



Ministry of Environment and Tourism

Strategic Environmental Assessment (SEA) for the coastal areas of the Erongo and Kunene Regions

Study Report

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Namibian Coast Conservation & Management Project – NACOMA



Preface

The Namibian coastal Strategic Environmental Assessment (SEA) for the Kunene and Erongo regions draws on international experience and is timely in relation to the mounting production sector pressures. Being an initiative of the Namibian Government through its Ministry of Environment and Tourism (MET) the SEA seeks to inform political and technical decision makers at local, regional and national levels. The twinning of environment and development issues is pivotal in Vision 2030 and is supported by five year national development plans aiming to transform Namibia from a lower – middle income country to a high – income country.

A thriving economy cannot be built on a bankrupt environment and Namibia's biodiversity and unique "sense of place" should not be diminished by this transition.

Namibia is developing fast on the coast and cannot afford to choose easy options for short term gain if it reduces future options in the long term. The main production sector activity in Namibia's coastal zone needs careful, comprehensive and integrated planning, the first step in achieving this end is by conducting an SEA and developing a user friendly Decision Support Tool (DST). The SEA and DST will assist in making informed decisions on issues related to biodiversity conservation, land use planning and socio-economic development planning in the Kunene and Erongo coastal regions.

SEA is a rapidly evolving field with growing applications internationally. More and more countries are adopting SEA approaches with different degrees of enthusiasm. SEA "upstreams" development planning by shifting away from the individual project level towards a policy based lending and a sector level programming. Both SEA and Environmental Impact Assessment (EIA) have improved environmental management and development planning since EIA inception in the early 1970s. There has been a call for more pro-active integrated approaches recently, notably in the Plan of Implementation of the World Summit on Sustainable Development (WSSD).

The Namibian Government has made a very positive step by embracing this approach to the planning of the Namibian coast.

As far as possible the SEA and DST present the latest position, but inevitably things change and updating is required when new information becomes available. With environmental variability, climate change and production sector progress, adjustments will have to be made as information quickly becomes updated.

Namibia has gained some experience with small SEAs since 2000, however this is the most comprehensive and innovative SEA with the support of the user friendly DST.

The Kunene and Erongo Coast SEA will serve as input and a base to a number of MET and NACOMA activities especially the Namibian Coast Conservation and Management White Paper Policy (NACOWP).

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ACRONYMS AND ABBREVIATIONS

BCLME	Benguela Current Large Marine Ecosystem
BENEFIT	Benguela Environment Fisheries Interaction and Training Programme
BOP	Bottom Of Pipe
CBD	The Convention on Biological Diversity
CBNRM	Community Based Natural Resource Management
CMC	Contingency Management Committee
DST	Decision Support Tool
ETM+	Landsat Enhanced Thematic Mapper Plus
GDP	Gross Domestic Product
GIS	Geographic Information System
GLF	Global Land-cover Facility
ICZM	Integrated Coastal Zone Management
MAWF	Ministry of Agriculture, Water & Forestry
MAWRD	Ministry of Agriculture, Water and Rural Development
MET	Ministry of Environment and Tourism
MFMR	Ministry of Fisheries and Marine Resources
MLR	Ministry of Lands and Resettlement
MME	Ministry of Mines and Energy
MPA	Marine Protected Area
MRLGHRD	Ministry of Regional and Local Government and Housing and Rural Development
NACOMA	Namibian Coast Conservation and Management Project
NACOWP	Namibian Coast Conservation and Management White Paper
NatMIRC	National Marine Information and Research Centre
NBSAP	Namibia's Biodiversity Strategy and Action Plan
NWR	Namibia Wildlife Resorts
NDP	National Development Plan
NPC	National Planning Commission
NTB	National Tourism Board
NWCTRA	National West Coast Tourist Recreation Area
PPP	Policies Plans Programmes
RDP	Regional Development Plan
RSC	Regional Service Council
SCNP	Skeleton Coast National Park
SEA	Strategic Environmental Assessment
SP	Structure Plan

SRTM	Shuttle Radar Topography Mission
SWKM	Swakopmund
TAC	Total Allowable Catches
TFCA	Trans Frontier Conservation Area
TOR	Terms Of Reference
TPS	Town Planning Scheme
UNAM	University of Namibia
WB	Walvis Bay
WBM	Walvis Bay Municipality
WTTC	World Travel & Tourism Council

EXECUTIVE SUMMARY

In September 2006, the Namibian Coast Conservation and Management Project (NACOMA - <http://www.nacoma.org.na>) commissioned DHI Water & Environment to develop a user friendly, decision guiding and policy relevant Strategic Environmental Assessment (SEA) of the Erongo and Kunene regions' coastal zones. The information, data and findings resulting from the SEA process have, further, been transferred to a Decision Support Tool (DST), which will assist political and technical decision makers at local, regional and national levels to make decisions on biodiversity conservation, land use planning, and social and economic development planning in the Kunene and Erongo coastal zones.

The SEA and DST will also form inputs to NACOMA's other activities. All data and other information collected during the SEA process will also feed into the preparation work by NACOMA for separate regional coastal profiles for particular use by the Kunene and Erongo Regional Councils. A specific contribution to the preparation of these regional profiles is identified in the recommendations of the SEA. These recommendations will inform the finalisation of a review of existing institutional mandates, policies and laws for coastal management in Namibia. In these ways, the results of the SEA will contribute to the development of the Namibian Coast Conservation and Management White Paper (NACOWP) to ensure that coastal development planning and management is based on pertinent information and data and on analysis and consideration of the most suitable actual and potential land uses.

As per the Terms of Reference, the SEA contains:

1. A description of current land uses, impacts, threats and pressures along the coastal zone, with recommendations for prevention and mitigation overall and in relation to Policies, Plans and Programmes (PPPs), including spatial data for use in the DST;
2. A description of environmental/biodiversity conservation and management gaps, problems and implementation difficulties of current environmental/biodiversity conservation and management safeguards, management/control practices, and conservation/biodiversity management targets. This includes detailed concrete recommendations for improvement of environmental/biodiversity conservation and management overall and in relation to PPPs and data for use in the DST;
3. The outcomes of the integration of (i) and (ii) above in relation to existing PPPs.

Methodology

SEA is usually described as an Environmental Assessment (EA) process and method that assists in strategic decision making above the individual project level. SEA therefore refers to the environmental assessment of policies, plans, and programmes (PPPs) towards the purpose of achieving ecologically sustainable development. These days, SEA is increasingly seen as a tool which can address the inter-relationships between biophysical, social and economic impacts, rather than environmental impacts alone. SEA is a very useful tool for coastal planning and management, and SEA can be particularly helpful taking environmental issues into account whilst preparing or evaluating land use plans. For NACOMA, as for any other Integrated Coastal Zone Management (ICZM) initiative, SEA can help in identifying both the environmental opportunities and the constraints to social, physical and economic development in a coastal zone – and thus supply a broad strategic framework within which ICZM can occur. In this way, SEA provides at least some of the strategic parameters or guidelines within which ICZM can best take place.

Many hundreds (if not thousands) of technical and scientific studies of the biophysical and environmental conditions and dynamics of Namibia's lengthy, thinly populated 1,570 km coastline have been made over the years. Similarly, many attempts, these now dating back several decades, have also been made to link environmental, social and economic dimensions in planning for coastal development. The real difficulty lies in the inability by stakeholders to find common understandings of and a shared strategic perspective on the economic, social and environmental interactions necessarily involved in coastal development today, and of the adjustments, compromises and trade-offs that need to be made to assure better coastal planning and management.

A key to a successful development and application of the SEA and DST has been the ongoing liaison with the stakeholders during the entire project. Stakeholder involvement has focused on delivery of planning documents and data, methodologies related to the analysis of land use suitability, including the analysis of biodiversity trends as well as on discussions on individual land use plans. An important element of the project has been the establishment of the SEA GIS – a GIS mapping system covering all major landscape, biodiversity, infrastructure, land use and PPP data of the coastal regions of Kunene and Erongo. In order to facilitate the use of the DST as a tool for assisting the decision-making process at the regional level all available physical, biological and land use data have been analysed in an integrated way. Trade-offs between economic, social and environmental issues has been enabled by application of multi-criteria evaluation. In this way the end user will now be able to use the modelled land use suitability data with background information and his or her own data to explore various development scenarios.

A mapping system in support of a coastal SEA not only requires integrated analyses of land use, planning and environmental data, but it also requires a relatively high resolution to produce sufficiently detailed information to be useful in the decision-making process related to various land-use options. Thus, in order to map key components of the coastal landscape with sufficient detail, two remote sensing data sets have been used: a Landsat ETM+ data set from 2001 in 28.5 m resolution and a digital topographic data set (SRTM) in one meter vertical and 90 m horizontal resolution. The ETM+ data have been processed to a seamless backdrop for the SEA GIS and have been used as a basis for digitising exact river courses and locate areas with prominent vegetation. The SRTM data have been used to estimate the relief and topographic complexity of the coastal zone. The data made available by the stakeholders were used to map the spatial extent of current land uses, priority zones for development of some land uses according to PPPs and the range of exploitable resources.

Estimation of land use suitability was made by integration of the PPP data, exploitable resource ranges, current land uses, environmental data, and modelled biodiversity hot spots. Although the two regions boast a variety of internationally recognised nature conservation assets the current boundaries of protected areas may not agree entirely with the gradients in coastal biodiversity found in the regions. Accordingly, gradients in biodiversity were estimated by mapping the distribution of priority areas or habitats for conservation in the coastal zone, including lichen distribution, priority species of vegetation, birds and mammals, wetlands of global importance, distance from regions of enhanced diversity and endemism like the Escarpment, Etosha and Brandberg, rocky outcrops and cliffs, rocky shorelines, well vegetated ephemeral rivers and areas of high topographic complexity. These priority areas/habitats for conservation were chosen on the basis of landscape characteristics known as important environmental drivers in relation to the movement of prioritised species of large mammals between Etosha and the coast, in relation to the distribution of prioritised species of birds and higher plants, and in relation to increased levels of diversity and endemism in plants, invertebrate and vertebrate animals. The mapped priority areas/habitats were combined into three classes of area importance. Land use suitability was modelled for each land use type using multi-criteria evaluation (weighted linear combination). The environmental factors for each land use were combined with information (if available) on exploitable resources, areas currently developed for urban land use, areas outlined by PPPs as priority development areas and the mapped priority areas/habitats for conservation. The four latter data sets

were used as technical constraints to development: i.e. no development was regarded as suitable if the area was outside a PPP zone, or in areas of no exploitable resources, or in urban land use zones, or priority areas/habitats for conservation.

SEA - General

More than 90% of the two coastal regions fall within Namibia's national protected areas system. At the same time, the boundaries of the Skeleton Coast Park, the National West Coast Tourist Recreation Area and the Namib-Naukluft Park were proclaimed before Namibia gained independence and the modern environmental legislative framework in support of the integration of nature conservation and sustainable development was established. Thus, with the exception of the Namib-Naukluft Park, no clear goals have been set up linking management of human resource use and the conservation status of key species and habitats. As a result it is unclear which biodiversity elements constitute the focus for the coastal parks, and which elements are the focuses of more wide-scale habitat conservation action due to their widespread occurrence or lower susceptibility to human activities. This lack of conservation targets degrades both the conservation of the most sensitive elements of the biodiversity in the coastal parks as well as the implementation of sustainable development within the park's boundaries.

Like other studies on biodiversity trends in Erongo and Kunene, the SEA clearly indicates a mismatch between the boundaries of the coastal parks and the general trends in biodiversity found in the coastal regions. The trends are quite striking and underline the fact that conservation priority areas and habitats in the protected coastal parks are indeed not evenly distributed along or across the coastal strip. The NBSAP provides for the implementation of article 95 (l) of the Namibian Constitution and the Convention on Biological Diversity and it offers MET the legal mechanisms for achieving the goal to develop management plans for the coastal parks. Currently, however, management plans with zoning of the area and tourism development plans have only been prepared for the Namib Naukluft Park. In that respect the SEA provides guidance to the zonation of the parks into potential areas for sustainable development and areas of differential sensitivity and importance as a basis for identifying core areas for conservation to be held free of any development.

Due to the enormous biodiversity assets of the coastal regions of Erongo and Kunene and the sensitive ecosystems they support, the largest development potential is related to the tourism industry. Although tourism land use patterns can not currently be separated into the various types of tourism activities undertaken on the coast, it is clear that low-impact adventure and wildlife tourism (eco-tourism) can be widely applied and developed hand-in-hand with the conservation of biodiversity hot spots. Indeed, in terms of competition with other destinations – both domestic and international and even regional – preservation of the extraordinary conditions of the coastal environment in Kunene and Erongo might give the industry a competitive edge.

However, due to the fact that tourist policy and plan making are lagging behind both at regional and local levels, a current strategy and a support programme for both conventional and eco-tourism are urgently needed to boost the sector in both Kunene and Erongo. Local governments, at times working together, are enabling the activities of a resurgent private sector. But coordination between stakeholders seems poor, and there is little shared understanding of how coastal tourism has shifted its target markets, adapted its products, and moved forward. Up to date information to back up such an understanding is lacking. In this situation, there is a danger that environmental planning and management receives only lip service, and the resources on which coastal tourism depends are degraded. The need to strengthen the basis for capitalising on the potential win-win development scenario between eco-tourism and nature conservation on the coast is closely linked to the need to strengthen the power of MET relative to other line ministries and to align tourism development on the coast with the MET Concessions Policy. The full use of the tourism potential in the coastal

areas will also depend on the implementation of the Neighbours and Residents Policy, as tourism is currently growing in inland escarpment areas outside the coastal zone.

Compared to eco-tourism, other land uses, including traditional 'high-impact' tourism, possess a significantly smaller development potential in the two coastal regions. In spite of the lower potential, sustainable development is possible to achieve for all land uses by adopting the following environmental standards for land use development in pristine and sensitive environments:

- Avoidance of the most sensitive areas identified on the basis of a detailed baseline, in which habitat sensitivity in focal areas for land use development is mapped or modelled prior to environmental impact studies. The SEA provides guidance on the general location of hot spots of biodiversity, and may be used as basis for designing more detailed studies of the sensitivity of the areas in relation to various development projects;
- International standard environmental impact studies coupled to careful mitigation which secures the application of effective response mechanisms, which can then allow developments to proceed in close proximity to important and sensitive habitats. In cases where significant impacts can not be avoided, changes to the planned development must take place. In cases where impacts of minor or moderate scale are estimated, careful mitigation measures must be set up and the residual impact following implementation of mitigation must be estimated. Assessments of single project as well as cumulative impacts of a planned project together with all other existing human activities must be included.
- Comprehensive environmental monitoring and management, which secures that the level of control necessary to assure authorities and NGOs of compliance with environmental quality objectives for development in proximity to sensitive habitats, requires quantifiable compliance targets. Of equal importance are effective and rapid response mechanisms, to allow feedback of monitoring results into compliance targets and work methods.

As stated in the Vision 2030 sub-vision on urbanisation there is a growing need for Namibia's secondary cities like Walvis Bay and Swakopmund to play a bigger part in absorbing urban development than they do today, when Windhoek is hosting the major urban growth. Accordingly, the need for better urban policy, planning and management to accommodate urban growth is likely to become a more urgent imperative in the future. Sustainable urban development will rely on urban policy, planning and management practices facilitating the development of the Walvis Bay - Swakopmund area as a sub-regional platform to spatially concentrate, accommodate and enhance the benefits of urban and economic growth in the Erongo Region.

The location of nearby areas of conservation priority like the river valleys of the Kuiseb and Swakop rivers, the wetlands like Walvis Bay Lagoon, lichen fields and localised high densities of breeding Damara terns severely constrain the suitability for spreading urban land use beyond areas currently allocated to residential, beach resort and industrial establishments. However, even facing these constraints Walvis Bay and Swakopmund can increase their importance as a key national asset by developing an improved basis for spatial planning and management, by observing high standards of strategic and impact assessment and by developing detailed tourism plans.

A major factor in the future economy of Erongo and Kunene is the mining industry. In order to improve planning of the extraction of minerals and avoid unsustainable development of the industry on the coast the environmental standards for land use development in pristine and sensitive environments mentioned above must be observed. It is particularly important to ensure liaison with MET at an early stage of prospecting for mineral extraction in the protected areas and national monuments. For each licence awarded, MME and the MET must agree with the licensee on the scope of the prospecting in terms of volume of soil/sand removed.

Larger amounts may only be removed after exemption or renewed application and permit. A new Bill is being prepared which introduces requirements for financial guarantees for reparation of environmental damage and the setting up of trust funds for rehabilitation after mine closure. This may provide leverage for the enforcement of rehabilitation. The environmental monitoring of mining activities which is carried out by the Division of Engineering and Environmental Geology of MME provides for an important environmental control of potentially adverse impacts like excessive water supply, dust emission and pollution of surface- as well as groundwater. Here, again, MET should be involved as a third party to evaluate monitoring results.

Better planning of water resource use in mining activities must also be regarded as a key to a more sustainable mineral extraction on the coast. The existing water use policy, which leaves the organisation of water supply to the individual mining company, has to be replaced by a policy which ensures that suboptimal water extraction/desalination and distribution patterns do not emerge. As the current water use in Erongo is over-utilising the water resource, desalination plants are being considered whenever future water demands are discussed. A feasible project has yet to appear, but other coastal developments in arid zones have resorted to this solution and the cost of the technology is decreasing. Namwater may licence a desalination plant feeding mines through a distribution network to mines based on the Rössing pipe.

Aquaculture (fish and seafood) has gained considerable interest in Namibia over the last few years. The current National Development Plan (NDP 2) calls for the promotion of aquaculture activities and the national policy paper Vision 2030 both foresee a thriving aquaculture industry. Since 2003, the Aquaculture Act has provided a legislative context, and the policy paper Towards the Responsible Development of Aquaculture (2001) and the Aquaculture Strategy (2004) were developed to address the development of a sustainable aquaculture sector. Recently, detailed plans have been developed for Erongo, while very little aquaculture has been proposed in the Kunene region due to the distance to market and infrastructure challenges. In addition, the Walvis Bay Council has proposed to zone two plots between Walvis Bay and Swakopmund for aquaculture development with land based facilities. Unfortunately, the current plans have not been founded on the basis of a comprehensive environmental master plan which considers both the natural marine environment from a feasible production and environmental point of view. An environmental master plan could provide a detailed zoning on the basis of the SEA and water quality data available from BCLME and could provide a sectoral strategic environmental assessment including modelling of effects on local water quality properties. The modelled suitability for sea-based and land-based aquaculture made by this SEA indicates that suitable locations in Erongo are few and localised and associated with Walvis Bay, Swakopmund and Henties Bay. Hence, proper planning of aquaculture developments in Erongo will require careful scrutiny of potential land use conflicts between residential areas and suitable areas for aquaculture.

SEA - Specific

ERONGO

Sandwich Harbour

The SEA classified the area as of very high conservation priority. In line with the new Wetland Policy, Sandwich Harbour should be declared a Marine Protected Area to protect the large numbers of waterbirds, fish spawning and rearing in the area, the shark population and the possibility of right whale calving. A detailed management plan should be prepared allowing strict protection of the site, while enabling low-impact eco-tourism to continue to take place.

Walvis Bay Wetland

The SEA classified the area as of very high conservation priority. In line with the new Wetland Policy, enforcement of the Walvis Bay Nature Reserve Management Plan should be pursued in the short term. MET should formally designate the Nature Reserve as a protected area. MET, the Walvis Bay Municipality and the Coastal Environmental Trust of Namibia should ensure further enforcement of the national Wetland Policy in the area by adopting the Nature Reserve Management Plan.

MET, the Walvis Bay Municipality and the Coastal Environmental Trust of Namibia should as soon as possible also establish a long-term environmental monitoring programme including the biodiversity elements for terrestrial, coastal as well as offshore habitats found in the wetland. A baseline for the monitoring programme should produce diversity gradients in relation to tourism, aquaculture and agriculture and the acquired data should feed into the requirement for improved Environmental Impact Assessments. To make full use of the potential for development of eco-tourism and traditional tourism in the wetland, a tourism development plan for the Nature Reserve should be drafted by the Walvis Bay Municipality in collaboration with the Walvis Bay Tourism Association and the Marine Tour Association of Namibia. Developments of all tourist activities in the reserve and accommodation adjacent to the reserve should occur on the basis of permissions subject to Environmental Impact Assessment. A feasibility study of the development of the existing aquaculture farms for oyster and future marine and land-based aquacultures in the wetland should be made in relation to the most sensitive parts and residential areas.

The aquaculture development near Pelican Point is in waters zoned for port activities and included in the nature reserve. The planned area conflicts with the dredge spoil dump site nearest to the harbour and may conflict with the conservation targets for the nature reserve. An environmental master plan for the Aqua Park should include provisions for retrieving oysters when dredging and spoil dumping is in progress and detailed assessments of impacts on coastal and marine biodiversity elements.

Dune belt

The dune belt should be included in the Walvis Bay Nature Reserve, and free zones for off-road driving should be maintained east of Walvis Bay and east of Long Beach. The management and environmental monitoring of the area should be part of the activities proposed for the Nature Reserve. Expansion of eco-tourism activities should be promoted through inclusion of the Dune belt in the proposed Walvis Bay tourism development plan. Once the existing mining licenses expire, new reconnaissance, prospecting or mining licences should not be granted in the dune belt. The zoning of eco-tourism and free zones for off-road driving should become object of a detailed Environmental Impact Assessment.

Walvis Bay

The process for the revision of the Walvis Bay Municipality Structure Plan will be concluded in the next months. This will involve, in part, the discussion and approval of the proposals relevant to the Esplanade and to the coastal area. This process provides a valuable opportunity for Walvis Bay Municipality and other stakeholders to resolve the land use and zoning issues that have caused controversy for a long period. The proposals for the Esplanade are broadly in line with the structure plan. The proposal for encouraging higher density developments and activities related to conventional tourism along the lagoon, should be reconsidered or justified further, as the modelled land use suitability for conventional beach tourism in the Walvis Bay area indicates low suitability along the lagoon. Protests about the proposed mixed use development on the Atlantis Sports Grounds could be set to rest by keeping the development on the eastern side of the road, and therefore not closing the Esplanade to through traffic.

The SEA indicates high biodiversity values in the northern part of the coastal area adjacent to the Swakop River and the land use suitability maps indicate a lack of suitability for land uses other than eco-tourism. This area remains undeveloped, and the only proposal for development that was subjected to an EIA in recent years – a residential area near the Swakop River in 2002 – was rejected by MET on the basis of the EIA and the Peri-Urban Policy. In view of its biodiversity and recreational and landscape values, it is recommended that the area, which is still in any event state land, be maintained solely as a Conservation Area, as per the original Walvis Bay Structure Plan and Peri-Urban Land Use Policy. The proposals for nodal residential developments near the Swakop River mouth and in the Caution Reef area should be rejected. Conservation, Eco-Tourism and Aquaculture – are uses that do not fit easily with one another – the proposed development zone at Caution Reef should also be shelved.

The *fait accompli* of urban and economic development on the southern part of the coast should be accepted by stakeholders. This development started nearly 20 years ago with the proclamation and development of Long Beach. It was given ample room for expansion by WBM's rezoning in 2003 and the subsequent development of Long Beach Extension 1 and of the three new residential areas that are now either underway or planned for the near-term future. The structure plan revisions propose a mix of harbour and aquaculture, residential and public beach/recreational activities in the area. These should be accepted, as indicated by the SEA land use suitability models. More analysis will have to be done on the means that can be used, such as design guidelines, for assuring that these very different land uses do not conflict with one another, with negative impacts for residents and the natural environment. At the same time, sufficient public beach and recreational space and access to it for residents will be needed to also be assured. Given that the land-use suitability models indicate that the majority of the area sustains low suitability for aquaculture and high suitability for tourism the potential for increased recreational uses of the area should set the scene.

Swakopmund

It will be necessary for SM and MFMR to decide jointly which portions of the land between Mile 4 and the Mile 4 Saltworks should be allocated to aquaculture and which to possible future urban development. In principle, both uses can be accommodated, as indicated by the SEA land use suitability models, provided measures are taken to mitigate any impacts from the essentially industrial processes which characterise aquaculture. The area north of the Saltworks is seemingly more suitable for land-based aquaculture development. An EIA is recommended for any future developments of scale in the area.

Mile 4 Saltworks

The Mile 4 Saltworks comprises a private nature reserve of 400 ha, saltworks, guano platforms and oyster production. No conflicts seem to exist between the waterbird concentrations, the salt extraction, oyster production and guano scraping at the saltworks. In line with the new Wetland Policy the current seemingly sustainable activities should be monitored and any new development should be subject of environmental impact assessment. The area just north of the saltworks has been identified as a potential development area for land-based aquaculture by MFMR, and the land use suitability models of the SEA indicate that the area is suitable for aquaculture development.

Wlotzkasbaken

Under the auspices of the ERC, a structure or development plan should be prepared for the Wlotzkasbaken area. This should highlight both development options (residential, recreational, aquaculture, etc.) and the zoning of future land uses.

Henties Bay

The tourism development in Henties Bay overlaps with an urbanisation of prime land along the beach, and it is therefore recommended to consider future profitable and sustainable tourism development along the coast of the town of Henties Bay. Development should continue to be directed towards the south of the current urban area. The potential for land-based aquaculture should be pursued to the south of the town.

Brandberg Massif

The SEA classified the area as of very high conservation priority. The rocky areas of the Brandberg Massif, which are connected with Namibia's highest mountain Brandberg, at 2,606m, located in the central section of the Namib Desert some 30 km from the boundary of the National West Coast Tourist Recreation Area, is a priority area for conservation of a wide range of desert plants and animals. The area also includes the Messum Crater. Recent analyses show that Brandberg is the epicentre of a rich vein of endemic mammals, reptiles, plants and amphibians that runs from the Sperrgebiet in the south to the Otjihipa Mountains in the north. No other area in Namibia is as rich in endemics as the Brandberg massif; among the 90 endemic plants, eight are found nowhere else, whilst three of six near-endemic frogs, eight of 14 near-endemic mammals, 49 of 59 near-endemic reptiles, and 11 of 14 near-endemic birds occur on or around this inselberg. No land use development, except for eco-tourism, should take place in the Brandberg Massif.

Cape Cross Nature Reserve

Currently this wetland is registered as a nature reserve with the purpose to restrict access to the public. The seal reserve is visited by 40,000 tourists per year. In line with the new Wetland Policy, the current seemingly sustainable levels of tourism, guano-scraping and small-scale salt-extraction activities should be monitored and any new development should be subject of environmental impact assessment.

National West Coast Tourist Recreation Area

MET should develop a new conservation management regime for the NWCTRA, which satisfies the requirements for improved integration of growing land uses and nature protection. New management plans should establish a multiple use framework for future developments with zonation for all land uses, including information on the most sensitive areas to be avoided by mining activities, on the basis of detailed profiles of landscape, vegetation, wildlife, livestock and human settlements. The SEA provides assistance to this process.

The mapping of priority areas for conservation indicates that the most sensitive areas and areas with the largest eco-tourism potential within the NWCTRA are found at Cape Cross Lagoon and Seal Reserve, the river beds and associated areas of the Swakop and Ugab rivers and the rocky area associated with the Brandberg Massif. Other land uses, including conventional tourism, should be focused on the parts of the NWCTRA with limited concentration of biodiversity. The development of conventional and eco-tourism should be guided by a tourism plan for the area.

KUNENE

Skeleton Coast National Park

The Skeleton Coast National Park is a globally unique place, and must maintain its protected status and wilderness characteristics. At the same time, increased sustainable activities regarding tourism are possible which will benefit locals and neighbours in adjacent conservancies. The government's policies on Protected Areas, Neighbours and Resident People and the Policy Framework for Concessions in Proclaimed Protected Areas should be implemented as soon as possible, and the park's Master Plan should be agreed upon and enforced. New management plans for the Skeleton Coast National Park, the TFCA, and the proposed extension to Etosha should establish target habitats for conservation and species

action plans as well as zonation for all land uses, including areas to be avoided by mining activities, on the basis of detailed profiles of landscape, vegetation, wildlife, livestock and human settlements. The SEA provides guidance to this process.

Development of diamond mining activities in the park is undertaken without advice on sensitive zones to be avoided and best areas for location of pipelines, tracks and roads. The lack of a detailed management plan has also introduced other activities in sensitive areas like off-road driving, recreational angling, private tourism, littering and the excavation of trenches. The SEA and the mapping of priority areas for conservation will contribute to the understanding of the sensitive areas. The most sensitive areas are the mouth of the Kunene River, the river beds of the ephemeral rivers with prominent stands of higher plants and the eastern-central sector between Koigab and Hoanib rivers. The easternmost parts of the river beds of the Ugab, Huab, Koigab, Uniab, Hoanib, Hoarusib and Khumib located within the Skeleton Coast National Park are characterised by habitats which support elevated densities of a wide range of taxa and species, like growth of *Acacia* spp. and *Colophospermum mopane*, rocky areas like the Agate Mountain and high topographic complexity. The unique fauna includes several species of large herbivorous and carnivorous mammals, and bird species like the Black harrier. The eastern-central sector of the SCNP between Koigab and Hoanib rivers marks a zone of significant concentrations of habitats, especially for mammals migrating between Etosha and the coast as well as for a number of bird species recruited in the Escarpment. In addition the zone supports extensive coverage of *Welwitschia*, and rocky outcrops are found centrally while an area of high complexity is found in the south. The zone is used both by relatively common mammal species like Springbok as well as by rare and endangered species like Mountain zebra, Lion, Elephant and Leopard. Elephants seem mainly to use the northern-most part of the zone.

The northern part of the SCNP from the Kunene River to Möwe Bay should remain a closed area and be integrated with the planned TFCA. Möwe Bay should develop its tourism potential to accommodate and cater for day trippers from Terrace Bay and fly-ins; this would include new housing to replace the existing pre-fab constructions. The landing site (“harbour”) should be improved to allow launching of angling boats. The MET facilities should be rehabilitated with a clear objective of becoming a showcase sustainable settlement with solar and wind power, desalination, housing construction etc. Terrace Bay should be developed to capitalise on the suitability of the location for tourism, including beach resorts. The area might be developed into a high-end angling site and the point-of-departure for day trips to Möwe Bay and trips to the adjacent core wilderness area with accommodation in an all inclusive resort. Torra Bay should remain a site for budget accommodation aimed at domestic, and SADC region eco-tourist and angler target groups. The development of a Skeleton Coast Biodiversity Centre in support of eco-tourism should be explored aiming at the improved potential for wilderness safaris in the Skeleton Coast – Etosha extension area.

Considering its vast size, the park is severely understaffed. It should be discussed in MET, MME, MFMR and other relevant ministries how existing responsibilities with respect to surveillance and inspection of the North West of Namibia can most efficiently be carried out. Costs could be shared and rangers could carry out duties for other ministries to increase frequency and efficiency. From the biodiversity and eco-tourism point of view the proposal for the construction of a port in Cape Fria or Angra Fria should not be pursued, since the necessary infrastructure developments will severely affect the present remoteness/wilderness attraction to tourists. Unless national strategic concerns or strong economic incentives dictate a revisiting of the proposal it seems neither feasible nor sustainable under the present conditions.

Conservancies

In order to develop a wider palette of tourist services in the Skeleton Coast National Park with the involvement of the conservancies it is of the utmost importance that the Master Plan adopts a multiple use framework for the management of the park, which includes the three

conservancies of **Palmwag, Etendeka and Hobatere**. **A multiple use framework needs to be developed** with detailed advice on sensitive zones to be avoided by tourism, mining exploration and production and other human activities as well as advice on the best locations for the placement of supporting infrastructure like pipelines, tracks and roads.

Kunene River Mouth

The building of a dam at Epupa will require that a management framework be set up covering the entire lower Kunene River for successful management of the TFCA. Water availability influences the type and biological quality of the planned TFCA transboundary area. This is especially true in the Kunene River Mouth as it is located in an arid region. A thorough understanding of the overall hydrology is thus imperative for all management aspects both in the TFCA as such as well as in the upstream part. Literally, the Kunene River Mouth is the 'end of the line' and all interventions in the upstream part will inevitably have an impact downstream. Unpredictable changes in the overall climate conditions may also dramatically influence the Delta area. Obviously, strategies to construct a dam may have significant adverse effects on the potential for freshwater fisheries, aquaculture and angling. Management aspects of the TFCA should therefore be seen in a dual context – both from an upstream view and from a downstream view.

RECOMMENDED IMPLEMENTATION SCHEDULE

Table 1. Recommended Implementation Schedule – Sector-Based Actions.

Sector	Recommended action	Time frame	Expected outcome	Key stakeholders	Recommended indicators
Nature conservation	Definition of management goals for protected areas	3 years	Focal species/habitats defined for the coastal parks	MET NGOs Conservancies	Species lists and detailed distribution maps for each area
Nature conservation	Zoning established for the coastal parks	3 years	Identification of sensitive areas and potential areas for sustainable development	Regional councils Line ministries NGOs Conservancies Municipalities	Spatial definition (GIS maps) of core areas and potential areas for sustainable development
Tourism	Detailed analysis of current and short-term tourism activities	1 year	Provision of a detailed profile of current and short-term tourism activities	Municipalities Regional councils MET Tour operators Conservancies	Statistics on numbers of tourist and revenues from different tourist activities at local and regional level
Tourism	Development of regional tourism development plans	1 year	Strategy and support programme for conventional and eco-tourism	Municipalities Regional councils MET Tour operators Conservancies	Draft development plan available at the regional councils
All	Guidelines for environmental impact assessments and assessments of the sensitivity of sites targeted by development projects	1 year	EIAs undertaken using state-of-the-art technologies and international standards	Regional councils Line ministries NGOs Municipalities	Draft guidelines available at MET

Table 1 (Cont.)

Sector	Recommended action	Time frame	Expected outcome	Key stakeholders	Recommended indicators
All	Guidelines for comprehensive environmental monitoring and management by all large-scale projects	1 year	Compliance with environmental quality objectives for development in proximity to sensitive habitats	Regional councils Line ministries NGOs Municipalities	All
Mineral extraction	Improve liaison with MET in relation to prospecting for mineral extraction in protected areas	1 year	Leverage for the enforcement of EIA guidelines, monitoring and rehabilitation associated with mining activities	MME MET Regional councils Municipalities	Agreement between MME and MET on involvement of MET in planning and licensing of mining activities
Water supply	Development of a plan for sustainable water supply in Erongo	2 years	Co-ordinated organisation of water supply to the individual mining company	MME MET Namwater Regional councils Municipalities	Draft plan available at Namwater
Aquaculture	Development of an environmental master plan	1 year	Sectoral strategic assessment of environmental and financial implications of aquaculture developments	MFMR NatMIRC Regional councils Municipalities	Draft zoning plan available at NatMIRC

Table 2. Recommended Implementation Schedule – Area-Based Actions.

Area/Zone	Recommended action	Time frame	Expected outcome	Key stakeholders	Recommended indicators
Sandwich Harbour	Designation of Marine Protected Area	2 years	Protection of wetland and marine biodiversity	MET MFMR NGOs	Draft MPA declaration
Walvis Bay wetland	Enforcement of the Walvis Bay Nature Reserve Management Plan	2 years	Designation of the Nature Reserve as protected area and development of monitoring and tourism development plans for the wetland	MET WB Municipality NGOs	Nature Reserve Management Plan adopted Draft monitoring and tourism development plans available with WB Municipality
Walvis Bay wetland	Environmental Impact Assessments of accommodation and tourist developments	1 year	Sustainable accommodation and tourist developments in and near the wetland	MET WB Municipality NGOs	Requirements for EIAs included into WB Municipalities' license requirements for accommodation and tourist developments
Walvis Bay	Re-assess development proposals for higher density developments and activities along the lagoon	1 year	Sustainable tourist developments near the wetland	MET WB Municipality NGOs	Draft Walvis Bay Municipality Structure Plan revised
Walvis Bay	Focus development along the Esplanade to the eastern side of the road	1 year	Conflicts on the use of the Esplanade solved	WB Municipality NGOs	Draft Walvis Bay Municipality Structure Plan revised

Table 2 (Cont.)

Area/Zone	Recommended action	Time frame	Expected outcome	Key stakeholders	Recommended indicators
Walvis Bay	Withdraw plans for residential developments near the Swakop river mouth and in the Caution Reef area	1 year	Swakop River Mouth and Caution Reef area maintained as Conservation Area	MET WB Municipality NGOs	Draft Walvis Bay Municipality Structure Plan revised
Walvis Bay	Withdraw plans to integrate conservation with eco-tourism and aquaculture at Caution Reef	1 year	Caution Reef area maintained as Conservation Area	MET WB Municipality NGOs	Draft Walvis Bay Municipality Structure Plan revised
Walvis Bay	Focus development of harbour, aquaculture, residential and public beach/recreational activities on the section between Long Beach and the WB harbour	3 years	Coastal developments concentrated to least sensitive sector	Line ministries WB Municipality Key project developers NGOs	Draft Walvis Bay Municipality Structure Plan revised
Dune belt	Free zones for off-road driving should be maintained east of Walvis Bay and east of Long Beach	1 year	Sustainable conventional tourism achieved	MET Regional council WB Municipality Tour operators NGOs	Maps of free zones updated at disseminated from MET
Dune belt	Management integrated into the management of Walvis Bay Nature Reserve	2 years	Integrated nature conservation and sustainable tourism achieved	MET Regional council WB Municipality Tour operators NGOs	EIA published by MET/WB Municipality with zoning of eco-tourism and free zones for off-road driving.
Swakopmund	Focus developments of urban and aquaculture development on the sector between Mile 4 and Mile 4 Saltworks	3 years	Sustainable development of the sector achieved	MFMR Regional council Sw. Municipality NGOs	Swakopmund Structure Plan includes zoning for urban and aquaculture for this sector

Table 2 (Cont.)

Area/Zone	Recommended action	Time frame	Expected outcome	Key stakeholders	Recommended indicators
Swakopmund	Environmental Impact Assessments of all major developments between Mile 4 and Mile 4 Salt-works	3 years	Sustainable development of the sector achieved	MFMR MET Regional council SWKM. Municipality NGOs	Requirements for EIAs included into SWKM. Municipalities' license requirements for aquaculture and other developments
Swakopmund	Development of land-based aquaculture north of Mile 4 Salt-works	3 years	Sustainable aquaculture development achieved	MFMR Regional council SWKM. Municipality Aquaculture farmers NGOs	Swakopmund Structure Plan includes zoning for aquaculture for this sector
Wlotzkasbaken	Development of a structure or development plan for the Wlotzkasbaken area	1 year	Sustainable development of residential, recreational, aquaculture and other land uses achieved	Regional council SWKM. Municipality NGOs	Draft Structure Plan available at Erongo Regional Council
Henties Bay	Focus developments of urban and aquaculture development south of the town	3 years	Sustainable development of the sector achieved	MFMR Regional council Henties. B. Municipality NGOs	Draft Structure Plan available at Henties Bay Municipality
National West Coast Tourist Recreation Area	Develop management plan	1 year	Multiple-use framework for integrated conservation and sustainable use of the area	Line Ministries Regional council NGOs	Draft management plan with zoning of strict protection and land uses available at MET

Table 2 (Cont.)

Area/Zone	Recommended action	Time frame	Expected outcome	Key stakeholders	Recommended indicators
Brandberg Massif, Mile 4 Saltworks, Cape Cross Lagoon, the mouth of the Swakop River, river beds of the Swakop River and the area southeast of the Ugab River	No land use development, except for eco-tourism, should take place in the areas	1 year	Protection of core areas of conservation priority	Line Ministries Regional council NGOs	Areas designated for strict protection in management plan for National West Coast Tourist Recreation Area
Skeleton Coast National Park	Development of new management plan, including the Kunene River TFCA and the proposed extension to Etosha (Palmwag, Etendeka and Hobatere conservancies)	2 years	Multiple-use framework for integrated conservation and sustainable use of the area	Line Ministries Regional council NGOs Conservancies	Draft management plan with zoning of strict protection and land uses available at MET
Kunene River Mouth, river beds with higher plants and the area between Koigab and Hoanib rivers	No land use development, except for eco-tourism, should take place in the areas	1 year	Protection of core areas of conservation priority	Line Ministries Regional council NGOs	Areas designated for strict protection in management plan for National West coast Recreation Area
Möwe Bay	Development of improved tourism potential, incl. improved accommodation, landing site for boats and MET facilities	5 years	Provision of accommodation and tourism support for day trippers from Terrace Bay and fly-ins	MET Möwe Bay Regional council Developers	Applications for accommodation facilities received by Kunene Regional Council Rehabilitation of MET facilities commenced

Table 2 (Cont.)

Area/Zone	Recommended action	Time frame	Expected outcome	Key stakeholders	Recommended indicators
Terrace Bay	Development of tourism potential	5 years	Provision of a wide range of tourist establishments, including beach resorts and other tourist facilities	MET Terrace Bay Regional council Developers	Applications for developments received by Kunene Regional Council
Skeleton Coast National Park	Development of a Skeleton Coast Biodiversity Centre	5 years	Support of eco-tourism in the park	MET Regional council Tour operators Conservancies NGOs	Increased number of tourists on wilderness safaris in the Skeleton Coast – Eto-sha extension area
Kunene River/Baynes Mountain	Develop a management framework in relation to the establishment of a dam at Baynes Mountain covering the entire lower Kunene River	2 years	Successful management of the Kunene River Mouth TFCA	MET MME Regional council NGOs	Hydrological study included in the EIA for the construction of the dam

THE SEA DECISION SUPPORT TOOL (DST)

One of the outcomes of the SEA of the coastal areas is the synthesis of PPPs and the GIS-based dissemination of information and data within the framework of a user-friendly, policy relevant and IT-based Decision Support Tool (DST). The DST has the role of informing the decision making process on land use options in the two coastal regions, and does not provide decisions *per se*. As the GIS capacity of the primary end-users, the Regional Councils, is relatively low the DST has been developed as a stand-alone application; either as a cluster of PDF files with results of the suitability maps for each land use type or as a collection of GIS files, encompassing all major results and background files, which can be viewed in the widely available ArcView 3.2 as well as in the freeware ArcExplorer.

The early version of the DST is disseminated as a CD-ROM, which apart from the PDF-files and GIS files will also contain the SEA final report and a manual for using the maps in ArcView/ArcExplorer. Following this a longer-term solution for the DST needs to be developed, which ensures that the DST data and functions are available via the Web. Following the finalisation of the SEA and DST for Karas and Hardap, the DST Web service could accommodate a full set of land-use suitability scenarios and background data for the entire Namibian coastline.

