	Access?	Good

Inverts = Invertebrates

6.2.2 Zone 2 (13N to Boteler Point)

Table 6 lists the main uses and issues of concern for Zone 2 (13N to Boteler Point – about 9 km). In Zone 2 there is extensive recreational and subsistence use. Some rocky shore areas are heavily used and some more resident fish species are locally overexploited. As in Zone 1, subsistence users want fewer restrictions and more access. Subsistence and recreational users were not interviewed in this area as part of this study, the views expressed above and in Table 6 are based on the expert knowledge of researchers and managers in the area.

Table 6. Use and issues of concern in Zone 2 of GSLWP

Resource /habitat	Use	Conservation concerns	User concerns	Condition
Sandy beaches	<i>recreation:</i> Boat launching, shore angling, beach enjoyment <i>subsistence:</i> invertebrate collection	Illegal developments at Bhanga Nek, carrying capacity, ship-borne pollution	Access limited, development issue	Dynamic but generally good
Turtles	Community based tourism & Research	Status of turtles worldwide, harvesting of turtles in Mozambique. Vigilance needed in SA	Locals want access to turtle eggs for traditional uses	Loggerheads increasing, leatherbacks stable
Inverts	Subsistence harvesting of mole crabs, ghost crabs	Unknown?	Concern at possible future controls	Dynamic but use appears to be sustainable
fish	Recreational & subsistence line-fishing, main species include Natal stumpnose, large spotted pompano etc.	None?	Limited access, especially beach driving	Recruitment fluctuations but status of most species appears sustainable
Rocky shore	Frolicking, snorkeling, shore angling, subsistence invertebrate collection	Oil pollution. Over-harvesting by subsistence users? (e.g. Boteler Point)	User conflict between subsistence & recreational use, access limited	Dynamic with sand inundation, generally good, some areas heavily harvested

Resource /habitat	Use	Conservation concerns	User concerns	Condition
Inverts	Subsistence harvesting of mussels, red bait, limpets, oysters, etc	Overuse in some areas, possible shifts in community structure	User conflict between subsistence & recreational use	Some areas heavily utilized (e.g. Boteler Point)
fish	Recreational & subsistence linefishing, main species include blacktail, grey grunter, stone bream, speckled snapper, etc.	Some extremely resident species e.g. speckled snapper & potato bass have probably been locally overexploited	Limited access, especially beach driving	Recruitment fluctuations, some resident species may be locally overexploited
Subtidal soft	No use allowed	None?	None?	Good
Inverts	No harvesting allowed	None?	None?	Good
fish	No harvesting allowed	None?	None?	Good
Subtidal reefs	No current use	Unknown?	Boat access?	Reef condition probably good
Inverts	No harvesting allowed	Poaching by foreign vessels (deep water rock lobster trapping)	None?	Probably good
fish	No harvesting allowed, some reef fish occasionally caught accidentally	Impact of pelagic gamefishing on reef fish community structure, illegal linefishing from Mozambique	None?	Good
Pelagic/ water column	Skiboat fishing (pelagic game-fish only)	Pollution, poaching	Access limited	Good
fish	Recreational skiboat fishing, spearfishing, main species include king mackerel, tunas, dorado, billfish, etc.	Poaching by foreign vessels	Access (launches) limited, reduced catches & bag limits	Status of most fish is probably good, although status of many is unknown
mammals	Whale & dophin watching (no permits currently issued)	Pollution, ship strikes	Scope for permits?	Humpback whale numbers increasing, dolphins probably stable

Inverts = Invertebrates

6.2.3 Zone 3 (Boteler Pt-Dog Pt)

Table 7 lists the main uses and issues of concern for Zone 3 (Boteler Pt-Dog Pt – about 10 km). Although Zone 3 is a sanctuary area (the Maputaland Marine Sanctuary), subsistence use of rocky and sandy shores for invertebrate harvesting and linefishing is allowed. Some rocky shore areas are heavily used and some more resident fish species are locally overexploited. As in Zone 1, subsistence users want fewer restrictions and more access. Subsistence and recreational users were not interviewed in this area as part of this study, the views expressed above and in Table 7 are based on the expert knowledge of researchers and managers in the area.

Table 7. Use and issues of concern in Zone 3 of GSLWP

Resource/habitat	Use (Sanctuary area)	Conservation concerns	User concerns	Condition
Sandy beaches	Subsistence invertebrate collection	Subsistence use being allowed in a no-take sanctuary	Access limited	Good
Turtles	No use allowed	Status of turtles worldwide, harvesting of turtles in Mozambique	None?	Loggerheads increasing, leatherbacks stable?
Inverts	Subsistence harvesting of mole crabs, ghost crabs	Unknown?	Inequitable allocation of resources	Dynamic but use appears to be sustainable
fish	Subsistence linefishing, main species include large spotted pompano, bastard mullet, etc.	Unknown?	Inequitable allocation of resources	Recruitment fluctuations but status of most species appears reasonable
Rocky shore	Subsistence harvesting	Easily accessible areas heavily utilised, oil pollution. Over-harvesting by subsistence users (e.g. Rabbit Rock)	Inequitable allocation of resources	Dynamic with sand inundation, exposed rocky areas heavily harvested
Inverts	Subsistence harvesting of mussels, red bait, limpets, oysters, etc	Overuse in some areas, possible shifts in community structure	Inequitable allocation of resources	Some areas are heavily utilized (e.g. Dog Point, Boteler Point)
fish	Subsistence linefishing, main species include blacktail, grey grunter, stone bream, speckled snapper, etc.	Few, as true subsistence anglers catch mostly smallish, abundant fish close inshore.	No real concerns	Recruitment fluctuations, some resident species may be locally overexploited

Resource/habitat	Use (Sanctuary area)	Conservation concerns	User concerns	Condition
Subtidal soft inverts	No use allowed	None?	Access?	Good
fish	No use allowed	None?	Access?	Good
Subtidal reefs	No use allowed	Pressure to open reefs in the sanctuary to scuba diving, poaching, threat from linefishing	Access?	Good
Inverts	No use allowed	None?	Access?	Good
fish	No use allowed	Pressure to open reefs in the sanctuary to scuba diving, poaching, threat from linefishing	Access?	Good
Pelagic/ water column	No use allowed	Pollution, poaching, threat from longline fishing	Access?	Good
fish	No use allowed	Pollution, poaching, threat from longline fishing	Access?	Good
mammals	No use allowed	Pollution, ship strikes	Access?	Good

Inverts = Invertebrates

6.2.4 Zone 4 (Dog Pt-Red Cliffs)

Table 8 lists the main uses and issues of concern for Zone 4 (Dog Pt-Red Cliffs– about 73 km). In Zone 4 there is a wide range of uses including heavy recreational use around Sodwana and subsistence invertebrate harvesting and linefishing. Some rocky shore areas are heavily used and some more resident fish species are locally overexploited. As in Zone 1, subsistence users want fewer restrictions and more access. In terms of tourism development, a further approximately 100 beds are planned for just north of Sodwana and another 100 on lake Sibaya.

Subsistence and recreational users were interviewed in this area (Mabibi for subsistence users and Sodwana for tourists) as part of this study. Ten of the 43 comments from subsistence users concerned the restrictions on resource use, which were felt to be too restrictive or not well managed or inequitable or arbitrary (chopping and changing). Tourists interviewed in Sodwana generally felt that the coral reefs were in good condition (60%) and the marine and coastal environment generally was in an excellent or good condition (86%). They felt that the main problem in the area was that there were too many people, fishers and cars. Although some recreational and subsistence users resent the beach driving restrictions 72% of those interviewed as part of this study wanted the beach driving ban to be more strict and / or better enforced as opposed to only 16% who wanted it removed or less strict.