The GIS for the DST will have a resolution of 90 m. This high resolution serves to provide the end users with possibilities for resolving land use conflicts/solutions at the finest possible scale with the data at hand. The choice of regions and sub-regions and themes to display is different between the PDF and the ArcExplorer application. In the PDF maps showing predefined themes for the different sub-regions will be available, while in ArcExplorer the end user will be able to select any theme and any portion of the mapped coastal stretch of Kunene and Erongo for visualisation. The collection of GIS maps with ArcExplorer will make it possible for the local user to add his/her own project data in vector and raster format.

STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) STUDY

1 INTRODUCTION

In September 2006, the Namibian Coast Conservation and Management Project (NACOMA) commissioned DHI Water & Environment to develop a user friendly, decision guiding and policy relevant Strategic Environmental Assessment (SEA) of the Erongo and Kunene regions' coastal zones. The information, data and findings resulting from the SEA process are to be presented in a Decision Support Tool (DST). This tool will be disseminated to political and technical decision makers at local, regional and national levels in order to assist them in taking decisions on biodiversity conservation, land use planning, and social and economic development planning in the Kunene and Erongo coastal zones.

The SEA and DST will also form inputs to NACOMA's other activities. It is intended that all data and other information collected during the SEA process be fed into the preparation work for the intended separate regional coastal profiles for particular use by the Kunene and Erongo Regional Councils. A specific contribution to the preparation of these regional profiles will be identified in the recommendations that will be derived from the SEA. These recommendations will inform the finalisation of a review of existing institutional mandates, policies and laws for coastal management in Namibia.¹

In these ways, the results of the SEA will contribute to the development of a Namibian Coast Conservation and Management White Paper (NACOWP) to ensure that coastal development planning and management is based on relevant and updated information and data and on analysis and consideration of the most suitable actual and potential land uses.

1.1 Objective of the Assignment, Specific Tasks, Outputs

The objective of the assignment is stated in the Terms of Reference (ToR) as: Conduct an SEA of the Erongo and Kunene regions' coastal zones to support and inform the decision making processes affecting biodiversity conservation and sustainable coastal development, and present its results in a user friendly, easily updatable, policy relevant format or DST.

The specific tasks involved have been divided into three phases:

- Phase 1: Assignment Inception: Conduct initial stakeholder workshops in both Kunene and Erongo coastal regions and Windhoek
- Phase 2: Conduct a comprehensive SEA for the Kunene and Erongo regions' coastal zones
- Phase 3: Present the SEA results in a DST.

The outputs for each phase can be summarized as follows:

- Phase 1: Inception Report
- Phase 2: Draft SEA Report

¹ SAIEA, 2007. *Review of existing institutional mandates, policies and laws relating to coastal management and proposals for change. Draft report for NACOMA.*

- Phase 3: Presentation of SEA Report findings in DST.

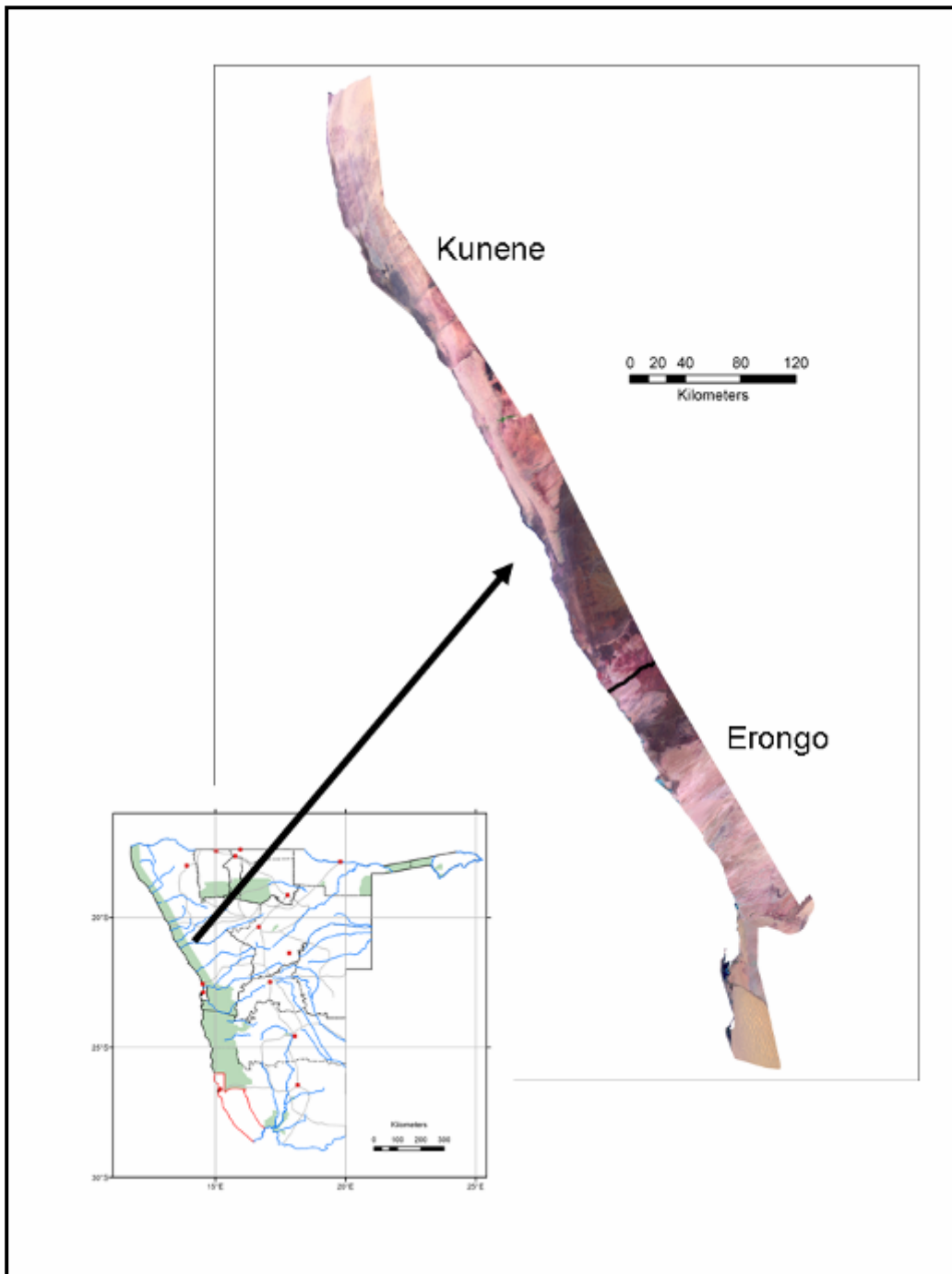


Figure 1: Location map and outline of the Erongo and Kunene coastal zones covered by the SEA. The boundary between the two regions is marked by a black line.

1.2 Purpose of this report

This report is the SEA Report for the second phase of the assignment. As per the ToR, it contains:

1. A description of current land uses, impacts, threats and pressures along the coastal zone, with recommendations for prevention and mitigation overall and in relation to Policies, Plans and Programmes (PPPs), including spatial data for use in the DST;
2. A description of environmental/biodiversity conservation and management gaps, problems and implementation difficulties of current environmental/biodiversity conservation and management safeguards, management/control practices, and conservation/biodiversity management targets. This includes detailed concrete recommendations for improvement of environmental/biodiversity conservation and management overall and in relation to PPPs and data for use in the DST;
3. The outcomes of the integration of (i) and (ii) above in relation to existing PPPs.

Also included in the ToR is a specification for a description of the SEA process including objectives and outcomes of workshops/consultations and incorporation of comments/suggestions. The Inception Report contained full details of the consultative process to the end of 2006. This account is updated with details of the overall SEA process since that time and is incorporated in Chapter 4 and in the comprehensive methodological annex (Appendix 1) that accompanies this report.

1.3 Strategic Environmental Assessment – and its Methods

SEA is usually described as an Environmental Assessment (EA) process and method that assists in strategic decision making above the individual project level. As already indicated above, therefore, SEA refers to the environmental assessment of policies, plans, and programmes (PPPs) towards the purpose of achieving ecologically sustainable development. As one recent authoritative account puts it,

The aim of SEA is to provide decision makers and affected stakeholders with timely and relevant information on the potential environmental impacts of a PPP in order to modify the PPP to make it environmentally more reliable. SEA is therefore a process that is inextricably linked to decision making. It facilitates the early consideration of environmental impacts, the examination of a broad array of potential alternatives, the generation of standard mitigation measures and the opportunity to address a wide range of impacts, including those that are cumulative, synergistic, indirect, long range, delayed and global.²

SEA is increasingly seen as a tool which can address the inter-relationships between bio-physical, social and economic impacts, rather than environmental impacts alone. The World Bank's approach to SEA follows in this line. SEA is intended as "a participatory approach for "upstreaming" environmental and social issues to influence development planning, decision making and implementation processes at the strategic level."³ Three types of SEA are identi-

² "Introduction," by Carys Jones, Mark Baker, Jeremy Carter, Stephen Jay, Michael Short and Christopher Wood, in *Strategic Environmental Assessment and Land Use Planning*, edited by Carys Jones, Mark Baker, Jeremy Carter, Stephen Jay, Michael Short and Christopher Wood, Earthscan, London, Sterling VA, 2005, p. 6.

³ World Bank, by Jean-Roger Mercier and Kulsum Ahmed, p. 262, in Jones, et al, op cit, p. 262.

fied by the Bank: sectoral EA, regional EA, and other types of EA.⁴ Within each type of SEA a wide range of continuum approaches may be applied from impact-centred to institution-centred approaches⁵. The SEA for the Kunene and Erongo Coastal zones can be seen as an institution-centred regional SEA, focused on a particular geographical area.

SEA is a very useful tool for coastal planning and management. According to two experts in the field, it can

- Enable coastal managers, when they are making decisions, to raise the importance of coastal concerns to the same level as other aspects of development planning
- Facilitate consultation, negotiation and consensus between organisations and the public on a range of coastal issues.⁶

At the same time, in its consideration of the inter-relations between processes, as discussed above, SEA can be particularly helpful taking environmental issues into account while preparing or evaluating land use plans.

For NACOMA, as for any other Integrated Coastal Zone Management (ICZM) initiative, SEA can help in identifying both the environmental opportunities and the constraints to social, physical and economic development in a coastal zone – and thus supply a broad strategic framework for ICZM. In this way, SEA provides at least some of the strategic parameters or guidelines within which ICZM can best take place.⁷

1.4 Considerations for the Namibian Situation

Mandated SEA processes, such as the European Commission's (EC) SEA Directive of 2001, usually define desired outputs rather than specific SEA methods. This allows for flexibility and creativity in conducting an SEA. Indeed, as Jones et al put it, "The starting point for any SEA should ideally be the decision making context into which the findings of an SEA feed."⁸

Some of the specificities of the Namibian decision making context therefore warrant brief discussion. Many hundreds (if not thousands) of technical and scientific studies of the biophysical and environmental conditions and dynamics of Namibia's thinly populated 1,570 km coastline have been made over the years. Similarly, many attempts, these now dating back several decades, have also been made to link environmental, social and economic dimensions in planning for coastal development. Yet stakeholders have apparently found it very difficult to resolve key issues like the integrated conservation and management of the Dune-belt between Walvis Bay and Swakopmund, and the disposition of the Walvis Bay Nature Reserve and Sandwich Harbour.

This very real weakness of coastal management in Namibia is often ascribed to a lack of institutional capacity, or to unclear, over-centralised, confused and/or overlapping legal or in-

⁴ According to a World Bank review, the purpose of SEA is "to improve investment decisions by bringing environmental opportunities and constraints into development planning at the regional level." Quoted in Mercier and Ahmed, *op cit*, p. 263.

⁵ www.worldbank.org/seatoolkit

⁶ Robert Kay and Jacqueline Alder, *Coastal Planning and Management, Second Edition*, p. 201, Taylor and Francis, New York and London, 2005.

⁷ *Strategic Environmental Assessment Guidelines for the countries of eastern Africa and the western Indian Ocean Island States*, Secretariat for Eastern African Coastal Area Management (SEACAM), Maputo, n.d., p. 7.

⁸ "SEA: an Overview," by Carys Jones, Mark Baker, Jeremy Carter, Stephen Jay, Michael Short and Christopher Wood, in Jones, *et al*, *op cit*, p. 20.

stitutional mandates, notably in the public sector agencies involved. All of this may well be and is probably correct. But, relative to many other national coastal planning and management contexts, Namibia is actually fairly well-endowed with the technical and managerial capabilities to deal with what are, given the country's small scale of population and recent good economic performance, manageable issues. The country also features a group of stakeholders, which whatever the different interests involved, is at least in agreement (moreover the players are well-known to one another) on the necessity to better plan for and manage what is a crucial national asset – as the site for much of the resource extraction which underpins the Namibian economy's performance.

It appears, in fact, that what is really lacking is not technical or scientific knowledge, or the existence of Policies, Plans and Programmes. There is a plethora of PPPs. Many of these are good documents. Others exist in an unfinished or semi-finished form. Many of them are seemingly unread, let alone implemented. The real difficulty lies in the inability by stakeholders to find common understanding of and a shared strategic perspective on the economic, social and environmental interactions necessarily involved in coastal development today, and of the adjustments, compromises and trade-offs that need to be made to assure better coastal planning and management.

It is instructive to look at some history. Over twenty years ago, in July 1986, a symposium on the Central Namib was held under the auspices of the then Directorate of Nature Conservation and Recreation Resorts of the Department of Agriculture and Nature Conservation in Swakopmund. At the meeting,

“...scientists, researchers and those developing the resources had the opportunity not only to deliver papers but also to contemplate economic factors, as well as the conservation-worthy aspects of its [i.e. the Central Namib's] plants, animal and soil. Detailed attention was given to the immediate effects of uncontrolled mining activities and the imbalance caused by recreation activities, the use of off-road vehicles, and population.

At the end of the symposium, the need for a coordinated development plan was identified.”⁹

Much “contemplation” and management activity has continued to occur since 1986, but the abovementioned and interconnected topics – conservation, economic development (notably mining), population (i.e. urban) growth, and recreational activities (with off-road vehicles now predominantly featuring quad bikes) – are still basic issues for this SEA report. Assisting in finding common ground on them is one of the report's – and NACOMA's – central purposes (Figure 3).

This SEA report and accompanying DST represents an input to this intention in the form of a broad, clear strategic framework which condenses – to the ends of brevity, clarity and readability – the assessment of vital impacts into an easily comprehensible output to assist decision making.

Accordingly, two methodological steps have been required upfront. Firstly, rather than take on everything connected with the coastal zones, it has been necessary to define the boundaries of the study area closely (see Figure 1). These boundaries extend from the low-water mark to the eastern boundary of the Skeleton Coast National Park (SCNP) and the National West Coast Tourist Recreation Area (NWCTRA). The north-western extreme of the Namib-Naukluft Park stretching to the south-western boundary of the Erongo Region (including Sandwich Harbour) is included in the SEA. The SEA thus covers a geographically extensive but circumscribed area. Accordingly, the SEA does not cover the marine environment adjoining the coastal regions of Erongo and Kunene.

⁹ *Guidelines for the Development of the Central Namib, mimeo, no date, (presumably 1987), Section 1.2. This document was an output of the symposium and its follow up meetings.*

Secondly, facilitated by this close definition, the SEA is necessarily focused on the major issues for coastal planning and management in the coastal zones as these are initially reflected in a number of crucial PPPs (see Chapter 2.1). It is intended that such delimiting can assist in achieving the objective of developing a “user friendly, decision guiding and policy relevant” SEA, as per the assignment’s goal.

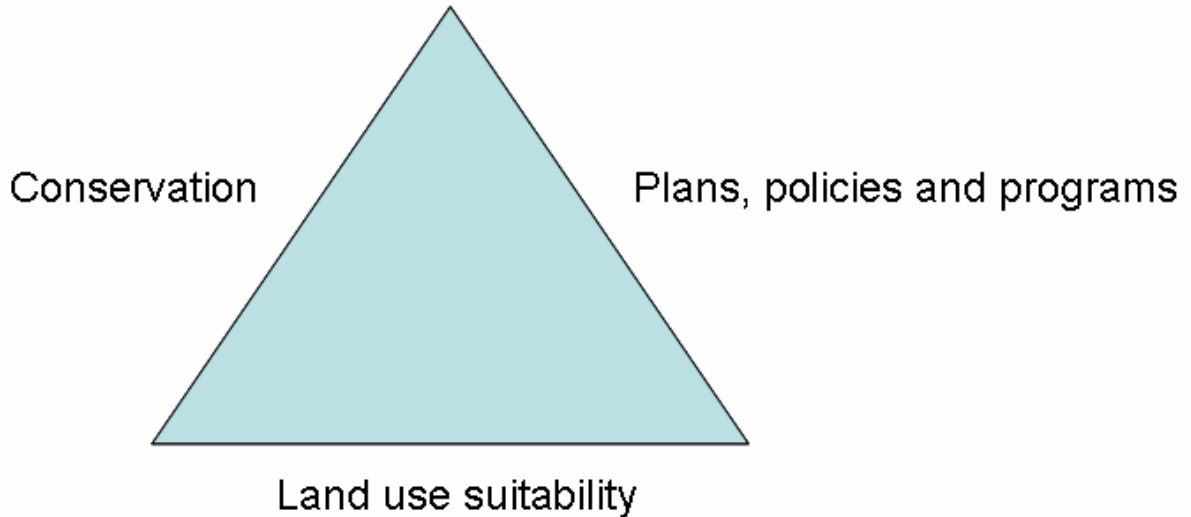


Figure 2: The aim of this SEA with regard to resolving strategic land use planning issues through the integrated analysis of nature conservation, land use suitability and PPPs.

1.5 Report Structure

This SEA Report is divided into four chapters.

Following this Introduction, Chapter 2, Methodology, gives a brief outline of the methods used for the collection of planning documents and data, stakeholder liaison, mapping of coastal landscape and physics, development plans and resources and assessment of land use suitability.

Chapter 3, SEA Assessment: Land Use and Coastal Development Trends, follows a sectoral approach in describing the broad trends now characterising coastal development, including conservation, and its associated land use patterns in the coastal zones of the Erongo and Kunene Regions. Key PPPs, as discussed above, are used as reference points. The trends are described for each of the two regions with regard to four large sectors: resource extraction, urban development, tourism, and conservation/biodiversity. Initial recommendations are provided for each sector.

Chapter 4, SEA Assessment: Improving Nature Conservation and Management, by area, then takes a spatial perspective. For both the Kunene and Erongo Regions, a focus is placed on priority geographical areas within the respective coastal zones, these including biodiversity hotspots. Maps are provided of these areas, and again, key PPPs are reference points. The opportunities and challenges facing these spatial areas are discussed and initial recommendations made.

Chapter 5, Conclusions and Recommendations, outlines the preliminary conclusions of the analysis for coastal development policy in Namibia in relation to existing PPPs, as well as provides recommendations for the NACOMA project as it goes forward. A description of how the upcoming DST will reflect and condense the findings of the SEA report and of the way forward for the assignment is also included.

2 METHODOLOGY

In the following, a short description of the SEA Methodology is provided dealing with the collection of planning documents and data, stakeholder liaison, mapping of coastal landscapes and physics, development plans and resources, assessment of land use suitability, comments on available data and DST and map design. A detailed description of the SEA methodology, including details of stakeholder involvement, data sources, GIS models and DST design and functionality is given in Appendix I.

2.1 Collection of planning documents and data

Documents and data on regional, national and sectoral land use and other relevant policies, programmes and plans (PPPs) were collected during the Project Inception Phase in October 2006 (Table 1). Important activities during this phase were a workshop held in Swakopmund, in which thematic discussions on data and PPP availability took place between the project team and a wide range of stakeholders and end-users, and meetings with selected stakeholders, end users and experts on the coast and in Windhoek. The collection of data and planning documents was followed up by a phase of close scrutiny of data samples and of the PPPs.

Although a large amount of data has been made available to the SEA process, some information has failed to become available for various reasons. During the second workshop held in Khorixas in February 2007, it was possible to receive feedback on these missing data, and fill in some of the most important gaps on land use, plans and biodiversity. The same procedure was followed during the third SEA Workshop held in Swakopmund in August 2007.

2.2 Stakeholder liaison

A key to a successful development and application of the SEA and DST has been the liaison with the stakeholders during the entire project. Stakeholder involvement has focused on delivery of planning documents and data, on methodologies related to the analysis of land use suitability, including the analysis of biodiversity trends and on discussions on individual land use plans. The three workshops have served as focal points for communication with the stakeholders. During the Phase 1 workshop in October 2006 the overall SEA strategy and stakeholder involvement was discussed not only with stakeholders at large, but also in particular with the principal stakeholders, the Regional Councils of Erongo and Kunene. During the Phase 2 workshop various issues related to the PPPs were discussed with end users from the Kunene region. During the Phase 3 workshop the team will have the opportunity to discuss the major SEA findings and DST design with key stakeholders.

Table 3. List of key PPPs.

MET

- MET Policy on Tourism and Wildlife Concessions on State Land (Draft June 2006)
- MET Policy on Protected Areas, Neighbours and Resident People (Draft July 2006)
- MET Biosafety Act (6th draft)
- MET Policy and Legal Framework of the National CBNRM Programme
- MET Namibia's Pollution Control and Waste Management Policy
- MET Namibia's Environmental Assessment Policy
- MET EMA Bill (draft)
- Walvis Bay Nature Reserve (proposed) Management Plan (draft)
- North West Tourism Plan
- Namib-Naukluft Management and Tourism Development Plan
- Skeleton Coast National Park Management Plan
- Iona Transfrontier Park Memorandum of Understanding
- Policy Framework for Concessions in Proclaimed Protected Areas
- Cape Cross Seal Reserve Plan
- National West Coast Tourist Recreation Area Plan
- MET Strategic Plan
- National Biodiversity Strategic Action Plan
- Namibia Wetland Policy

MME

- MME Strategic Plan 2007/08- 2011/12
- MME White Paper on Energy Policy 1998
- MME Minerals Policy of Namibia 2006
- MME acts (Minerals (Prospecting and Mining) Act, 1992, Diamond Act, 1999, Petroleum Products and Energy Amendment Act, 2000, Gas Act - Draft), Electricity Act (2000), Petroleum (Exploration and Production) Act of 1991
- Petroleum Exploration Onshore/Offshore Open Licensing System
- Prospecting and Mining in Protected Areas

MFMR

- MFMR Marine Resources Policy 2004
- MFMR Mariculture Feasibility
- MFMR Aquaculture Policy, 2001
- MFMR Towards the Responsible Development of Aquaculture (2001)

- Marine Resources Act 2000
- Aquaculture Act 2002
- MFMR Marine Protected Area Feasibility
- Cape Fria Feasibility

MAWF

- MAWF Water Resources Management Act (2004), Water Act (1956)
- National Water Policy (2001) and National Agricultural Policy (1995)
- *Table 3. List of key PPPs (continued).*

Regional/Municipal/Other

- Namibian Ports Authority Act, 1994
- NAMPORT's Environmental Management System
- White Paper on Transport Policy and Walvis Bay Corridor Plans
- Structure Plans for Walvis Bay, Swakopmund and Henties Bay Municipalities
- Town Planning Schemes for Walvis Bay, Swakopmund and Henties Bay Municipalities
- Walvis Bay Municipality Regulations for Dune Belt (draft)
- Erongo and Kunene Regional Development Plans

2.3 Mapping of coastal landscape and physics, development plans and resources

An important element of the project has been the establishment of the SEA GIS – a GIS mapping system covering all major landscape, biodiversity, infrastructure, land use and PPP data of the coastal regions of Kunene and Erongo. The structure of the SEA GIS and meta-data information is found in Appendix I. The main goal of the SEA GIS is to facilitate the DST as a tool for assisting the decision-making process at the regional level. Physical, biological and land use data have been analysed in an integrated way using multi-criteria evaluation to enable trade-offs between economic, social and environmental issues. The end user can use the modelled land use suitability data with background information and his or her own data to explore various development scenarios.

A mapping system in support of a coastal SEA not only requires integrated analyses of land use, planning and environmental data, but also depends on relatively high resolution to produce sufficiently detailed information to be useful in the decision-making process related to various land-use options. Although some GIS data, e.g. the infrastructure data held by the municipalities of Walvis Bay and Swakopmund, are available in high resolution, the majority of GIS data from the Atlas of Namibia or from the Namibian Biodiversity Database are only available in relatively low resolution, this typically exceeding 10 km. Thus, in order to map key components of the coastal landscape with sufficient detail two remote sensing data sets have been used: a Landsat ETM+ data set from 2001 in 28.5 m resolution (University of Maryland) and a digital topographic data set (SRTM) in one meter vertical and 90 m horizontal resolution (NASA). The ETM+ data have been processed to a seamless backdrop for the SEA GIS and have been used as a basis for digitising river courses and locate areas with prominent vegetation. The SRTM data have been used to estimate the relief and topographic complexity of the coastal zone. Estimated fine-scale distributions of lichen communities were made available by Dr. Christoph Schultz at the German Aerospace Centre. An orthorectified

coastline and bathymetry data were made available by the BCLME project. The data made available by the stakeholders were used to map the spatial extent of current land uses, priority zones for development of some land uses according to PPPs and the range of exploitable resources.

2.4 Assessment of land use suitability

Estimation of land use suitability was made by integration of the PPP data, exploitable resource ranges, current land uses, environmental data, and modelled biodiversity hot spots. Although the two regions have a variety of internationally recognised nature conservation assets the current boundaries of protected areas may not agree entirely with the gradients in coastal biodiversity found in the regions. Accordingly, gradients in biodiversity were estimated by mapping the distribution of the following 20 priority areas or habitats for conservation:

1. Lichen distribution
2. Main habitat for Welwitschia
3. Main habitat for Quiver tree
4. Main habitat for Mopane
5. Main breeding zone for Damara tern
6. Breeding colonies of Fur seal
7. Zone of medium herbivore abundance
8. Zone of regular Elephant occurrence
9. Lion density above 0.004/ km²
10. Leopard density above 0.005/km²
11. Mountain zebra density above 0.25/km²
12. Wetlands of global importance
13. Distance less than 30 km from the Escarpment
14. Rock outcrops and cliffs
15. Distance less than 140 km from Etosha
16. Distance less than 2 km from regularly vegetated ephemeral rivers
17. Distance less than 5 km from the Brandberg massif
18. Zones of extensive coverage of higher plants
19. Areas of high topographic complexity
20. Rocky shoreline

These priority areas/habitats for conservation were chosen on the basis of landscape characteristics known as important environmental drivers in relation to the movement of prioritised species of large mammals between Etosha and the coast, in relation to the distribution of prioritised species of birds and higher plants, and in relation to increased levels of diversity and endemism in plants, invertebrate and vertebrate animals, e.g. ^{10,11,12,13}. The mapped priority

¹⁰ Simmons, R.E., Griffin, M., Griffin, R.E., Marais, E. & Kolberg, H. 1998. Endemism in Namibia: patterns, processes and predictions. *Biodiversity and Conservation* 7: 513-530.

¹¹ Harrison, J.A., Allan, D.G., Underhill, L.G., Herremans, M., Tree, A.J., Parker, V., Brown, C.J. (eds). *The Atlas of Southern African Birds. Vols. 1 and 2. BirdLife South Africa, Johannesburg.*

areas/habitats were combined into three classes of area importance. A full account of the sources of biodiversity data and methods used is given in Appendix I. Land use suitability was modelled for each land use type using multi-criteria evaluation (weighted linear combination). Two aspects of the multi-criteria evaluation process implemented for the SEA DST should be highlighted, as they serve to reduce the decision risks (risk of making chance decisions) of the system (Alonso, 1968):

- Fuzzy factors
- Standardisation of scores

The use of fuzzy factors for all land uses meant that factors were distributed along a continuum from 0 reflecting poor conditions to 1 reflecting suitable conditions for development (a cosine function with 2 control points, see Appendix I). The environmental factors for each land use were then combined with information (if available) on exploitable resources, areas currently developed for urban land use, areas outlined by PPPs as priority development areas and the mapped priority areas/habitats for conservation. The four latter data sets were used as technical constraints to development: i.e. no development was regarded as suitable if the area was outside a PPP zone, or in areas of no exploitable resources, or in urban land use zones, or priority areas/habitats for conservation.

¹² Curtis, B.A. & Mannheimer, C.A., 2005. *Tree Atlas of Namibia*. Windhoek: National Botanical Research Institute. 688 pp.

¹³ LOOTS, S. 2005. *A Red Data Book of Namibian plants*. SABONET Report No. 38. 124 pp. ISBN 1-919976-16-7.

3 SEA ASSESSMENT: LAND USE AND COASTAL DEVELOPMENT TRENDS (BY SECTOR)

3.1 Introduction

In this chapter, a sectoral approach is taken in order to provide an overview of the broad trends characterising coastal development and the land use patterns associated with development in the coastal zones of the Erongo and Kunene Regions. Key PPPs are used as reference points. Drawing on these PPPs, which include national, regional and local level policy and planning documents, the development trends with regard to four sectors are portrayed for the coastal zones of each of the two regions:

- Resource Extraction (mining, marine fisheries, aquaculture, ports/shipping, water, power)
- Urban Development and Urban Environmental Management
- Tourism
- Conservation and Biodiversity.

Opportunities, impacts, threats, and pressures, which by their nature are interconnected, are discussed. Initial recommendations for better policy, planning and management practices, including prevention and mitigation of negative environmental impacts, are provided for each sector.

3.2 Mining and Energy

The exploitation of minerals and other natural resources has been the backbone of the Namibian economy for many years. The mining sector maintains its importance to the gross national product, exports and tax revenue in the plans of the Government and the mining industry is essential to the development goals of Namibia as laid out in the National Development Plan.

The Southern African region is facing a diminishing electricity generation surplus capacity and the region, including Namibia will run out of surplus capacity by 2007. The government have promoted the Kudu Gas Project which is planned to supply gas to a proposed power plant in Oranjemund of 800MW for 22 years and is also looking into the hydropower generation on the Kunene River to contribute towards the solution to this problem.

The minerals extracted remain a pillar of Namibian economy and a comprehensive Minerals Policy of Namibia provides the vision for the sector:

To achieve a high level of responsible development of national resources in which Namibia becomes a significant producer of mineral products while ensuring maximum sustainable contribution to the socio-economic development of the country. To further attract investment and enable the private sector to take the lead in exploration, mining, mineral beneficiation and marketing.

The Mission of the Ministry is given as:

The Ministry of Mines and Energy (MME), as the custodian of Namibia's rich endowment of mineral and energy resources, facilitates and regulates the responsible development and sustainable utilisation of these resources for the benefit of all Namibians.

It is a key objective of the Minerals Policy to:

Ensure compliance with national environmental policy and other relevant policies to develop a sustainable mining industry.

Consequently one of the eight themes of the Policy, Mining Industry and the Environment, deals with the protection of the environment and with minimising the impact of mining on the environment¹⁴.

MME has issued a Policy specifically addressing mining and prospecting activities in environmentally sensitive areas¹⁵. The areas of particular interest in relation to biodiversity are those that are gazetted as "Protected Areas" and exploitation of mineral resources is allowed under the Prospecting and Mining Act of 1992. Since approximately 13.6% of the land surface area of Namibia is "Protected Areas" and many of these areas have considerable mineral potential, prospecting in protected areas is and has been a common activity. The lack of concern for the environment most often shown by prospectors and mining companies in the past has led to a loss of key ecological characteristics and tourism potential of some protected areas.

Contrary to the situation in many other countries Namibia's parks are not strictly protected, and only by exemption subject to the exploitation of minerals, oil and gas. The provisions of the Prospecting and Mining Act of 1992 gives MME the "right of way" since the development of mining is considered crucial to the Namibian economy. Yet, recently the MME has emphasised proper environmental operation of prospecting and mining in the licensing procedures and the policy envisages controlled prospecting and mining in these areas under conditions that satisfy the protection of the environment.

The present SEA can be seen as a part of the commitment of the Government to ensure that short to medium term projects such as mining do not jeopardize the potential for long-term sustainable development in tourism. As the Policy reads:

In order to reconcile the objectives of mineral exploitation and environmental protection, it is essential that the negative impacts of prospecting or mining activities on the environment be minimised in accordance with international best practice. Commitments, in respect of prospecting and mining activities, have to be made in line with strategies developed for the environmental protection.

Although a number of mineral concessions in protected areas were granted before the development of the new environmental guidelines, provisions to regulate the access to these areas is available and can be used to protect them against further environmental degradation.

Government will ensure that exploration and mining within Protected Areas complies with the environmental and economic regulatory frameworks.

The two ministries Ministry of Environment and Tourism (MET) and Ministry of Mines and Energy (MME) have been tasked to ensure that mineral development only commences in Protected Areas when rehabilitation is guaranteed.

It is defined policy of Namibia to develop small scale mining. Small scale miners are expected to adhere to an environmental contract, but the issuing and policing of the contracts have been slow and not efficient:

¹⁴ Minerals Policy of Namibia (2006)

¹⁵ Prospecting and Mining in Protected Areas

Government will ensure compliance by small-scale miners with environmentally acceptable mining practices through regular monitoring.

MME and MET will implement a system to monitor compliance with the Environmental Contract. There is an increased focus on the remediation of all the soil activities in mining both with respect to prospecting and mining at all scales.

3.2.1 Erongo

The urban nodes of Walvis Bay and Swakopmund consume huge amounts of water and energy for residents, tourism, trade and industrial purposes. In addition, the port of Walvis Bay is the main port with respect to import/export, fishing industry and transport of ore and ingots from the hinterland mining activities both in Erongo and other Namibian regions.

3.2.1.1 Uranium mining

Erongo has its share of the mining potential in Namibia and there are numerous reconnaissance and prospecting licences for base metals, uranium, diamonds, gemstones and gold. The area of uranium licenses in the SEA area of Erongo is shown in Figure 2. Over the recent years the increasing profitability in the uranium market has seen several new Namibian uranium projects emerge¹⁶. In addition to the physical impacts of open pit mining the consumption, transport and discharge of water are key issues from an environmental point of view. Although close, none of the proposed mines are directly in the SEA area, but since the dimensions of uranium mining are huge impacts may reach beyond a mine's immediate surroundings¹⁷.



Open pit, Rössing Uranium Mine
Arandis-Erongo
Photo: N. Cadot



Uranium prospecting in Namib-Naukluft Park
Moon landscape-Erongo
Photo: N. Cadot

¹⁶ *The spot price of uranium hit an all-time high of \$136 per pound in June 2007, up from \$7 in 2000, which has spurred a new rush to find deposits of the material (Mining Weekly 20 Sept. 2007).*

¹⁷ *Rio Tinto's Rössing Uranium mine in Namibia hopes to extend the life of the mine to 2021 and aims to boost output by 12,5% to 4 500 t in 2008 (Mining Weekly 20 Sept. 2007).*

One mine, the Langer Heinrich Mine, is now in operation and another, the Trekkopje Uranium Project has submitted an EIA and entered into feasibility phase. According to the developers Trekkopje is expected to become one of the world's ten largest uranium mines when it enters into production, and will also be one of the top five low-cost, open pit uranium operations. A third development is the Valencia Uranium Project which is also in the feasibility phase. The two latter projects will operate desalination plants to cover their water consumption. The fourth uranium development is less progressed than those just mentioned, but has made headlines since the licence covers areas approaching the ecologically sensitive Sandwich Harbour.

It is not the purpose of an SEA to evaluate individual projects and for all these projects EIAs have been or will be carried out to clarify the impacts of the individual project. The main point to be made in an SEA context is that the combined effect of impacts such as water and power consumption, tailings issues and transport should be evaluated on a regional basis. Thus, water extraction has been addressed and the most recent projects have been asked to be self reliant with respect to water and have opted for desalination plants. Following this SEA the Namibian Chamber of Mines has embarked on an SEA for the "Namibian Uranium Province" including all uranium mining and prospecting sites.

3.2.1.2 Metal prospecting and mining in the dune belt

Licenses for the extraction of resources from the dune belt between Walvis Bay and Swakopmund are awarded to several companies. The area is heavily utilised by Namibia's second and third largest towns both for recreational and tourist activities. In the future, increasing urbanisation will take place in the area from Lover's Hill in Walvis Bay to Mile 4 north of Swakopmund and the Dune belt will serve as a recreational area for even more people. It may be considered whether the gains acquired from renewed prospecting or mining licences justifies the exclusion of other profitable and beneficial uses of the area. The diversity of the economical activities may also add robustness to the Namibian economy.

3.2.1.3 Saltworks

The saltworks in Walvis Bay, Swakopmund and Cape Cross have long term concessions on salt extraction from seawater. Salt pans are highly productive biological environments and provide rich food supplies for waders and flamingos. The salt pans constitute a huge wetland area, albeit artificial, and for this reason alone the Saltworks should be encouraged to maintain production.



Cape Cross Saltworks
Cape Cross - Erongo
Photo: G. Reitz



Walvis Bay Saltworks
Walvis Bay - Erongo
Photo: N. Cadot

Recommendations:

New reconnaissance, prospecting or mining licences should not be granted in the dune belt once the existing licenses expire.

The Division of Engineering and Environmental Geology (DEEG) is establishing continuous contacts with the mining companies concerning environmental monitoring. Aspects like excessive water supply, dust emission and pollution of surface- as well as groundwater are causing adverse impacts to the geo-ecosystem. The division conducts independent monitoring programmes by sampling of soil, stream sediments, water and vegetation. It is crucial that the collaboration with MET be improved. In this respect the implementation of the renewed agreement between MME and MET on these matters should be carefully monitored.



Figure 3: Uranium licenses area of Erongo coastal zone (Source: MME, 2007)

Presently, the water supply to mines is left to the individual company. This may cause sub-optimal water extraction/desalination and distribution patterns to emerge. In addition to economic and ecological sub-optimisation, the existence of several pipelines across the desert will present serious hindrances to the foraging and migration of game, and the total cost of the necessary remediation activities will be higher.

Energy

There is no policy directed toward the establishment of energy facilities in the Erongo coastal region *per se*. Proposals for nuclear energy production near WB has been presented as an attempt to use some of the uranium produced in Namibia for the good of the Namibians. Nuclear power does not at present comprise a part the National Energy Policy¹⁸.

Although the Government of Namibia has declared that the country will move towards the sustainable use of natural resources for energy production and consumption and although the environment of the regions may offer great potential for both wind and solar power no governmental plans or feasibility studies have yet been made to boost the production of renewable energy.

3.2.2 Kunene

The Minerals Policy of Namibia and three acts covering Minerals, Petroleum and Diamonds form the basis of mining activities. There is no strategic plan available for Kunene and Erongo and basically all areas are open for mining. Presently, several new mines are about to start. The Northwest area and Kunene hinterland is under general consideration for development, including iron and copper mining, harbour development in Cape Fria and hydro-power at Baynes Mountain (the plan formerly for a dam at Epupa has been relocated). There are no immediate plans for oil or gas explorations in the inshore area or onshore, but offshore oil and gas licences are available (e.g. block 20/11 which is close to the shore) and the licence 17/11 quoted as having "great potential for the economic development on Regional as well as National level" in the Kunene Regional Development Plan.

Mining is a huge source of foreign exchange in Namibia and has politically and legally attained a priority claim for resources, also in the protected areas and national monuments. The Skeleton Coast Park itself was originally a closed diamond mining area, and licences for prospecting in the entire park are issued. Although the Kunene Region is limited in terms of mineralised rock formations compared to the rest of Namibia, the entire SEA area from the Ugab River to the Kunene River is subdivided and licensed for prospecting, mainly diamond mining.



Diamond Mining in Toscanini
Skeleton Coast Park - Kunene
Photo: P. Tarr

¹⁸ *White Paper on Energy Policy 1998*

Diamond mining and prospecting moves a considerable amount of soil and it is not always possible to establish a clear borderline between the prospecting activities and actual mining. Therefore, exploratory mining also leads to a considerable redistribution of the soils in the shoreline area and historically this impact was not rehabilitated.

The small scale mining licenses are awarded frequently, one reason being that the license fee is very small, but some are never explored. The RDP for Kunene mentions that a weakness of the small scale mining is the lack of technical expertise and investment power. This often leads to a haphazard approach where old sites are reinvestigated or where only the upper loose soil layers are explored and the site abandoned when hard subsoil is met. Although, small scale miners must sign an Environmental Contract this is rarely policed or monitored.

Recommendations:

The RDP is concerned with the landscape and general environmental quality after diamond prospecting/mining, and proposes to this end better enforcement of EMPs and Environmental Contracts. Also, value added activities such tourism activities in abandoned diamond camps and sites may be feasible as part of adventure tourism.

The MET should be empowered to influence the Minerals Prospecting and Mining Rights Committee more strongly, in particular regarding protected areas and national monuments. For each licence given the MME and the MET should agree with the licensee on the scope of the prospecting in terms of volume of soil/sand removed. Larger amounts of soil should only be removed after exemption or renewed application and permit.

A new Bill is being prepared which introduces requirements for financial guarantees for reparation of environmental damage and the setting up of trust funds for rehabilitation after mine closure. This may provide leverage for the enforcement of rehabilitation.

Energy

The Kunene River is one of five perennial rivers in Namibia, and one of only two reaching the coast line. Due to Nampower's dependence for energy on a single large supplier, South Africa's Eskom, and the projected energy shortage in Namibia and in the SADC in general, proposals have been floated to dam the Kunene at Epupa and create a large (>500 km²) reservoir or construct a smaller dam at Baynes. A dam would have significant effect on the flow velocity and regularity of flow in the Kunene, thus potentially affecting the ecological conditions also in the coastal zone.

Presently, the damming of the Kunene appears to be less prioritised since Nampower is now looking at the alternatives of power generation sources with the offshore Kudu Gas Power Project in the south of Namibia. However, the Baynes Environmental Assessment Report states that the financial costs associated with mitigating the impacts on humans and environment are moderate (2.0%) of construction costs, and economically insignificant in the overall cost picture. Since the Kudu Gas Power Project does not make Namibia independent of importing energy and the price and delivery of imported electricity is not secure, Nampower maintains that: "The intention is to build a 360MW hydro power station downstream from Epupa Falls. As the Kunene is shared with Angola, the governments of both countries have to agree on the final site for the plant's construction."¹⁹

¹⁹ <http://www.nampower.com.na/2005/pages/projects.asp>

3.3 Fisheries and Marine Resources

Man's harvesting of resources from the sea has a history of overexploitation with the same approach as the mining industry, i.e. that resource is not renewed and it is a matter of extracting it from nature as quickly and efficiently as possible. The historical examples from Namibia of mining of biological resources to local depletion or near depletion include whales, guano, abalones, pilchards and sharks. After Independence total allowable catches and management of quotas were introduced and previously depleted stocks may now be recovering, however a huge jelly fish biomass has established itself in the niche left by overfishing.

The fishing industry is a source of considerable employment in Namibia and the sector is the second largest contributor to the GDP. Considerable research and management resources are directed towards establishing a sustainable fishery²⁰. The TACs are combined with the goal of protecting spawning and nursery areas and to this end the BCLME project has provided much new data. A few marine species are protected from fishing: Great white sharks, whales, dolphins and marine turtles. In addition, the use of polychaete (bristle) worms for bait is prohibited.

3.3.1 Erongo

3.3.1.1 Inshore fisheries

Inshore fisheries are limited in the coastal region partly because only few harbours and protected landing sites are available and the coast is open and exposed to oceanic swell and waves. The subsistence fishery from small boats known to the coastal areas elsewhere in Southern Africa is not possible on the high energy coast. There is a small scale informal shore based line fishery around Swakopmund²¹. The commercial inshore fishery occurs with larger vessels operating out of Walvis Bay to fishing areas to the north off the Kunene coast.



Line fishing boat
Walvis Bay - Erongo
Photo: T. Mufeti

²⁰ *Marine Resources Policy 2004, Marine Resources Act 2000, Aquaculture Policy, 2001, Aquaculture Act 2002, Towards the Responsible Development of Aquaculture (2001)*

²¹ *BCLME (2006) Socio-economic baseline survey of coastal communities in the BCLME region – Namibia Final report August 2006 prepared by Dr Peter Fielding, Paula Cardoso, Martin Shapi and Dr Merle Sowman (p 35)*

3.3.1.2 Angling

Recreational angling from the coast is popular both in relation to tourism and for local citizens. Subsistence angling is widespread and may also add welcomed food supply or provide a cash injection to the local economy if infrastructure allows the catch to be sold to the restaurant trade. This happens in particular in the area between Swakopmund and Henties Bay, but also takes place all along the coast. Angling is generally subject to permitting and the catch is limited if it includes overexploited stocks of Steenbras, Galjoen, Kabeljou and Blacktail, which are also among the commercially most interesting species.

In contrast to the case in the SCNP the NWCTRA is open to angling and the following areas are specifically mentioned;

- From the Ugab River to Walvis Bay;
- from the southern limits of the quay in the harbour of Walvis Bay, along the coastline to Pelican Point;
- From Pelican Point to Sandwich Harbour (Sandwich Harbour marked with concrete beacons, in the south SV1 and in the north SV2).

There are several companies in Erongo, that operate deep sea boat-angling tours for species such as Snoek, Broadnose sevengill shark, Yellowtail, Tuna and Bluntnose spiny dogfish.



Anglers
Erongo coast
Photo: P. Tarr

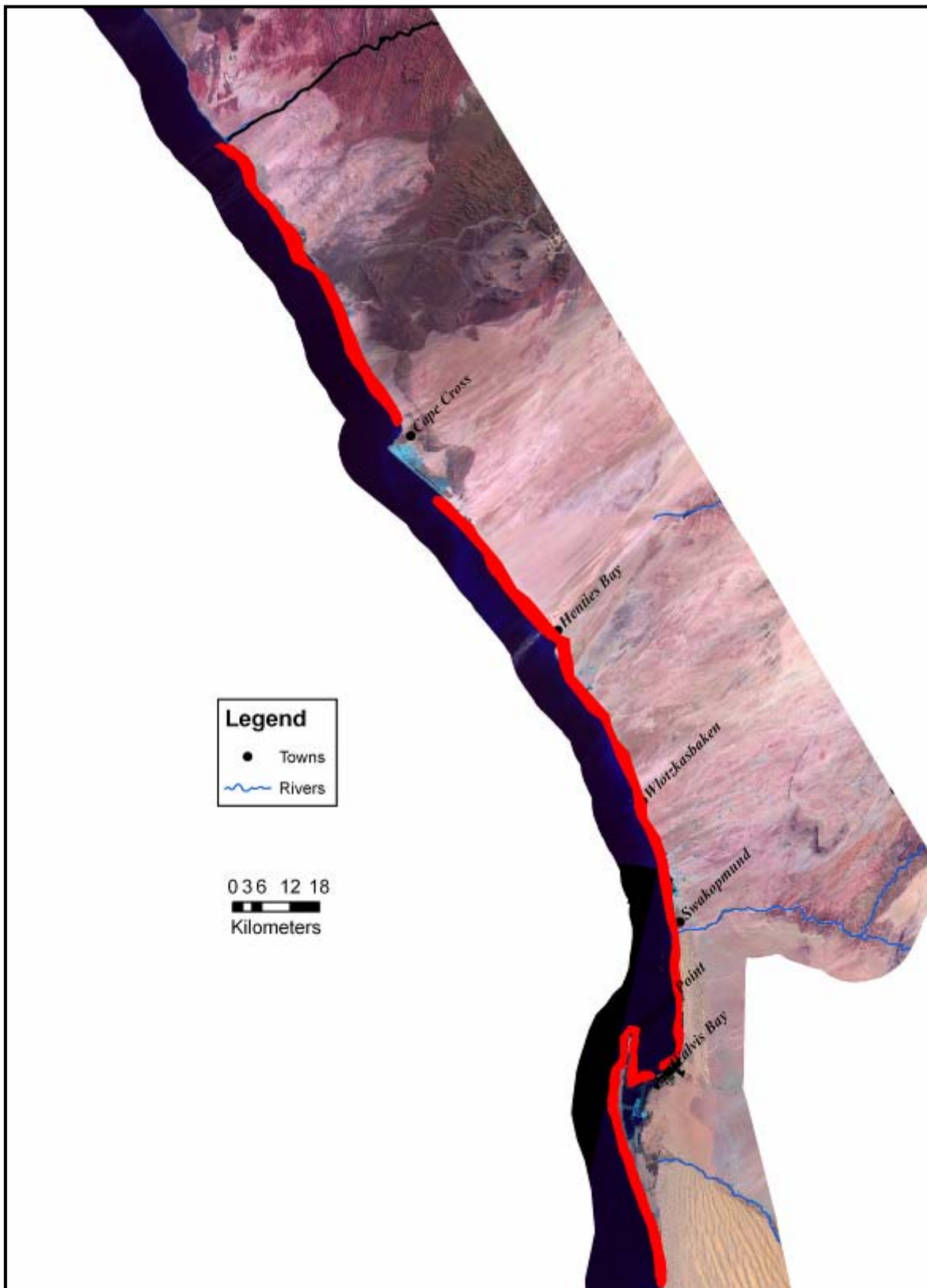


Figure 4: Locations used regularly for angling in Erongo (marked in red).

3.3.1.3 Other resources

Other species caught on the coast are restricted crabs, a range of bivalves, rock lobsters and also here quantity and seasonal limitations apply. In particular rock lobsters are popular but this and other stocks are under pressure. The areas for lobsters are the rocky outcrops distributed along the coast, whereas the soft bottom species are found widely distributed on the Erongo coast line.

3.3.1.4 Guano

On seabird roosting areas guano may accumulate in amounts that can be feasible to exploit for the fertiliser market. Bird Island north of Walvis Bay and the platforms in the Cape Cross salt pan are examples of artificial platforms from which guano is collected at regular intervals. A proposal for the construction of a similar platform in Sandwich Harbour has been put forward from a local entrepreneur.



Guano platform "Bird Island"
Walvis Bay – Erongo
Photo: T. Mufeti



Cape Cormorants: most common birds on
guano platforms
Walvis Bay – Erongo
Photo: N. Cadot

3.3.1.5 Seals

Colonies of Cape fur seals occur in several locations on the Erongo coast, but the Cape Cross Seal Reserve was proclaimed in 1968 particularly to protect the Cape fur seal, *Arctocephalus pusillus*. The reserve has a total area of 60 km² which is currently inhabited by some 293,000 seals²². Access to the reserve is controlled and in Erongo it is only at Cape Cross that licensed seal harvesting takes place. Presently, the national catch is less than the recent total allowable annual catch for 2007-2009 of 80,000 pups and 6,000 bulls. The catch is primarily processed locally at a factory in Henties Bay. The culling of the Namibian Cape fur seals is disputed internationally by NGOs²³.

²² H. Skrypzeck, MFMR pers. comm.

²³ The estimates of the income generated annually range from 600,000 to 5 million N\$ annually depending on the source



Seal colony
Cape Cross – Erongo
Photo: N. Cadot



Seal pup
Cape Cross – Erongo
Photo: Dlist

3.3.1.6 Aquaculture

On the Erongo coast Namibia has had an aquaculture sector based in Walvis Bay, Swakopmund and Henties Bay for some time. Fresh-water aquaculture does not take place on the coast, and the freshwater aquaculture sector is generally small-scale and catering for a local market, while the marine sector operates on a larger investment scale and produces for export. The successful oyster farms in Walvis Bay and Swakopmund have stimulated the development of aquaculture. A recent red tide severely impacted the marine based oyster farming industry.

Aquaculture has gained considerable interest in Namibia over the last few years since the current National Development Plan (NDP-2) calls for the promotion of aquaculture activities and the national policy paper Vision 2030 foresees a thriving aquaculture industry. Since 2003 the Aquaculture Act has provided a legislative context, and the policy paper *Towards the Responsible Development of Aquaculture (2001)* and the *Aquaculture Strategy (2004)* were developed to address the enhancement of a sustainable aquaculture sector.



Oyster farm in the Walvis Bay lagoon
Walvis Bay – Erongo
Photo: C. Lecrompt

Recently, a detailed plan for development of the sector in Erongo and Karas Regions (MCA Namibia Programme - Poverty reduction through economic growth, 8 September 2006) was submitted. It proposes:

- An Aqua Park for oyster farming in Walvis Bay at Pelican Point. The area is under the jurisdiction of Namport, is located within the boundaries of the Walvis Bay Nature Reserve and it has recently been zoned for aquaculture. It is a large development and will accommodate 10-20 oyster farms in a 1200 ha area.
- The plan also proposes the construction of an Aqua Park facility at each of the coastal towns: Henties Bay Mile 4 and/or Mile 17 (Swakopmund) and Lüderitz (second lagoon). The latter is not in the SEA area.

In addition, the Walvis Bay Town Council has zoned two plots between Walvis Bay and Swakopmund for aquaculture development with land based facilities. These latter developments propose to produce shrimp, finfish and abalone. No kelp production is proposed in Erongo.

Recommendations:

Without any undue delay, Sandwich Harbour should be declared a marine protected area to protect the fish spawning and rearing in the area, the shark population and the possible calving area for Southern Right Whales.

The plans for land-based aquaculture in the area between the breakwater and Bird Island should be revisited regarding the location and investment requirement as a greenfield land development. Some of the nearby fish factories are underutilised and already in possession of parts of the necessary infrastructure.

3.3.2 Kunene

Fishing in the Skeleton Coast National Park as well as within 2 nautical miles of the park boundary is prohibited, or in fact as the MFMR regulation reads: "No person shall catch or disturb any fish or damage the seabed in such a way that it may be detrimental to the marine life ecosystem in general, within two nautical miles from the high water-line in any of the following areas" and then mentions "from the middle of the Kunene River to the southern bank of the Ugab River".

In certain areas the prohibition is lifted and angling and collection of bait is allowed. These areas are:

- Terrace Bay between approximately 5 km north of Terrace Bay and approximately 25 km south of Terrace Bay;
- Torra Bay between approximately 20 km north of Torra Bay (Harolds Bay) and approximately 20 km south of Torra Bay (Black Rocks).

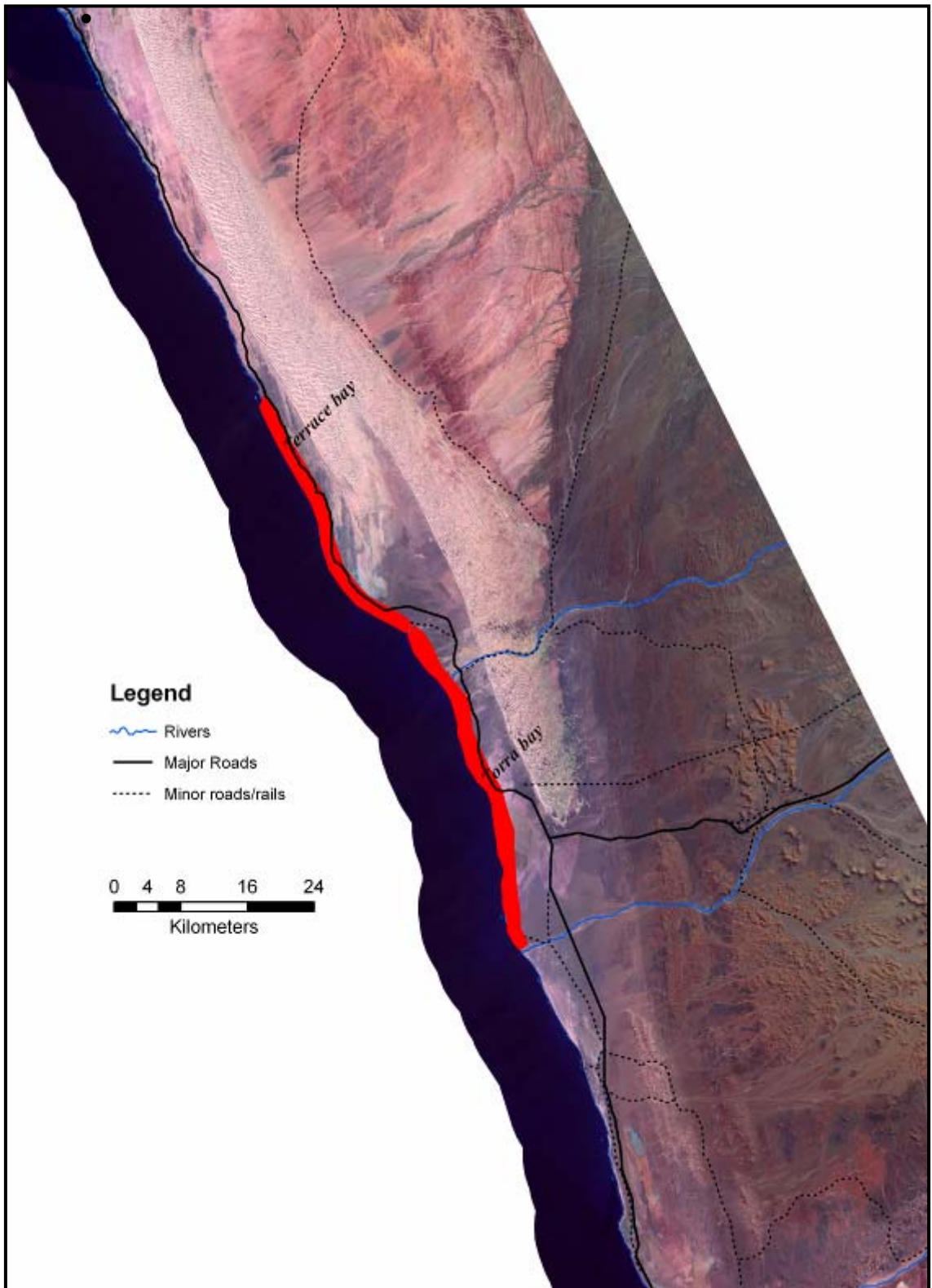


Figure 5: Location of areas in Kunene where angling and collection of bait for angling is allowed (marked in red).

3.3.2.1 Inland fisheries

The Kunene River is presently not commercially exploited for its fish resources in the SEA coastal zone and there is no fish farming.

3.3.2.2 Inshore fisheries

There are no local inshore fisheries in the Kunene coastal region due to prohibition of fisheries near the SCNP, the absence of human settlement, the high energy wave environment and lack of protected landing sites. Some marine fishing grounds are close to the coast and fishing occurs with larger vessels operating out of Walvis Bay. The fisheries are tightly controlled with TACs and fished to their maximum, however fishing activities in the prohibition zone are not controlled.

Several areas toward the Angolan border are assumed to be spawning and rearing grounds for some of the commercial fish species.

3.3.2.3 Angling

Angling from the coast is popular both in relation to tourism and for local citizens. For the underprivileged, angling may also add welcome food or, especially where the infrastructure allows, it provides a cash injection to the local economy if the catch is sold to the restaurant trade. The catch is subject to permitting and to limitations if it includes Steenbras, Galjoen, Kabeljou and Blacktail, which are also among the commercially most interesting species.

The tourist destinations Torra Bay and Terrace Bay are renowned angling spots well known to anglers all over Southern Africa. During the season Torra Bay may have several hundred visitors staying at the camp site, with the prime attraction being angling.



Torra Bay camping site during holiday season
Torra Bay – Kunene
Photo: J. Paterson

3.3.2.4 Other catches

Other species that may be caught on the coast includes a range of bivalves, crabs, rock lobsters, and also here quantity and seasonal limitations apply. In particular rock lobsters are popular but this and other stocks are under pressure. The main areas are the rocky outcrops distributed along the coast but the soft bottom species are found widely distributed on the Kunene coast line. No noteworthy commercial catch takes place.

3.3.2.5 Seals

Colonies of Cape Fur Seals occur in several locations on the Kunene coast, but no commercial seal harvesting takes place. A sizeable colony is found Cape Fria, smaller in Möwe Bay, and in several other locations in the Skeleton Coast Park.

3.3.2.6 Aquaculture

Due to the remoteness and lack of infrastructure very little aquaculture has been proposed in the Kunene region: a prospect for a marine facility in Terrace Bay is available and prospects for cage based farming in the Kunene River mouth are available, but the distance to a market and infrastructure challenges suggest that the locations are not optimal under the present conditions

3.3.3 Ports and coastal infrastructure

Namibia's ports are managed by Namibian Ports Authority (Namport), a parastatal supervised by the Ministry of Works, Transport and Communications. The objective of the Namibian Ports Authority is the successful operation and further development of the existing harbour infrastructure in Walvis Bay and Lüderitz.

A long national debate on the need for adding a third harbour in the north to the ports of Walvis Bay and Lüderitz has taken place over the years since Independence. Initially spurred by the rejection of apartheid South Africa to surrender Walvis Bay to the newborn Namibian Nation, thus leaving Namibia with only the smaller Port of Lüderitz, studies were carried out that pointed to Cape Fria and Möwe Bay as alternatives for port development. Although Walvis Bay came under the Namibian flag in 1994, no final decision pro or con has been taken on the issue of a port in the north.

One of the objectives of the Ministry of Works, Transport and Communications' transport policy is to improve the route between Walvis Bay harbour and Namibia's neighbouring countries to the east, especially landlocked Botswana. The aim is to provide a fast and comfortable road communication link, i.e. the Trans-Kalahari Highway, which forms part of the Walvis Bay-Botswana-Gauteng-Maputo Development Corridor. Other corridors are also in the making: the TransCaprivi and the TransCunene²⁴.

3.3.3.1 Erongo

The port of Walvis Bay is the only port in the Erongo and Kunene regions. It is a modern deepwater port with significant transshipment activity and a key cargo transport node in Namibia; in addition it also hosts the country's main fishing harbour. It is operated by Namport and one of the few deep ports on the Southern African Coast. Namport has seen increased maritime transport, in particular in the container segment, and with the coming mine openings in Namibia bulk and break bulk will also increase. Presently, Namport is modernising

²⁴ *White Paper on Transport Policy and Walvis Bay Corridor Plans*

and expanding the harbour, and plans exist to develop towards the southern part of the Bay²⁵.

Namport has implemented an Environmental Management Plan (EMP), incl. ISO 14001 (environmental management) and ISO 9000 (quality management) certifications in Walvis Bay. An EIA for the long term dredging strategies is available.

On the longer term a Master Plan comprising a number of specific projects is under consideration, where the development of the yacht club area and the possibility of a container port area on land north of the naval base have most interference in a SEA context.: The Port Authority is currently busy updating this Masterplan to cater for developments for the next five to ten years²⁶.

The development plan for a harbour in the north is not spearheaded by Namport at this point, since for commercial reasons it would be more feasible to open hubs in other existing ports in neighbouring countries. A quote from the Namport homepage outline the present approach: "We have therefore made a principle decision to concentrate on exploring business opportunities beyond the border of Namibia in specific terms imports and exports to and from Angola, Botswana, Zambia and the Gauteng Region of South Africa".

However, a clear message is also received that Namport will develop the port once politically decided. The port may serve as a bulk and break bulk terminal depending on the development of the mining in the hinterland.



Walvis Bay harbour
Walvis Bay – Erongo
Photo: N. Cadot

Recommendations:

The aquaculture development near Pelican Point is in waters zoned for port activities and the planned area is in the proximity of the dredge spoil dump site nearest to the harbour. An EMP for the Aqua Park should include provisions for retrieving oysters when dredging and spoil dumping is in progress.

²⁵ Namport: Port of Walvis Bay Development Plan (draft August 2006)

²⁶ Quote from Namport homepage (<http://www.namport.com.na>)

3.3.3.2 Kunene

There is neither significant coastal infrastructure such as breakwaters nor any ports in the Kunene Region. The lack of a natural harbour is considered a barrier to the development of the region according to the Kunene Regional Council. Over the last +50 years a number of studies for the establishment of a northern port have been carried out for Cape Fria, Rocky Point and Mōwe Bay. Although a port in this area would be closer to many fishing grounds the complete lack of infrastructure, accessible freshwater and the considerable distance for transport of goods over land has until now precluded a positive evaluation.

Recently, plans for the establishment of a port at Cape Fria or Angra Fria have been assessed. The study concluded that a port would only be marginally financially viable over a 50-year horizon period (as opposed to the anticipated 20 year horizon), and that Namibia's Constitution, Vision 2030, the second National Development Plan and the Kunene Regional Development Plan all emphasise environmental sustainability of development projects. The study reflects on the considerable environmental and social changes possibly inflicted on the area: "Some of these changes will be beneficial and others may be in conflict with the aims of Vision 2030 and the Kunene Regional Development Plan."²⁷

Presently, no major upgrade of the roads or construction of new roads in the Skeleton Park is underway.

Recommendations:

From the biodiversity and eco-tourism point of view the proposal for the construction of a port in Cape Fria or Angara Fria should not be pursued, since the necessary infrastructure developments will severely affect the present remoteness/wilderness attraction to tourists. Unless national strategic concerns or strong economic incentives dictate a revisiting of the proposal it seems neither feasible nor sustainable under the present conditions.



Cape Fria – Satellite photo
Skeleton Coast Park – Kunene
Photo: Google Earth



Seal colony at Cape Fria
Skeleton coast Park Kunene
Photo: J. Paterson

²⁷ *Pre-feasibility study of a future port facility in Namibia in the vicinity of Cape Fria – Angra Fria (November 2006). Comprise Main Report (Volume I), an Executive Summary (Volume II) and Report Annexes (Volume III). Quote from Executive Summary, p 20.*

3.3.4 Agriculture and Water

The government approved the National Water Policy in 2001. The policy is based on the foundation that water resources and their use and management are part of the national economic and social development framework and therefore should be fully integrated therein. It views water as being essential in the human life process, food production and agriculture, industry and the ecosystems of the natural environment. The management of the water resources should balance the allocation effectively between these various uses and users. The National Water Policy builds on its predecessor the Water and Sanitation Policy (1993) that addressed the need for essential water supply and sanitation at affordable costs.

The use and management of water resources is to be integrated with the conservation and protection of the resource through environmentally sustainable use of the water to enhance economic wellbeing. The policy adopts a cost-effective approach to the pricing of water as a mechanism for its conservation. The prices charged will take into account the financial cost of water, its opportunity cost and the consequences of environmental degradation. It will however be flexible enough to ensure that all members of the society have access to a minimum amount of water regardless of economic status. The issue of providing water to all Namibians are also addressed in the Regional Rural Water Supply Development Plans for the planning horizon of 2015. Economic development projects and activities, including conservancies will be required to account for the use and management of water and the effect these actions will have on the water cycle, equity and the protection of the natural environment.

The coastal zone is an arid to semi-arid region and not well suited for agriculture. This also is reflected in priorities of the National Agricultural Policy (MAWRD 1995) where the inland regions with higher rainfall are targeted for agricultural development.

3.3.4.1 *Kunene*

The arid conditions of the Kunene coastal zone do not invite to any agricultural activities and within the park boundaries of the Skeleton Coast Park farming is not allowed. In the hinterland there is limited cattle (Sanga) rearing and some irrigation near the springs in town areas, but none of these have any impact on the coastal zone. There is no game farming in the coastal zone.

Water is a scarce resource in Namibia and the availability of water is a key component when the scene is set for the development potential of an area. Only the Kunene River in the Erongo and Kunene Coastal Zone is perennial and exploitable underground water is often limited to aquifers in the ephemeral river beds.

The utilisation of the water in the Kunene River is subject to an international agreement with Angola addressing the fair allocation of water between the neighbouring states of Namibia and Angola.

Recommendations:

None

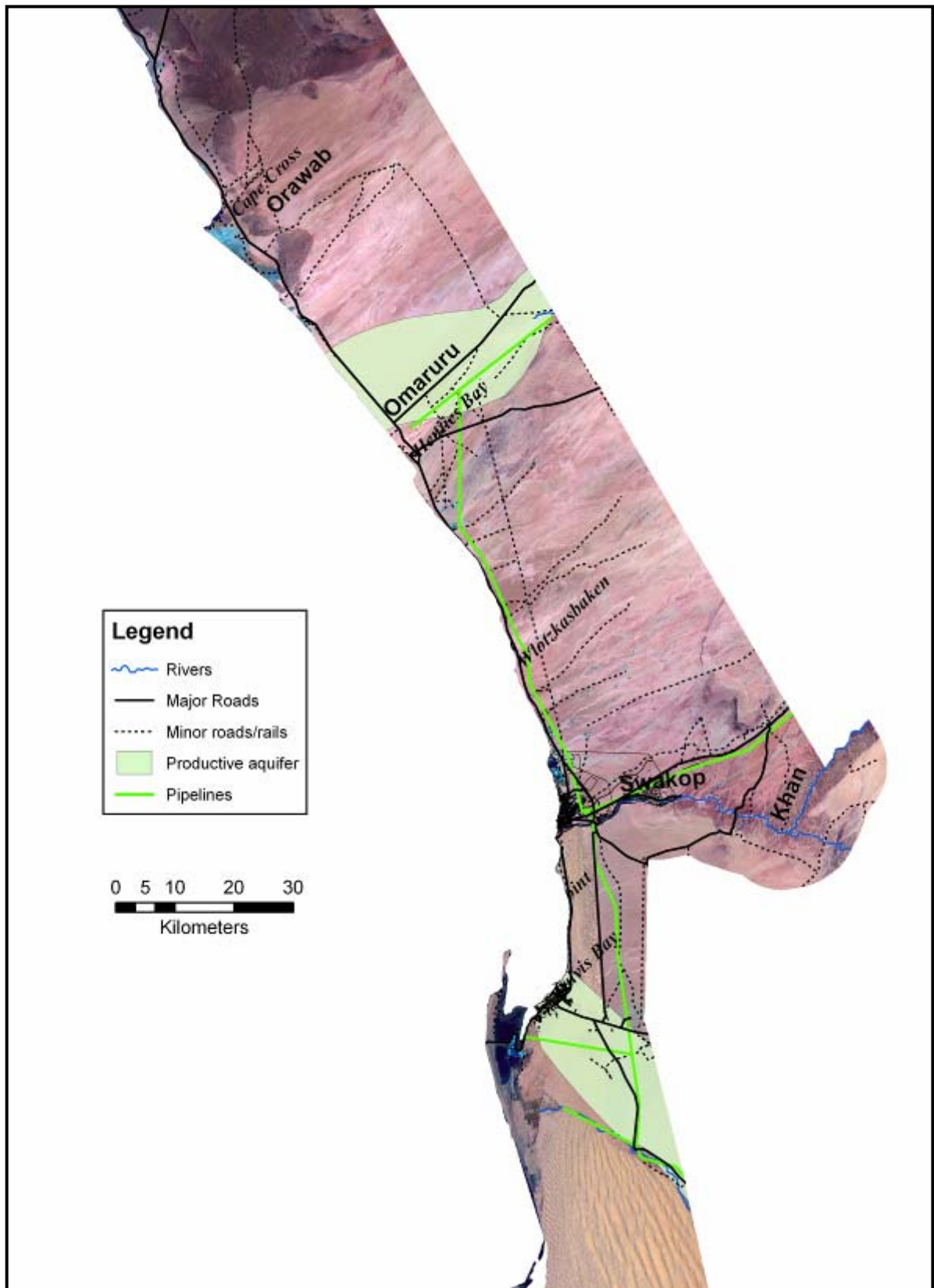


Figure 6: Pipelines and productive aquifers in Erongo.

3.3.4.2 Erongo

The Regional Development Plan of the Erongo Region points to the small scale agricultural production that does take place in the coastal zone of Erongo in the river beds of the Kuiseb and Swakop. In the latter limited commercial farming of vegetables and nursery activities take place. A further development of unexploited areas and water resources is foreseen in the RDP focusing on non-traditional, high value crops rather than subsistence farming. The economic and ecological sustainability of developing commercial agriculture in these and other river beds like Khan, Omaruru, Orawab or Messum, must be carefully assessed before engaging on full scale productions.

Water is a scarce resource in Namibia and the availability of water is a key component when the scene is set for the development potential of an area. For the urban nodes in the Erongo water is piped from the aquifer resources in Rooibank (Figure 6). The long term prospects of the present resource extraction are not sustainable.

Recommendations:

The current water consumption in Erongo is over-utilising the water resource and desalination plants are considered whenever future water demands are discussed, in particular with mining and tourism developments. An economically feasible project has not yet emerged, but other coastal developments in arid zones have resorted to this solution and the cost of the technology is decreasing.

The recent increased interest in developing the uranium and other mineral resources in or near the coastal zone of Erongo could form the basis for a single desalination plant reaping the benefits of large scale production. In addition this will entail a more rational layout of a pipeline grid to the mining companies. It is recommended to consider licensing a private or public operator to operate a desalination plant providing water to the large mining developments on long term contracts.

3.4 URBAN DEVELOPMENT AND URBAN ENVIRONMENTAL MANAGEMENT

Concern is often expressed by stakeholders about the environmental impacts of urbanisation – the rise in the share of the urban population relative to overall population – on the Namibian coast. NACOMA's brochure summarises well the perspective commonly taken on the issue, under the heading 'Human Influence':

...Namibia has an exceptionally low, and geographically very concentrated, coastal population compared to other countries... Growing economic development and human activities along the coast are leading to unprecedented migration, bringing with it uncontrolled urban development that results in overuse and land based pollution, an increase in industrial, coastal and marine pollution, degradation of water regimes for coastal wetlands, and other land and water degradation... If remaining unchecked and unplanned, this development will result in long-term loss of biodiversity, ecological functioning and, contrary to the national poverty eradication objectives, a reduction of the economic potential of the coast itself. This possibility presents a great challenge to the expanding nature-based tourism industry, which depends upon a healthy environment for its sustainable success.

The Kunene region features no real urban development on its 500 km long coastline, apart from a number of small recreational, tourism and conservation settlements which fall within the Skeleton Coast National Park. Urban, in this context, has been defined as both residential and tourism-related buildings.

The Erongo region's situation is rather different: its approximately 300 km long coastal zone features what is the Namibian coast's only urbanised sub-region, incorporating the municipalities of Walvis Bay, Swakopmund and Henties Bay, and the declared settlement area of Wlotzkasbaken. Approximately half this area, stretching from the Kuiseb River, south of Walvis Bay, to Mile 14 north of Swakopmund, is actually the only part of the Namibian coast-line without any nature protection status. The area south of the Kuiseb to the Erongo border, which includes the Sandwich Harbour wetland, is incorporated within the Namib-Naukluft National Park, and the area north of Mile 14 to the boundary with Kunene region falls within the National West Coast Tourist Recreation Area.



Swakopmund
Erongo Region
Photo: G. Reitz



Walvis Bay
Erongo Region
Photo: B. J. McMorrow

For more than a century, the urbanisation of the Erongo coastal zone has been associated with economic activities that have exploited the sea and land's natural resources: marine fisheries and fish processing (and now aquaculture), salt refining, mining, port and other transportation activities, and recreational activities and tourism, the latter increasingly nature-based. Managing the impacts of urban and economic development with due regard to protecting and conserving biodiversity of the Erongo coastal zone, as exemplified by the world-renowned wetlands of Sandwich Harbour and the Walvis Bay Lagoon, the Damara tern breeding area between Walvis Bay and Swakopmund, and the lichen fields near Wlotzkasbaken and Cape Cross (another protected area) is a principal challenge for stakeholders.

National government policy and plans currently have little to say directly on the issue of urban development. Neither, for that matter, does policy and planning at the regional scale.

To put this in perspective, some facts on urban development in Namibia are useful. In 2001, approximately a third of Namibia's population of 1,826,000, or just over 600,000 people, lived in urban areas. While the country is now urbanising rapidly, at between 4 to 5 per cent per annum, it is unlikely that the 5.6 per cent urban growth rate of the 1980s is being realised, as the Government of Namibia's overall national development policy, *Vision 2030*, seems to assert. This makes estimations of a 50 per cent urbanisation rate by 2010 unlikely to be realised.

At around or at slightly higher than a third of its population, Namibia is in fact very close to the African average (in 2003) for urbanisation of 36 per cent. Namibia is also at or around the average African urbanisation rate of 5 per cent. However, the capital and largest city Windhoek's national primacy (its population as a percentage of overall urban population) of 38 to 40 per cent considerably higher than the African average of 24 per cent.²⁸ The contribution of

²⁸ The African averages come from a recent important report, Christine Kessides, *The Urban Transition in Sub-Saharan Africa: Implications for Economic Growth and Poverty Reduction*, The Cities Alliance (and Sida and

in-migration to urbanisation in Namibia, as compared to natural urban increase, is not clear. Recent data on migration does not seem to exist. What is incontrovertible is that Windhoek is the major destination for migrants and that in-migration is likely to continue – particularly to Windhoek.²⁹ Namibia’s secondary cities, including Erongo’s coastal towns, are not as popular destinations for in-migrants as Windhoek is.



Long Beach
Walvis Bay – Erongo
Photo: G. Reitz



Long Beach extension
Walvis Bay – Erongo
Photo: G. Reitz

National development policy has shown a measure of ambivalence to the urban transition that Namibia shares with other African societies. There is no national urbanisation or urban policy. Both first and second National Development Plans (NDPs) contained goals to facilitate urban development, as well as development goals aimed at limiting rural-urban migration. In its section on “Migration, Urbanisation and Population Distribution,” The *Vision 2030* document’s sub-vision is that

*There is free movement of the population within the country and population distribution is maturely adjusted to the location of resources for livelihood. Namibia is a highly urbanised country with about 75% of the population living in proclaimed urban centres, while the predominance of Windhoek has considerably reduced as a result of the growth of other urban centres throughout the country.*³⁰

This sub-vision is then translated into an objective “to achieve integrated rural and urban development in which living conditions and social and economic opportunities are adequate for all.” Later in the *Vision 2030* document, in the section on the Urban Environment, the sub-vision is that:

Despite high growth rates, Namibia’s urban areas will provide equitable access to safety, shelter, essential services and innovative employment opportunities within an efficiently managed, clean and aesthetically pleasing environment.³¹

To further this vision, the insertion of a “clear urban development plan” into national development plans is called for. In the section’s ‘Things to avoid’ it is asserted that urbanisation should not be allowed to spill over in an *ad hoc* manner into “sensitive coastal areas, causing

The World Bank), Washington D.C., 2006. Namibia’s population is now held to be 1,900,000 people and Windhoek’s up to 300,000.

²⁹ See Wade Pendleton and Bruce Frayne, “Migration as a Population Dynamic in Namibia,” in Ben Fuller and Isold Prommer, eds., *Population-Development-Environment in Namibia: Background Readings (IR-00-31)*, International Institute for Applied Systems Analysis, Laxenburg, Austria, 2000, pp. 273-293.

³⁰ *Vision 2030*, National Planning Commission, 2004, p. 49.

³¹ *Ibid*, p. 171.

the destruction of valuable ecosystems and their resources,” into reclaimed wetlands and into areas which are suitable for agriculture.³²

NDP3: 2007/08 – 2011/12 is currently under preparation. It is being coordinated by the National Planning Commission, with submissions expected from all 13 regions and from civil society and the community and public sectors, NDP3 is taking Vision 2030’s eight objectives and associated Key Result Areas (KRAs) to identify its 26 goals in four sectors: economic (12 goals), social (8), security (4) and administration (2).³³

At this point in the process, it is not clear whether an urban development plan is underway for inclusion. The plan’s overall theme is “Accelerated Economic Growth through Deepening Rural Development” which indicates a rural rather than urban focus. None of the 26 goals mentioned above makes specific reference to the urban sector. NDP3 is to be launched in August 2007.

Regional development plans (RDP) for each of Namibia’s regions for the period 2001/2002 – 2005/2006, these including at least in principle the consideration of urban development, were produced under the auspices of the NPC in 2000. The RDPs contain a social, economic and physical/environmental overview of the situation in each region, a regional development framework which sets overall development goals for the region’s economy, society, institutions and infrastructure, and on the basis of deeper analysis the proposal of objectives, strategies and targets for sub-sectors within the larger sectors. These proposals are then translated into detailed programmes (which are themselves also only proposals) for implementation.



Henties Bay
Erongo region
Photo: G. Reitz

There has been debate and some criticism of the RDP process, its outputs and of its limited contribution, through the principal implementing vehicle of the Regional Service Councils (RSCs), to regional development via decentralisation (the Regional Councils Act of 1992 gives this responsibility to the RSCs, which is framed by Namibia’s Regional Planning and

³² *Ibid*, p. 172.

³³ *The KRAs are: Equality and Social Welfare, Peace and Political Stability, Productive and Competitive Human Resources and Institutions, Competitive Economy, Quality of Life, Productive Utilization of Natural Resources and Environmental Conservation, Knowledge Based and Technology Driven Nation and Regional and International Stability and Integration.*

Development Policy of 1997 and Decentralisation Policy of 2000).³⁴ According to a recent report by the NPC, the regional development process has failed in the main goal to achieve integrated regional development. Shortages of capacity, funding, and planning data and limited harmonisation between PPPs and coordination of effort between those tasked to implement them are all implicated in this failure. Only limited aspects of the RDPs in Kunene and Erongo have therefore actually been carried through to implementation. The documents stand as now outdated indicative plans. In both of them, urban issues are touched upon but urban development, unlike rural development, is not treated in sub-sectoral terms.

Erongo

The Erongo RDP 2001/2002 – 2005/2006 acknowledges that some 63% of the estimated 120,800 total population in 2000 are urbanised³⁵ and settled in the towns of Walvis Bay, Swakopmund and Henties Bay on the coast, and in the inland towns of Omaruru, Karibib, Arandis, Usakos and Uis. Walvis Bay and Swakopmund are identified as “possible growth points.” The vision for the region links a “spatial-economic development model” and a “human-environmental development model,” and seeks to diversify the economy towards the secondary and tertiary sectors and to de-concentrate population resources away from the main centres, “with the focus of providing development and services to outlying areas as a priority.”³⁶

The strategy for urban infrastructure services and housing follows in this vein, and suggests prioritising disadvantaged outlying areas, with little implications for the structuring and management of the coast’s ongoing urban development or for environmental management.

At local level, the Local Authorities Act 1992 establishes a local government for Namibia. It defines the powers, duties and functions of scheduled local authority councils of three types: municipalities (e.g. Walvis Bay, Swakopmund), towns (Henties Bay) or villages (Kamanjab). The Townships and Division of Land Ordinance of 1963 regulates the establishment of townships and the development and subdivision of land. The preparation and application of town planning schemes is mandated by the Town Planning Ordinance of 1954. The Town and Country Planners Act 1996 establishes the Namibian Council for Town and Regional Planners and provides for the registration of town and regional planners, of which there are some 35 in the country. The enactment of the draft Urban and Regional Planning Bill 2003, and of its associated regulations, would serve to reform the planning system and provide for a more coordinated set (or package) of land use plans from the national through the regional and local levels.³⁷ It will also tighten and extend the power of town planning schemes.

Under the Town Planning Ordinance, all scheduled local authorities are required to prepare a Town Planning Scheme for their area of jurisdiction. Walvis Bay, Swakopmund and Henties Bay have all complied with the ordinance. These statutory instruments serve as land use control and/or facilitation plans, and typically indicate the permitted land uses or the restrictive conditions applying to particular zones of land (industrial, commercial, residential, etc.). The formulation and amendment of schemes is politically inflicted, as municipal councils

³⁴ See the comprehensive NACOMA preparation phase report by EcoAfrica Environmental Consultants, *Rapid Assessment of the Development Plans, Biodiversity Conservation Projects and Socio-Economic Situation of the Namib Coastal Regions*, pp. 32-37 for a good account, and the recent report for NACOMA, *Draft Review of Existing Institutional Mandates, Policies and Laws Relating to Coastal Management and Proposals for Change*, The Southern African Institute for Environmental Assessment (SAIEA), 2007, pp. 85-87.

³⁵ This is an overestimate as recent figures indicate a population closer to 110,000 making the urban population around 65,000.

³⁶ *Erongo Region Regional Development Plan 2001/2002 – 2005/2006*, Erongo Regional Council, 2000, p. 32.

³⁷ The SAIEA report for NACOMA, *op cit*, provides a full analysis of land use and planning legislation at local level (pp.30-35) and an assessment of the functioning of the planning system and relevant institutions (pp. 88-94).

have the power to make proposals with regard to zoning categories or to suggest changes to the schemes. In accordance with the ordinance, however, the evaluation and amendment of town planning schemes is carried out by the Namibian Planning Advisory Board (NAMPAB). On NAMPAB's advice, the Minister of Regional and Local Government and Housing (MRLGH) approves town planning schemes through a notice in the Government Gazette.