Table 8. Use and issues of concern in Zone 4 of GSLWP

Resource/habitat	Use	Conservation concerns	User concerns	Condition
Sandy beaches	Tourism, concession driving, boat launching, beach recreation, shore angling, subsistence invertebrate collection	Impacts associated with proposed & existing access points, carrying capacity, ship-borne pollution	Access limited, user conflict at Sodwana	Dynamic but generally good. Area around Sodwana has high use/ impact
Turtles	tourism tours, research	Status of turtles worldwide, harvesting of turtles in Mozambique	None?	Loggerheads increasing, leatherbacks stable
Inverts	Subsistence harvesting of mole crabs, ghost crabs	Decreasing abundance in heavily utilized/impacted areas?	Inequitable allocation of resources	Dynamic but use appears to be sustainable
fish	Recreational & subsistence line-fishing, main species include Natal stumpnose, large spotted pompano etc.	None?	Limited access, especially beach driving	Recruitment fluctuations but status of most species appears reasonable

Resource/habitat	Use	Conservation concerns	User concerns	Condition
Rocky shore	Fossicking, snorkeling, shore angling, subsistence invertebrate collection	Easily accessible areas heavily utilised, oil pollution. Over-harvesting by subsistence users (e.g. Black Rock)	User conflict between subsistence & recreational use, access limited	Dynamic with sand inundation, generally good, some areas in north heavily harvested
Inverts	Subsistence harvesting of mussels, red bait, limpets, oysters, etc	Overuse in some areas, possible shifts in community structure	User conflict between subsistence & recreational use	Some areas to the north are heavily utilized (e.g. Dog Point, Black Rock)
fish	Recreational & subsistence line-fishing, main species include blacktail, grey grunter, stone bream, speckled snapper, etc.	Some extremely resident species e.g. speckled snapper & potato bass have probably been locally overexploited	Limited access, especially beach driving	Recruitment fluctuations, some resident species may be locally overexploited
Subtidal soft	No use allowed	None?	None?	Good
Inverts	No harvesting allowed	None?	None?	Good
fish	No harvesting allowed	None?	None?	Good
Subtidal reefs	Recreational diving	Concern about proposed new launch sites (Nine-mile). Coral bleaching, some concern regarding diver damage, diver carrying capacity, disposed fishing tackle	Congestion (e.g. Two-mile reef)	Reef condition generally good
Inverts	No harvesting allowed, some poaching of shells	Sporadic outbreaks of crown-of-thorns starfish	None?	Probably good
fish	No harvesting allowed, some reef fish occasionally caught accidentally	Impact of pelagic gamefishing on reef fish community structure	None?	Good
Pelagic/water column	Skiboat fishing (pelagic gamefish only), tourism	Pollution, poaching	Access limited	Good
fish	Recreational & charter skiboat fishing, spearfishing, main species include king mackerel, tunas, dorado, billfish, etc.	Poaching by foreign vessels (longliners)	Access (launches) limited, reduced catches & bag limits	Status of most fish is probably good, although status of many is unknown
mammals	Whale & dolphin watching (no permits currently issued)	Pollution, ship strikes	Scope for permits?	Humpback whale numbers increasing, dolphins probably stable

Inverts = Invertebrates

6.2.5 Zone 5 (Red Cliffs-Leven Point)

Table 9 lists the main uses and issues of concern for Zone 5 (Red Cliffs to Leven Point– about 23 km). Zone 5 is a sanctuary (St Lucia Marine Reserve Sanctuary) and no use is allowed. It is possible that subsistence users in neighbouring communities would like to have access to marine resources in the area.