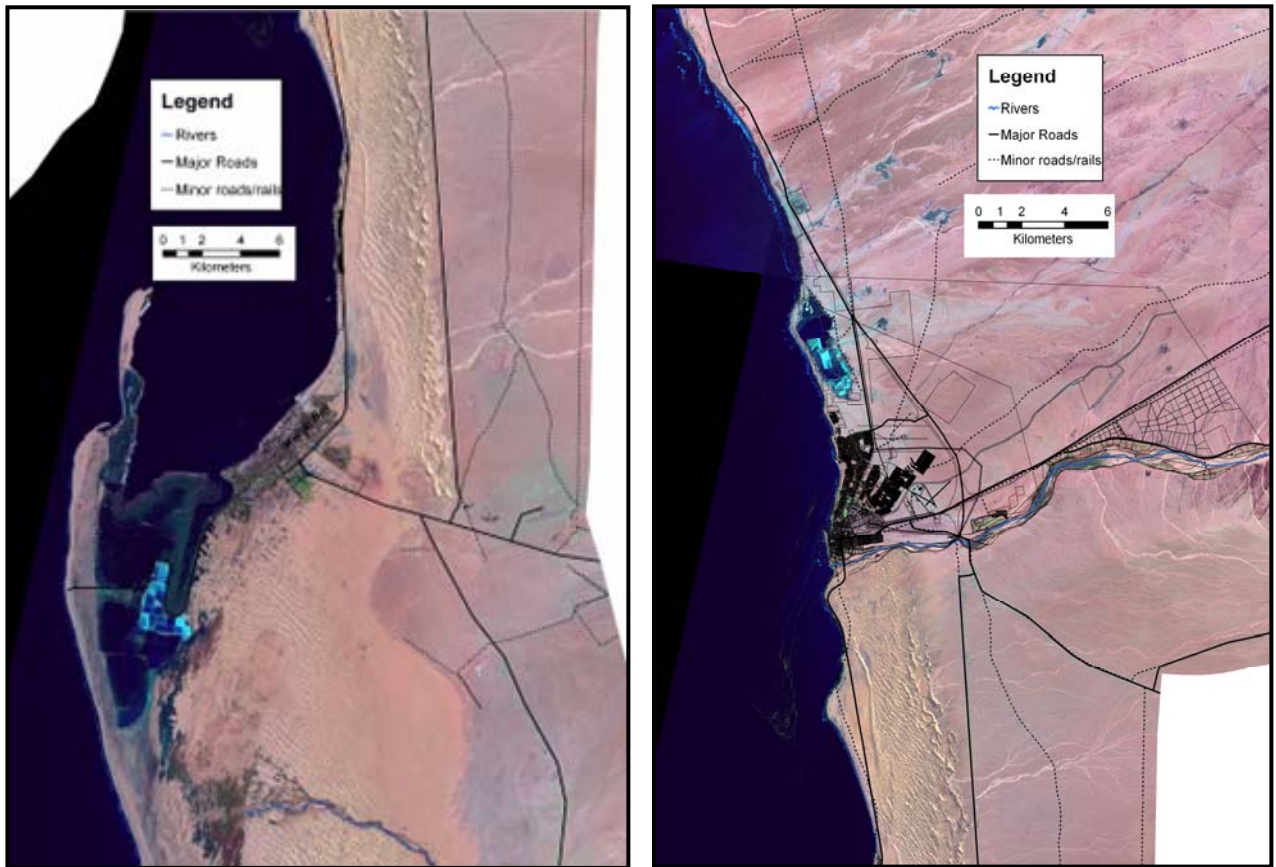


Figure 7: The current infrastructures of Walvis Bay (above left) and Swakopmund (above right) and including areas designated for urban development according to town planning schemes.

Although it is not mandatory at present (it would be under the new Urban and Regional Planning Bill when enacted), the schemes are typically framed by Structure Plans. These are long-term, non-statutory guide plans for urban development that are based upon intensive analysis of economic, social, spatial and environmental conditions. The three scheduled areas in Erongo all have in place what in formal terms are well-executed structure plans.³⁸ Of the three, only Walvis Bay has an Environmental Policy in place, and a staff complement – two environmental officers and a manager – dedicated to urban environmental management. Increasingly and in pursuance of Namibia's Environmental Assessment Policy the local three authorities are requiring that bigger development applications be accompanied by Environmental Impact Assessments.

Walvis Bay Municipality has strategically considered its place in the national economy, and in the Southern African regional economy, given the town's port, its Export Processing Zone, and its role as the western terminus of the Trans-Kalahari Highway. The town plays the pivotal role in the Walvis Bay Spatial Development Initiative, a bilateral economic development programme between South Africa and Namibia that has been focused on identifying and securing larger-scale investments. Although these considerations apparently yet have to be

³⁸ The Town Planning Schemes and Structure Plans will be discussed and evaluated in Section 3, with the exception of with the Henties Bay Town Planning Scheme, which the consultant team was not as yet provided with by Henties Bay Municipality.

consolidated into an overall urban development strategy for the town, they do shape the selected options for future development, particularly with regard to bulk infrastructure services to accommodate urban and economic growth (e.g., water and power) and the expansion of transportation facilities. An upgrading of the Walvis Bay Airport to proper international status, involving a lengthening (from 1,300 metres to 3,440 metres) and widening (from 30 to 60 metres) of the runway, allowing for larger planes, will be completed by October 2007.

Kunene

Kunene's small – and declining – overall population of 68,735 is, as stated above, principally rural, with urban concentrations only in the small inland towns of Outjo, Khorixas, Opuwo and Kamanjab and no proclaimed settlements on the coast. The Kunene RDP notes that migration from rural areas continues, and proposes focusing infrastructural resources on six settlements, including the four above, as “primary growth points” and on 11 secondary points identified by their communities. Urban infrastructure services and housing plans and programmes follow this path. There is no consideration of or implications for urban development or urban environmental management in Torra Bay, Terrace Bay and Möwe Bay, the three tiny settlements in the Skeleton Coast National Park on the Kunene Coast.



Möwe Bay
Skeleton Coast National Park – Kunene
Photo: J. Paterson



Terrace Bay
Skeleton Coast National Park – Kunene
Photo: B. J. Mc Morrow

Recommendations

The Namibian economy is now growing at close to 4 per cent per annum. The performance of the resource extraction sectors – demersal fisheries (pelagic fisheries remains weak) and mining, particularly uranium, which is booming as seen above – which underpin economic development on the coast of both the Erongo and Kunene regions is improving significantly after a period of slow growth. Tourism, as will be seen below, is also doing fairly well, and there is much potential for oil and gas development finally getting off the ground. This economic growth is necessary if the high rates of poverty and unemployment in both regions are to be reduced.

The take up of profitable opportunities in mining, tourism, fishing and manufacturing is thus likely to be actively encouraged by the GRN at all of its levels, and to increase, with this facilitated by upgraded economic infrastructure, particularly investments in transportation. Urban development is thus also likely to accelerate, and with it, its impacts and the consequent pressures on the integrity and performance of the coastal ecosystem, which is itself a crucial asset for assuring further economic growth and poverty reduction.

At this time, national development policy and planning – and in its path regional development planning – is strongly focused on reducing disparities across the space of the country and its regions, and is concentrated on rural development. The process of urban transition is acknowledged, but as with many other African countries, the positive benefits of urban development for economic growth and poverty reduction still go under-recognised, or are even discounted. Windhoek's growth, in particular, seems to be regarded with something approaching alarm.³⁹

In this picture, the need for better urban policy, planning and management to accommodate urban growth is likely to become a more urgent imperative in the near future. At the same time, given Windhoek's undisputable rapid growth, the need for the country's secondary cities to play a bigger part in absorbing urban development is also likely to grow, as stated in the Vision 2030 sub-vision on urbanisation cited above. The effectively conjoined towns of Walvis Bay and Swakopmund are together the country's second largest urban settlement, and by far the largest urban concentration on the coast. Seen separately or together, they make up a key national asset, which can only grow in importance, rather than an intrusion of human activity that is disturbing a somehow pristine coastline. They need to be better understood in such terms as a national asset by local, regional and national stakeholders and decision makers.

The NACOMA process can contribute here. More up-to-date information and analysis is required on the urbanisation process, including the role of in-migration, and on the urban development trends now characterising Erongo's coastal towns. Although Walvis Bay in particular has the distinction of having had two recent books devoted to its human geography and environmental history respectively, there are still information and knowledge gaps.⁴⁰

NACOMA is shortly to develop Coastal Profiles for the four Namibian coastal regions. It is recommended that the Erongo Coastal Profile highlight the dimension of urban development

³⁹ See the article "Population boom puts pressure on Windhoek," in *The Southern Times*, www.southerntimes.com.na, June 2007. Chairperson of the City of Windhoek's Management Committee, Councillor Bjorn Finkelstein states in the article that "This urbanisation is an issue that should be addressed on a national, regional, as well as local level...It is imperative, and also in the national interest, to study the urbanisation process with its consequences, bad and good, and come up with a definite plan of action."

⁴⁰ Hungiree Wilson Billawer and Muriel Same Ekobo, *A Human Geography Atlas of Walvis Bay: Beyond the Re-integration*, Gamsberg Macmillan, Windhoek, 2002; Melinda Silverman, *Between the Atlantic and the Namib: An Environmental History of Walvis Bay*, Commissioned by the Walvis Bay Local Agenda 21 Project, Namibia Scientific Society, Windhoek, 2004;.

in order that decision makers are informed on the necessity for better planning and management of the coastal sub-region in the near-term future. The Kunene Coastal Profile should emphasise that there is already limited urban development in Torra Bay, Terrace Bay and Möwe Bay, as well as mining-related settlement at Toscanini.

It is also recommended that NACOMA and its stakeholders encourage the completion and enactment of the draft Urban and Regional Planning Bill, which will result in the emergence of a more integrated, coordinated and effective system of land use planning, development and control in Namibia in general, and on the coast in particular. In the medium term, such a system will also assist in the planning of the Walvis Bay – Swakopmund area as a sub-regional platform to spatially concentrate, accommodate and enhance the benefits of urban and economic growth in the Erongo Region, rather than as two often competing small towns. Moreover, and depending on the fortunes of mining and tourism, the small settlements on the Kunene coast may well grow in the future, for which pro-active land use planning will be required.

3.5 Tourism

Tourism is a sector of considerable importance to the Namibian economy. The industry's direct impact is estimated at some 18,840 jobs, or 4.7 per cent of total employment, and N\$1.584 million in output, approximately 3.7 percent of Gross Domestic Product (GDP). It has been further estimated that tourism directly and indirectly contributes up to N\$6.788 million to the economy annually, and thus potentially contributes close to 72,000 jobs.



Beach Tourism
Coastline between Swakopmund &
Walvis Bay – Erongo
Photo: N Cadot



Quad biking guided tour
Dune belt between Swakopmund &
Walvis Bay – Erongo
Photo: J. Tromp

The number of overall tourists – defined as a person visiting a country other than his/her usual country of residence for between one night and one year – has risen from 254,978 in 1993 to 777,890 in 2005. Output in 1993 was estimated at N\$500 million. Some 82 per cent of just over 200,000 arrivals by air in 2004, i.e., 167,000 people, were tourists. The average length of stay is 17 days, with most tourists moving around the country to experience its varied attractions. Some 1,728 establishments have applied for registration with the Namibian Tourism Board (NTB), these split between 912 accommodation establishments of various types and 816 regulated businesses (e.g. tour operators, conference operators, vehicle rental, booking agents, etc.).

Namibia's protected areas (parks) system, which covers some 18 per cent of the country's land area, was recently estimated to generate between N\$1.099 million to N\$2.259 million in overall output. At the same time, the number of tourists visiting community-based tourism enterprises, which are often adjacent or in proximity to the parks, has increased promisingly

from 30,000 in 1999 to over 90,000 in 2004, according to the Namibian Community-Based Tourism Authority (NACOBTA).⁴¹

In the post-2000 period, however, growth in both the numbers of tourists and in revenues has been less than expected. Despite rosy predictions of growth for the future – over the next decade to 2016, by 8.6 per cent in output per year to N\$5.696 million, and 4.4 per cent per annum for employment to 28,845 direct jobs – travel and tourism in Namibia is under-performing, relative to its own potential, and compared to the performance of its immediate neighbours (and competitors) in Southern Africa, Botswana, Zambia and South Africa. This under-performance is now the focus of much GRN attention.

A White Paper on Tourism, which reflected the findings and recommendations of the National Tourism Development Plan 1993-1997, was approved by Cabinet in 1994. In recent years it has been augmented by the development of *A National Tourism Policy for Namibia*. It is understood that this policy is now close to being launched.⁴² Tourism is also emphasised in *Vision 2030*. Although it is not mentioned as yet as a specific sectoral goal in NDP3, it will certainly be regarded as a priority area for growth. *Vision 2030* acknowledges that despite tourism's "very important role in economic development...its full potential has neither been explored nor exploited." Accordingly, the sub-vision for Wildlife and Tourism is declared as follows:

The integrity of Namibia's natural habitats and wildlife populations are maintained, whilst significantly supporting national socio-economic development through sustainable, low-impact consumptive and non-consumptive tourism.⁴³

This aspiration is echoed by the National Tourism Policy, which sets out its vision as follows:

Namibia will develop the tourism industry in a sustainable and responsible manner to contribute significantly to the economic development of Namibia and the quality of life of all her people – primarily through job creation and economic growth.⁴⁴

The policy strongly emphasises the two related tourism concepts above, sustainability and responsibility. The principle of sustainable tourism "implies the planning of tourism activities in such a manner that visitor satisfaction is retained, the industry is profitable, the fragile environment is protected, and the natural resources are sparingly utilised for the benefit of current and future generations."⁴⁵ It must be seen within the context of the understanding that it is Namibia's environmental resources – in simple terms, the country's nature and wildlife – that are the key basis for its tourism industry. Accordingly, responsible tourism is to be promoted, as:

...an approach aimed at ensuring that Namibia develops tourism that is economically, socially and environmentally sustainable – tourism that contributes positively to the local and national economy, the local environment and the empowerment of local people and, ultimately, to the quality of life of all Namibians. This means encouraging the sort of tourism that has the greatest chance of providing a long-term future for local communities, where ongoing

⁴¹ Statistics are drawn from the World Travel & Tourism Council (WTTC) Country Report, *Namibia: The Impact of Travel & Tourism on Jobs and the Economy*, commissioned by the Ministry of Environment and Tourism, 2006, and from *Namibia Statistical Report 2004*, Directorate of Tourism, Ministry of Environment and Tourism, 2005.

⁴² The consultant is in possession of the fourth draft of the policy, dated June 30th 2005. The process has been ongoing since 1999.

⁴³ *Vision 2030*, op cit, p. 152.

⁴⁴ *A National Tourism Policy for Namibia, Fourth Draft, 2005*, p. 6.

⁴⁵ *Ibid*, p. 25.

market demand is most likely to sustain tourism businesses and where tourism can assist in environmental conservation.⁴⁶

Environmental planning and management considerations are built into Namibia's tourism policy. Planning and land use issues are well-covered. Land use planning is vital to regional economic development, and specifically to tourism, and land use plans will be incorporated into regional economic development plans and regional tourism strategies. Tourism facilities are to "minimise their impact on the environment in terms of both resource utilisation and visual impact," with mechanisms such as EIAs to assure this. New tourism developments, in particular, are to be "designed in such a way that they are unobtrusive, environmentally sympathetic and, as far as possible, enhance rather than detract from the visual impression of the environment."⁴⁷

The National Tourism Policy can be seen as simultaneously ambitious in its intentions for the tourism industry in Namibia and strongly conservation-oriented (or even conservative). There are several issues that will have to be tackled if the tourism industry is to live up to its potential:

- Funding and institutional strengthening: MET overall faces severe budgetary constraints. For several years, budgetary allocations have not covered operational costs (there was over-expenditure of N\$12.3 million in the 2006/2007 financial year). The Ministry, with a budget of N\$141 million for 2007/2008, is arguably under-budgeted with only N\$50 million a year spent on maintaining and running its national parks, the cornerstone of Namibian tourism. At the same time, the tourism agencies falling under MET auspices, the NTB, responsible for tourism marketing and the licensing of tourism businesses since 2001, and the National Wildlife Resorts parastatal (NWR), which has managed resorts in the national parks since 1998, also face serious financial and capacity constraints. The NWR in particular has struggled with managing its assets, the resort facilities, which are widely seen as below comparable international standards and expensive. A refurbishment programme is now underway. The NWR received a Cabinet bailout of N\$120 million in 2005.⁴⁸
- The definition of market segments and associated tourism products: national policy, while recognising that some diversification is needed, focuses on stimulating "high-spending low-impact tourism." *Vision 2030* warns against "Uncontrolled low quality mass tourism" (p. 153). However, apart from mentioning "lower-spending but more adventurous visitors who will travel more widely in Namibia," it is unclear what market differentiation is envisaged by the policy.⁴⁹ The WTTC report points out that of the 780,000 international tourist arrivals in 2005, the largest share, of 44 per cent, was accounted for by visitors to friends and/or relatives (VFR tourists) who are not necessarily high-spending tourists at all (many are self-driving South African and other South African Development Community region holidaymakers and visitors). This VFR segment nonetheless contributes significantly to tourism receipts, and is arguably under catered for in terms of the products offered to it, or the attention paid to its needs. It is also widely acknowledged that there is much that can still be done to encourage more domestic tourism. Presently, many

⁴⁶ *Ibid*, p. 2.

⁴⁷ *Ibid*, p. 15.

⁴⁸ See Brigitte Weidlich, "Conservation hit by limited funds," in *The Namibian*, February 12 2007

⁴⁹ *Vision 2030*, p. 153; *A National Tourism Policy for Namibia*, p. 2

Namibians are priced-out of their own facilities by what the WTTC calls “prohibitively high accommodation prices and entrance fees.”⁵⁰

To address these challenges the National Tourism Policy calls for the development of a national tourism strategy and action plan to further its policy objectives. This is to be accompanied by regional tourism strategies to be developed by regional and local stakeholders under the framework of updated regional development plans. The WTTC report also recommends that a detailed Tourism Master Plan/Strategy be drawn up and adopted as a Cabinet directive. This should include a product development strategy (including wildlife tourism, cultural tourism, adventure tourism, game hunting, etc.). Region-specific master plans should also be developed which can be attached or incorporated within the national plan.

Erongo

The situation analysis in the Erongo Region *Regional Development Plan 2001/2002 – 2005/2006* is very weak, without recognisable depiction of tourism in the region. With little justification, five priority areas, which with the exception of the Kuiseb River Delta are located in outlying communal areas to the east of the coastal zone, are identified for tourism promotion. The associated tourism investment programme is cursory.

At local level, none of the three coastal towns, Henties Bay, Swakopmund and Walvis Bay, appear to have current relevant tourism policies or plans.

The lack of tourism policy and plans at regional and local levels in the Erongo and Kunene coastal zones has negatively affected coordination and communication between public, private and community sector stakeholders. This, however, does not seem to have held back the progress of the sector, whose performance since the early 2000s has been good. Coastal tourism is considered a growing product in most of the national policy documents, and Swakopmund and Walvis Bay are second and third respectively, after Windhoek, as the most visited locations by tourists in Namibia. Reliable up to date statistics and other data do not appear to exist. Informed through discussions with tour operators, hoteliers and travel agents, it appears that private sector led coastal tourism has taken off in the past five years or so, with some facilitation by the public sector.



Tourism activities in Walvis Bay Lagoon
Walvis Bay Lagoon - Erongo
Photos: N. Cadot & N. Dreyer

⁵⁰ *Namibia: The Impact of Travel & Tourism on Jobs and the Economy*, p. 55. This judgement was passed by WTTC well prior to NWR increasing its rack rates at its 23 resorts threefold in May 2007, to take effect from November. Despite the 25 per cent discount for Namibians being maintained, this will significantly weaken affordability prospects for the vast majority of Namibians. The NTB also produced a study in May 2007 which concluded that the tourism sector was neglecting domestic tourists due to high prices for accommodation, food and services. See Brigitte Weidlich, “Tourism price-hike shocks” in *The Namibian*, May 14 2007. An article by the same author, “Tourism spots too costly for Namibians,” in *The Namibian*, December 8 2006 is also relevant.

For many years, Walvis Bay perceived itself as an industrial rather than tourist town, and deferred to Swakopmund when it came to promoting itself, or to developing new facilities, amenities, or attractions. As one account accurately described it,

The nauseating odours emanating from fish factories, the monotony of the Anglo-Saxon grid of the town's layout and the charmless houses (compared with the fresh smell of the sea and the quaint German-influenced architecture in neighbouring Swakopmund) repel tourists from Walvis Bay.⁵¹

This has changed recently. On the basis of its natural attractions – the Bay itself and the Lagoon, with marine life and birdlife, the Kuiseb Delta and the Namib Desert surrounding the town, and the dune belt north of it – Walvis Bay has started to position and market itself successfully in Southern Africa and internationally as a marine (seals, dolphin, whales), birdlife and adventure tourist (wind surfing and parasailing, quad biking, dune boarding, kayaking, paragliding, etc.) destination. The Walvis Bay Tourism association, established in 1998, and a newly-formed Marine Tour Association of Namibia (MTAN) have both played a strong role in this development, supported by the Walvis Bay Municipality. Walvis Bay can build further on this new identity and enhance its tourism prospects.

Meanwhile Swakopmund's tourism industry has continued to market its long-run strengths as a more traditional seaside destination, but an unusual one in that swimming and other beach-related pursuits take a lesser role as attractions than its village-type atmosphere and shopping, eating and drinking facilities. Henties Bay's tourism industry successfully promotes itself as "An Angler's Haven" and supports the activities of recreational fishermen through the provision of the required accommodation and services. The town also titles itself the "Gateway to the Central Namib," and promotes the natural attractions of the National West Coast Recreation Area (Cape Cross, the lichen fields, the Ugab and Messum Rivers) and those in the adjacent portions of the Namib Desert to the east (the Messum Crater, Spitzkoppe, and Brandberg).

Over the past few years the private sector at the Erongo coast has moved considerably forward in modernising its offers and profiting from an updated coastal tourism product. It is of interest that some co-marketing of this product now occurs, in the form of brochures and tourism information offices that are supported jointly by a number of local governments.⁵² There is still scope for more such private sector-led tourism development on the Erongo and Kunene coastal zones, and for extending these opportunities to previously disadvantaged entrepreneurs. There are also new opportunities: in particular, the facilities provided in the National West Coast Recreation Centre – the four camp sites at Mile 14, Jakkalsputz, Mile 72 and Mile 108 – and the camp site at Torra Bay and resort/rest camp at Terrace Bay in the Skeleton Coast National Park – are perhaps under-utilised and have further potential if they are modernised.

Kunene

At the regional level, such plans appear to be urgently required. The Kunene Region *Regional Development Plan 2001/2002 – 2005/2006* contains a brief analysis of the tourism sector, and makes a number of proposals to strengthen tourism-related infrastructure, principally transportation and information centres. Some of the recommendations of the *North West Tourism Plan*, which was developed by NACOBTA in the 1998-2000 period, and those of its later follow up documents, the *North West Tourism Options Plan*, and the *North West Tourism Implementation Project* are supported, especially to open the Dolomite Point gate at

⁵¹ Billauer and Ekobo, *op cit*, p. 60.

⁵² For example, *The Official Coastal Guide, Namibia, 7th Edition*, published by Colourgem Publications in conjunction with the Municipalities of Walvis Bay, Swakopmund, Henties Bay and Luderitz, 2007. The excellent *Namib Information (Namib i)* offices are also relevant here.

the western boundary of the Etosha National Park thereby creating a link to the Skeleton Coast National Park and to develop opportunities in communal or conservancy areas, these to include camp sites, walking trails and lodges (the plan also recommended guided tours into the Skeleton Coast National Park). But there is nothing specific in the RDP on tourism in the region's coastal zone.

Recommendations

The above assessment of PPPs in the tourism sector and of their implications for and effect on tourism in the Kunene and Erongo coastal zones must conclude that some real work is required in this sphere. National-level policymaking is underway, but for quite some time now. Policy and plan making at regional and local levels lag behind, the plans in use are outdated, and a current strategy and a support programme for both conventional and eco-tourism do not exist for the coastal areas of either Kunene or Erongo. Local governments, at times working together, are enabling the activities of a resurgent private sector. But coordination between stakeholders seems poor, and there is little shared understanding of how coastal tourism has shifted its target markets, adapted its products, and moved forward. Up to date information to back up such an understanding is lacking. In this situation, there is a danger that environmental planning and management receives only lip service, and the resources on which coastal tourism depends are degraded.

NACOMA can also play a strong, positive role here. Current information and analysis is required on coastal tourism in the two regions. The Coastal Profiles that are to be produced for the Kunene and Erongo regions can make a start by emphasising the importance of coastal tourism and by providing an information baseline for the different types of tourism. In addition, NACOMA should actively promote the objectives of national tourism policy and encourage the development of tourism strategies for both of the regions and for the local governments within them, in which coastal tourism should receive real attention.

3.6 Nature conservation

The biodiversity assets of Kunene and Erongo coastal regions are recognised globally as exceptional, and the protection of the unique landscapes, flora and fauna of these coastal regions has a high priority on the political agenda at all levels. Details on areas and habitats of conservation priority are given in Chapter 4.1 and in Annex II.

More than 90% of the two coastal regions fall within Namibia's national protected areas system (Figure 8). The boundaries of the Skeleton Coast National Park, the West Coast Recreation Area and the Namib-Naukluft Park were proclaimed before Namibia gained independence, and the modern environmental legislative framework in support of the integration of nature conservation and sustainable development were established. With the exception of the Namib-Naukluft Park, no clear goals have been set up linking management of human resource use and the conservation status of key species and habitats. MET's mission 'to maintain and rehabilitate essential ecological processes and life-support systems' target both conservation of specific protected areas and support to sustainable utilisation of natural resources. It is, however, unclear which biodiversity elements constitute the focus for strict protection within the coastal parks, and which elements are the focus of more wide-scale habitat conservation action due to their widespread occurrence or lower susceptibility to human activities.

The national study on biological diversity⁵³ represents a milestone in Namibia's history of biodiversity knowledge and management. This study and the study on patterns and proc-

⁵³ Barnard, P. (ed.), 1998. *Biological diversity in Namibia: a country study*. Windhoek: Namibian National Biodiversity Task Force. 332 pp.

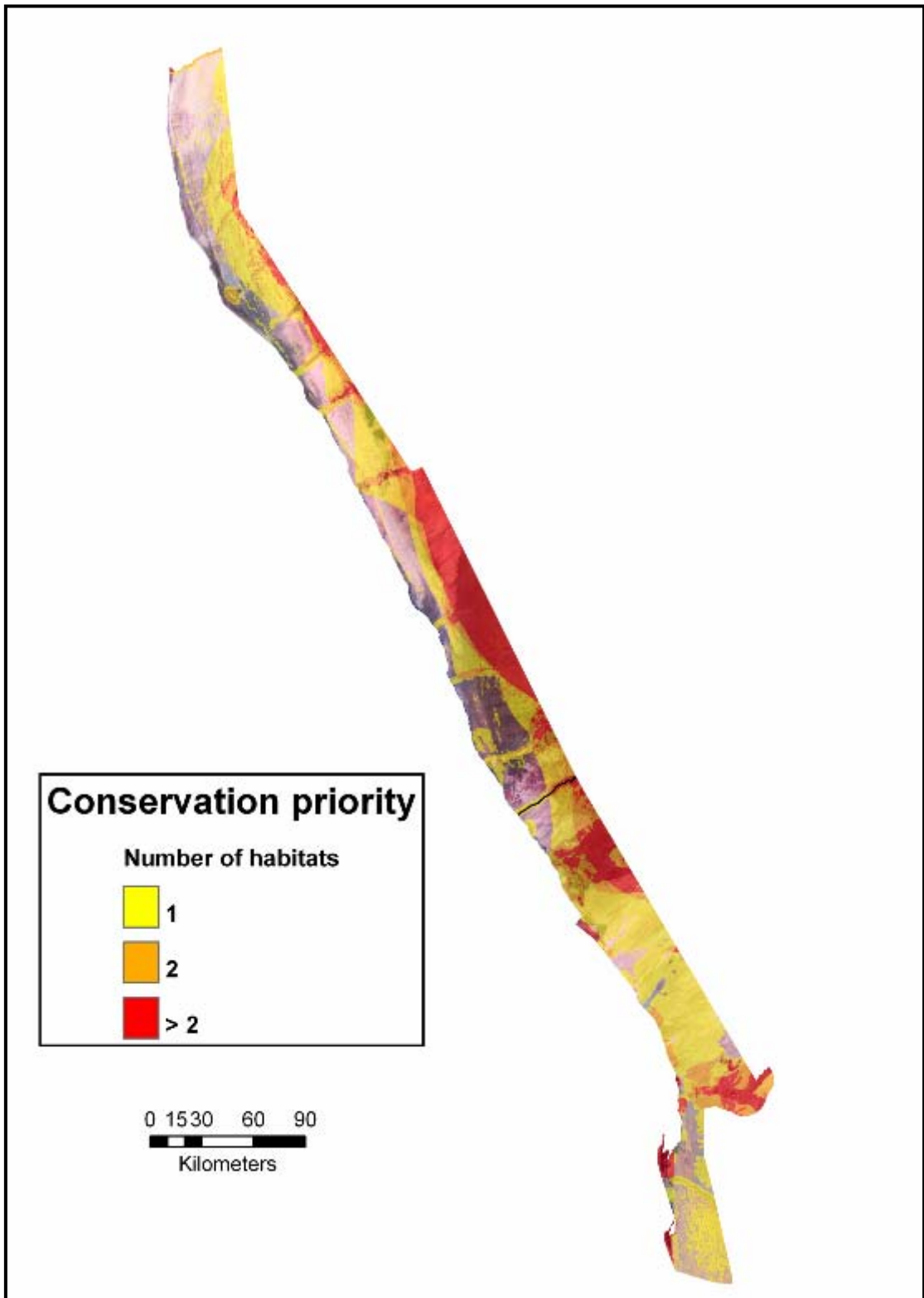


Figure 9: General Biodiversity trends as reflected by the analysis of the distribution of priority areas and habitats for conservation (see Methodology for details). Priority areas have been grouped into three categories according to the number of target habitats present. Wetlands of international significance and the main breeding colony for Damara terns are included in the highest priority category. No colour is given for areas lacking target habitats. The resolution of the map is 90 m.

The ten-year strategic plan of action for biodiversity conservation, Namibia's Biodiversity Strategy and Action Plan (NBSAP)⁵⁵, provides for the implementation of article 95:l of the Namibian Constitution and the Convention on Biological Diversity (CBD) and offers MET the legal mechanisms for achieving the goal of developing management plans for the coastal parks. Currently, however, management plans with zoning of the area and tourism development plans in place have only been prepared for the Namib Naukluft Park.⁵⁶ In that respect the SEA provides guidance to the zonation of the parks into areas of different sensitivity and importance as a basis for identifying core areas for conservation and potential areas for sustainable development. With respect to the latter, all developments in protected areas are required to prepare an Environmental Impact Assessment. Unfortunately, the legal provisions for development concessions within the parks are still inadequate. This is especially the case in relation to mining activities. As discussed above; MET's Policy for Prospecting and Mining in Protected Areas and National Monuments is expected to be updated in the forthcoming Environmental Management Act.⁵⁷

A key policy of MET in relation to the future development of the management of the coastal parks is the National Policy on Protected Areas, Neighbours and Resident People.⁵⁸ This policy sets out a new vision of how Namibia's protected areas can contribute not only to conservation, but also to other national development goals such as economic development, and how the protected areas can benefit the people who are neighbours to these areas or who are resident within them. The policy's three main goals are:

1. Improved conservation of Namibia's protected areas
2. Greater social equity in the distribution of benefits from protected areas
3. Stimulation of local and regional economies through creating business opportunities linked to protected areas

Linked to the intention of achieving the goals for greater social equity and multiple use of the park areas is the evolving concession framework as reflected by the new Policy on Tourism and Wildlife Concessions on State Land⁵⁹ which has the aim of improving opportunities for business development and addressing the economic empowerment of formerly disadvantaged Namibians through the tourism, hunting and forestry industries. This policy will enhance the opportunity for the conservancies adjacent to the parks to get concessions, a situation which may help realising the real ecotourism potential for the parks, and help to implement the goal of integrating conservation with the basic development needs of local people in the conservancies. The goals for a sustainable and more decentralised development in the parks as reflected by the NBSAP and the two new policies go hand in hand with the national and regional development goals for ecotourism (see chapter 3.5).

As a response to the weak status of wetland conservation in Namibia MET has drafted Namibia's Wetlands Policy,⁶⁰ which describes new guiding principles for wetland resource use and conservation. Among the goals set by the Wetland Policy are:

⁵⁵ Ministry of Environment and Tourism, 2000. *Biodiversity and development: an overview of Namibia's ten-year strategic plan of action for sustainable development through biodiversity conservation 2001-2010*, Pp 137.

⁵⁶ Ministry of Environment and Tourism, 2004. *Namib-Naukluft Park. Management and Tourism Development Plan. Draft*. Pp 52.

⁵⁷ Ministry of Environment and Tourism, 1999a. *Policy for prospecting and mining in protected areas and national monuments. Policy Document*. Pp 1-10.

⁵⁸ Ministry of Environment and Tourism, 2006. *National Policy on Protected Areas, Neighbours and Resident People. Draft*. Pp 8.

⁵⁹ Ministry of Environment and Tourism, 2004. *Policy on Tourism and Wildlife Concessions on State Land. Draft*. Pp. 40.

⁶⁰ Ministry of Environment and Tourism, 2004. *Namibia's Draft Wetland Policy*. Pp. 3.

- The right of every citizen to be able to obtain, within reasonable distance from their place of abode, a quantity of water sufficient to maintain life, health and reasonable productive activity.
- The protected areas network in Namibia shall be expanded to include vulnerable wetlands as well as functional units of each wetland type. Trans-frontier protected areas shall be established.
- The management of wetlands and wetland resources will recognise that ecosystems are legitimate water users.
- The principle of sustainable utilisation shall be adopted by all stakeholders to prevent wastage of wetland resources and erosion of natural resource capital.
- Any decisions concerning the use and management of Namibia's wetland resources (including water) shall be made in accordance with the Precautionary and Polluter Pays Principles.
- The economic benefits of wetlands to communities dependent on wetland resources for their livelihoods should be taken into account in assessing wetland values and priority uses.
- Tools such as EA and SEA will be applied in accordance with Namibia's EA policy and Environmental Management Act to help reduce negative impacts and enhance sustainability.

The development of new legislation and regulations on wetlands is expected to include designation of Namibia's most diverse and vulnerable wetlands as protected areas, multi-sectoral regulations for maintaining water quality and the ecological integrity of wetlands, legal guidelines and mechanisms for the implementation and enforcement of wetland conservation and sustainable wetland management and integration of biodiversity conservation and ecological functioning of wetlands into all new laws and policies.

The goal to strengthen the conservation of wetlands, especially those which are vulnerable and of international significance, is highly recognised in the coastal regions of Kunene and Erongo, where five wetlands of international significance are located, none of which are currently included in the national network of protected areas: Sandwich Harbour, Walvis Bay Lagoon, Mile 4 Saltworks, Cape Cross Lagoon and Kunene River Mouth. Although Sandwich Harbour and Walvis Bay Lagoon have been designated as Ramsar sites, this status does not necessarily provide any protection as the Ramsar Convention does not imply the implementation of particular management or protection schemes.

The development of marine protected areas (MPAs) and fisheries exclusion zones are the responsibility of MFMR. Although a baseline study in 1998⁶¹ provided recommendations for MPA designation in Namibia, no national policy on marine protected areas has been produced. MFMR is managing a trawling restriction zone in waters shallower than 200 m. The BCLME project is expected to deliver an updated status of marine biodiversity later this year, and this will supply the information necessary to identify potential MPAs. The establishment of a MPA policy will require resolving the issue of jurisdiction in relation to MPAs between MFMR and MET. MFMR manages several fisheries exclusion zones, which provide protection from recreational fishing within two miles seaward of the high-water line of the sea shore or any of the islands along the Namibian coast and prohibit angling from the shore at Sandwich harbour, Cape Cross and the Skeleton Coast outside Torra Bay and Terrace Bay.

⁶¹ Mastaller, M., 1998. *Baseline study on the establishment of marine reserves in Namibia. Advisory Assistance to the Ministry of Fisheries and Marine Resources. Short term consultancy report. Cofad & DCPA-Consultants, Germany.*

3.6.1 Erongo

3.6.1.1 Sandwich Harbour

Within the Namib Naukluft Park, the Sandwich Harbour covers almost 25 square kilometres of wetlands, comprising salt marshes, intertidal flats, and vast mudflats. Sandwich Bay, that was once a natural harbour, is located 48 km south of Walvis Bay in a geomorphologically dynamic area. It features a protective sand spit similar to the Pelican Point sand spit that has grown from deposited sand and finally closed off a lagoon. The lagoon is fed by fresh water seeping to it from an inland aquifer, and has been designated as a Ramsar site on the basis of the quality of its wetlands and importance to migratory and resident water birds.

Two main sections of this wetland are recognised: the northern freshwater wetland, much reduced in size since the early 1970s when it covered several square kilometres, and the southern mudflats, a 20 km² area of sand and mudflats inundated daily by the tides. Traditionally, the northern wetland held the highest species diversity (with up to 51 species of wetland birds), while the southern mudflats in general holds larger numbers of birds. The site is one of the most important areas for water birds in Southern Africa with regular concentrations exceeding 50,000 birds and maximum concentrations of 238,000 birds and densities of 7000 birds per square kilometre⁶². The site is especially important to flamingos and Palaearctic waders and terns, and it supports eight Namibian Red Data bird species.



Sandwich Harbour
Erongo

Photo: N. Cadot

The marine area in front of Sandwich Harbour is rich in biodiversity, and cetaceans like Bottlenose dolphin are often seen. A colony of over 10,000 fur seals is located on the beach. There have been no permanent human inhabitants at Sandwich since 1969. Plans for the area should take into account that the most important area for birds is the southern end of Sandwich Harbour and this will remain, irrespective of the fate of the northern wetland. While it was at one time the only national marine protected area in Namibia, this formal protection is no longer in place, although recreational fishing is still banned.

Despite being a Ramsar site, there is jurisdictional dispute between the MFMR and MET as well as conflicting sectoral legislation and the status of the area is questionable. Nevertheless, Sandwich Harbour constitutes the only coastal wetland in Namibia in close-to-pristine

⁶² Simmons, R.E., Barnes, K.N., Jarvis, A.M. & Robertson, A. 1999. *Important Bird Areas in Namibia*. DEA. Ministry of Environment & Tourism. Pp 68.

conditions that is visited by tourists. According to the MFMR Sandwich Harbour is a principle spawning area for fish resources, in particular Kabeljou, on the Namibian coast. Also, a shark population may be depending on the area and the importance of southern right whale calving in the area is currently debated.

Recommendations

The MFMR should re-install Sandwich Harbour's status as an MPA as soon as possible. Together with MET a plan for transferring the management of the MPA from MFMR to MET should be developed. A detailed management plan should be prepared allowing strict protection of the site, while enabling low-impact eco-tourism to take place. It would be an advantage if jurisdiction on enforcement of MPA regulation could be transferred to MET rangers.

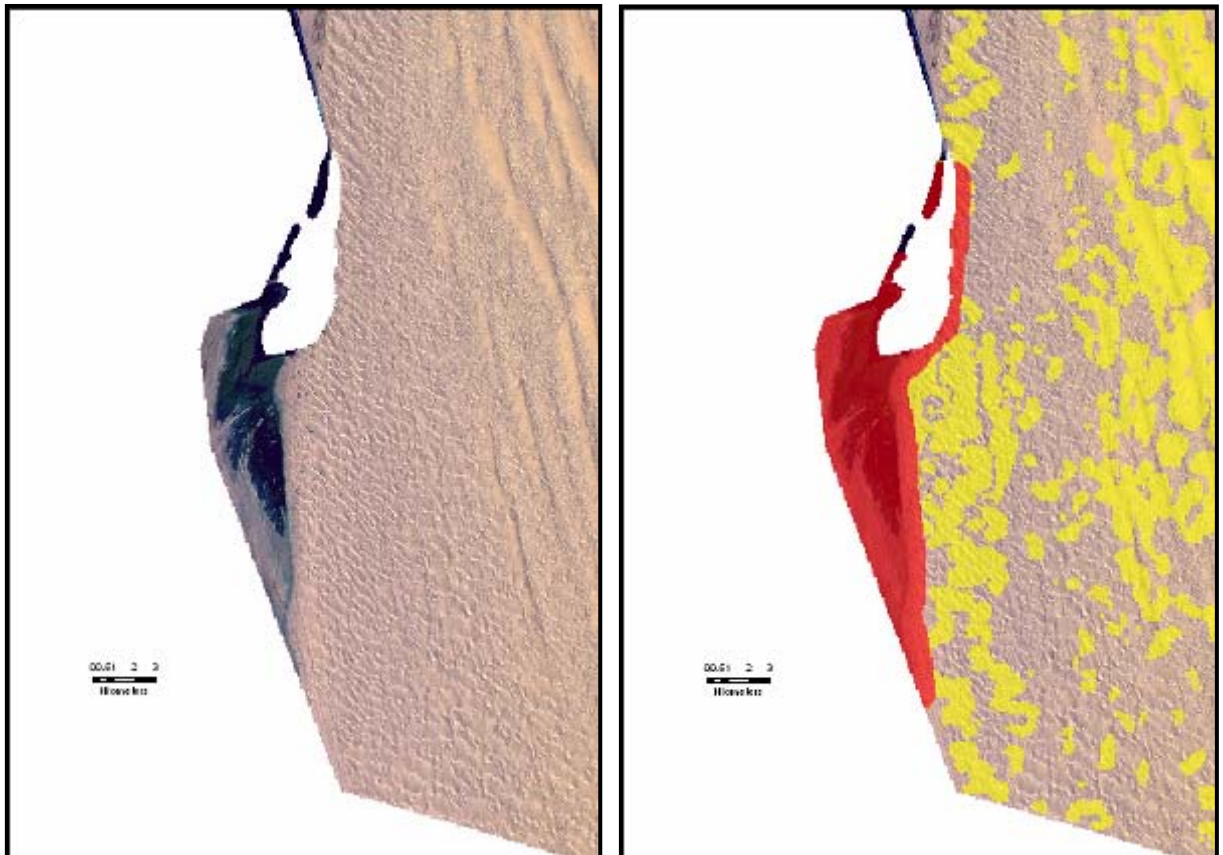


Figure 10: Sandwich Harbour and areas/habitats of conservation priority (above). The ranking of conservation priority follows Figure 9.

3.6.1.2 Walvis Bay Wetland

Walvis Bay Wetland is located south and west of the town and comprises the natural areas of Walvis Bay Lagoon, and includes inter-tidal mudflats and the eastern half of Pelican Point. This spit provides protection to the bay from Atlantic swells. A lagoon lies at the southern end of the open water. A Saltworks at the southern end of the lagoon reduces the tidal sweep, possibly adding to increased siltation. Included in the wetland are the artificially flooded evaporation ponds of the Saltworks, as well as the occasionally flooded areas to the south of the Saltworks. The only terrestrial vegetation in the wetland is the extensive riverine vegetation in the delta and in the ephemeral river itself.



Walvis Bay Wetland
Erongo

The Walvis Bay Wetland supports the greatest number of coastal birds in southern Africa and parts of it have been declared a Ramsar site. It is the main feeding ground south of West Africa for a number of protected migrant and resident bird species, including the greater and lesser flamingo. The dune areas south and east of the lagoon, including the ephemeral Kuiseb Delta, hold significant ecological and cultural values. Although the construction of the Saltworks at Walvis Bay destroyed large areas of naturally flooded salt pan, it does provide large areas of permanently flooded shallow water with a range of salinities not naturally occurring in this environment. This artificial section of the wetland regularly supports more than half the birds at Walvis Bay.

The Walvis Bay Environmental Management Plan implements a multiple use framework and attempts to clarify jurisdictions of the wetland use between Walvis Bay Municipality, NAMPORT and the MLR. The draft Walvis Bay Nature Reserve Management Plan aims to promote a multiple-use principle in light of the varied interests and the multitude of stakeholders in and around the area. It includes a description of the management approach and goals, together with a framework for decision making and mechanisms for involving stakeholders as well as ensuring socio-economic sustainability of the management measures.

Recommendations

In line with the new Wetland Policy enforcement of the Walvis Bay Nature Reserve Management Plan should be pursued in the short term backed up by detailed mapping of the gradients in vulnerability of biodiversity in relation to the wide range of land uses.

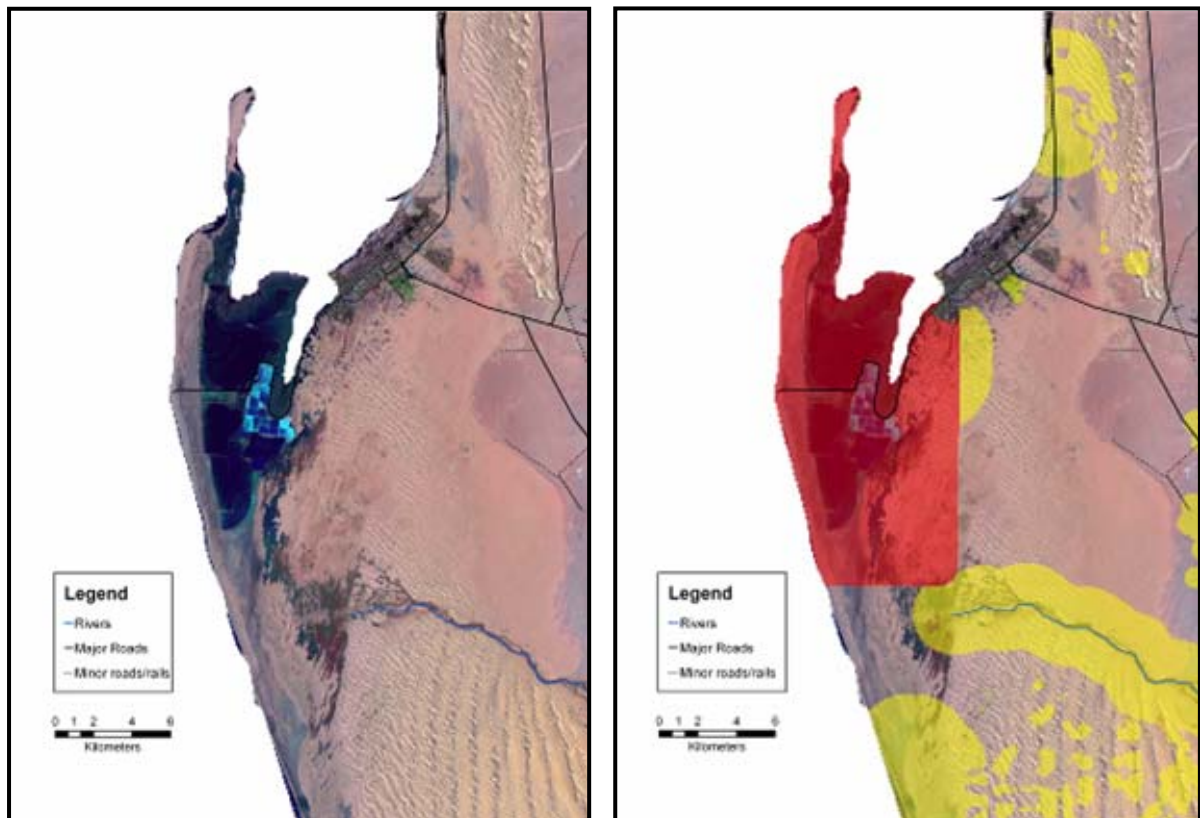


Figure 11: Walvis Bay Wetland and areas/habitats of conservation priority (above). The ranking of conservation priority follows Figure 9.

3.6.1.3 National West Coast Tourist Recreation Area (NWCTRA)

A new status and management plan for the NWCTRA and the Walvis Bay magisterial district is envisaged. The NWCTRA has a lower conservation status than national parks, and as the coastal urban centres are all located in the area the pressure from urban and tourist developments is high and increasing. The NWCTRA includes three wetlands of international significance mainly due to their concentration of breeding and non-breeding waterbirds: Walvis Bay, Mile 4 Saltworks, and Cape Cross Lagoon. The sustainable use of resources and conservation of the Walvis Bay wetland is addressed in the Walvis Bay Environmental Management Plan⁶³ and the draft Walvis Bay Nature Reserve Management Plan⁶⁴. The Cape Cross Lagoon is protected by the Cape Cross Reserve, and managed by the Cape Cross Seal Reserve Plan.

Recommendations

New management plans for the NWCTRA should establish target habitats for conservation and species action plans as well as a multiple use framework for future developments with zonation for all land uses, including areas to be avoided by urban, traditional tourist and mining activities, on the basis of detailed profiles of landscape, vegetation, wildlife, livestock and human settlements.

⁶³ Burger, L., 1998. *Walvis Bay Lagoon integrated environmental management plan*. Cape Town: Environmental Evaluation Unit. Pp. 53.

⁶⁴ Clayton, M. (ed.), 2004. *Walvis Bay Nature Reserve Training Workshop - Report*. Welwitschia Conference Centre, Walvis Bay, 28 – 30 July 2004. *Walvis Bay Local Agenda* 21.

3.6.2 Kunene

3.6.2.1 Skeleton Coast National Park (SCNP)

The MET describes SCNP with the following words: “This park has always had an aura of mystery and impenetrability due to the many shipwrecks along the coast, the dense coastal fogs and the cold sea breeze caused by the Benguela current. The landscape ranges from dunes to rocky canyons and extensive mountain ranges. Xerophytic plants like the elephant’s foot, as well as lichen species are found here. Animals in the park include oryx, springbok, jackal, ostrich and brown hyena, while elephants, black rhinos, giraffes and lions are found in the dry river courses. Visiting places of interest are the “Clay Castles” of the Hoarusib River, the salt pans near the Agate Mountain, and the seal colony at Cape Fria.” Details on the biodiversity characteristics of the most important areas and habitats in the SCNP (other than the Kunene River Mouth) are given in Chapter 4.3.1.

The draft Master Plan identifies a number of areas in SCNP for which special regulations should apply to restrict access. These include:

- Terrace Bay marine terraces plus their adjacent geomorphologic features.
- The Uniab delta from its southern bank to Studentebaa
- The Kunene estuary
- River courses
- Permanent and seasonal wetlands
- Lichen fields.

These habitats are included in the assessment of the land use potential inside the park regarding mining and tourism activities. The preparation of a new management plan for the park is required and has been in progress for several years to take account of the NBSAP. In the past, the tourist concession of the northern part of the park was leased on a long-term basis to a single license holder. Development of diamond mining activities in the park is undertaken without advice on sensitive zones to be avoided and best areas for location of pipelines, tracks and roads. The lack of a detailed management plan has also allowed for other activities in sensitive areas like off-road driving, recreational angling, private tourism, poaching, littering and the excavation of trenches.

The new policies urging for sustainable and decentralised development in the park, including increased involvement of the adjacent conservancies, have stimulated the launch of the Integrated Community-Based Ecosystem Management Project (ICEMA) under the MET-led National Community-Based Natural Resources Management (CBNRM) Programme. This programme offers the potential of extending biodiversity conservation and management beyond Namibia’s protected areas network, while providing at the same time for wildlife corridors between protected areas.

The ICEMA Project and the plan for a new 6,700 km² park covering the three concession areas Palmwag, Etendeka and Hobatere will help establish the link between the SCNP and the Etosha National Park, and will allow rural communities to generate income through ecotourism, biodiversity management and rural development.

Recommendations

New management plans for the SCNP the TFCA, and the proposed extension to Etosha should establish target habitats for conservation and species action plans as well as zonation for all land uses, including areas to be avoided by mining activities, on the basis of detailed profiles of landscape, vegetation, wildlife, livestock and human settlements.

3.6.2.2 Kunene River Mouth/Transfrontier Conservation Area

The Kunene River Mouth is a 500 ha unprotected wetland of international significance located within the proposed Transfrontier Conservation Area (TFCA). The area of conservation focus is the section of river within 4 km of the coast (Figure 12). The small lagoon immediately east and south of the river mouth is a 2.3 km long stretch of mud/sand which, at its widest point, is 1.6 km across. When the river flow is low, the total area of exposed sand and mudflat is about 125 ha. The river mouth itself varies from 30 to 80 m in width at low flows, to about 1 km in width during high flow years. At high tide fresh water backs up into the lagoon, which can then be up to 2 km wide. Shorebirds are concentrated in these areas. During low flow months (July-November) however, little water is backed up and large amounts of sand flats are exposed. Although not traditionally seen as an estuary, saline water penetrates the lagoon. At the river mouth, sandbars develop from both northern and southern shores but these are periodically obliterated during large scale flood surges, and river flow to the sea is never closed off. The wetland has a high diversity of species with 72 species of wetland birds recorded, including twelve Namibian Red Data species, Nile Soft-Shelled Terrapin and Green Turtle and 69 freshwater fish species, five of which are endemic to the river.



Kunene River Mouth
Kunene
Photo: R. Braby

A Memorandum of understanding between Namibia and Angola has been prepared for establishing the TFCA, which will contribute to the implementation of the Ramsar Convention guidelines for wise use of wetlands and the new wetland policies of Namibia and Angola. The protection status of the park is still not clarified, and could potentially fall into several categories, including MPAs. An aerial survey conducted by Angolan and Namibian officials has given a better understanding of the condition of the park's wildlife. Further updates of the biodiversity characteristics of the area are expected later this year with the publication of the results of data collections from the BCLME Project.

Recommendations

None

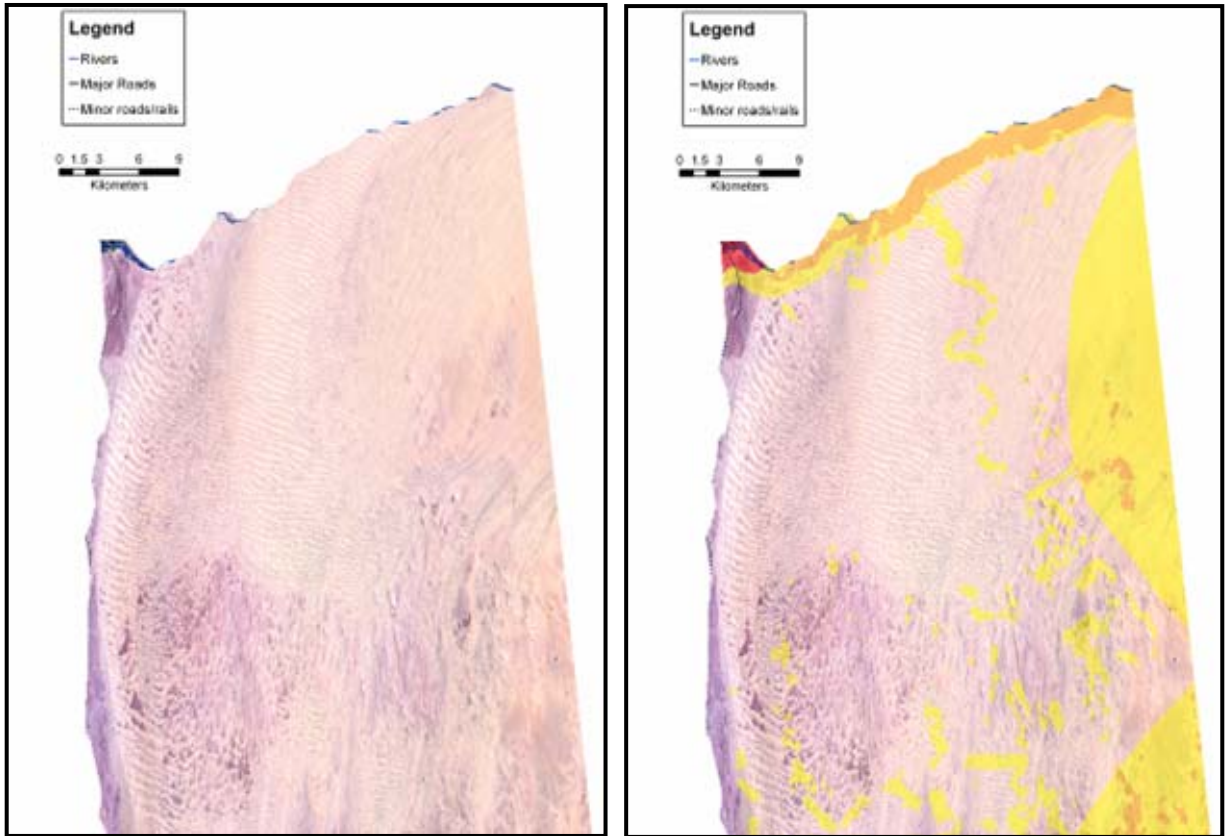


Figure 12: Kunene River Mouth and areas/habitats of conservation priority (above). The ranking of conservation priority follows Figure 9.

4 SEA ASSESSMENT: IMPROVING NATURE CONSERVATION AND MANAGEMENT BY AREA

4.1 Introduction

In this chapter, the spatial perspective is used to assess current biodiversity conservation and other relevant environmental management practices in particular priority areas. These priority areas are often biodiversity hotspots, in the coastal zones of the Erongo and Kunene Regions. Key PPPs are again used as reference points. These PPPs comprise national level policies and management plans, and local level land use and environmental management plans. The following priority areas are covered:

1. Erongo Region

- Sandwich Harbour
- Walvis Bay Wetland
- Urbanised Coastal Area Walvis Bay – Swakopmund – Henties Bay
- Dune belt
- National West Coast Tourist Recreation Area, including Cape Cross, Brandberg Massif and river beds/watercourses

2. Kunene Region

- Skeleton Coast National Park, including Torra Bay, Terrace Bay, Möwe Bay, river beds/watercourses, the eastern central sector between Koigab and Hoanib rivers and Wilderness concessions
- Adjacent conservancies
- Kunene River Mouth (and Transfrontier Conservation Area)

A discussion is provided on how interlinked impacts, pressures and threats to biodiversity are being managed, in their relation to development trends and opportunities. Recommendations for better policy, planning and management practices, including prevention and mitigation of negative environmental impacts, are provided for each priority area.

4.2 Erongo Region

4.2.1 Priority areas for conservation

Concentrations of biodiversity elements are principally found in seven areas: the four internationally significant wetlands Sandwich Harbour, Walvis Bay, Mile 4 Saltworks and Cape Cross Lagoon and Seal Reserve, the river beds and associated areas of the Swakop and Ugab rivers and the rocky area associated with the Brandberg Massif. Moderate concentrations of biodiversity are found in the Kuiseb riverbed, in a large sector east of Swakopmund, adjacent to and within Damara tern colonies found in several locations in the outermost 5 km of the shoreline, south of the Omaruru River, between Cape Cross and the Brandberg Massif and between the Brandberg Massif and the Ugab River.

4.2.2 Sandwich Harbour

The biodiversity characteristics of Sandwich Harbour have been described in Chapter 3.6.1.1. It requires a permit to visit Sandwich Harbour and it is only accessible by 4x4 vehicles. Over-night camping is not allowed at the site.

The protection status of the site itself is not clear. In 1979 an extension of the Namib Desert Park into the Atlantic Ocean was gazetted creating the first and only Marine Reserve in Namibia. The extension was not included in marine legislation after 1990 and the status of a Marine Reserve can not be confirmed.



Sandwich Harbour – Northern view
Erongo
Photo: N. Cadot

Sandwich Harbour Dunes – Southern view
Erongo
Photo: N. Cadot

Under the new Marine Resources Act 2000 a protected area can be declared at the discretion of the Minister, who may gazette "...such area to be a marine reserve for the protection or regeneration of marine resources". Marine fish are managed by the MFMR and the Sandwich area may again be proclaimed as an MPA from the high tide mark and 1.6 km into the ocean to protect the fish and intertidal life. Access to Sandwich Harbour and the coast for fishing falls under the responsibility of MET. Finally, the recurring conflict with the MME on the prospecting and mining policy in protected areas is a key challenge to be addressed within government. In this respect it is worth noticing that the Marine Resource's Policy of 2004 also calls for co-ordination and co-operative arrangements to be established between different authorities involved in managing marine environments.

4.2.3 Walvis Bay Wetland

The biodiversity characteristics of Sandwich Harbour have been described in Chapter 3.6.1.1. The management of the natural resources and conservation of the Walvis Bay Wetland Reserve is under the control of the Walvis Bay Municipality through the Walvis Bay Environmental Management Plan and the draft Walvis Bay Nature Reserve Management Plan. According to the Walvis Bay Structure Plan (Walvis Bay Municipality) the boundary of the Nature Reserve is demarcated as indicated in Figure 11. As described in chapter 3.6.1.2 the Nature Reserve is the most important wetland for waterbirds in Namibia, and is declared a Ramsar site. In addition, the Kuiseb River is vital to Walvis Bay since it provides all the water used by the town. The structure plans state that the Lagoon, Kuiseb River and the Topnaar community settlement present an opportunity for Cultural- and Eco-Tourism. These can be allowed without jeopardising the integrity and sensitivity of the area. As indicated by the modelled land-use suitability the largest eco-tourism potential lies in or adjacent to the core areas used by the waterbirds (Figure 11). Aquaculture/agriculture activities within the Lagoon and other areas within this zone are also permitted subject to environmental impact assessment.



Lesser Flamingos in the Walvis Bay Wetland
Erongo

Photo: K. Wearne

Since the wetland supports unique and fascinating ecological communities, Walvis Bay Municipality recommends it to be left free of any development other than those relating to cultural and eco-tourism and/or aquaculture/agriculture. All existing developments located in this area should continue their activities. However, new applications of such kind will not be allowed. The results of the SEA land use suitability models indicate lack of suitability for any land uses other than eco-tourism. Development for aquaculture may be feasible, but will need careful assessment of impacts on habitat quality and residential areas. Quad bikes and all other off road vehicles are not allowed in the area. Despite the recommendations of the structure plan this wetland has no legally binding conservation status. In line with the new Wetland Policy regulations on wetlands are expected to include designation of Namibia's most diverse and vulnerable wetlands as protected areas. Further, multi-sectoral regulations for maintaining water quality and the ecological integrity of wetlands and integration of biodiversity conservation and ecological functioning of wetlands into all new laws and policies will be a result of the Wetland Policy. These regulations will be enforced once the Nature Reserve Management Plan is adopted.

Recommendations:

MET should formally designate the Nature Reserve as a protected area. MET, the Walvis Bay Municipality and the Coastal Environmental Trust of Namibia should ensure further enforcement of the national Wetland Policy in the area by adopting the Nature Reserve Management Plan.

MET, the Walvis Bay Municipality and the Coastal Environmental Trust of Namibia should as soon as possible establish a long-term environmental monitoring programme including the biodiversity elements for terrestrial, coastal as well as offshore habitats found in the wetland. A baseline for the monitoring programme should produce diversity gradients in relation to tourism, aquaculture and agriculture and the acquired data should feed into the requirement for improved Environmental Impact Assessments. To make full use of the potential for development of eco-tourism and traditional tourism in the wetland a tourism development plan for the Nature Reserve should be drafted by the Walvis Bay Municipality in collaboration with the Walvis Bay Tourism association and the Marine Tour Association of Namibia. Developments of all tourist activities in the reserve and accommodation adjacent to the reserve should happen on the basis of permissions subject to Environmental Impact Assessment. A feasibility study of the development of the existing aquaculture farms for oyster and future marine and

land-based aquacultures in the wetland should be made in relation to the most sensitive parts and residential areas.

4.2.4 Dune belt

The dune belt is a coherent 3-4 km wide zone of relatively high dunes extending along the 30 km stretch of coastline from Walvis Bay to Swakopmund. The western boundary of the dune area lies approximately 500 m from the seashore. Although the entire dune belt must be considered a conservation priority on the coast, as it is the only dune area easily accessible to the public and possesses a large eco-tourism potential, it is presently categorised as a recreation area and managed by MET through Cabinet decision no. 5th/27.03.07/013 with demarcations for a wide range of uses, including high-impact activities like quad biking (Figure 13). Areas of high conservation priority lie in the northernmost part of the area adjacent to the Swakop riverbed and just west of the dune belt in two core areas used by Damara terns for breeding: one south of Long Beach and one (the biggest colony known) south of the Swakop river mouth. MET has closed the one northern free zone located in close proximity to Damara tern colony, and maintained free zones southeast of Long Beach and at Dune 7 (Figures 13 and 14). The free zone east of Long Beach partly overlaps the area used by Damara terns breeding south of Long Beach.



Dune belt between Swakopmund & Walvis Bay
Erongo
Photo: N. Cadot



Protected Damara Tern breeding area
Erongo
Photo: R. Gys

As the management of the dune belt falls within the responsibility of MET and as the use of quad bikes has greatly increased in recent years, a Contingency Management Committee (CMC) with participation from MET, municipalities, police and tourist organisations and operators was established in November 2006 to advise the relevant institutions on improved management actions to be taken. The CMC has held 10 meetings, and their recommendations include:

- Institutional responsibility for the dune belt should be established as a matter of urgency to clear the way forward for the implementation of future regulations.
- Law enforcement presence: Uniformed officers of the MET need to be more visible, preferably on quad bikes east of the dunes to patrol the boundaries of the free zones and the beaches.
- Free zones need very clearly demarcated boundaries. People outside these areas without permission, should be prosecuted.
- Beach driving needs to be properly assessed and stopped especially north of Long Beach up to the last toilet where quad bikes are still racing along the beach unnecessarily, as a graded gravel road exists for access.

- The NACOMA Project Implementation Plan, which supports the establishment of the Walvis Bay Nature Reserve with a suggestion to expand its territory to include the Dune belt, needs to be activated.

Recommendations:

Following the intent of Cabinet decision no. 5th/27.03.07/013 the dune belt should be included in the Walvis Bay Nature Reserve, and the two free zones for off-road driving should be maintained east of Long Beach and at Dune 7. The management and environmental monitoring of the area should be part of the activities proposed for the Nature Reserve. Expansion of the eco-tourism activities should be promoted through inclusion of the dune belt in the proposed Walvis Bay tourism development plan.



Figure 13: The currently demarcated off-road free zones in the Dunebelt (hatched areas)..

4.2.5 Coastal Area Walvis Bay – Swakopmund – Henties Bay

4.2.5.1 Introduction

The Namibian coast's only urbanised sub-region was identified in the previous chapter. The area is some 100 km long and incorporates the three municipalities of Walvis Bay, Swakopmund and Henties Bay, as well as the holiday home village of Wlotzkasbaken, which as a declared settlement area falls under the authority of the Erongo Regional Council. Each of the towns is located on or close to the mouth or floodplain of three of the four ephemeral rivers coming down to the Erongo coast, the Kuiseb, Swakop and Omaruru, respectively. The sub-region includes the only part of the Namibian coastline with little nature protection status, the area stretching from the Kuiseb River Delta just south of Walvis Bay to Mile 14 north of Swakopmund. This specific area is the most urbanised and developed portion of the coast. Indeed, according to the Walvis Bay Structure Plan, Walvis Bay, Swakopmund and Lüderitz are the only desert coastal towns in Africa south of the Sahara.

The sub-region is the focus of coastal development activity in Namibia and also of intense controversy over the terms of the necessary balance that still needs to be struck between conservation and the development stemming from extraction of its natural resources and urban development. The measures that should be taken to achieve such compromise also need clarification. The interests of stakeholders differ considerably. Despite years, if not decades, of study and of management initiatives, including two large-scale development projects in the post-1996 period co-funded by the Namibian and Danish governments (the Integrated Coastal Zone Management Project for the Erongo Region, and the Walvis Bay Local Agenda 21 Project), the debate between them is still raging.

In what follows, land use, biodiversity/conservation, environmental planning and management practices in the urbanised sub-region are assessed in terms of their efficacy in dealing with key urban and economic development issues, including those related to tourism – with this seen against the backdrop of the overall policy framework and management system (i.e. PPPs) as outlined in the previous chapter. The focus is on land use planning and management, which forms the 'core' of the system.

The spatial emphasis falls upon what can be seen as an “urban coastal area.” This is broadly defined as the area reaching some 500 m inland from the high water mark within the built-up areas of the three towns, and also within the terrain in-between. Of particular importance are areas where pressures and impacts are most apparent – and contested – as a result of actual or proposed development projects. Developments in the Walvis Bay area, where contention is most virulent, receive the most attention.

The national, regional and local legislative, policy and planning framework in operation was discussed at more length in the previous chapter and assessed at the aggregate level. As per the Town Planning Ordinance of 1954 all three towns under consideration have Town Planning Schemes (TPS) in place. In addition, the three towns also have ‘voluntary’ and council-approved Structure Plans (SP). Walvis Bay’s and Swakopmund’s plans date back to 1999 and 2000 respectively, and Henties Bay’s to 2003. The Town Planning Schemes in place have been amended as necessary, and Walvis Bay’s Structure Plan has just been reviewed, in the first half of 2007.

Urban development in Walvis Bay is also regulated by a Policy for Residential Densities, a Peri-Urban Land Use Policy, the Long Beach - Dolphin Beach Structure Plan and Long Beach Design Guidelines, the Integrated Environmental Policy and Coastal Area Strategy and Action Plan and the Coastline Strategic Environmental Assessment, which was conducted by the consultants EnviroSolutions two years ago. The Integrated Environmental Policy contains a vision for the Coastal Area: “The coastal area will be managed collaboratively by stakeholders in such a fashion that it achieves its potential as a true asset for all Walvis Bay residents in conservation, production and recreation terms.” The Coastal Area Strategy and Action Plan is derived from the Walvis Bay Local Agenda 21 Project, and seeks to promote environmental management by stakeholders, with an emphasis on the monitoring of coastal conditions. In Swakopmund, a Municipal Master Development Plan supplements the structure plan.

The structure plans serve to guide the towns’ overall development for a period of some 10 to 15 years. Their purpose, status and content seem to be little known by the residents of the coastal towns. This is not to blame either the municipalities which try to run participation processes, or their residents, who often do participate. Given their technical nature, it could be useful for the municipalities to summarise the central thrusts of the structure plans and town planning schemes in brochure form.

This lack of knowledge is unfortunate, as the Walvis Bay and Swakopmund plans, which were conducted by a similar consortium of consultants in the same period and should thus be read together, are both excellent plans. The urban design input in both plans, presumably carried out in part by the South African firm of Uytendogaardt and Dewar, is particularly good. Both of them make a strong argument for planning for urban development on the regional scale, i.e., the urbanised sub-region from Walvis Bay to Henties Bay, as defined above, and also, more narrowly, for Walvis Bay and Swakopmund to be viewed and planned as an increasingly contiguous urban area. Close to 10 years ago, this regional argument could perhaps be dismissed, given the salience of long-run differences between the individual settlements in economic, political and jurisdictional terms. Today, with rapid urban development in the area, in a Namibia near to reaching the end of its second decade of independence, this perspective is not easily dismissible.

4.2.5.2 Walvis Bay

The Walvis Bay SP considers human settlement in the context of the coastal and desert ecosystems:

A number of settlements exist along the coastline. The largest of these are Walvis Bay...and Swakopmund...North of Swakopmund to Henties Bay, there is a distinct pattern of settlements, with permanent recreational settlements being spaced at a rhythm of 25 – 30 kilome-

tres, and with areas of temporary settlement providing access to the coast located between these and served by them. The same patterns exist between Walvis Bay and Swakopmund, although at a shorter spacing, with the exception of the permanent suburb of Long Beach. The central point is that the uniqueness and sense of place of the region derives from the richness of all its habitats: all should be treated as extremely valuable and conserved to the greatest degree possible.⁶⁵

At the same time the regionalised planning concept is emphasised

...is based on the realisation that Walvis Bay and Swakopmund cannot and should not be seen as individual settlements that are in competition with each another. Functionally, they are part of the same system.⁶⁶

In specific terms, this sub-regional concept as applied to Walvis Bay advocates:

1. "The natural systems are seen as the most positive elements, in the sense that they are conserved as much as possible and urban development is prevented from simply sprawling roughshod over the landscape. **Urban development is thus compacted to the greatest degree possible.** All biophysical habitats are seen as important in their own right, since collectively they comprise the character of the place. It is proposed that all land not earmarked for urban development in the concept should be incorporated into a municipal nature reserve. The peri-urban areas should stay peri-urban. Any developments in the area should be isolated 'pavilions' within the area and not be seen as comprehensive developments."⁶⁷
2. Heavy and noxious industry be located behind the Dunebelt and space be reserved for airport-related industry.
3. The road east of the Dunebelt parallel to the railway line be upgraded for heavy traffic.
4. Urban sprawl northward along the coast from Walvis Bay towards Swakopmund be prevented, emphasising that:
 - A compact camping site/recreational node be allowed between Dolphin Beach and Long Beach
 - Urban development not be allowed immediately south of the Swakop River.
5. Access to the dune belt for off road vehicles be controlled via specific access points.
6. Urban development in the Swakop and Kuiseb Rivers be limited and controlled.

The Walvis Bay SP also contains recommendations at the scales of the overall town area and that of the built-up area. At the scale of the town area, the most relevant aspects for the urban coastal area, as defined above, are:

- Positive landscape features be identified and conserved
- Lateral spread be restricted and new development be channelled within existing settlement boundaries
- A planted berm be instituted to define and improve the edge of the harbour and to provide a walkway that links with the lagoon front (esplanade).

⁶⁵ *A Structure Plan for Walvis Bay Volume 2: Recommendations, Prepared for the Municipality of Walvis Bay by Stubenrauch Planning Consultants cc in association with Uytenbogaardt and Dewar, Architects, Planners and Piet Louw, Architects, Planners and Urban Designers, 1999, pp. 6-7.*

⁶⁶ *Ibid p. 14*

⁶⁷ *Ibid, p.15.*

With regard to the built-up area, the relevant recommendations are:

- A mixed-use, largely residential precinct should be created close to the coast to the north of Kuisebmond.
- The south-western edge of the harbour should be shielded behind a broad berm, which serves as a walkway connecting to the esplanade (and also serves as a coastal defence against the threat of sea level rise).
- The creation of a small waterfront development around the small-boat harbour (yacht club area).
- The maintenance of the public character of the public edge of the lagoon. While permanent facilities should generally be kept east of the Esplanade road, an additional 'Raft' type development could be allowed to extend over the lagoon edge, mixed uses could be encouraged in the (residential) buildings opposite the lagoon, and hotel/s could be developed in the existing camping site, or in the Atlantis sports fields at the southern entrance to Sam Nujoma Avenue, which site is regarded as "locationally too important for use as a walled off sports field."
- Harbour expansion be carefully planned and managed.

Since its approval by Walvis Bay Council in October 1999, a number of the proposals in the Walvis Bay Structure Plan (SP) have been implemented. The Walvis Bay TPS which dates back to 1997 and provides for 18 different uses of land while also allowing for some combined land uses, has been in operation alongside the SP.

The SP's sub-regional concept was also condensed into a *Peri-Urban Land Use Policy in the Walvis Bay Municipal Area*, which was approved by council in 2003. The policy broadly follows the concept, which it summarises as follows:

...the Peri-Urban area should remain peri-urban with limited or no urban development taking place. Any development in the Peri-Urban area should be scattered isolated 'pavilions' and not be seen as 'comprehensive' agglomerated developments, to allow the dominant natural desert presence to be maintained.

Existing activities...will remain, but be reviewed where necessary on a case by case basis.

Any major or significant development in the Peri-Urban area should be subject to environmental assessment.

The policy which follows is centred on the demarcation of defined zones to accommodate existing and future land uses that are also depicted in plan form (see Figure 15):

- **Zone 1: Walvis Bay Nature Reserve:** : "The zone is on the southern part of Walvis Bay, roughly from the southern edges of Farms 29, 37 and 38 to the Kuiseb River. The Lagoon, the Salt-Works and the Topnaar community settlement are located in this zone... Since this zone is ecologically fragile, in such a way that it supports unique and fascinating ecological communities, it is recommended to be left free of any development other than those relating to cultural and eco-tourism and/or aqua-culture/agriculture. All existing developments located in this area should continue their activities in this area. However, new applications of such kind will not be allowed." (see also Chapter 4.2.3).
- **Zone 2: Conservation:** "This area includes Farms owned by Council, part of the coastline between Walvis Bay and Swakopmund, part of the dune belt and the area immediately adjacent to the Swakop River Bed...Activities relating to environmental conservation education, and/or eco-tourism, may be al-

lowed in this zone. Off road vehicles are prohibited in this area. Quad bikes and all other off road vehicles are not allowed in this zone.”

- **Zone 3: Recreation:** “Five areas are demarcated as recreation zones: South of the Swakop River, East of Long Beach, North – West of the Tumas River, Dune 7, and the coastline along Long Beach and Dolphin Park. Quad bikes as well as all other off road vehicles will only be accommodated in the *dune-field* part of this zone. All off road vehicles are to be led into the dunes via fixed tracks. Quad bikes are prohibited in the beach area (i.e. the coastline along Long Beach/Dolphin Park) of the recreation zone.”
- **Zone 4: Industrial:** “The zone comprises of the areas demarcated for the heavy industrial development behind the dune belt. Noxious and nuisance creating industries should be located in this area.”
- **Zone 5: Government:** “The zone is bounded by the Tumas River on the South and the gravel road between Walvis Bay and Swakopmund on the West... Zone 5 will permit only military related activities.”
- **Zone 6: Land for Development:** “This includes the area just south of the Airport and Dune 7 and South-East of the ‘built-up urban area’ as well as the Long Beach/Dolphin Park development. The node at Long Beach/Dolphin Park can be strengthened. Developments at Long Beach/Dolphin Park have to abide to this policy...With the exception of the Long Beach/Dolphin Park development, any other proposed development in this area should be: scattered, not agglomerated, to allow the dominant presence of the desert to be maintained, and are subject to an Environmental Impact Assessment.”

In the period since the approval of the Peri-Urban Land Use Policy, Walvis Bay’s peri-urban areas have been subject to strong development pressures. These have been particularly marked in the coastal area between Walvis Bay and Swakopmund. Urban development in the area had in fact begun earlier, with Long Beach. Long Beach (Langstrand in Afrikaans) had originally been established as a tourist/recreational resort in 1989, with 140 residential plots for holiday cottages. In 1992, under the apartheid-era Group Areas Act, a separate recreational facility for black and mixed race Namibians called Dolphin Beach was developed two km to the south. After the re-integration of Walvis Bay into Namibia in 1994, considerable tracts of land in the coastal area between Walvis Bay and Swakopmund were transferred from state land to municipal land. This included Farms 39, 36, 46, 44, 47, 42 and 48, i.e. effectively the whole coastal area up to the northern boundary of Long Beach. The area to the north of Farm 48 (i.e., to the Swakop River) remained state land, and was from then on understood to be under the jurisdiction of Walvis Bay.

Long Beach and Dolphin Beach were incorporated within the TPS and the 1999 Structure Plan as part of the urbanised area of Walvis Bay. With the exception of Long Beach and Dolphin Beach, the transferred lands above were zoned “Conservation” under the Walvis Bay Town Planning Scheme, and as seen above, largely fell within the Conservation Zone under the Peri-Urban Policy. Dolphin Beach remained a beach resort but permanent residences had always been permitted at Long Beach, and the suburb started to take off as a much in demand high-end residential area. This led, firstly, to a Long Beach Extension 1 being proclaimed to the south of the original Long Beach area towards Dolphin Park.⁶⁸

Then, as contained in the Walvis Bay Amendment Scheme No. 10, a rezoning of portions of Farms 36, 46, 44, and erf 413 of Long Beach Extension 1 from “Conservation” to “Undetermined” took place. This amendment was approved in 2005 by the Minister of Regional and Local Governments, Housing and Rural Development. Prior to that, Walvis Bay Council had approved the sale of a number of large parcels of land in the area to three developers: Quad-

⁶⁸ Billawer and Ekobo, *op cit*, p. 64

rant Engineering Services Pty (Ltd), Phincon Enterprises Pty (Ltd), and One & Only Holiday Resort. In roughly the same period, a proposed housing development just south of the Swakop River Mouth was subjected to an EIA which pointed out its significant negative impacts to certain species in the area. The Directorate of Environmental Affairs of MET declined an Environmental Clearance for the scheme, also citing in support of its decision the Walvis Bay Peri-Urban Land Use Policy.

The result of the rezoning detailed above has been the opening of large parts of the coastal area owned by Walvis Bay to wider urban development. Infrastructures services, notably sanitation, are being expanded for the area. Long Beach Extension 1 and the area south to Dolphin Park are being developed by Quadrant, and Farm 36 will be developed by Phincon (called Namib Eco Village) and Farm 46 by One & Only (also known as the Savva development after the name of the developer, Mr. John Savva) respectively.

Much of the development so far, including two multi-story blocks of flats in Long Beach Extension 1, has been vehemently criticised for being insensitive to its desert and ocean setting, and hence compromising of the value of this natural landscape. A set back line of only 100 m has been used. The Long Beach Design Guidelines, which require that all plans be submitted to the Walvis Bay Aesthetics Committee, and follow the general provisions of the Walvis Bay TPS with regard to site coverage, floor area, height, building lines, and parking, as well as specific construction guidelines and features, appear to have been disregarded in some instances.

In a more general sense, ongoing urban development on the coastline – the final completion of the schemes above and the build-out of Long Beach and Extension 1 would result in perhaps 750 - 1,000 new residential units as well as retail, hotels, and sporting/recreational facilities – has two contradictory implications:

- It invalidates much of the approach of the Walvis Bay SP towards compacting urban development and limiting sprawl, and seemingly contravenes the zoning provisions of the Peri-Urban Land Use Policy
- In encouraging linear sprawl on the coast, it sets in place an urban settlement pattern that soon will effectively reach from Meersig, opposite the Walvis Bay Lagoon to Long Beach, making it ever more difficult to functionally distinguish Walvis Bay from Swakopmund, and thus realising in part the sub-regional vision of the Walvis Bay and Swakopmund SPs.

In 2005, in the face of much public debate on coastal development the Walvis Bay Municipality commissioned a Coastline Strategic Environmental Assessment in order to:

- Provide balanced protection of the coastline environment
- Integrate environment into urban planning and development
- Promote sustainable development
- Stimulate alternative coastline development solutions
- Promote coastline development awareness.

The SEA report made its recommendations according to its own spatial categorisation:

Coastline SEA Recommendations

A Swakop River Mouth Area: The Swakop River mouth is an important ecosystem and needs to be protected from further degradation by vehicular activities. A section of this area is already protected by the cable barriers. This cable should continue to be maintained and remain in place. Developments should not be considered in this area.

B Vierkantklip Area: This area is currently used for recreational sea harvesting activities. It also consists of rocky shores which are important waterbird feeding areas. It is recommended that no vehicles be allowed on the beaches and the general public should be retaining access to this area for recreational sea harvesting.

C Caution Reef Area: It is recommended that this area be a nature reserve connected to the dune area. This area is an Important Bird Area (IBA) and is already protected by the cable barriers. This cable should continue to be maintained and remain in place. No developments should be considered for this area. This would be in line with Namibia's Vision 2030 of "Conservation and management of biological diversity along the coastal region" and to increase the number of registered conservancies in Namibia.

D Long Beach: The beach in this area is mainly sandy and rich in white mussel colonies. The Municipality of Walvis Bay erected signs that prohibit vehicles on the beach to protect the white mussel colonies. This area is used for a range of recreational activities especially during holiday periods and vehicular traffic on the beaches is still continuing. It is recommended that the beaches be protected from further degradation by vehicular activities and the general public should retain access to the area for recreational purposes.

E, F & G Long Beach Residential Area, Farm 47, Dolphin Park, Farm 36, and Farm 46: This area consists of rocky and sandy shores which is important waterbird feeding areas and also serves as seasonal breeding areas. This is also a residential area and future residential developments area earmarked for this area. It is recommended that buildings be 150 metres from the high tide mark and where possible, all developments should be enclosed behind a wall.

H Bird Platform To Navy Base: The area north of Kuisebmond beach to just south of Bird Island is regarded as the least sensitive. Developments planned for this area should consider incorporating the vegetated dune hummocks to maintain the biodiversity that utilizes them.

Source: Executive Summary, Coastline SEA, 2005.

Interest in the coastal area by developers has, if anything increased over the last two years (apparently over 40 applications have been submitted to WBM). In October 2006, citing the Coastline SEA's recommendations, the Council resolved that not all land development applications be approved, that "prime sites" be developed in accordance with a "structured development plan" and in line with "proper budgetary provisions," that suitable sites for aquaculture be identified in discussion with MFMR, and that an application be made for the transfer to the Council of the balance of the state land under the jurisdiction of Walvis Bay on the coastline (i.e. the area north of Long Beach).¹ There is also apparently now an application to the Ministry of Lands and Resettlement to transfer this land to the jurisdiction of the ERC

Over the last months, Walvis Bay Municipality has carried out a review of the Walvis Bay SP in order for it to reflect and prepare for the existing urban development situation and the foreseeable future (Figures 14-21). Proposed revisions have been made with input from the public. These revisions relate to:

1. The Sub-Regional Concept including Coastal Areas
2. The Built-Up Area with Urban Design Concept Proposals for the following areas:
 - a. Meersig and Walvis Bay Central
 - b. CBD/Town Centre Precinct
 - c. The Esplanade
 - d. Kuisebmond Suburb & Kuisebmond Centre
 - e. Narraville Suburb.

The following summary proposals are of importance for the coastal area (figures 14, 15, 16):

Walvis Bay Structure Plan Review Proposals

The Sub-Regional Concept: FIGURE A

- Conservation of the natural environment, including the declaration of the southern area as a nature reserve is proposed.
- The town development edge is demarcated and urban development should be compacted within the demarcated edge to prevent urban sprawl.
- Large scale and noxious industries are proposed to be located in the “Heavy Industrial Area” between Dune 7 and the Walvis Bay International Airport. These developments will not be continuous, but will be scattered in order to maintain visual contact with the dunes and gravel plains.
- Existing rail shunting yards are proposed to be relocated to the new Heavy Industrial area behind the dune-field, in order to create additional land for commercial harbour expansion.
- The existing entrance road into Walvis Bay is planned to be downgraded to a light vehicle, tourist and recreational route. On the other hand, the gravel road behind the dune-field is proposed to be upgraded to a major heavy vehicle traffic route, to serve the new Heavy Industrial area behind the dune field as well as existing industrial areas in town.
- Access to the dune-field and other sensitive environmental areas for recreation vehicles should be controlled and managed, with clearly defined access points and routes.
- The Entrance Gateway into Walvis Bay is to be constructed on the northernmost side, at the edge of the Swakop River mouth.