Table 9. Use and issues of concern in Zone 5 of GSLWP

Resource/habitat	Use (Sanctuary area)	Conservation concerns	User concerns	Condition
Sandy beaches	No use allowed	Ship-borne pollution	Access?	Good
Turtles	No use allowed	Status of turtles worldwide, harvesting of turtles in Mozambique	Access?	Good
Inverts	No use allowed	None?	Access?	Good
fish	No use allowed	None?	Access?	Good
Rocky shore	No use allowed	None?	Access?	Good
Inverts	No use allowed	None?	Access?	Good
fish	No use allowed	None?	Access?	Good
Subtidal soft	No use allowed	None?	Access?	Good
Inverts	No use allowed	None?	Access?	Good
fish	No use allowed	None?	Access?	Good
Subtidal reefs	No use allowed	Pressure to open reefs in the sanctuary to scuba diving; poaching; threat from linefishing	Access?	Good
Inverts	No use allowed	None?	Access?	Good
fish	No use allowed	Pressure to open reefs in the sanctuary to scuba diving; poaching; threat from linefishing	Access?	Good

Pelagic/water column	No use allowed	Pollution, poaching, threat from longline fishing	Access?	Good
fish	No use allowed	Pollution, poaching, threat from longline fishing	Access?	Good
mammals	No use allowed	Pollution, ship strikes	Access?	Good

Inverts = Invertebrates

6.2.6 Zone 6 (Leven to Cape Vidal)

Table 10 lists the main uses and issues of concern for Zone 6 (Leven Point to Cape Vidal – about 23 km). There is intensive tourism activity in the Cape Vidal area including general beach enjoyment, diving, boat tours, beach and ski-boat fishing. Rocky shores at Cape Vidal are heavily used and resident species may be overexploited. There is some anchor damage and the problem of discarded fishing lines on the offshore reefs and there is some poaching on reefs and in the open waters.

There are extensive tourism developments planned for the Cape Vidal area. About 500 beds are planned in the first phase and another 700 in the next phase.

Table 10. Use and issues of concern in Zone 6 of GSLWP

Resource/habitat	Use	Conservation concerns	User concerns	Condition
Sandy beaches	Tourism, concession driving, boat launching, beach recreation, shore angling	Impacts associated with access points, carrying capacity, ship-borne pollution	Access limited	Dynamic but generally good
Turtles	tourism tours, research	Status of turtles worldwide, harvesting of turtles in Mozambique	Number of concessions granted	Loggerheads increasing, leatherbacks stable?
Inverts	No use allowed	None?	Access?	Good
fish	Recreational linefishing only, main species include shad, Natal stumpnose, large spotted pompano etc.	High usage during shad runs	Vehicle access to beaches	Recruitment fluctuations but status of most species reasonable.
Rocky shore	Tourism, snorkeling, shore angling	Easily accessible areas heavily utilised, oil pollution	Vehicle access limited	Dynamic with sand inundation, generally good, Cape Vidal point heavily fished
Inverts	No use allowed	None?	Access?	Good
fish	Recreational linefishing only, main species include shad, blacktail, grey grunter, speckled snapper, catface rockcod, etc.	Some extremely resident species e.g. speckled snapper & potato bass have probably been locally overexploited	Limited access, especially beach driving	Recruitment fluctuations, some resident species may be overexploited
Subtidal soft	No use allowed	None?	None	Good
Inverts	No use allowed	None?	None	Good
fish	No bottom fishing allowed	None?	None	Good
Subtidal reefs	Limited recreational diving	Impact of pelagic gamefishing on reef fish community structure; poaching	No bottom fishing allowed	Good, some anchor damage & discarded fishing line
Inverts	No use allowed, some poaching by deepwater lobster trapping	Anchor damage & discarded fishing gear, threat from offshore trapping	None	Good
fish	No bottom fishing allowed	Impact of pelagic gamefishing on reef fish community structure; poaching	No bottom fishing allowed	Good
Pelagic/water column	Skiboat fishing, tourism	Pollution, poaching, threat from longline fishing	Launching access limited, demand for competition fishing events, user conflict at launch site	Good
fish	Recreational & charter skiboat fishing, spearfishing, main species include king mackerel, queen mackerel, tunas, dorado	Poaching by foreign vessels (longliners), some gamefish species e.g. green jobfish & king-fish are more resident & may have been reduced	Access (launches) limited, reduced catches & bag limits	Status of most fish is probably good, although status of many is unknown
mammals	Potential whale & dophin watching	Pollution, ship strikes	Sufficient turnover? Scope for more permits?	Whale numbers increasing, dolphins probably stable