Coastal Areas: FIGURE B

- Urban development along the coastline is limited to residential nodal developments, aquaculture, bulk-cargo handling facility, eco-tourism and recreational related developments.
- Specific design guidelines should be introduced to aquaculture, bulk cargo handling facility and all other coastal developments in order to enhance the aesthetic character of the town. Furthermore, all coastal developments will be required to be submitted to the Aesthetics Committee for consideration.

- Although an additional Bulk Cargo Handling Facility is proposed along the coast, extensive harbour expansion along the coastline is generally restricted.
- Buffer zones are to be introduced between residential, bulk cargo handling facility and aquaculture developments, by zoning them either Public Open Spaces or Conservation.
- The area between coastal developments (particularly aquaculture and bulk cargo handling facility developments) and the Trunk Road should be landscaped.
- The “no development” zones along the coastline should remain undeveloped.
- Limited and discrete developments that promote eco-tourism and heritage tourism can be allowed along the Kuiseb River.

The Esplanade: FIGURE E

- The lagoon edge including the public walkway to remain accessible to the public and as public open space.
- No developments will be permitted to the west side of the road, except for two additional facilities being a restaurant/coffee shop and residential/educational facilities (on Farm 45 and on the area across the Atlantis Sports Club).
- The Atlantis Sports Club is proposed to be relocated in order to accommodate the planned mixed land use developments on the site.
- Sam Nujoma Avenue is proposed to be realigned at the lagoon in order to create a panorama entrance to the lagoon through the proposed mixed land use developments centre. This means that part of the Esplanade (across the Atlantis Sports Club) will be closed to through traffic.
- The redevelopment of existing erven along the lagoon for tourism related activities and high density developments is encouraged.
- A marina development is planned at the sites that currently house the Yacht and Angling clubs, Municipal swimming pool and tennis courts.
- Phase 2 of the marina development is planned at the existing cricket field site. The cricket field and club are to be relocated.
- The public walkway around the lagoon should be extended around the edge of the harbour to the CBD/Town Centre and the Railway Station square.

The revisions for the Esplanade to relocate the Atlantis Sports Club, and for a new mixed use development on the site – both proposals were in the SP – and for higher density development in general on the Lagoon frontage (which was not) have resulted in a petition from residents in opposition to them. According to a newspaper report, “Petitioners state that they are totally against the proposed change in the town’s structural plan review that will do away with the public road and public parking space in front of the Atlantis Sports Club.” The other revisions, in line with the SP, do maintain public access to the lagoon edge (or shoreline) and extend the public walkway into the town centre (the landscaped berm between the harbour and town proposed in the SP is also held to). A proposed joint NAMPORT/WBM marina development in the immediate area that has already seen the construction of a new hotel, and which is the hub of marine tourism activity, is also planned for.

The revisions to the sub-regional concept extend residential development and other land use developments on the southern half of the coastal area, in line with the trend that is now occurring. Far more development than had been foreshadowed in the SP is also proposed for the northern half. The proposal for a northern Entrance Gateway to Walvis Bay at the edge of the Swakop River Mouth is novel and wholly contradicts the spirit of the SP, which calls for collaboration between the two coastal towns rather than gestures towards territorial aggrandisement.

It is in the coastal area between Walvis Bay and Swakopmund that most change is anticipated by the revisions. The area from the edge of the existing Built-Up Area through to the northern boundary of Long Beach, with the exception of three small areas reserved for public beaches and recreation, will be subject to infill developments of various types, mostly of a residential character but also port-related and for eco-tourism and aquaculture uses. The area will be wholly urbanised. North of Long Beach, in the currently state-owned land, two areas of possible new residential development are now proposed, these to be interspersed with a mixed-use conservation, eco-tourism and aquaculture zone, and no development zones. Three recreational areas are provided for in the Dunebelt.

There is, in general terms, a lack of congruence between the revisions proposed for both the sub-regional concept and the coastal area when they are compared to the original SP, the Peri-Urban Land Use Plan, and the recommendations in the Coastline SEA.

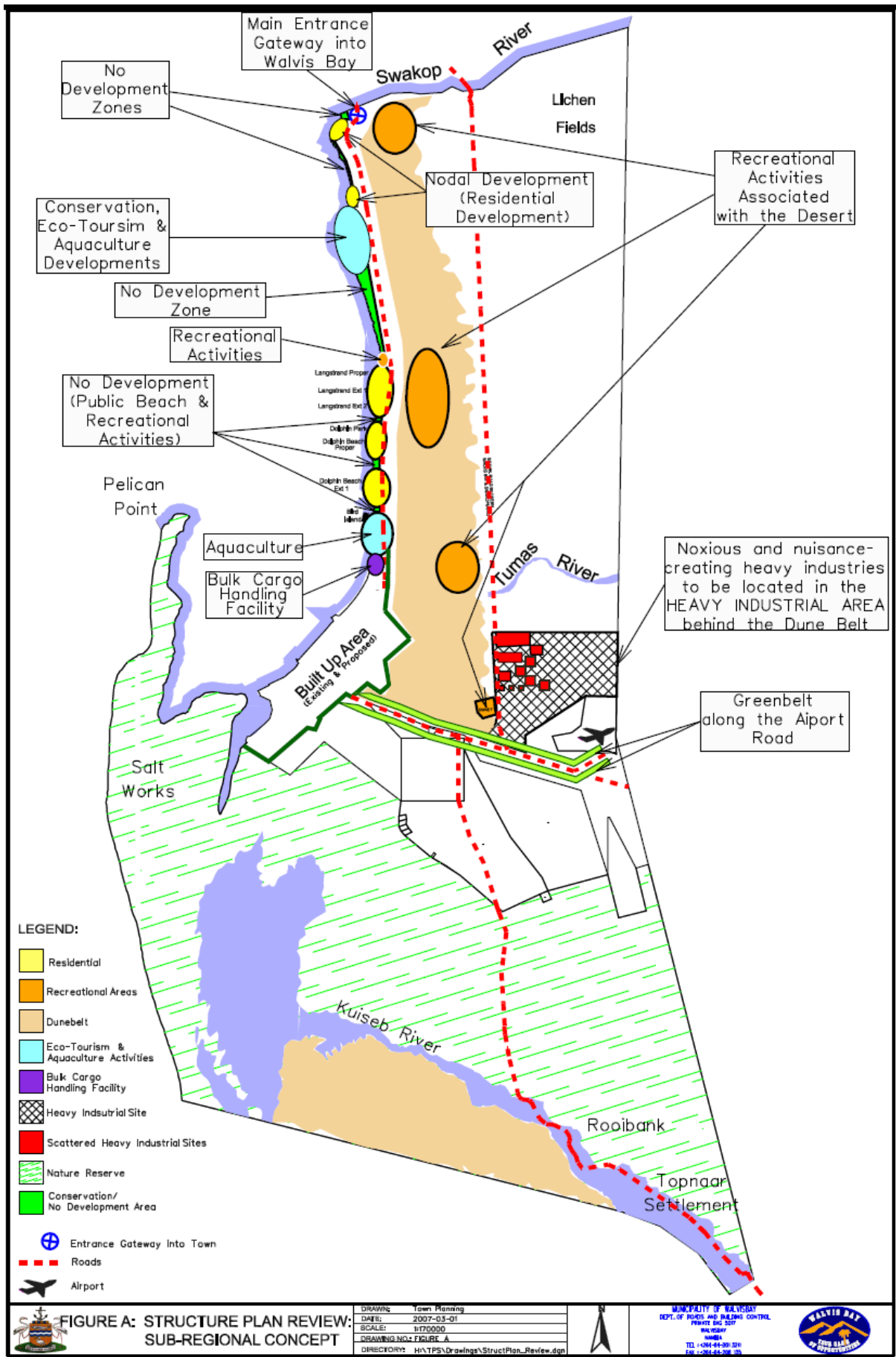


Figure 14: Walvis Bay Structure Plan Review Proposals.

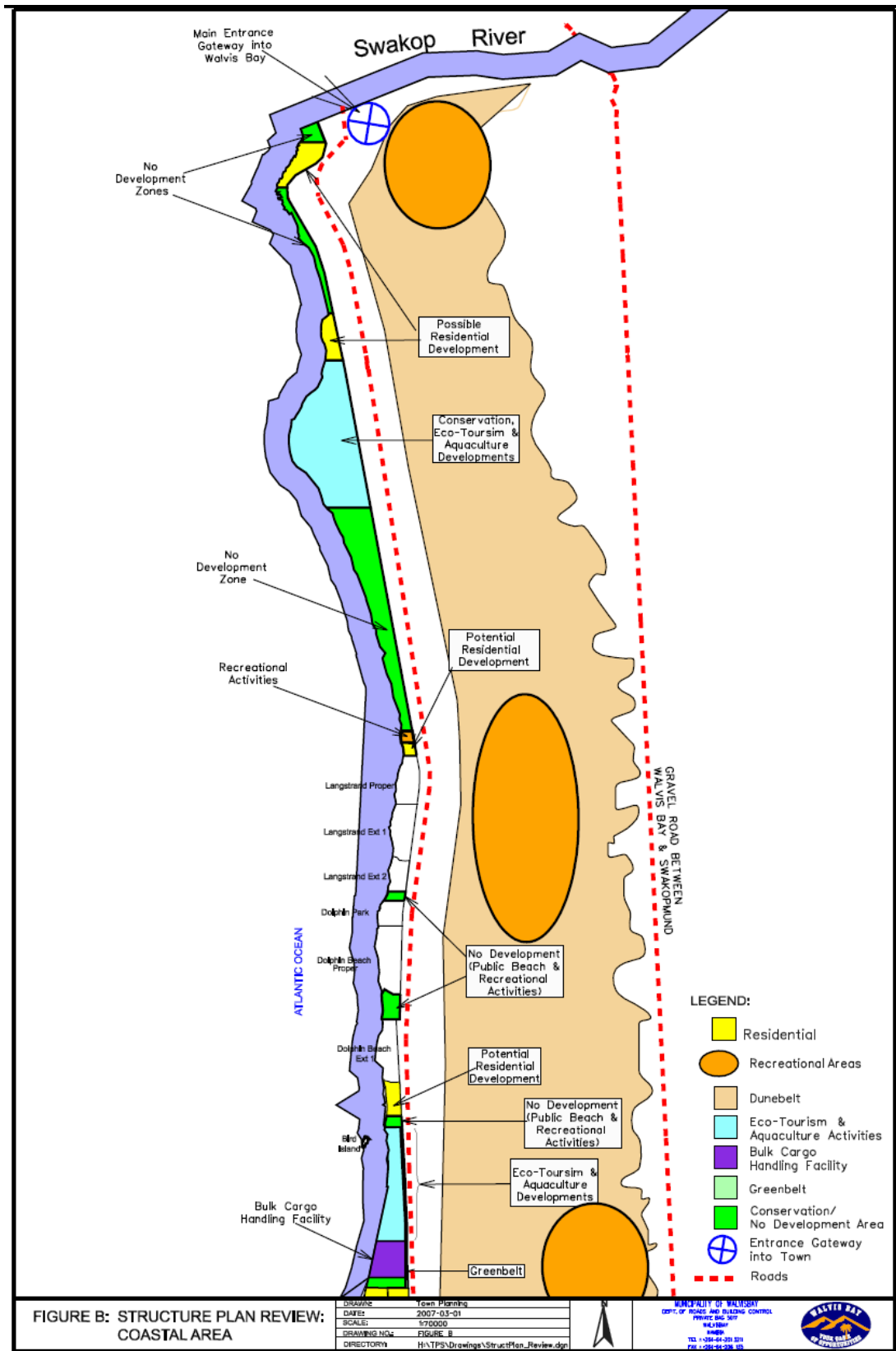


Figure 15: Walvis Bay Structure Plan Review Proposals.

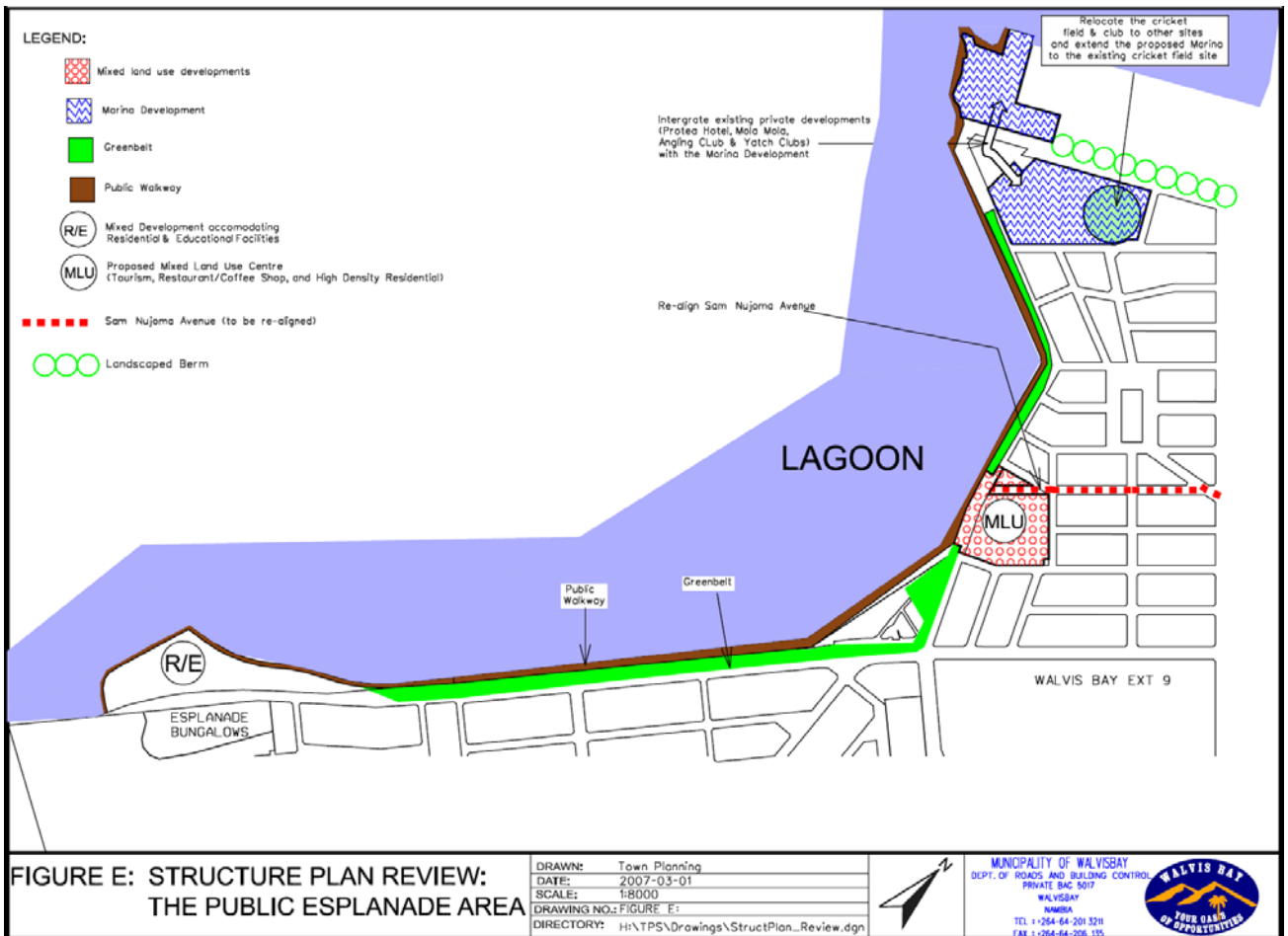


Figure 16: Walvis Bay Structure Plan Review Proposals.

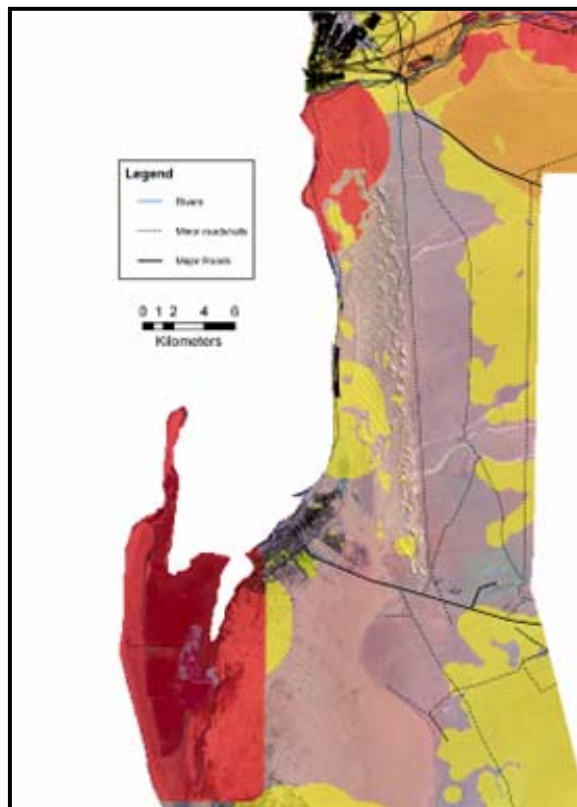


Figure 17: The modelled areas/habitats of conservation priority for the region covered by the Walvis Bay Structure Plan Review Proposals. The ranking of conservation priority follows Figure 9.

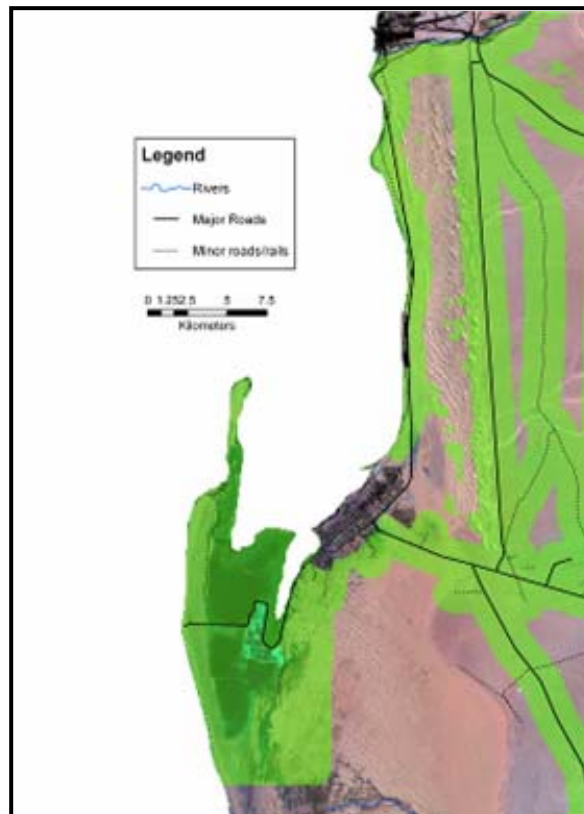


Figure 18: The modelled suitability areas for eco-tourism (in green) for the region covered by the Walvis Bay Structure Plan Review Proposals.

Recommendations

The process for the revision of the Walvis Bay Municipality Structure Plan will be concluded in the next months. This will involve, in part, the discussion and approval of the proposals relevant to the Esplanade and to the coastal area, as summarised above. This process provides a valuable opportunity for Walvis Bay Municipality and other stakeholders to resolve the land use and zoning issues that have caused controversy for a long period.

The proposals for the Esplanade are broadly in line with the SP. The proposal for encouraging higher density developments and activities related to conventional tourism along the lagoon should be reconsidered or justified further, as the modelled land use suitability for conventional beach tourism in the Walvis Bay area indicates low suitability along the lagoon. Protests about the proposed mixed use development on the Atlantis Sports Grounds could be set to rest by keeping the development on the eastern side of the road, and therefore not closing the Esplanade to through traffic.

The inconsistencies between various WBM policies and planning instruments and the proposed revisions for land use in the coastal area between Walvis Bay and Swakopmund are pointed out above. It is now incumbent upon Walvis Bay Municipality to resolve the inconsistencies between the original SP, the Peri-Urban Land Use Policy, the Coastline SEA and the SP revisions.

The maps prepared for this report by the consultant indicate high biodiversity values in the northern part of the coastal area (Figure 17). These land use suitability maps indicate a lack of suitability for land uses other than eco-tourism (Figure 18). This area remains undeveloped, and the only proposal for development that was subjected to an EIA in recent years – a residential area near the Swakopmund River in 2002 – was rejected by MET on the basis of the EIA and the Peri-Urban Policy.

In view of its biodiversity and recreational and landscape values, it is our recommendation that the area, which is still in any event state land, be maintained solely as a Conservation Area, as per the original SP and Peri-Urban Land Use Policy. The proposals for nodal residential developments near the Swakop River Mouth and in the Caution Reef area should be rejected. The Conservation, Eco-Tourism and Aquaculture – these are uses that do not fit easily with one another – zone at Caution Reef should also be rejected.

It is also our recommendation that the fait accompli of urban and economic development on the southern part of the coast be accepted by stakeholders. This development started nearly 20 years ago with the proclamation and development of Long Beach. It was given ample room for expansion by WBM's rezoning in 2003 and the subsequent development of Long Beach Extension 1 and of the three new residential areas that are now either underway or planned for the near-term future.

The SP revisions propose a mix of industrial (harbour/port, notably a Bulk Cargo Handling Facility, and aquaculture), residential and public beach/recreational activities in the area. These should be accepted. More analysis will have to be done on the means that can be used, such as design guidelines and buffer zones, for assuring that these very different land uses do not conflict with one another, with negative impacts for residents and the natural environment, in a spatial context in which there is not, as yet, industrial development. All potential industrial developments should, at minimum, be subjected to comprehensive Environmental Impact Assessments. Moreover, for each application Walvis Bay Municipality and the applicant should also jointly explore the alternative possibility of re-use or redevelopment of vacant/unused or brownfield industrial space in the existing industrially-zoned areas and in the Fishing Harbour area.

At the same time, sufficient public beach and recreational space and access to it for residents will be needed to also be assured. Given that the land-use suitability models indicate low suitability for aquaculture and high suitability for tourism the potential for increased recreational uses of the area should set the scene.

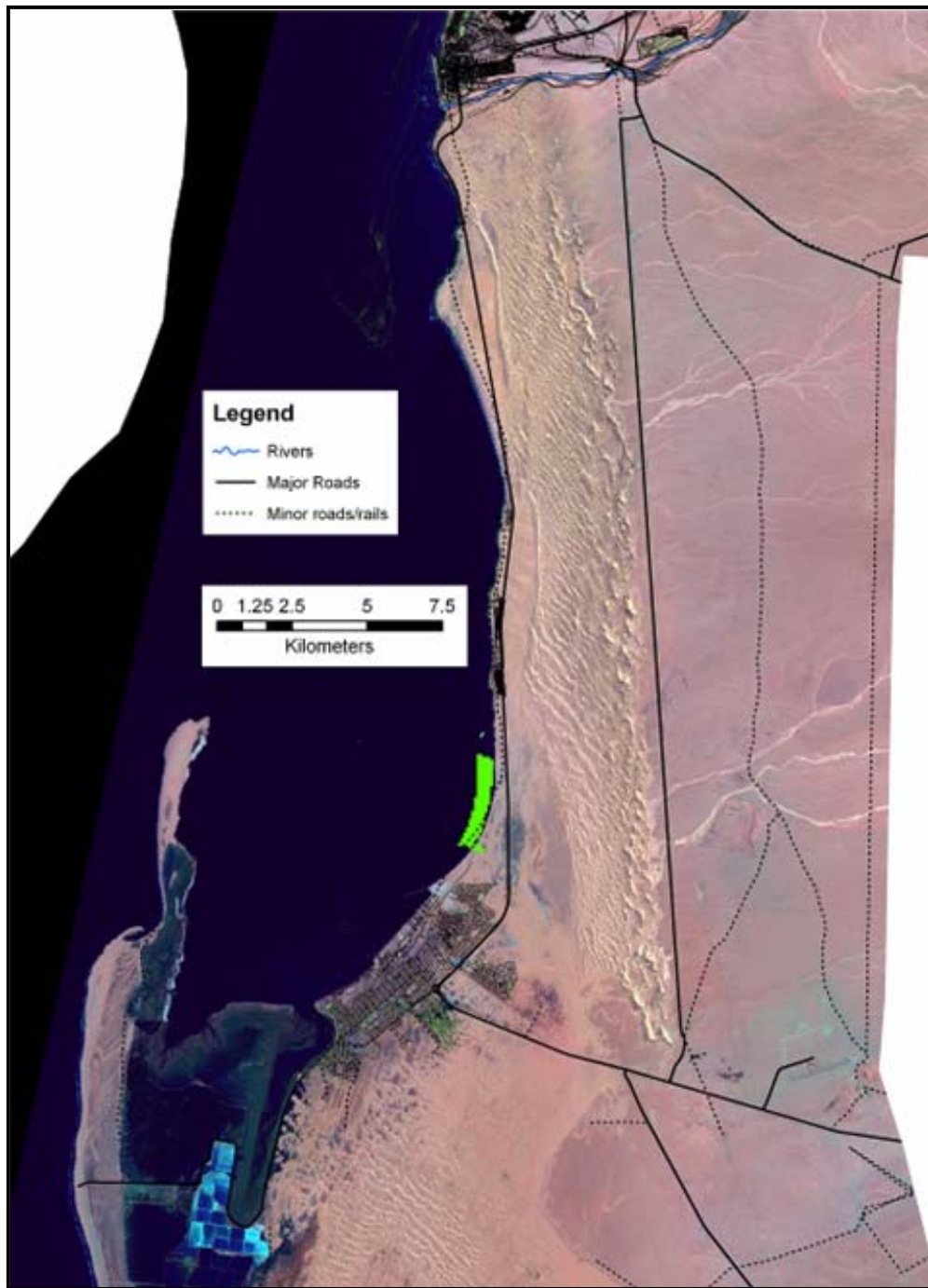


Figure 19: The modelled suitability areas for development of land-based and marine aquaculture (in green) for the region covered by the Walvis Bay Structure Plan Review Proposals.



Figure 20: The modelled suitability areas for port development (in green) for the region covered by the Walvis Bay Structure Plan Review Proposals.



Figure 21: The modelled suitability areas for urban development (in green) for the region covered by the Walvis Bay Structure Plan Review Proposals.

4.2.5.3 Swakopmund

Two areas of high conservation priority are located in the vicinity of Swakopmund; The river bed and associated areas of the Swakop River and the Mile 4 Saltworks. The river bed and associated areas of the Swakop River constitute an area of very diverse geological, geomorphological, floral and faunal characteristics, including areas of high topographic complexity, rocky outcrops and permanent vegetation including the protected *Welwitschia* and the Quiver tree. The diversity of habitats support a high number of insect, reptile and bird species. The western-most part overlaps with the area planned for urban development by Swakopmund Municipality. The area just south of the river mouth houses the most important colony of Damara terns in the world.

The Mile 4 Saltworks comprises a private nature reserve of 400 ha and a Saltworks. It lies adjacent to the sea on the central Namib Desert coast and has been extensively altered to create numerous evaporation ponds. Immediately inland lie the gravel plains of the Namib Desert. The Saltworks are situated about 7 km (4 miles) north of Swakopmund. Mile 4 occasionally supports more than 150,000 waterbirds, of which breeding Cape cormorants and non-breeding Common terns dominate. No conflicts seem to exist between the waterbird concentrations and the oyster production and guano scraping at the Saltworks⁶²³.

The brief for A Long Term Plan for Swakopmund, Swakopmund Municipality's SP, was for the development of a strategic spatial plan for the town. In the approach followed, much emphasis was placed on integrating what was seen as a fragmented urban fabric, on reducing high levels of sprawl (spread-out development) in the town by making it more compact, on improving spatial equity and convenience with regard to facilities for residents, and on reinforcing and enhancing a sense of place.



Swakopmund
Erongo
Photo: G. Reitz



Waterfront development
Swakopmund - Erongo
Photo: G. Reitz

Swakopmund's coastal area was central to all of these issues. In particular, it was argued that sprawl, which had the effect of 'privatising' public coastal amenities, should be limited by preventing further lateral expansion northward along the coast, that growth on the coast should be focused in higher density nodes, and that improving access to and facilities on the coast – via such means as a coastal scenic drive, the development of nodes for active recreation on the coast and the conservation of the rest of the beach zone for passive recreation – was central to strengthening Swakopmund's character and identity as a unique coastal and desert place that was attractive to both tourists and residents. As the document put it,

Swakopmund is the coastal playground of Namibia and is an increasingly important attractor of international tourists. Its environment is its greatest economic asset and its strongest element of international and national comparative advantage. It is imperative not only to pre-

serve its character and sense of place, deriving from both the natural and the built environment, but actively to enhance it.⁶⁹

At the regional scale, the SP argued strongly for the integration of Walvis Bay and Swakopmund into “a functional entity, which operates to the advantage of both towns.”⁷⁰ An inter-town working committee to advise the councils of the two towns was proposed. In line with the emphasis on concentrating rather than spreading urban development, it was emphasised that “The settlement pattern north of Swakopmund, with small permanent settlements serving temporary ones should be retained. Swakopmund itself should not expand northward along the coast.” Echoing the Walvis Bay SP, the area south of the town was to be carefully planned, and left undisturbed in its natural state as much as possible:

Urban sprawl along the coast between Swakopmund and Walvis Bay should be prevented. The conceptual model of temporary accommodation for visitors between nodes of more permanent occupation, which is found northward along the coast, should be applied along this section of the coast as well. Seen in this light, the historical decision to establish a small node of permanent dwelling at Langstrand simply represents a different form of sprawl. In terms of this argument, there may be a case for establishing one more node, in the form of a compact camping site, for national and international visitors who wish to enjoy the solitude of the dune and coastal experience, to the back of the beach. It is important that the open stretch of beach which currently exists between Swakopmund and Langstrand should be retained. Urban development should not be allowed immediately south of the Swakop River. The wilderness vista abutting the river, as one approaches the town from the south is an important part of the quality of the space.⁷¹

At the scale of the overall town, too, the need for sensitive planning of the coastal area was highlighted, in particular the imperative of improving access to the coast at selected points, while simultaneously protecting and creating view lines for both desert and sea. Urban design recommendations for the built-up area followed these imperatives, and are focused on preserving the historic town heart (or centre), including the abutting portions of the coastal area. The sea front, in fact, was held to be “a fundamental part of the uniqueness of Swakopmund and it should be accessible to, and thus ‘owned’ by all of the inhabitants of the town in perpetuity.”⁷² A “Beach Area” zone in the Swakopmund Town Planning Amendment Scheme No. 12 (2002) follows the SP in reserving the sea front area for public beach activities. The scheme also features a Conservation Area and a height restriction of 13m. A 4-Year and 12-Year Plans provides prioritised proposals for budgeting and for policy purposes for the two periods. The 4-Year Plan currently in operation includes:

- The development of Recreational Areas: Venita/CBD/Beachfront/Riverbed and the Redevelopment of Public Open Spaces (for budgeting)
- Save the Jetty (policy)
- Henties Bay Road should not be a narrow road (policy).

A Master Development Plan (2002) expands on the proposals contained in the 4-Year and 12-Year plans. An environmental management framework or plan for Swakopmund does not exist.

In a general sense, Swakopmund Municipality (SM) has successfully followed the SP’s guidance and implemented several of its specific proposals. The Municipality appears to be in control of development in the town’s coastal area and is well aware of its importance for the town’s identity and tourist industry – and hence the need to maintain its character and utility,

⁶⁹ *A Long Term Plan for Swakopmund Volume 2: Detailed Recommendations, 2000.*

⁷⁰ *Ibid p. 14.*

⁷¹ *Ibid p. 16.*

⁷² *Ibid pp. 27-28.*

and to upgrade it as necessary via the means of strategic investments. The area of coastal terrain under jurisdiction stretches about 25 km from the Swakop River to beyond the formal boundary at Mile 4, thus including the Saltworks and a Chinese Satellite Station. About four to five km of this is government land, and SM would like to organise a land swap if possible.

Principal current issues for the coastal area from south to north, as identified by SM, are as follows:

- SM and many Swakopmund residents were not in favour of the residential development proposed in Walvis Bay territory on the other side of Swakop River. This was criticised and eventually turned down after a negative EIA, as discussed above. The municipality remains opposed to development in the area. Friends of the Swakop River group are active in safeguarding the Swakop Estuary.
- In consequence the Swakop River bed and adjacent area now features only temporary structures, including the Tiger Reef Beach bar.
- The 70 municipal bungalows nearby may be upgraded.
- The six to seven ha. site of the Hansa Brewery is now vacant after its closure a year or so ago; redevelopment of this crucial site is anticipated in the future.
- The University of Namibia is to build a research facility behind the fish cleaning facility opposite MFMR on the coastal frontage.
- Overdevelopment of the beachfront is seen as negative for the town's image and tourism. There is no tourism strategy, however. A strong historical preservation/conservation lobby in the town reinforces this perspective.
- The Mole is undergoing a facelift. The swimming pool is being relocated to the Central Sports Fields and a local developer is developing a 40 unit block of high-end flats, called "The Palms." The Waterfront development, about 5 km up the coast, has had a troubled history – with environmental issues (a compromised surf break, birds on the rocky shoreline, and sand accretion). The R350 m development was scaled down on the financier's demand. The question of whether there is sufficient demand for such facilities was raised (e.g. a 65 yacht Marina was planned, and then dropped).
- In late 2006, the Council turned down a proposal for a golf course north of the Mole along the promenade, citing public space preservation considerations. A consideration here was that access to the beachfront in the area northwards from the suburb of Mondesa to Mile 4 is not very good. Neither are amenities.
- The area from Mile 4 to Mile 8 could be where the town's extension occurs, in a 15 to 20 year perspective. This area is also proposed for aquaculture zoning by MFMR.

Shaped by the analysis and recommendations of its SP, as well as the commitment of many of its residents, Swakopmund, has been able to successfully plan and manage its urbanised coastal area. While expensive residential development has continued northwards up the coast, and with it what the SP describes as urban sprawl, this has been contained within formal municipal boundaries, and has not elicited the degree of public concern and conflict that has been seen in Walvis Bay. In view of its significance for the town and its residents, development in the Swakopmund coast should continue to be carefully planned and managed.

Recommendations

It will be necessary for SM and MFMR to decide jointly which portions of the land between Mile 4 and the Mile 4 Saltworks should be allocated to aquaculture and which to possible future urban development. In principle, both uses can be accommodated providing measures are taken to mitigate any impacts from the essentially industrial processes which characterise aquaculture. The area north of the Saltworks is seemingly more suitability for land-based aquaculture development (Figure 24). An EIA is recommended for any future developments of scale in the area.

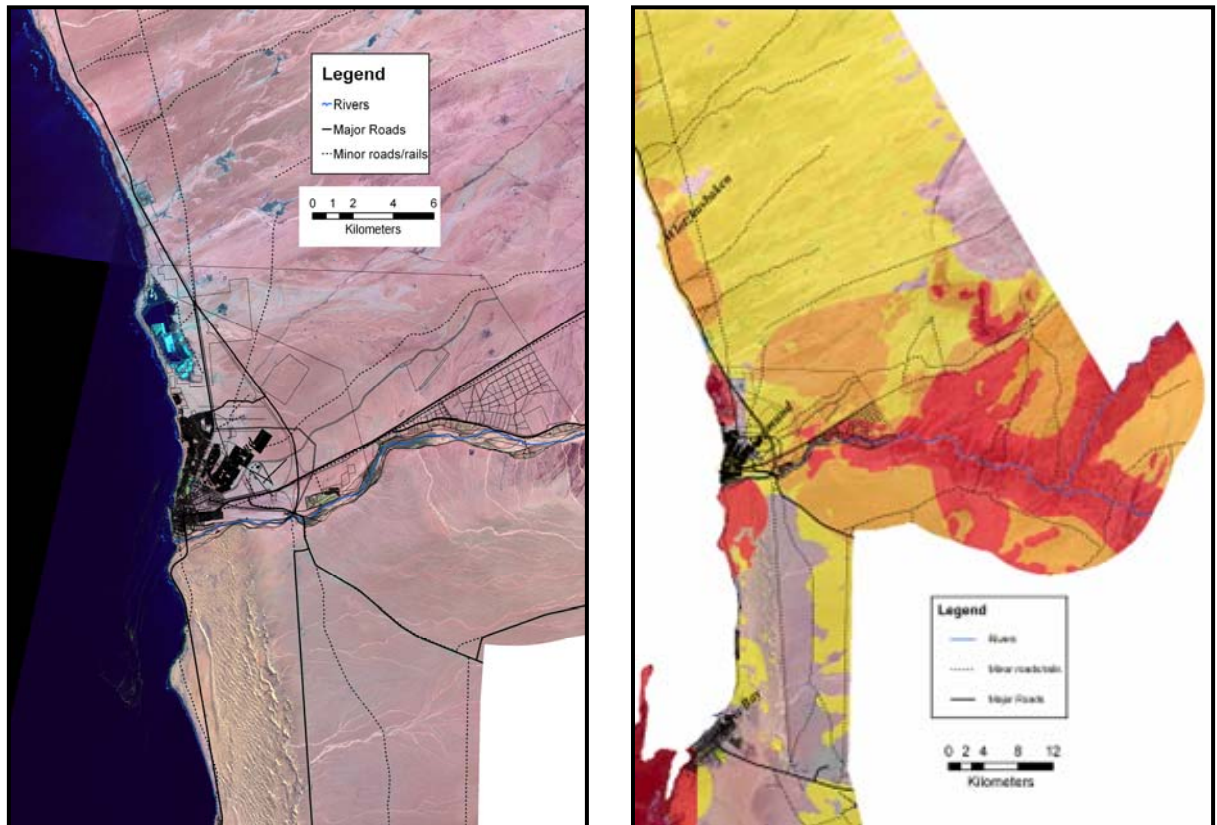


Figure 22: Mile 4 Saltworks and the lower reaches of the Swakop River and areas/habitats of conservation priority. The ranking of conservation priority follows Figure 9.

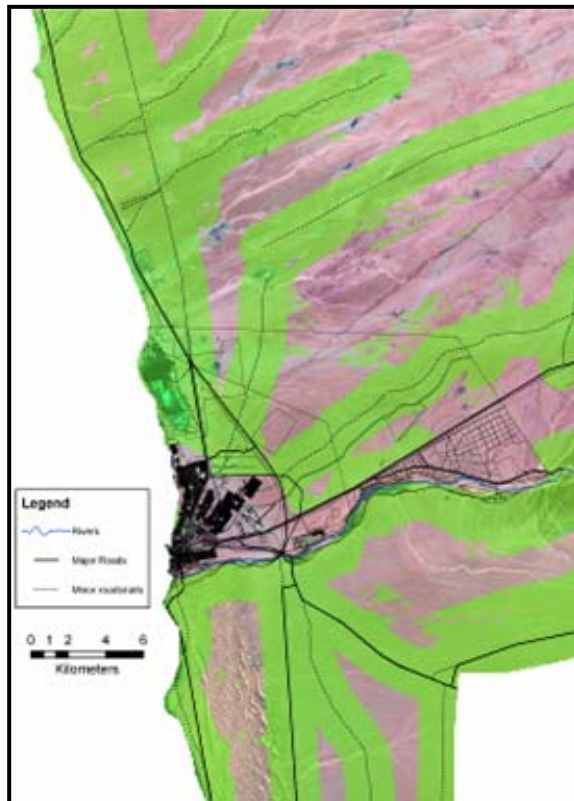


Figure 23: The modelled suitable areas for eco-tourism (in green) for the Swakopmund area.

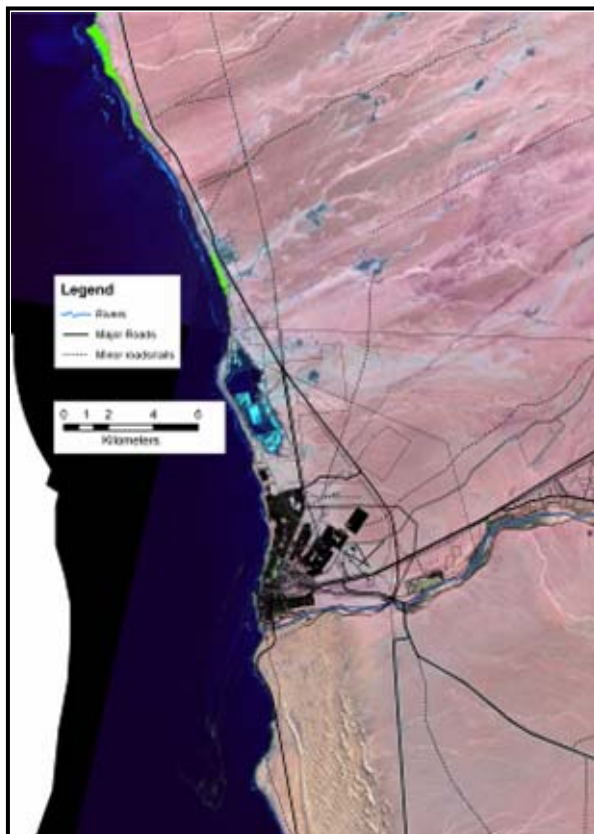


Figure 24: The modelled suitable areas for development of land-based aquaculture for the Swakopmund area (in green).

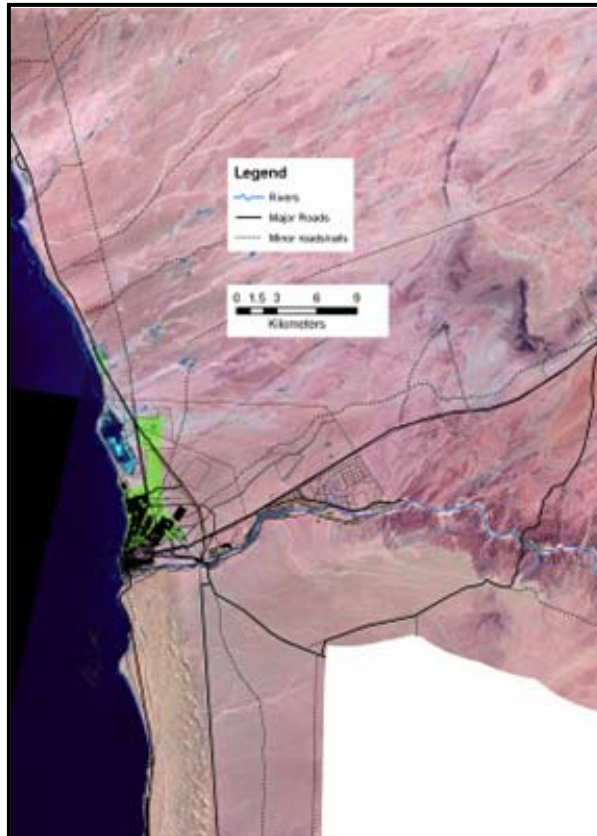


Figure 25: The modelled suitable areas for urban development for the Swakopmund area (in green).