Inverts = Invertebrates

6.2.7 Zone 7 (Cape Vidal to Cape St Lucia)

Table 11 lists the main uses and issues of concern for Zone 7 (Cape Vidal to Cape St Lucia – about 47 km). There is intensive tourism activity associated with the town of St Lucia area, the lake/ estuary and the shore (general beach and water enjoyment, diving, boat tours, beach and ski-boat fishing), some gill- and seine-net fishing in the lake, some illegal prawn harvesting in the lake, invertebrate harvesting on sandy and rocky shores and commercial prawn trawling offshore. There are various threats posed by over-exploitation off sandy and rocky shores, and off-tidal reefs as highlighted in Table 11. There are extensive tourism developments planned for the St Lucia area (about 700 beds).

Subsistence and recreational users were interviewed as part of this project. Subsistence users felt that the closing of St Lucia estuary mouth had affected fishing and some complained that the ban on beach driving had made access to good fishing areas difficult. They also complained about bag limits, the need for permits and permit prices. They felt that the drought and estuary closure had affected fishing and tourist numbers. Most recreational users (57% - less than was the case in the Sodwana area) felt the beach driving ban should be made more strict or better enforced while only 22% would have preferred it to be made less strict or removed.

Table 11. Use and issues of concern in Zone 7 of GSLWP

Resource/habitat	Use	Conservation concerns	User concerns	Condition
St Lucia Lake & estuary	Recreational fishing, small-scale commercial gill & seine netting, tourism	Freshwater inflow, catchment management, mouth status	Mouth status, access by user groups	Dynamic, stressed by reduced freshwater inflow & mouth closure
Estuarine inverts	Illegal harvesting of swimming prawns & crabs	Nursery area, important to maintaining natural functioning of ecosystem, poaching concern	Demands by adjacent communities for legal access. Reduced recruitment to offshore trawl fishery	Variable depending on mouth/lake status
Estuarine fish	Recreational line fishing, illegal subsistence/ artisanal gill & seine netting main species include dusky kob, spotted grunter, river bream, Natal stumpnose, mullet, tilapia	Some species e.g. kob are overfished, mouth status effects recruitment, poaching concern	Mouth status, access by user groups, reduced recruitment to marine stocks	Extremely variable dependent on estuarine status. Some species e.g. dusky kob are overexploited
Estuarine vegetation	Seasonal harvesting of ncema & reeds	Increasing demand for use	Access limited	Stable
Sandy beaches	Tourism, concession driving, boat launching, beach recreation, shore angling, invertebrate collection	Impacts associated with access points, carrying capacity	Access limited	Dynamic but generally good
Turtles	Tourism tours, research	Status of turtles worldwide, harvesting of turtles in Mozambique	None?	Loggerheads increasing, leatherbacks stable?
Inverts	Recreational & subsistence harvesting of mole crabs, ghost crabs	None?	None?	Dynamic but use appears to be sustainable
fish	Recreational & subsistence line-fishing, main species include shad, spotted grunter, Natal stumpnose, large spotted pompano etc.	Some species are overfished, mouth status affects recruitment	Limited access, especially beach driving, concern about trawler by-catch	Recruitment fluctuations but status of most species reasonable. Some species e.g. dusky kob overexploited
Rocky shore	tourism, snorkeling, shore angling, invertebrate collection	Easily accessible areas heavily utilised, oil pollution	User conflict between subsistence & recreational use, access limited	Dynamic with sand inundation, generally good, some areas heavily fished
Inverts	Recreational & subsistence harvesting of mussels, red bait, limpets, oysters, etc	Overuse in easily accessible areas, possible shifts in community structure	User conflict between subsistence & recreational use, access limited	Generally good but some more accessible areas e.g. south of Mapelane heavily used
fish	Recreational & subsistence line-fishing, main species include shad, blacktail, grey grunter, speckled snapper, catface rockcod, etc.	Some extremely resident species e.g. speckled snapper & potato bass have probably been locally overexploited	Limited access, especially beach driving	Recruitment fluctuations, some resident species are overexploited

Subtidal soft	Limited trawling	Trawling is an inappropriate activity for this area, by-catch & damage to benthos, possible mining threat	Trawling companies concerned about losing access & recruitment of prawns from the estuary	Some impact within trawling grounds
Inverts	Prawn trawling, white prawn	Damage to sea floor, high levels of by-catch, inappropriate activity in World Heritage site	Trawling companies concerned about losing access & recruitment of prawns from the estuary	Some impact on sea pens & other benthic invertebrates, prawn stocks dynamic
fish	By-catch of prawn trawlers	High levels of by-catch, inappropriate activity in World Heritage site	Non-saleable status of some by-catch species	Unknown
Subtidal reefs	Skiboat fishing, recreational diving	Overexploitation of some species; poaching	Access limited	Reef condition unknown but probably good, some fish stocks overexploited
Inverts fish	East coast rock lobster harvesting Recreational, charter & commercial ski-boat fishing, spearfishing, cray-fishing, main species include, slinger, soldier, catface rock-cod, blue emperors, east coast rock lobster	None? Some species e.g. catface rockcod have probably been locally overexploited	Poaching User conflict between commercial & recreational use, access (launches) limited, reduced catches & bag limits	Probably good Several reef fish species are over-exploited, status of many species unknown
Pelagic/ water column	Skiboat fishing, tourism	Pollution, poaching	Access limited	Good, high turbidity from Umfolozi
fish	Recreational, charter & commercial ski-boat fishing, spearfishing, main species include king mackerel, queen mackerel, tunas, dorado	Poaching by foreign vessels (longliners)	Access (launches) limited, reduced catches & bag limits	Status of most fish is probably good, although status of many is unknown
mammals	Whale & dolphin watching	Pollution, ship strikes	Sufficient turnover? Scope for more permits?	Whale numbers increasing, dolphins probably stable

Inverts = Invertebrates

6.3 Opportunities

There is a fairly widespread negative perception among subsistence resource users regarding the conservation authorities (EKZ/NW/WA) and the restrictions placed on them regarding resource use and access. While there is acknowledgement that tourism is likely to bring opportunities, they feel the benefits have not yet been felt and /or are far less than they feel was 'promised'. There are some ways in which locals can and have benefited from conservation and tourism and these include:

- Investment in communities through the building of or improvements to infrastructure (e.g. electrification of schools),
- Granting of concession for running tours (e.g. birding, turtle watching, etc.),
- Partnerships with communities in the development and running of camps and lodges (e.g. Mabibi).

With regards to these initiatives, there were also some negative perceptions. For example, there were complaints from some people from Khula (St Lucia) area that concessions were kept for friends of EKZ/NW/WA employees. Some training initiatives have been rather *ad hoc*; for example the training of life guards where no-one (neither EKZ/NW/WA nor municipality) had taken the responsibility for providing or employing lifeguards (even though this is clearly a necessity), the training of tour guides (e.g. birders) where no more concessions are being allowed etc. However, the projects at Mabibi (Thonga beach lodge and camp) was positively perceived by the community and directly benefits them in terms of employment, training and the trust.