4.2.5.4 Wlotzkasbaken and Surroundings

Wlotzkasbaken is a tiny settlement of holiday houses on 99 year lease, typically held in the same families for decades, and with very few permanent residents. Wlotzkasbaken was surveyed in preparation for its declaration as a settlement under the control of the ERC, which favours further development. Long-term (and often temporary) residents apparently do not, and are not particularly keen to see their large plots subject to sub-division. There has apparently been negotiation between the parties. According to MRLGHRD, declaration of the settlement has occurred. Wlotzkasbaken is completely surrounded by lichen fields. The coastal area falls within the area from Mile 8 to Mile 20 proposed for aquaculture by MFMR, and most of this section was found to be suitable for land-based aquaculture.



Wlotzkasbaken
Erongo
Photo: G. Reitz

Recommendations

Under the auspices of the ERC, a structure or development plan should be prepared for the Wlotzkasbaken area. This should highlight both development options (residential, recreational, aquaculture, etc.) and the zoning of future land uses at both aggregate and plot level.

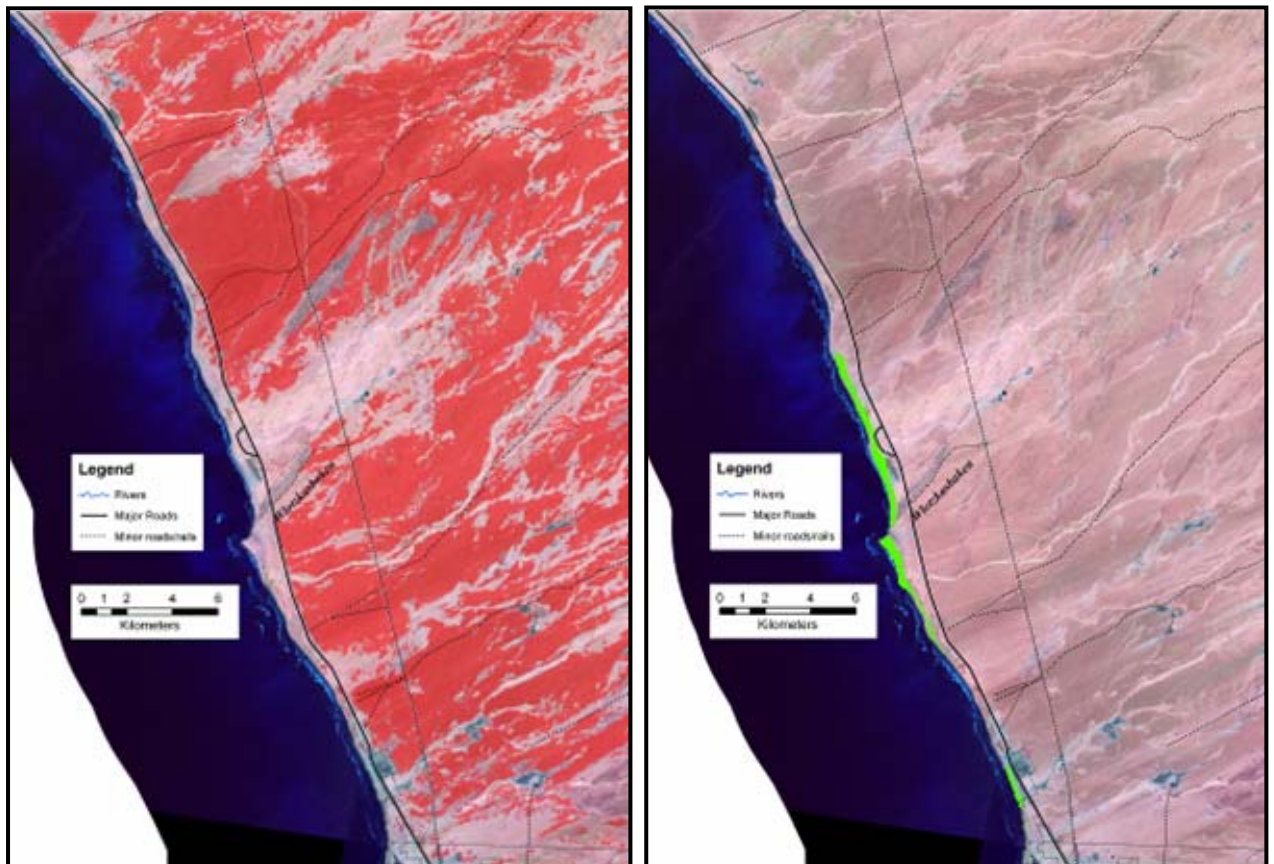


Figure 26: Wlotzkasbaken with surrounding lichen fields indicated in red colour (left graphic) and modelled suitability for land-based aquaculture shown in green (right graphic).

4.2.5.5 Henties Bay

The small municipality of Henties Bay, with an overall town area of 1,500 ha. and a population of 3,608 in 2001 is some 70 km up the coastal road from Swakopmund and like Wlotzkasbaken also lies within the National West Coast Tourist Recreation Area. The Henties Bay Town and Townlands is, however, excluded from the area itself, to allow for the establishment and operation of the local authority area of the municipality. Development is guided by an approved structure plan, *A Structure Plan for Henties Bay*, which dates back four years to July 2003. Henties Bay has also had a Town Planning Scheme in place for some years.

The Structure Plan, drawn up by Stubenrauch Planning Consultants, is comprised of two volumes like those of Walvis Bay and Swakopmund. Volume 1 contains a general description and findings, and Volume 2 the recommendations. The *raison d'être* for Henties Bay as a holiday town is well-described in the Regional Context section:

Henties Bay has a peaceful, rustic atmosphere and the absence of heavy traffic, the mild climate and long stretches of unspoilt beach creates the ideal setting for a leisurely holiday with long walks, sunbathing and picnicking or a few days rest for the overseas visitor after a

tiresome journey on hot and dusty roads. Parts of the beach are closed to anglers, vehicles or quad bikes to offer pedestrians and sunbathers maximum peace and quiet.⁷³

The pattern of urban development is accurately depicted as being

...characterised by a linear low density development along the coast with the old Omaruru River mouth being the centre of the town. The centre spine of the town is formed by commercial, recreational, institutional, light industrial and the higher density low income residential area of Omdel.⁷⁴

As a holiday town – many homes are second homes, and the population increases four times during the holiday season in December/January – Henties Bay is oriented to the coast and its amenities:

Henties Bay has a linear development pattern along the beach, which is typical of a holiday oriented town where the majority of the houses are oriented and located in terms of possible access to the beach and the view over the sea and beach area. This type of development pattern has the major disadvantage of ever increasing distances to public facilities, the commercial centre as well as the increasing cost to provide municipal services to the outer boundaries of the town.⁷⁵



Henties Bay
Erongo
Photo: G. Reitz

Henties Bay is growing rapidly (its population more than doubled in the 1990s), with residential development extending increasingly to the south in its coastal area. It faces the challenge of accommodating urban development while at the same time maintaining both its seaside character and identity and its natural environment, which is what attract new residents and tourists. The SP includes recommendations for

- A landscape plan for the entire local authority
- A structural and spatial concept for the town as a whole

⁷³ A Structure Plan for Henties Bay, Volume 1: General description and findings, 2003

⁷⁴ Ibid p. 26

⁷⁵ Ibid p. 28.

- Urban design proposals for strategic parts of the town, including the beach-front, where pedestrian walkways are proposed along a dune embankment
- Needs and priorities for social and physical infrastructure and services
- A review of control mechanisms.

A meeting to discuss the SEA process and relevant PPPs with Henties Bay Municipality was not attended by the relevant staff member. The SP was provided to the consultant on another occasion, but, as yet a further discussion has not been scheduled. Unfortunately it thus is not possible at this point to assess the effect of the Structure Plan, as policy, on recent developments in the town, and specifically on the coastal area. Aquaculture zones have also been proposed on the town's northern and southern peripheries.

Recommendations

Development should continue to be directed towards the south of the current urban area. The potential for land-based aquaculture should be pursued to the south of the town.

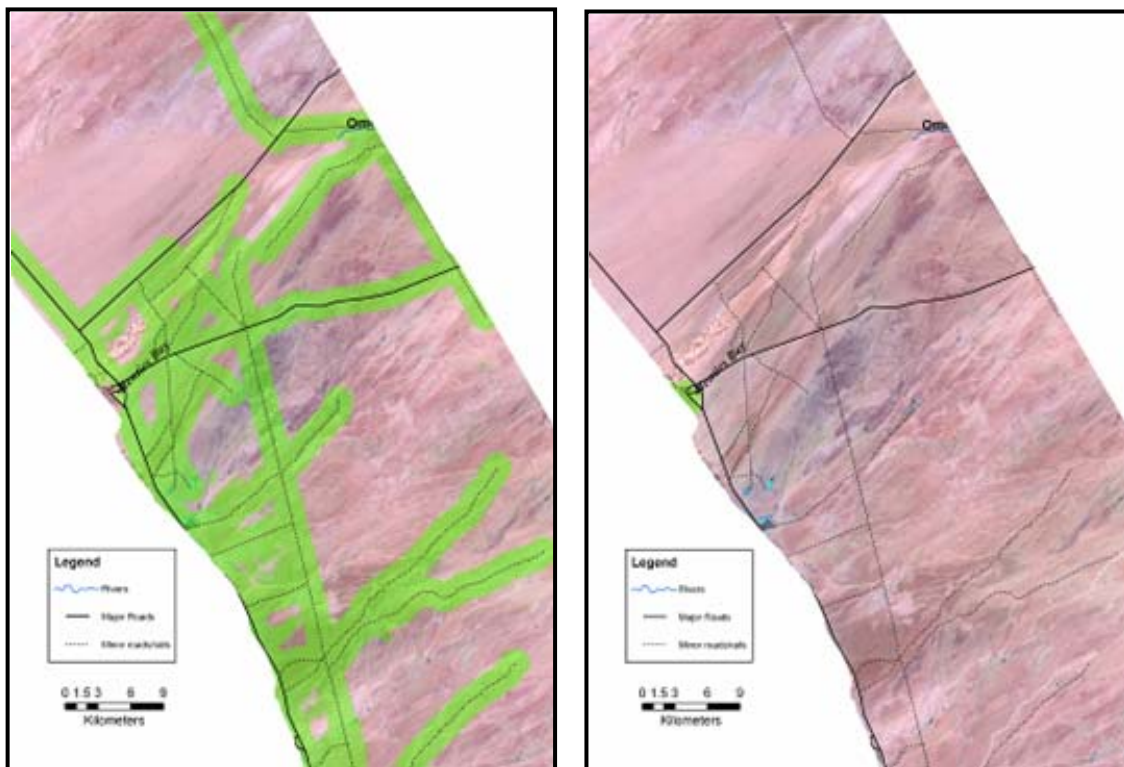


Figure 27: The modelled suitability for eco-tourism (left graphic) and urban development at Henties Bay and land-based aquaculture to the south of the town (right graphic). Suitable areas shown in green.

4.2.6 Cape Cross Lagoon and Seal Reserve

The Cape Cross Lagoon and Seal Reserve was formerly a coastal embayment just south of the rocky promontory of Cape Cross. The inner part of the embayment remains a series of saline lagoons. These receive saline sea water from seepage through the sand barrier and, during extreme high tides or storms, by water washed over the sand barrier. The lagoons vary in size and number depending on water level and are controlled by two main factors: evaporation and seawater input. Desiccation of the eastern borders of the embayment has produced sterile salt pans and flats. These salt deposits are worked commercially on a small scale. Three wooden platforms with a total area of 68,000 m² have been erected in some of the lagoons to provide roosting and breeding places for seabirds whose guano is commercially harvested. Guano from these platforms probably serves also to enrich the micro-flora and fauna of the lagoons. A massive mainland breeding colony of fur seals, numbering

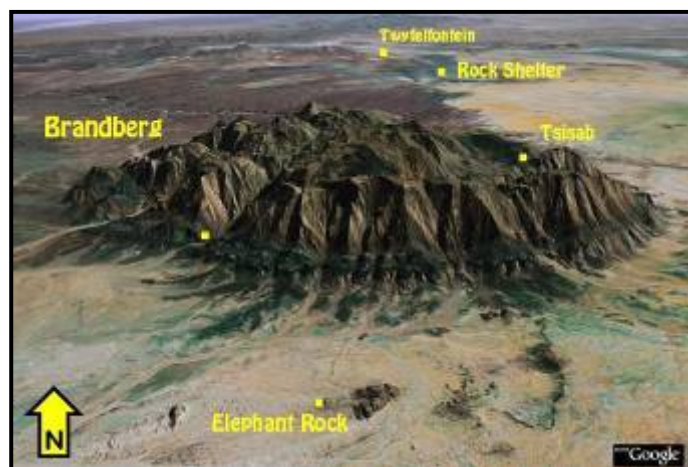
273,000 in 2005⁷⁶, occurs here. This is one of two populations in Namibia that are harvested commercially, mainly pups for their pelts, and some bulls for their genitalia. The lagoons and platforms have been known to support up to 14% of the global population of Cape Cormorant (30 600 pairs). Counts indicate that in addition to cormorants these lagoons regularly support up to 11 000 other birds. Currently this wetland is registered as a Nature Reserve with the purpose to restrict access to the public. The seal reserve is visited by 40 000 tourists per year.



Cape Cross Seal Reserve
Erongo
Photo: G. Reitz

4.2.7 Brandberg Massif

The rocky areas of the Brandberg Massif are connected with Namibia's highest mountain Brandberg, at 2,606m, a conical mountain of ancient volcanic granitic plug situated in the central section of the Namib Desert some 30 km from the boundary of the National West Coast Tourist Recreation Area. The area also includes the Messum Crater. Recent analyses show that Brandberg is the epicentre of a rich vein of endemic mammals, reptiles, plants and amphibians that runs from the Sperrgebiet in the south to the Otjihipa Mountains in the north. No other area in Namibia is as rich in endemics as the Brandberg massif; among the 90 endemic plants, eight are found nowhere else, while three of six near-endemic frogs, eight of 14 near-endemic mammals, 49 of 59 near-endemic reptiles, and 11 of 14 near-endemic birds occur on or around this inselberg.



Brandberg Massif
Erongo
Photo: Google Earth

⁷⁶ Heidi Skrypzeck, MFMR, pers. comm.

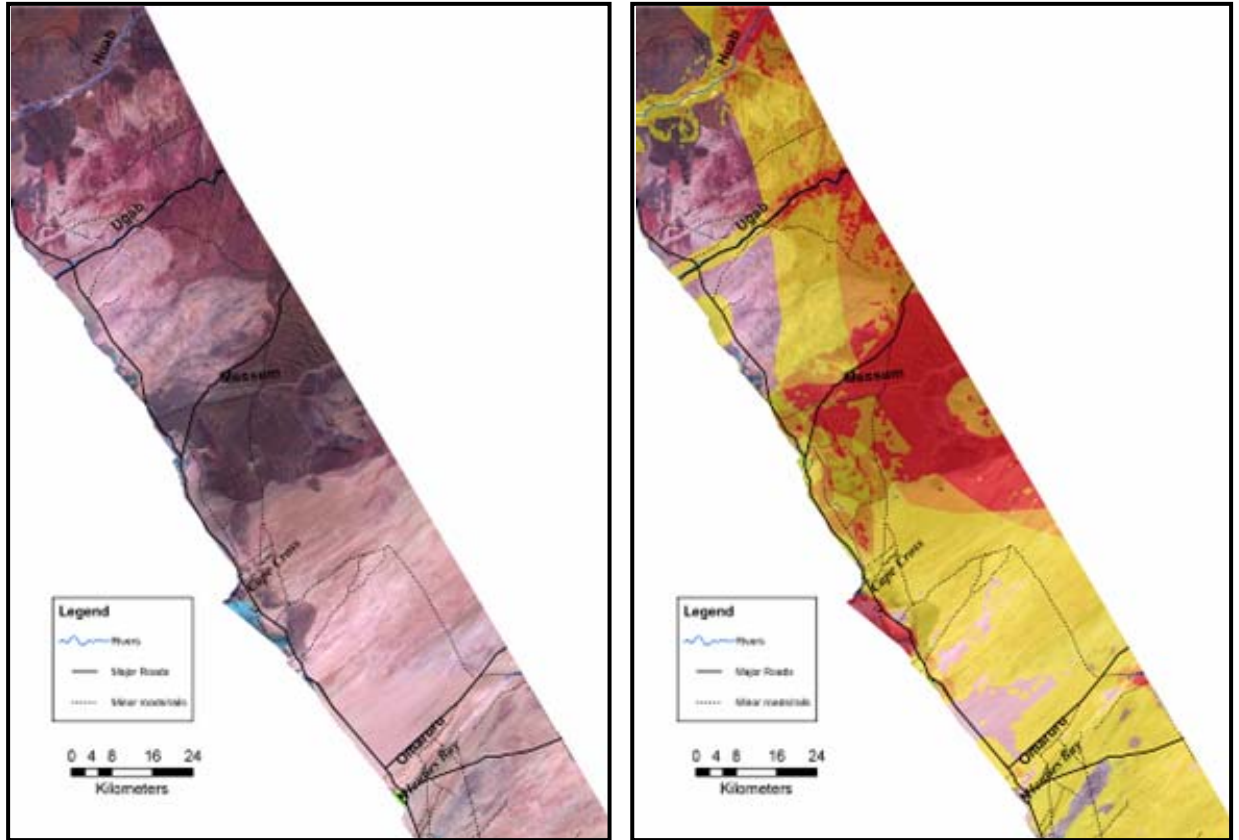


Figure 28: The Cape Cross Lagoon and Seal Reserve and the Brandberg Massif and areas/habitats of conservation priority (below). The ranking of conservation priority follows Figure 9.

4.2.8 National West Coast Tourist Recreation Area

On the Erongo Coast north of the Mile 4 Saltworks, the NWCTRA is entered. Temporary accommodation for recreational visitors, principally anglers (the camp sites at Mile 14, Jakkalsputz, Mile 72 and Mile 108) is mixed with small nodes of more permanent occupation. The new management plan for the NWCTRA and will have to take account of the increasing pressure from urban and tourist developments around Walvis Bay, Swakopmund and Henties Bay and from mineral extraction activities in the eastern part of the area. Given the mounting pressures, the relatively weak conservation status, the lack of an appropriate protection for the wetlands at Mile 4 Saltworks and Cape Cross Lagoon as well as a lack of detailed guidance for mining activities in relation to sensitive areas like the major river beds, the extensive lichen communities of Cape Cross and Wlotzkasbaken and the Brandberg Massif, MET is challenged with management requirements which may not be effectively covered by the conservation status of the area.

Recommendations

MET should develop a new conservation management regime for the NWCTRA, which satisfies the requirements for improved integration of growing land uses and nature protection. New management plans should establish a multiple use framework for future developments with zonation for all land uses, including information on the most sensitive areas to be avoided by mining activities, on the basis of detailed profiles of landscape, vegetation, wildlife, livestock and human settlements. The SEA provides assistance to this process. The mapping of priority areas for conservation indicates that the most sensitive areas and areas with largest eco-tourism potential are found at Sandwich Harbour, Walvis Bay, Mile 4 Saltworks and Cape Cross Lagoon and Seal Reserve, the river beds and associated areas of the Swakop and Ugab rivers and the rocky area associated with the Brandberg Massif (Figure

25). Other land uses, including conventional tourism, should be focused on the parts of the NWCTRA with limited concentration of biodiversity.

The development of conventional and eco-tourism should be guided by a tourism plan for the area.

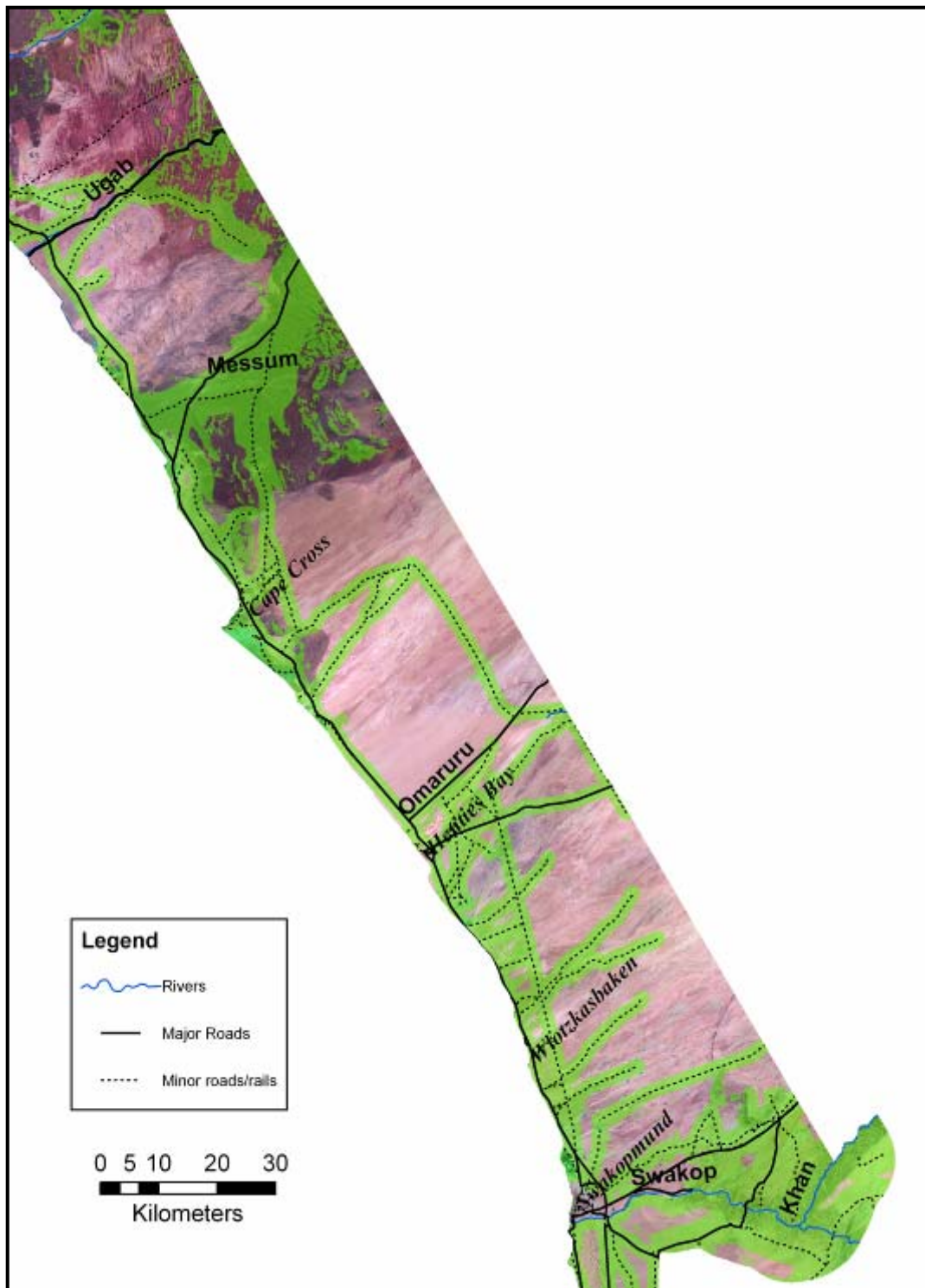


Figure 29: Suitable areas for eco-tourism in the NWCTRA.

4.3 Kunene Region

4.3.1 Priority areas for conservation

Concentrations of prioritised biodiversity elements are located in three areas or landscape types: the mouth of the Kunene River, along the river beds of all the ephemeral rivers with prominent stands of higher plants like *Acacia* spp. and *Colophospermum mopane* and throughout the eastern-central sector between Koigab and Hoanib rivers. Areas of moderate concentration of prioritised biodiversity elements are found in the periphery of these areas/landscapes.

The characteristic biodiversity features of the Kunene River mouth were described in Chapter 3.6.2. The existence of this wetland, and some of the unique fauna which it supports, is threatened by the proposal to build a dam further upstream at Epupa. During the filling of the dam, which would take between one and four years, the reduced water flow at the Kunene River mouth may have significant effects on this wetland.

The eastern-most parts of the river beds of the Ugab (see Chapter 4.1), Huab, Koigab, Uniab, Hoanib and Hoarusib located within the Skeleton Park are characterised by habitats which support elevated densities of a wide range of taxa and species, like growth of *Acacia* spp. and *Colophospermum mopane*, rocky outcrops and high topographic complexity (Figure 30). The unique fauna includes several species of large herbivorous and carnivorous mammals, and bird species like the Black harrier.

The eastern-central sector of the Skeleton Coast National Park between Koigab and Hoanib rivers marks a zone of significant concentrations of habitats, especially for mammals migrating between Etosha and the coast as well as for a number of bird species recruited in the Escarpment (Figure 30). In addition the zone supports extensive coverage of *Welwitschia*, and rock outcrops are found centrally while an area of high complexity is found in the south. The zone is used both by relatively common mammal species like Springbok as well as by rare and endangered species like Mountain zebra, Lion, Elephant and Leopard. Elephants seem to use the northern-most part of the zone. The zone extends furthest towards the coast near Möwe Bay, thus interactions between mammals and tourists visiting the zone is most likely here.

4.3.2 Skeleton Coast National Park (SCNP)

4.3.2.1 History and Management Policies

MET's Directorate of Parks and Wildlife Management is responsible for the SCNP. Most of the present SCNP was part of the German Colonial Rule's Game Reserve 2 of 1907 and expanded to the Ugab River in 1958 as the then huge Etosha National Park. After several reductions the strip along the coast was proclaimed as the Skeleton Coast Park in 1971 a contributing factor being the fact that the area is not fit for agricultural purposes or human habitation. The present status is demarcated in the *Nature Conservation Ordinance No. 4, 1975*.

The SCNP extends from the Ugab River in the south to the Kunene River in the north and reaches 30-50 km inland. The area receives 30-40 mm water annually from the coastal fog and occasional rain and except for the Kunene River, water is only found in ephemeral rivers.. The river beds are nevertheless the main source of the area's biodiversity.

Going from the northern border of the park, the Kunene River, 250 kms south one finds the first permanently inhabited location at Möwe Bay where the MET ranger station is located. After a further 80 kms one arrives in the Namibian Wildlife Resorts (NWR) run settlement of

Terrace Bay, which is a former mine that now features a school and a lodge providing accommodation for visitors. Another 50 kms brings one to Torra Bay and the self catering camping site very popular with anglers during the holiday season.⁷⁷ Up to Terrace Bay the park is accessible to tourists who have obtained a permit from the MET. Presently, visitors are not allowed further into the park unless through the concession holders arrangement or invitation from MET as the area is ecologically sensitive and managed by the MET as a wilderness area. This restriction does not apply to the prospecting teams, who are frequent travellers on the roads and beaches.

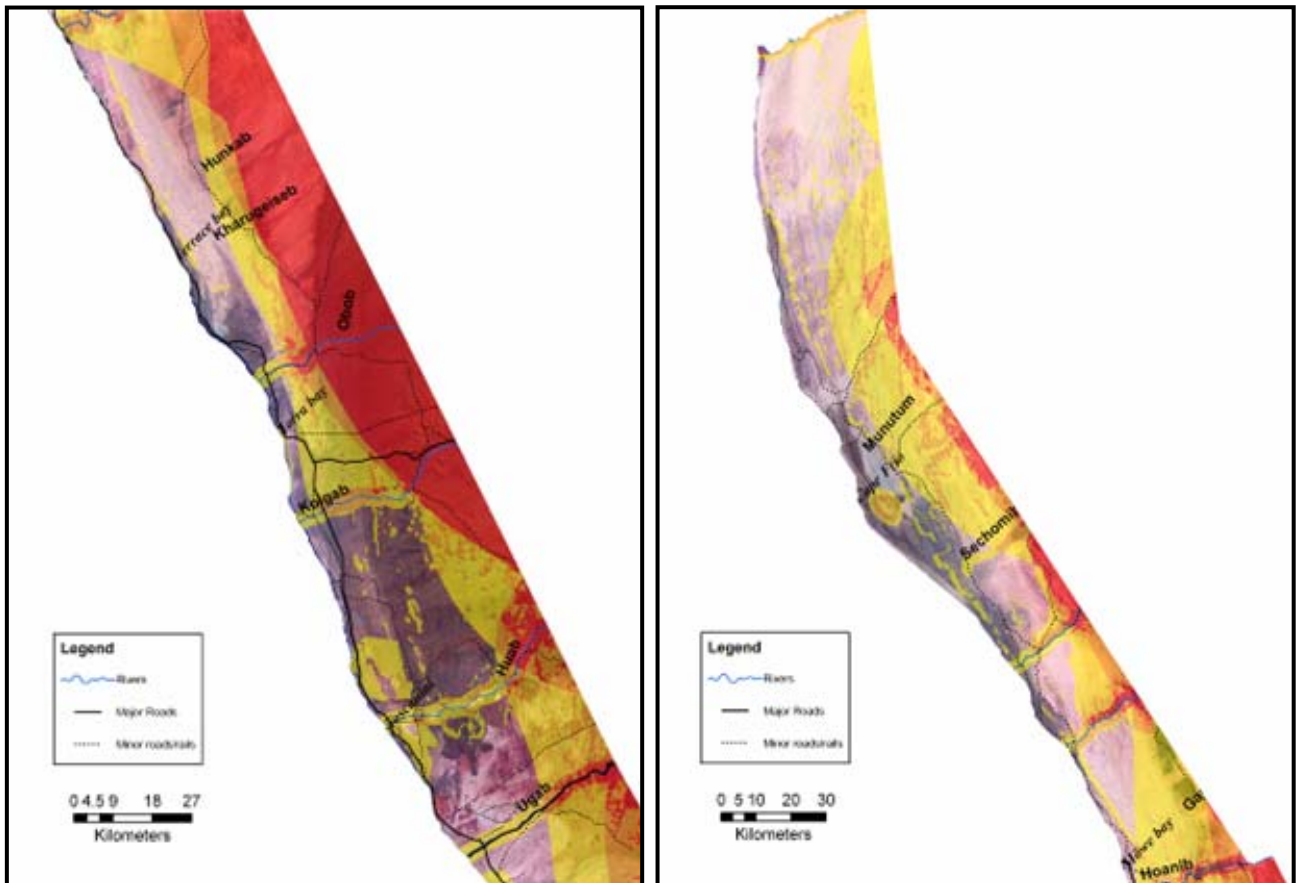


Figure 30: Priority areas for conservation in the southern and northern (south of Kunene mouth) parts of the Skeleton Coast National Park. Colour codes see Figure 9.

Presently, a management plan has been drawn up in the form of the Master Plan for the SCNP with a view to strengthen the management of activities in the park including prospecting, mining and tourism. The draft management plan for SCNP has three objectives:

- That the Park be given National Park status, and be conserved, controlled, monitored and administered as a National Park in accordance with IUCN criteria for the individual zones within the Park.
- To maintain the essential ecological processes, life-support systems, and biotic diversity, and
- Sustainable utilization of its resources for tourism, education and research, for the benefit of Namibians in particular, and humanity in general.

⁷⁷ The number of Namibian and RSA visitors to SCP is up 300-400% in December as seen in Entrance Statistics for 2006 from SCP Management.

In particular, all persons or companies falling within the category of Mineral prospectors and grant holders must comply with the National Environmental Policy for Namibia, as practised by the MET.

The only tourist activities permitted within the Park are recreational, environmental appreciation and education, where these are compatible with the Park objectives. Off-road driving trails are permitted in designated areas on routes approved for concession holders and Ministry staff. At Terrace Bay and Torra Bay off-road driving to the dune fields is permitted according to demarcated routes.

Protecting the biological value and integrity of SCP includes

- Development of categories of management zones
- Inventory of indigenous and exotic flora and fauna
- Control of water resources and wetlands
- Demarcation of angling areas
- Areas of special conservation concern
- Management of roads, vehicle tracks and airfields
- Layout and plans of tourist camps.

Permitting and zoning for these activities and resources will enable the MET staff to enforce the sustainable use of the park. Some of the tourism activities envisaged by the new management plan would include exclusive concessions, MET guided trails, self-guided trails and NWR run camps.⁷⁸

4.3.2.2 Concessions

The northern part of SCNP of close to 300,000 hectares is a private concession (Wilderness Safaris) running exclusive safari experiences for the upscale customer. The key words for the costly travels are that the SCNP is wild, desolate and uninhabited. The safaris are run on an island in the dry Khumib riverbed, about 20km inland from the coastline.

According to the contractor, last year included rare sightings of black-faced impala, African Jacana and of the "Skeleton Coast Lions".

Although not in the SCNP, it is interesting that the contractor also prides a successful community partnership programme with the 350,000-acre Torra Wildlife Conservancy that was barren and nearly poached out 10 years ago, and the new neighbouring community conservancy of another 180,000 acres. Some 10% of the net accommodation fees from each guest's stay at the Damaraland Camp as a catalyst are allocated directly to the community and all the staff members of this camp come from the surrounding district. Thus, the very existence of the camp has been instrumental in alleviating poverty in the region

As a central action in the process of implementing the evolving concession framework as reflected by the new Policy Framework for Concessions in Proclaimed Protected Areas (MET, 2004a) the concession policy in SCNP and the sole concession of Wilderness Safaris will end as of 2007, and licensing will be opened to multiple tenders. The SCNP is relatively under-developed in terms of tourism, with a narrow range of tourism services and activities on offer. Accordingly, MET sees the spreading of concessions as one of the mechanisms to expand the use of the park and diversify and modernize the tourism product, encourage innovation. Given the assets of the SCNP this development of the ecotourism and even targeted

⁷⁸ Interestingly, recent private initiatives in the Kaokoland aimed at less intrusive tourist activities in the area include '4x4' tours by camel rather than automobiles. *The Namibian*, Friday, May 18, 2007.

elements of more traditional tourism in coastal settlements could help enhancing Namibia's competitiveness in the international tourism market.

Recommendations:

SCNP is a globally unique place. It must maintain its protected status and wilderness characteristics. At the same time increased sustainable activities regarding tourism is possible. It should be considered how tourism business could be made into concessions to the benefit of locals and neighbours following the government's policies on Protected Areas, Neighbours and Resident People and the Policy Framework for Concessions in Proclaimed Protected Areas.

The Master Plan should be immediately agreed to and a start made in enforcing it. Development of diamond mining activities in the park is undertaken without advice on sensitive zones to be avoided and best areas for location of pipelines, tracks and roads. The SEA and the mapping of priority areas for conservation will contribute to the establishment of this advice. As described in Chapter 4.2.1 the most sensitive areas are the mouth of the Kunene River, the river beds of the ephemeral rivers with prominent stands of higher plants and the eastern-central sector between Koigab and Hoanib rivers. The lack of a detailed management plan has also introduced other activities in sensitive areas like off-road driving, recreational angling, private tourism, littering and the excavation of trenches.

The northern part of the SCNP from the Kunene to Möwe Bay should remain a closed area and be integrated with the Iona Transfrontier National Park.

Möwe Bay should develop its tourism potential to accommodate and cater for day trippers from Terrace Bay and fly-ins; this would include new housing to replace the existing pre-fab constructions. The landing site ("harbour") should be developed to allow launching of angling boats. The MET facilities should be rehabilitated with a clear objective of becoming a showcase sustainable settlement with solar and wind power, desalination, housing construction etc.

Terrace Bay

The area should be developed into a high end angling resort with accommodation in an all inclusive set up.. Day trips to Möwe Bay should be organised from Terrace Bay. Water resources should be conserved and no more fresh water should be used for the cleaning of saltwater fish. Waste water could be led into artificial wetlands.

Torra Bay

The site for budget accommodation should be monitored and aimed at domestic and RSA angler target groups. A Skeleton Coast Biodiversity Centre should be developed in support of eco-tourism aimed at improving potential for wilderness safaris in the SCNP – Etosha extension area.

Rangers

The vast area is severely understaffed, and discussions should be held between MET, MME, MFMR and other relevant ministries on how existing responsibilities with respect to surveillance and inspection of the North West Namibia could be most efficiently carried out. Costs should be shared and rangers should be able to carry out duties for other ministries to help increase frequency and efficiency.

4.3.3 Adjacent Conservancies

It is MET's hope that the new policies urging for sustainable and decentralised development in the SCNP, not least the attempt to involve the adjacent conservancies in this development, will help to accomplish multiple use of the park areas. Here, the key guidance are the evolving concession framework as reflected by the new Policy Framework for Concessions in Proclaimed Protected Areas (MET, 2004a) and the draft Policy on Tourism and Wildlife Concessions on State Land (MET, 2006). The new concession policy will improve the opportunity for formerly disadvantaged Namibians in the adjacent conservancies to obtain concessions within the park for business development and the economic empowerment through the tourism industry. This policy will further help realising the real ecotourism potential for the parks and help implementing the goal of integrating conservation with the basic development needs of local people in the conservancies. At the same time the sensitivity of the Skeleton Park environment and the resource requirements for wildlife tourism make it necessary that the licensing of concessions is made with careful planning. As it is written in the preamble to the new Policy on Tourism and Wildlife Concessions on State Land:

“Some of the concessions that potentially could be made available include world-famous attractions and scenery that lend themselves to the form of high value but low impact tourism that we wish to promote in Namibia, or include an unrivalled selection of high quality big game species and valuable indigenous plant resources. Most of the State land that is potentially suitable for concessions is nevertheless characterized by fragile environments, requiring careful attention to the management of concessions in ways that would avoid negative impacts and maintain the value of our natural assets.”

Tourism concessions could entail various types, for example the right to develop a lodge within a specified area, the right to offer tourism services such as guided tourism within a specific area, or the right to offer more specialized tourism services such as adventure tourism, aerial tourism, car rentals, etc. within a specified area. Concrete steps have already been taken to implement these policies together with the Plan for a link to Etosha, and MET **will now initiate an intensive, consultative management and development planning process for the park. Naming the new park will form part of this process. Three hunting concession areas in the Kunene Region will be consolidated and declared a national park. The areas are the Palmwag, Etendeka and Hobatere concession areas with a combined wildlife population of 150 black rhinoceros, about 1,000 desert elephants and 100 lions. Existing concessions for Etendeka and Hobatere will expire next year while the concession for Palmwag expires in 2010. The park will extend to the northern bank of the Hoanib River, inclusive of the associated flood plains, as well as unsettled state land connecting the Hobatere concession area.**

Further, these policies and plans for increased involvement of the adjacent conservancies in the ecotourism in the Skeleton Park have stimulated the launch of the Integrated Community-Based Ecosystem Management Project (ICEMA) under the MET-led National Community-Based Natural Resources Management (CBNRM) Programme. The ICEMA project offers the potential of extending biodiversity conservation and management beyond Namibia's protected areas network, while providing at the same time for wildlife corridors between protected areas. The ICEMA Project and the plan for an extension to Etosha covering some 6,700 km² will help establish the link between the Skeleton Coast and the Etosha National Park, and will allow rural communities to generate income through ecotourism, biodiversity management and rural development.

Recommendations:

In order to develop a wide palette of tourist services in the SCNP with the involvement of the conservancies it is of the utmost importance that the Master Plan adopts a multiple use framework for the management of the park, which includes the three conservancies of Palmwag, Etendeka and Hobatere. A multiple use framework needs to be developed with detailed advice on sensitive zones to be avoided by tourism, mining exploration and produc-

tion and other human activities as well as advice on the best locations for the placement of supporting infrastructure like pipelines, tracks and roads.

4.3.4 Kunene River Mouth

As described in chapter 4.3.1 the Kunene River Mouth on the basis of its unique mixture of desert, freshwater and marine habitats and its high diversity of species is regarded by MET as an area in need of being contained within Namibia's national network of protected areas. To respond to this need MET and the Ministry of Urbanism and Environment in Angola has initiated a process that will result in a treaty to establish and manage a Transfrontier Conservation Area (TFCA) which shall include the Iona National Park in Angola and the SCNP in Namibia. A Memorandum of Understanding between the two countries on the TFCA is in progress, yet no details with respect to the park status, exact boundaries and management framework of the TFCA have been disclosed.

In line with the implementation of the government's policies on Protected Areas, Neighbours and Resident People and the Policy Framework for Concessions in Proclaimed Protected Areas through the enforcement of the SCNP Master Plan it will be necessary to include the TFCA process in the Master Plan.

Recommendations:

The building of a dam at Epupa will require that a management framework be set up covering the entire lower Kunene River for successful management of the TFCA. Water influences the type and biological quality of the TFCA. This is especially true in the Kunene River Mouth as it is located in an arid region. A thorough understanding of the overall hydrology is thus imperative for all management aspects both in the TFCA as such as well as in the upstream part. Literally the Kunene River Mouth is the 'end of the line' and all interventions in the upstream part shall inevitably have an impact down stream as well as unpredictable changes in the overall climate conditions may dramatically influence the Delta area. Management aspects of the TFCA shall therefore be seen in a dual context – both from an upstream view - and from a downstream view.