There has been extensive investment (by EKZ/NW and the Department of Environment Affairs and Tourism) in the creation of subsistence fishing committees and in the training of monitors. This has been successful in most areas in terms of increasing control of fishing and, more pertinently, in increasing awareness of the need for sustainable use and some control. However, these efforts are also

threatened by an apparent reduced level of commitment to this initiative by the authorities (see D16). Community members emphasized that it was necessary to hold more regular workshops with feedback where they could see, for example, the results of the monitoring program or be told in a coherent fashion about changing rules and regulations (rather than in an *ad hoc* fashion as issues arose).

GSLWP hosts the longest running turtle (loggerhead and leatherback) monitoring program. The program has monitors doing daily patrols during nesting season along a 56 km stretch from Kosi mouth to Mabibi. As the main nesting sites are within GSLWP, returning loggerheads seem to be increasing while leatherbacks have remained constant, while in other parts of the world populations are declining. The monitoring program (WWF/Green Trust Turtle Monitoring and Community Development Project) is managed by EKZMW. Besides the obvious conservation benefits, the project has encourage community turtle tours, trained monitors and had a schools outreach component and there seems fairly wide-spread support for such initiatives, although others within local communities still want to have the right to harvest turtle eggs for consumption. This monitoring program has recently been extended, as a joint initiative, into Mozambique up to Santa Maria / the Machungolo peninsula.

Although subsistence use of coastal resources is of far lower importance to livelihoods in GSLWP (around 40%) than it is in other areas investigated as part of this study (around 88%), given the high levels of poverty and unemployment, this is still very important to the communities of concern. However, given the lower level of dependence, this does present an opportunity in terms of the likelihood that alternative livelihood strategies are more likely to be taken up in the South African areas.

Thus, there exist opportunities to improve the prospect of long-term conservation of the rich biodiversity of the region through continued pursuit of (a) partnership arrangements for tourism initiatives such as turtle tours and Thonga beach lodge and camp, (b) co-management arrangements for consumptive resource use (subsistence committees) and for resource monitoring (turtle nestings, subsistence use) and (c) introduction of alternative livelihood strategies. These need to be pursued more consistently and vigorously.

6.4 *Priority areas for conservation*

GSLWP has been zoned into sanctuary areas and areas where recreational and / or subsistence use can take place. There remain anomalies where some consumptive use takes place in sanctuary areas and where commercial fishing (prawn trawling, gill-netting) takes place within the GSLWP boundary. The latest zonation plan for the park has not yet been released therefore no further comment is made here regarding priority areas in terms of spatial location.

However, the exposition of conservation concerns (threats) in Section 6.2 at the same time highlights priorities for management authorities and in some cases the spatial location of such priorities. Priorities include:

- Better enforcement of resource use regulations,
- Resolutions of anomalies where consumptive use is taking place within no-take zones and commercial use is taking place within the park,
- Better communication regarding the need for and benefits of the subsistence use committees and monitors,

- Better communication regarding other park rules and regulations,
- Better transfer of the benefits of tourism to local users and communities.

In many areas where consumptive use is permitted, rocky shores tend to be intensively used and some resident fish species as well as invertebrates such as mussels may be overexploited.

The area between Mabibi and Kosi mouth where loggerhead and leatherback turtles nest is of high conservation priority in terms of ensuring that the benefits (increasing and stable populations) of this area being in a monitored conservation area are maintained and strengthened.

7. Summary and recommendations

Threats, opportunities and management approaches

In Tanzania, the physical damage to habitats such as corals and mangroves appears to be controlled, at least within the Marine Park. However, a decline in the fisheries and other resources is still being experienced, probably because fishing pressure remains high which affects the resilience of the system, or its capacity to recover from perturbations caused by earlier impacts. So far, only gear restrictions have been applied and the no-take zones specified in the general management plan have not yet been implemented. Once the zoning is enforced, fish catches will be negatively affected even further, at least in the short term until any spill-over effects from closed areas develop. Given high community dependence on marine resources, livelihood opportunities need to be promoted not only as a measure to mitigate the negative effects of gear restrictions and no-take zones, but also as a means to diversify and improve livelihoods in a context of slow recovery of ecosystems.

In Mozambique (north and south), there is weak enforcement of resource use regulations owing to lack of government means and resources. In addition to improving the monitoring and enforcement capacity of government, building and strengthening community-based institutions for resource co-management is a key priority. This would create an additional means to promote the sound resources management, but is likely to cover only small areas that can easily be controlled by communities. Community-based management complements but does not substitute for the role of the government in monitoring and controlling the use of resources at broader spatial scales. Some combination of command-and-control approaches to resource protection for wider areas with participatory approaches for localised ones is likely to yield better results than one or the other approach in isolation.

The recognition by stakeholders that resources are in decline can be a means to gain stakeholder support for conservation measures. Threats can become opportunities. In northern Mozambique, the arrival of migrant fishers from Nacala and Tanzania can become an important motivation for the establishment of community-managed areas. However, the issue of migration is complex and the exclusion of migrant fishers through community-based or conventional command-and-control approaches may not be practical or ethical, particularly in the case of Mozambican migrant fishers. Wherever possible, it would be more appropriate to integrate migrant fishers into management rather than to exclude them.

Further research is needed to understand migrant fishing. This includes the drivers of migration, which are likely to be multiple, and management implications and approaches. For example, the migration of fishers from Nampula is likely to be a response to changes in the abundance and distribution of fishing

resources in their home areas, and the economic opportunity provided by expanding markets and increasing value of fish and other marine resources in Mozambique. The movement of fishers from Tanzania to Mozambique is possibly connected with declining abundance of marine resources in the former, together with changes in access to resources motivated by gear restrictions implemented as part of the Marine Park, as well as improved markets for fish as a result of the Mkapa Bridge improving the connection to Dar-es-Salaam and the opening of branches of fish trading companies in Mtwara.

Reconciling multiple demands

Multiple and often contradictory demands on coastal and marine resources are a feature in most areas. In northern Mozambique, for example, several sector-based initiatives are either planned or already being implemented in the same coastal and marine space. This includes the exploration of oil and gas, promoted at the highest level by the Mozambican government through the ministries for Energy and Mineral Resources; the development of high-end tourism allied to the creation of protected areas, promoted by the Ministry for Tourism; and the development of artisanal fisheries, supported by the Ministry for Fisheries. At the moment, there is little evidence of efforts to reconcile these multiple demands on coastal zones. This is creating uncertainty and apprehension amongst stakeholders at different levels, because information lacks on the potential impacts of one sector on another.

Priority areas for conservation

With regards to spatial priority areas for conservation within the northern transboundary region, efforts should focus on further implementing MBREMP in Tanzania and securing the creation of the Palma-Rovuma Reserve across the border in Mozambique. Without community support, it will be difficult to achieve conservation goals. Although not all communities support MBREMP, this research showed that in some communities the conservation benefits of the Park are beginning to be understood and appreciated, particularly in terms of stopping the physical destruction of some habitats such as coral reefs. Some conflicts with the Park have arisen because the expectations of communities with regards to the potential of the Park to improve livelihoods were raised, but not fulfilled in the time frame communities hoped for. There is an urgent need to improve livelihoods, but the Marine Park by itself is unlikely to solve the problem of poverty and resource dependence. Managers need to be open and honest with communities about what the Park can and cannot do in terms of livelihood improvement.

Important lessons for the Palma-Rovuma Reserve in Mozambique can be learned from MBREMP in Tanzania. Community consultations were undertaken for securing community support for the creation of this protected area. However, this research found that there are misunderstandings within communities about the objectives of the Reserve. For many, the Reserve is the solution to the conflicts with wildlife over the destruction of crops. People understood that the reserve will place a fence around the elephants to prevent them from destroying their crops. If and when the Reserve is created, the establishment of such a fence is unlikely and this will automatically become a source of resentment for communities. It is not clear where this source of misinformation to communities comes from, but its consequences can be very serious, particularly in terms of community support for conservation.

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