Epupa Falls
Kunene
Photo: P. Tarr

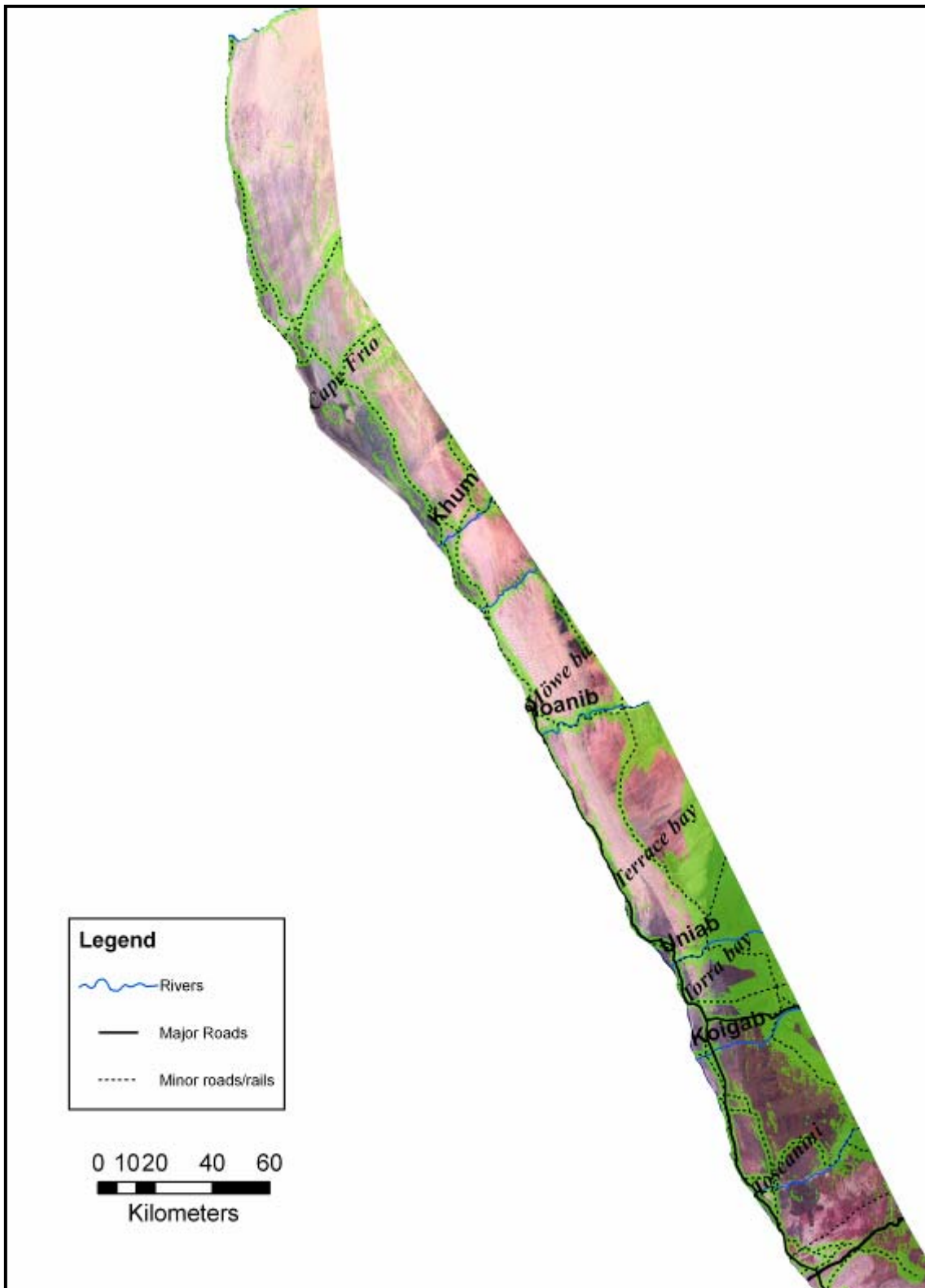


Figure 31: Suitable areas for eco-tourism in the Skeleton Coast Park.

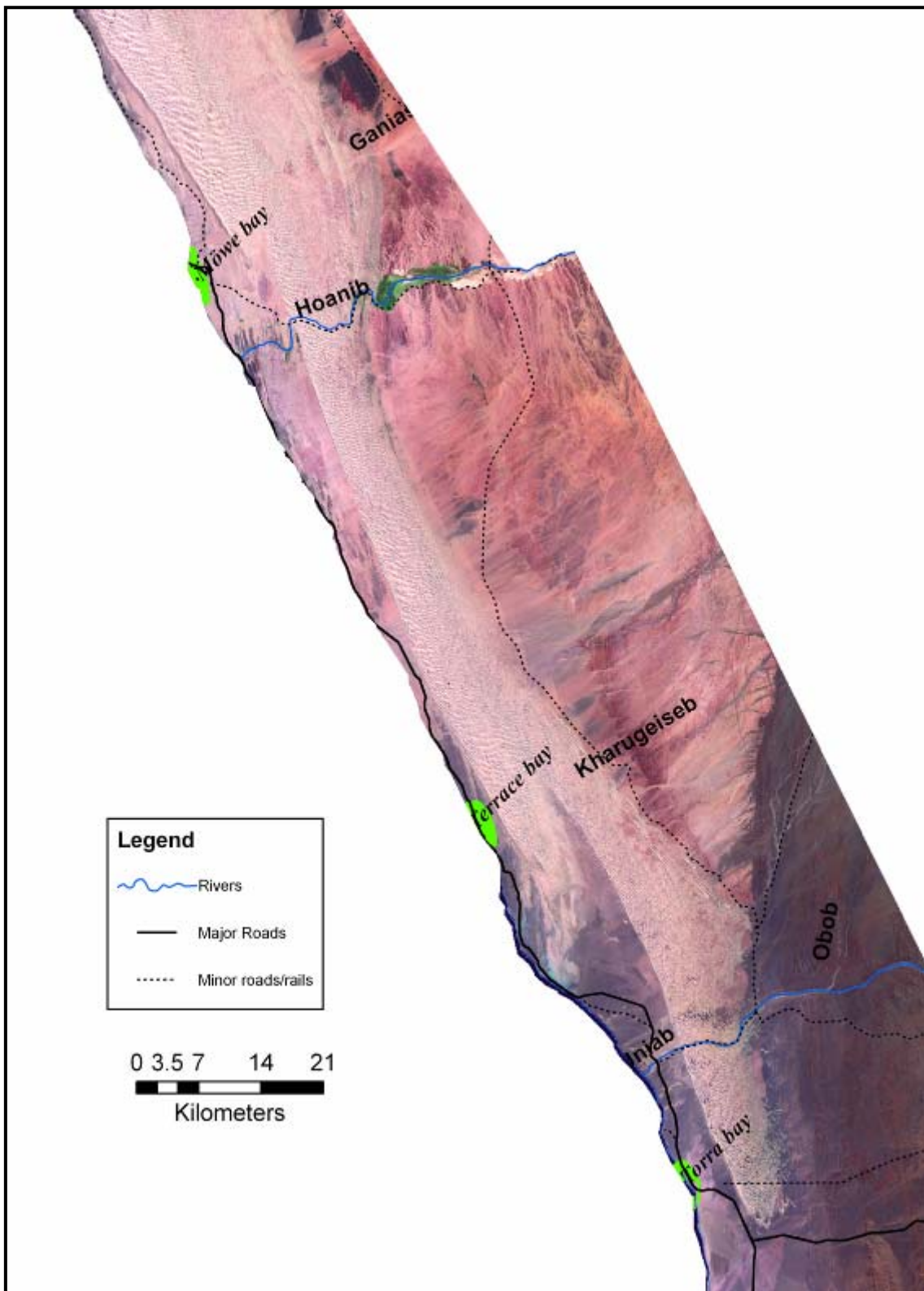


Figure 32: Suitable areas for development of conventional tourism activities in the Skeleton Coast Park (in green).

5 CONCLUSIONS AND RECOMMENDATIONS

5.1 General

It is the intention that through the parallel analyses of coastal policies and land use suitability this Strategic Environmental Assessment for the coastal areas will provide the Ministry of Environment and Tourism, regional councils, municipalities and other stakeholders with a broad strategic framework needed for improving both planning and management of the coastal regions of Kunene and Erongo. By offering an integrated high-resolution assessment of development opportunities and conservation targets the SEA should be viewed as an instrument by which the local and regional authorities may take the first steps to enrich the currently inefficient sector-based management with integrated and ecosystem-based management, particularly in the planning stages. In that sense, the SEA and the associated coastal Decision Support Tool (see Chapter 5.3), in concert with the various other outputs from NACOMA, will help in founding a shared strategic perspective on the economic, social and environmental interactions involved in the sustainable development of the Erongo and Kunene coastal regions, and of the adjustments, compromises and trade-offs that need to be made to assure better coastal planning and management in the short and medium term.

To be able to use ecosystem-based management as a vehicle to capture the new opportunities spawned by the decentralisation process and increased economic activity on the coast, existing institutional and legal frameworks also need to be updated. When enacted, the draft Urban and Regional Planning Bill will also result in the emergence of a more integrated, coordinated and effective system of land use planning, development and control in Namibia in general, and on the coast in particular.

More than 90% of the two coastal regions fall within Namibia's national protected areas system. At the same time, the boundaries of the Skeleton Coast National Park, the National West Coast Tourist Recreation Area and the Namib-Naukluft Park were proclaimed before Namibia gained independence and the modern environmental legislative framework in support of the integration of nature conservation and sustainable development was established. Thus, with the exception of the Namib-Naukluft Park, no clear goals have been set up linking management of human resource use and the conservation status of key species and habitats. As a result it is unclear which biodiversity elements constitute the focus for the coastal parks, and which elements are the focuses of more wide-scale habitat conservation action due to their widespread occurrence or lower susceptibility to human activities. This lack of conservation targets degrades both the conservation of the most sensitive elements of the biodiversity in the coastal parks as well as the implementation of sustainable development within the park's boundaries.

Like other studies on biodiversity trends in Erongo and Kunene, the SEA indicates a mismatch between the boundaries of the coastal parks and the general trends in biodiversity found in the coastal regions. The trends are striking and underline the fact that conservation priority areas and habitats in the protected coastal parks are not evenly distributed along or across the coastal strip. The NBSAP provides for the implementation of article 95:1 of the Namibian Constitution and the Convention on Biological Diversity and it offers MET the legal mechanisms for achieving the goal to develop management plans for the coastal parks. Currently management plans with zoning of the area and tourism development plans have only been prepared for the Namib Naukluft Park. In that respect the SEA provides guidance to the zonation of the parks into potential areas for sustainable development and areas of different sensitivity and importance as a basis for identifying core areas for conservation to be held free of any development.

Due to the vast biodiversity assets of the coastal regions of Erongo and Kunene and the sensitive ecosystems they support, the largest development potential is related to the tourism industry. Although tourism land use patterns can not currently be separated into the various types of tourism activities undertaken on the coast, it is clear that low-impact adventure and wildlife tourism (eco-tourism) can be widely applied and developed hand-in-hand with the conservation of biodiversity hot spots. Indeed, in terms of competition with other destinations – both domestic and international and even regional – preservation of the extraordinary conditions of the coastal environment in Kunene and Erongo might give the industry a competitive edge⁷⁹.

As the tourist policy and plan making are lagging behind both at regional and local levels, a current strategy and a support programme for both conventional and eco-tourism are urgently needed to boost the sector in both Kunene and Erongo. Local governments, at times working together, are enabling the activities of a resurgent private sector. But coordination between stakeholders seems poor, and there is little shared understanding of how coastal tourism has shifted its target markets, adapted its products, and moved forward. Up to date information to back up such an understanding is lacking. In this situation, there is a danger that environmental planning and management receives only lip service, and the resources on which coastal tourism depends are being degraded.

The need to strengthen the basis for capitalising on the potential win-win development scenario between eco-tourism and nature conservation on the coast is closely linked to the need to strengthen the power of MET relative to other line ministries. It is recommended that tourism development on the coast be aligned with the MET Concessions Policy, with guided tourism and camp/lodge development being undertaken as joint ventures between the private sector and state and/or local community groups (Barnes, 2007). This will assist in reducing open access problems and increasing the economic value and sustainability of the sector. The full use of the tourism potential in the coastal areas will also depend on the implementation of the Neighbours and Residents Policy, as tourism is currently growing in inland escarpment areas outside the coastal zone⁷⁹. The implementation of this policy could be enhanced if it is linked to coastal tourism developments and the new schemes for obtaining licenses for concessions are offered to inland as well as coastal disadvantaged groups as well as to joint ventures between well-established companies and local residents.

Compared to eco-tourism, other land-uses, including traditional 'high-impact' tourism, possess a significantly smaller development potential in the two coastal regions. In spite of the lower potential, sustainable development is possible to achieve for all land uses by adopting the following environmental standards for land use development in pristine and sensitive environments:

- Avoidance of the most sensitive areas identified on the basis of a detailed baseline, in which habitat sensitivity in focal areas for land use development is mapped or modelled prior to environmental impact studies. The SEA provides guidance on the general location of hot spots of biodiversity, and may be used as basis for designing more detailed studies of the sensitivity of the areas in relation to various development projects;
- International standard environmental impact studies coupled to careful mitigation which secures the application of effective response mechanisms, which can then allow developments to proceed in close proximity to important and sensitive habitats. In cases where significant impacts can not be avoided, changes to the planned development must take place. In cases where impacts of minor or moderate scale are estimated, careful mitigation measures must be set up and the residual impact following implementation

⁷⁹ J.I. Barnes & M. Alberts, 2007. *Sustainable tourism options for the coastal zone of Namibia and refinement of available data on coastal natural resource use practices. Draft report to NACOMA.*

of mitigation must be estimated. Assessments of single project as well as cumulative impacts of a planned project together with all other existing human activities must be included.

- Comprehensive environmental monitoring and management, which secures that the level of control necessary to assure authorities and NGOs of compliance with environmental quality objectives for development in proximity to sensitive habitats, require quantifiable compliance targets. Of equal importance are effective and rapid response mechanisms, to allow feedback of monitoring results into compliance targets and work methods.

As stated in the Vision 2030 sub-vision on urbanisation there is a growing need for Namibia's secondary cities like Walvis Bay and Swakopmund to play a bigger part in absorbing urban development than they do today, where Windhoek is hosting the major urban growth. Accordingly, the need for better urban policy, planning and management to accommodate urban growth is likely to increase in the future. Sustainable urban development will rely on urban policy, planning and management practices facilitating the development of the Walvis Bay - Swakopmund area as a sub-regional platform to spatially concentrate, accommodate and enhance the benefits of urban and economic growth in the Erongo Region.

The location of nearby areas of conservation priority like the river valleys of the Kuiseb and Swakop rivers, the wetlands like Walvis Bay Lagoon, lichen fields and localised high densities of breeding Damara terns severely constrain the suitability for spreading urban land use beyond areas currently allocated to residential, beach resort and industrial establishments. However, even facing these constraints Walvis Bay and Swakopmund can increase their importance as key national assets by developing an improved basis for spatial planning and management, by observing high standards of strategic and impact assessment and by developing detailed tourism plans. In addition, enhancement of the legal framework for coastal protection is required to implement sustainable urban development, as the land between the low and high water marks is currently lacking any protection from development⁸⁰.

A major factor in the future economy of Erongo and Kunene is the mining industry. In order to improve planning of the extraction of minerals and avoid unsustainable development of the industry on the coast the environmental standards for land use development in pristine and sensitive environments mentioned above must be observed, and MET must increase its influence on the Minerals Prospecting and Mining Rights Committee and must be involved in the assessment of environmental monitoring programmes. It is particularly important to ensure liaison with MET at an early stage of prospecting for mineral extraction in the protected areas and national monuments. For each licence awarded, MME and the MET must agree with the licensee on the scope of the prospecting in terms of volume of soil/sand removed. Larger amounts may only be removed after exemption or renewed application and permit. A new Bill is being prepared which introduces requirements for financial guarantees for reparation of environmental damage and the setting up of trust funds for rehabilitation after mine closure. This may provide leverage for the enforcement of rehabilitation. The environmental monitoring of mining activities which is carried out by the Division of Engineering and Environmental Geology of MME provides for an important environmental control of potentially adverse impacts like excessive water supply, dust emission and pollution of surface- as well as groundwater. Here, again, MET should be involved as a third party to evaluate monitoring results.

Better planning of water resource use in mining activities is the key to more sustainable mineral extraction on the coast. The existing water use policy, which leaves the organisation of water supply to the individual mining company, has to be replaced by a policy which ensures

⁸⁰ SAIEA, 2007. *Review of existing institutional mandates, policies and laws relating to coastal management, and proposals for change. Final draft for NACOMA. The Southern African Institute for Environmental Assessment.*

that unsustainable water extraction/desalination and distribution patterns do not emerge. As the current water use in Erongo is over-utilising the water resource, desalination plants are being considered whenever future water demands are discussed. A feasible project has yet to appear, but other coastal developments in arid zones have resorted to this solution and the cost of the technology is decreasing. Namwater may licence a BOP to run a desalination plant feeding mines through a distribution network to mines based on the Rossing pipe.

Aquaculture has gained considerable interest in Namibia over the last few years. The current National Development Plan (NDP 2) calls for the promotion of aquaculture activities and the national policy paper Vision 2030 both foresee a thriving aquaculture industry. Since 2003, the Aquaculture Act has provided a legislative context, and the policy paper *Towards the Responsible Development of Aquaculture* (2001) and the *Aquaculture Strategy* (2004) were developed to address the development of a sustainable aquaculture sector. Recently, detailed plans have been developed for Erongo, while very little aquaculture has been proposed in the Kunene region due to the distance to market and infrastructure challenges. In addition, the Walvis Bay Town Council has proposed to zone two plots between Walvis Bay and Swakopmund for aquaculture development with land based facilities. Unfortunately, the current plans have not been founded on the basis of a comprehensive environmental master plan which considers both the natural marine environment from a feasible production and environmental point of view. An environmental master plan could provide a detailed zoning on the basis of the SEA and water quality data available from BCLME and could provide a sectoral strategic environmental assessment including modelling of effects on local water quality properties. The modelled suitability for sea-based and land-based aquaculture made by this SEA indicates that suitable locations in Erongo are few and localised and associated with Walvis Bay, Swakopmund and Henties Bay. Hence, proper planning of aquaculture developments in Erongo will require careful scrutiny of potential land use conflicts between residential areas and suitable areas for aquaculture.

5.2 Specific

5.2.1 Erongo

5.2.1.1 Sandwich Harbour

In line with the new Wetland Policy, Sandwich Harbour should be declared a Marine Protected Area to protect the large numbers of waterbirds, fish spawning and rearing, the shark population and the possibility of Southern Right Whale calving. A plan for transferring the management of the MPA from MFMR to MET should be developed. A detailed management plan should be prepared allowing strict protection of the site, while enabling low-impact ecotourism to continue to take place. It would be an advantage if jurisdiction on enforcement of MPA regulations could be transferred to MET rangers.

5.2.1.2 Walvis Bay Wetland

In line with the new Wetland Policy, enforcement of the Walvis Bay Nature Reserve Management Plan should be pursued in the short term backed up by detailed mapping of the gradients in vulnerability of biodiversity in relation to the wide range of land uses. MET should formally designate the Nature Reserve as a protected area. MET, the Walvis Bay Municipality and the Coastal Environmental Trust of Namibia should ensure further enforcement of the national Wetland Policy in the area by adopting the Nature Reserve Management Plan.

MET, the Walvis Bay Municipality and the Coastal Environmental Trust of Namibia should as soon as possible also establish a long-term environmental monitoring programme including the biodiversity elements for terrestrial, coastal as well as offshore habitats found in the wetland. A baseline for the monitoring programme should produce diversity gradients in relation

to tourism, aquaculture and agriculture and the acquired data should feed into the requirement for improved Environmental Impact Assessments. To make full use of the potential for development of eco-tourism and traditional tourism in the wetland, a tourism development plan for the Nature Reserve should be drafted by the Walvis Bay Municipality in collaboration with the Walvis Bay Tourism Association and the Marine Tour Association of Namibia. Developments of tourist activities in the reserve and accommodation adjacent to the reserve should only take place on the basis of permissions subject to Environmental Impact Assessment. A feasibility study of the development of the existing aquaculture farms for oyster and future marine and land-based aquaculture in the wetland should be undertaken in relation to the most sensitive parts and residential areas.

The aquaculture development near Pelican Point is in waters zoned for port activities and included in the nature reserve. The planned area conflicts with the dredge spoil dump site nearest to the harbour and may conflict with the conservation targets for the nature reserve. An environmental master plan for the Aqua Park should include provisions for retrieving oysters when dredging and spoil dumping is in progress and detailed assessments of impacts on coastal and marine biodiversity elements.

5.2.1.3 Dune belt

The dune belt should be included in the Walvis Bay Nature Reserve, and free zones for off-road driving should be maintained east of Walvis Bay and east of Long Beach. The demarcation of the free zone east of Long Beach should take account of the area used by Damara Terns from the colony south of Long Beach. The management and environmental monitoring of the area should be part of the activities proposed for the Nature Reserve. Expansion of eco-tourism activities should be promoted through inclusion of the dune belt in the proposed Walvis Bay tourism development plan. Once the existing mining licenses expire, new reconnaissance, prospecting or mining licences should not be granted in the dune belt. The zoning of eco-tourism and free zones for off-road driving should become object of a detailed Environmental Impact Assessment.

5.2.1.4 Walvis Bay

The process for the revision of the Walvis Bay Municipality Structure Plan will be concluded in the next months. This will involve, in part, the discussion and approval of the proposals relevant to the Esplanade and to the coastal area. This process provides a valuable opportunity for Walvis Bay Municipality and other stakeholders to resolve the land use and zoning issues that have caused controversy for a long period. The proposals for the Esplanade are broadly in line with the structure plan. The proposal for encouraging higher density developments and activities related to conventional tourism along the lagoon, should be reconsidered or justified further, as the modelled land use suitability for conventional beach tourism in the Walvis Bay area indicates low suitability along the lagoon. Protests about the proposed mixed use development on the Atlantis Sports Grounds could be set to rest by keeping the development on the eastern side of the road, and therefore not closing the Esplanade to through traffic.

The SEA indicates high biodiversity values in the northern part of the coastal area adjacent to the Swakop River and the land use suitability maps indicate a lack of suitability for land uses other than eco-tourism. This area remains undeveloped, and the only proposal for development that was subjected to an EIA in recent years – a residential area near the Swakop River in 2002 – was rejected by MET on the basis of the EIA and the Peri-Urban Policy. In view of its biodiversity, recreational and landscape values, it is recommended that the area, which is still state land, be maintained solely as a Conservation Area, as per the original structure plan and Peri-Urban Land Use Policy. The proposals for nodal residential developments near the Swakop River Mouth and in the Caution Reef area should be rejected. Conservation, Eco-Tourism and Aquaculture are uses that do not fit easily with one another – the proposed mixed zone at Caution Reef should be shelved.

The urban and economic development on the southern part of the coast should be accepted by stakeholders. This development started nearly 20 years ago with the proclamation and development of Long Beach. It was given ample room for expansion by WBM's rezoning in 2003 and the subsequent development of Long Beach Extension 1 and of the three new residential areas that are now either underway or planned for the near future. The structure plan revisions propose a mix of harbour and aquaculture, residential and public beach/recreational activities in the area. These should be accepted, as indicated by the SEA land use suitability models. More analysis will have to be done on the means that can be used, such as design guidelines, for assuring that these very different land uses do not conflict with one another, with negative impacts for residents and the natural environment. At the same time, sufficient public beach and recreational space and access to it for residents will be needed to also be assured. Given that the land-use suitability models indicate that the majority of the area sustains low suitability for aquaculture and high suitability for tourism the potential for increased recreational uses of the area should set the scene.

5.2.1.5 Swakopmund

It will be necessary for SM and MFMR to decide jointly which portions of the land between Mile 4 and the Mile 4 Saltworks should be allocated to aquaculture and which to possible future urban development. In principle, both uses can be accommodated, as indicated by the SEA land use suitability models, providing measures are taken to mitigate any impacts from the essentially industrial processes which characterise aquaculture. The area north of the Saltworks appears more suitable for land-based aquaculture development. An EIA is recommended for any future developments of scale in the area.

5.2.1.6 Mile 4 Saltworks

The Mile 4 Saltworks comprises a private nature reserve of 400 ha, Saltworks, guano platforms and oyster production. No conflicts seem to exist between the waterbird concentrations, the salt extraction, oyster production and guano scraping at the Saltworks. In line with the new Wetland Policy the current seemingly sustainable activities should be monitored and any new development should be subject of environmental impact assessment. The area just north of the Saltworks has been identified as a potential development area for land-based aquaculture by MFMR, and the land use suitability models of the SEA indicate that the area is suitable for aquaculture development.

5.2.1.7 Wlotzkasbaken

Under the auspices of the ERC, a structure or development plan should be prepared for the Wlotzkasbaken area. This should highlight both development options (residential, recreational, aquaculture, etc.) and the zoning of future land uses.

5.2.1.8 Henties Bay

The tourism development in Henties Bay overlaps with an urbanisation of prime land along the beach, and it is therefore recommended to consider future profitable and sustainable tourism development along the coast of the town of Henties Bay. Development should continue to be directed towards the south of the current urban area. The potential for land-based aquaculture should be pursued to the south of the town.

5.2.1.9 Brandberg Massif

The rocky areas of the Brandberg Massif, which are connected with Namibia's highest mountain Brandberg, at 2,606m, located in the central section of the Namib Desert some 30 km from the boundary of the National West Coast Tourist Recreation Area, is a priority area for conservation of a wide range of desert plants and animals. Recent analyses show that Brandberg is the epicentre of a rich vein of endemic mammals, reptiles, plants and amphibians.

ans that runs from the Sperrgebiet in the south to the Otjihipa mountains in the north. No other area in Namibia is as rich in endemics as the Brandberg massif; among the 90 endemic plants, eight are found nowhere else, whilst three of six near-endemic frogs, eight of 14 near-endemic mammals, 49 of 59 near-endemic reptiles, and 11 of 14 near-endemic birds occur on or around this inselberg. No land use development, except for eco-tourism, should take place in the Brandberg Massif.

5.2.1.10 Cape Cross Seal Reserve

Currently this wetland is registered as a nature reserve with the purpose to restrict access to the public. The seal reserve is visited by 40,000 tourists per year. In line with the new Wetland Policy, the current seemingly sustainable levels of tourism, guano-scraping and small-scale salt-extraction activities should be monitored and any new development should be subject of environmental impact assessment.

5.2.1.11 National West Coast Tourist Recreation Area

MET should develop a new conservation management regime for the NWCTRA, which satisfies the requirements for improved integration of growing land uses and nature protection. New management plans should establish a multiple use framework for future developments with zonation for all land uses, including information on the most sensitive areas to be avoided by mining activities, on the basis of detailed profiles of landscape, vegetation, wildlife, livestock and human settlements. The SEA provides assistance to this process.

The mapping of priority areas for conservation indicates that the most sensitive areas and areas with the largest eco-tourism potential within the NWCTRA are found at Cape Cross Lagoon and Seal Reserve, the river beds and associated areas of the Swakop and Ugab rivers and the rocky area associated with the Brandberg Massif. Other land uses, including conventional tourism, should be focused on the parts of the NWCTRA with limited concentration of biodiversity. The development of conventional and eco-tourism should be guided by a tourism plan for the area.

5.2.2 Kunene

5.2.2.1 Skeleton Coast National Park

The Skeleton Coast National Park is a globally unique place, and must maintain its protected status and wilderness characteristics. At the same time, increased sustainable activities regarding tourism are possible which will benefit locals and neighbours in adjacent conservancies. The government's policies on Protected Areas, Neighbours and Resident People and the Policy Framework for Concessions in Proclaimed Protected Areas should be implemented as soon as possible, and the park's Master Plan should be agreed upon and enforced. New management plans for the Skeleton Coast National Park, the TFCA, and the proposed extension to Etosha should establish target habitats for conservation and species action plans as well as zonation for all land uses, including areas to be avoided by mining activities, on the basis of detailed profiles of landscape, vegetation, wildlife, livestock and human settlements. The SEA provides guidance to this process.

Development of diamond mining activities in the park is undertaken without advice on sensitive zones to be avoided and best areas for location of pipelines, tracks and roads. The lack of a detailed management plan has also allowed other activities in sensitive areas like off-road driving, recreational angling, private tourism, littering and the excavation of trenches. The SEA and the mapping of priority areas for conservation will contribute to the understanding of the locationally-sensitive areas. The most sensitive areas are the mouth of the Kunene River, the river beds of the ephemeral rivers with prominent stands of higher plants and the eastern-central sector between Koigab and Hoanib rivers. The easternmost parts of the river beds of the Ugab, Huab, Koigab, Uniab, Hoanib, Hoarusib and Khumib located within the

Skeleton Coast National Park are characterised by habitats which support elevated densities of a wide range of taxa and species, like growth of *Acacia* spp. and *Colophospermum mopane*, rocky areas like the Agate Mountain and high topographic complexity. The unique fauna includes several species of large herbivorous and carnivorous mammals, and bird species like the Black harrier. The eastern-central sector of the Skeleton Park between Koi-gab and Hoanib rivers marks a zone of significant concentrations of habitats, especially for mammals migrating between Etosha and the coast as well as for a number of bird species recruited in the Escarpment. In addition the zone supports extensive coverage of *Welwitschia*, and rock outcrops are found centrally while an area of high complexity is found in the south. The zone is used both by relatively common mammal species like Springbok as well as by rare and endangered species like Mountain zebra, Lion, Elephant and Leopard. Elephants seem mainly to use the northern-most part of the zone.

The northern part of the Skeleton Coast Park from the Kunene River to Möwe Bay should remain a closed area and be integrated with the planned TFCA. Möwe Bay should develop its tourism potential to accommodate and shelter for day trippers from Terrace Bay and fly-ins; this would include new housing to replace the existing pre-fab constructions. The landing site (“harbour”) should be developed to allow launching of angling boats. The MET facilities should be rehabilitated with a clear objective of becoming a showcase sustainable settlement with solar and wind power, desalination, housing construction etc. Terrace Bay should be developed to capitalise on the suitability of the location for tourism, including beach resorts. The area might be developed into a high-end angling site and the point-of-departure for day trips to Möwe Bay and trips to the adjacent core wilderness area with accommodation in an all inclusive resort. Torra Bay should remain a site for budget accommodation aimed at domestic, and SADC region eco-tourist and angler target groups. Develop a Skeleton Coast Biodiversity Centre in support of eco-tourism aiming at the improved potential for wilderness safaris in the Skeleton Coast – Etosha extension area.

Considering its vast area, the park ranger staff is severely understaffed. It should be discussed in MET, MME, MFMR and other relevant Ministries how existing responsibilities with respect to surveillance and inspection of the North West of Namibia can most efficiently be carried out. Costs could be shared and rangers could carry out duties for other ministries to increase frequency and efficiency. From the biodiversity and eco-tourism point of view the proposal for the construction of a port in Cape Fria or Angara Fria should not be pursued, since the necessary infrastructure developments will severely affect the present remoteness/wilderness attraction to tourists. Unless national strategic concerns or strong economic incentives dictate a revisiting of the proposal it seems neither feasible nor sustainable under the present conditions.

5.2.2.2 Conservancies

In order to develop a wider palette of tourist services in the Skeleton Coast National Park with the involvement of the conservancies it is of the utmost importance that the Master Plan adopts a multiple use framework for the management of the park, which includes the three conservancies of **Palmwag, Etendeka and Hobatere. A multiple use framework needs to be developed** with detailed advice on sensitive zones to be avoided by tourism, mining exploration and production and other human activities as well as advice on the best locations for the placement of supporting infrastructure like pipelines, tracks and roads.

5.2.2.3 Kunene River Mouth

The building of a dam at Epupa will require that a management framework be set up covering the entire lower Kunene River for successful management of the TFCA. Water availability influences the type and biological quality of the planned TFCA.. This is especially true at the Kunene River Mouth as it is located in an arid region. A thorough understanding of the overall hydrology is thus imperative for all management aspects both in the TFCA as such as well as in the upstream part. Literally, the Kunene River Mouth is the ‘end of the line’ and any in-

terventions in the upstream part will impact downstream. Unpredictable changes in the overall climate conditions may also dramatically influence the Delta area. Strategies to construct a dam may have significant adverse effects on the potential for freshwater fisheries, aquaculture and angling. Management aspects of the TFCA should therefore be seen in a dual context – both from an upstream view and from a downstream view.

5.3 The SEA Decision Support Tool (DST)

The SEA report and appendices provide a principal output of the Strategic Environmental Assessment for the coastal areas of Kunene and Erongo regions. The other output is the SEA Decision Support Tool (DST), which offers a map-based documentation of the results of the modelled land use suitability, including the analyses of spatial trends in biodiversity. Accordingly, the SEA report and DST should be used together to interpret the background for the conclusions and recommendations given. An important usage of the DST in relation to spatial planning of future developments is the possibility to compare the suitability of an area for different and potentially competing land uses.

The DST does not offer any decisions, but rather comprises a user-friendly map in high resolution of the suitability of each land use evaluated on the basis of multi-criteria evaluations of economic, social and environmental issues. Another important usage of the DST is related to the screening phase of single or multiple projects in which the end user will be able to import his or her own GIS project data to explore various development scenarios against the modelled land use suitability data, the high-resolution backdrop of seamless landscape and topographic maps as well as against all available background information to the SEA project.

The DST is organised into three types of themes:

1. Current land uses, including existing protected area system;
2. Extent of area with exploitable resources
3. Spatial description of regional development plans;
4. Modelled priority areas for conservation of biodiversity and sensitive areas;
5. Modelled land use suitability on the basis of themes 1-4 and eco-physical factors describing the acceptance criteria in terms of physical characteristics for the suitability of each land use.

Apart from these themes the DST hosts a range of background data, including roads, rivers, municipal infrastructures and administration zones, as well as all individual data sets on the geo-physics and biodiversity of Kunene and Erongo coastal regions which were made available to the SEA (see Appendix I for details). The land uses considered are: urban, hydrocarbon and mineral extraction, port, coastal resort, agriculture, land-based fish farming, marine fish farming, eco-tourism, beach recreation and conventional tourism and desert recreation and tourism.

In the short term, the DST is available as a CD-ROM with two applications: one is a cluster of PDF files with results of the suitability maps for each land use type and the other is a collection of GIS files, encompassing all major results and background files, which can be viewed in ArcGIS, ArcView 3.2 as well as in the freeware ArcExplorer. The CD-ROM also contains the SEA Final Report and a manual for using the maps in ArcView/ArcExplorer. The collection of GIS maps with ArcExplorer will make it possible for the local user to add his/her own project data. In the long term the DST may be set up as a server-based web-application with the Ministry of Environment and Tourism's EEIS unit.

5.4 The way forward

In order for the coastal SEA and DST to fulfil their expected role as key tools for sustainable development growth strategies for the coast and to mitigate against underlying causes of biodiversity loss, it is necessary that the analyses of land use suitability, including the trends in biodiversity importance, are assimilated into the NACOWP process and the production of coastal profiles and that the large amount of data developed by the SEA is used widely by the various NACOMA project and MET activities.

It is recommended that the Erongo Coastal Profile, in particular, highlight the dimension of urban development in order that decision makers be informed on the necessity for better planning and management of the coastal sub-region in the near-term future. In addition, through its participatory and multi-stakeholder process, NACOMA should encourage further research to be conducted on coastal economic and urban development by such agencies as the University of Namibia, the Polytechnic of Namibia, and the Habitat Centre.

The Coastal Profiles could play a strong and positive role in relation to the large efforts foreseen to enable the development of the tourism sector. Current information and analysis is required on coastal tourism in the two regions. The Coastal Profiles that are to be produced for the Kunene and Erongo regions can make a start by emphasising the importance of coastal tourism and by providing an information baseline for the different types of tourism. In addition, NACOMA should actively promote the objectives of the national tourism policy and encourage the development of regional tourism strategies and zonation for both regions, in which coastal tourism should receive real attention. Unfortunately, for this SEA, land use by tourism could not be resolved by different types of tourist activities. Procedures for monitoring tourist activities are needed to be able to make financial and economic budget and cost-benefit models as a basis for zonation.

Harmonisation between this SEA and the SEA for Karas and Hardap with respect to principles for integrating land use and conservation strategies is strongly recommended to ensure compatibility and duplication of results. The successful implementation of the DST requires that the end user, particularly the regional councils of Erongo and Kunene, receive training in applying the DST GIS software, and that solutions be found for a long-term web-based solution to host the DST for all four coastal regions.

Procedures should be set up for using the mapped priority areas for conservation in relation to the NACOMA Project Global Objective (PGO) to strengthen conservation of biodiversity in coastal ecosystems in Namibia. One of the key PGO indicators is the 'Area of biodiversity "hotspots" (including MPAs) under effective management increased by 40 percent by 2010.' The SEA's analysis of biodiversity trends will potentially be able to encourage and advance the identification of hot spots. In addition, procedures for using the boundaries of the mapped habitats to assist in the development of biological monitoring routines should be set up.

APPENDIX I - METHODS

1. STAKEHOLDER LIAISON, REQUIREMENT ANALYSIS AND INVENTORY OF PLANNING DOCUMENTS AND DATA

A key to a successful development and application of the SEA and DST has been the ongoing liaison with the stakeholders during the entire project. Stakeholder involvement has focused on delivery of planning documents and data, methodologies related to the analysis of land use suitability, including the analysis of biodiversity trends as well as on discussions on individual land use plans. The Erongo and Kunene coastal SEA has been divided into three phases with workshops during each phase functioning as focal points for communication with the stakeholders. During the Inception Phase, an initial stakeholder workshop and meetings with stakeholders and decision makers was held in both Kunene and Erongo coastal regions and in Windhoek, including the principal end-users; the Regional Councils of Erongo and Kunene. The aims of the workshop and meetings included the introduction of the proposed work plan and SEA process, definition of boundaries, confirmation of relevant PPPs, discussion of the proposed format for the presentation of SEA results and the soliciting of input and feedback related to the stakeholders' specific needs as well as the identification and collation of available spatial data.

During the Phase 2 workshop various issues related to the PPPs were discussed with end users from the Kunene region. During the Phase 3 workshops the team had the opportunity to discuss the major SEA findings and DST design with key stakeholders in Windhoek, Erongo and Kunene. During the third Phase, draft versions of the SEA report and the DST and recommendations for improved coastal policies will be discussed with NACOMA and stakeholders at four workshops both in Windhoek, Erongo and Kunene in July 2007.

One of the main activities of the Inception Phase was the definition of boundaries, verification and confirmation of PPPs and identification of available geo-referenced data, all of which were addressed by undertaking a Requirement Analysis, by listing confirmed and updated PPPs, and by making a Data Inventory. As part of the Requirements Analysis for the SEA the following were defined:

- Users: primarily the two Regional Councils of Erongo and Kunene, coastal municipalities and line ministries. Other stakeholders below will also likely find use for the SEA and DST.
- Stakeholders: Regional Councils, coastal municipalities, line ministries, fisheries including mariculture industries, mining companies, oil and gas industries, property developers, tourist companies, coastal and marine technical experts, NGOs and the general public.
- Management tasks/ policy processes: Planning of land uses and conservation of biodiversity at the regional level.
- Workflows / procedures: Exchange of policies, programmes, plans and GIS data, syntheses and summaries of biodiversity data, and modelling of coastal sensitivity from biodiversity summaries.
- Environmental priorities arrangement: The following sub-themes are required for the coastal SEA:
- Coastal and municipality infrastructure GIS data
 - Political and administrative boundaries

- Boundaries of protected areas
- Roads, railways, airports, landing strips, ports, power lines, sanitation, water supply incl. dams, sewers and solid waste dumps
- Buildings
- Public access
- Coastal land-use data, policies, programs and plans
 - Municipal plans
 - Regional plans
 - Protected areas management
 - Tourism and recreation areas
 - Coastal landscape - aesthetics
 - Mining (marine (near shore and offshore) and terrestrial)
 - Aquaculture
 - Fisheries
 - Port development (Walvis Bay, Cape Fria)
 - Local communities' involvement
 - Wetland policy
 - Protected areas designation (IONA protected area)
 - Water resources
 - Power generation
- Coastal landscape GIS data
 - Geo-referenced coastline
 - Digital elevation model
 - Landsat ETM+
 - Human density
 - Livestock density
 - Rivers, and tributaries
 - Coastal types, geo-morphology
 - Places, landmarks
 - Bathymetry, close to the coast
- Coastal physics GIS data
 - Soils
 - Rainfall
 - Fog intensity
 - Temperature, radiation, humidity
 - Sediments
 - Sea surface temperature
- Coastal biodiversity GIS data
 - Animal records - selected species
 - Plant records - selected species
 - Plant productivity (ENDVI)
 - Mammal diversity and density
 - Plant diversity
 - Bird diversity
 - Frog diversity
 - Reptile diversity
 - Scorpion diversity
 - Mammal diversity
 - Bird endemism
 - Plant endemism
 - Reptile endemism
 - Scorpion endemism
 - Mammal endemism

Documents and data on regional, national and sectoral land use and other relevant policies, programmes and plans (PPPs) were collected during the Project Inception Phase in October 2006. These are listed in Table 1. Although a large amount of data has been made available to the SEA process, some information has failed to become available for various reasons. During the second workshop held in Khorixas in February 2007, it was possible to receive feed-back on these missing data, and fill in the some most important gaps on land use, plans and biodiversity. The same procedure will be followed in the third set of SEA Workshops to be held in August 2007.

Table 1: Regional, national and sectoral land use and other relevant policies, programmes and plans (PPPs) used in the SEA.

<p>Key PPPs</p> <ul style="list-style-type: none"> • NAMPORT's Environmental Management System • Structure Plans for Walvis Bay, Swakopmund and Henties Bay Municipalities • Town Planning Schemes for Walvis Bay, Swakopmund and Henties Bay Municipalities • Walvis Bay Municipality Regulations for Dune Belt (draft) • Walvis Bay Nature Reserve (proposed) Management Plan (draft) • North West Tourism Plan • Namib-Naukluft Management and Tourism Development Plan • Skeleton Coast National Park Management Plan • Iona Transfrontier Park Memorandum of Understanding • Policy framework for Concessions in Proclaimed Protected Areas • Cape Cross Seal Reserve Plan • National West Coast Tourist Recreation Area Plan • MET Strategic Plan • National Biodiversity Strategic Action Plan • Namibia Wetland Policy • MFMR Mariculture Feasibility • MFMR Marine Protected Area Feasibility • Cape Fria Feasibility • MME Strategic Plan • MME White Paper on Energy Policy • MME Draft Minerals Policy Of Namibia • MME acts (Minerals (Prospecting and Mining) Act, 1992, Diamond Act, 1999, Petroleum Products and Energy Amendment Act, 2000, Gas Act - Draft) • Petroleum Exploration Onshore/Offshore Open Licensing System • MET Policy on Tourism and Wildlife Concessions on State Land (Draft June 2006) • MET Policy on Protected Areas, Neighbours and Resident People
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(Draft July 2006)

- **MET Biosafety Act (6th draft)**
- MET Policy and Legal Framework of the National CBNRM Programme
- MET Namibia's Pollution Control and Waste Management Policy
- MET Namibia's Environmental Assessment Policy
- MET EMA Bill (draft)
- Erongo and Kunene Regional Development Plans 2005-06

2. THE COASTAL GIS

2.1. GIS design

An important element of the project has been the establishment of the coastal SEA GIS – a GIS mapping system covering all major landscape, biodiversity, infrastructure, land use and PPP data of the coastal regions of Kunene and Erongo. The main goal of the SEA GIS is to facilitate the DST as a tool for assisting the decision-making process at the regional level. A mapping system in support of a coastal SEA not only requires integrated analyses of land use, planning and environmental data, but it also requires a relatively high resolution to produce sufficiently detailed information to be useful in the decision-making process related to various land-use options. Although some GIS data, e.g. the infrastructure data held by the General Surveyor and the municipalities of Walvis Bay and Swakopmund, are available in high resolution, the majority of GIS data from the Atlas of Namibia or from the Namibian Biodiversity Database are only available in relatively low resolution, this typically exceeding 10 km. In addition, relatively few original geo-referenced observations were available to the SEA, thus, in order to map key habitat components of the coastal landscape with sufficient detail we used remote sensing data (ETM+) and digital topographic data (SRTM) in high resolution in combination with modelled distributions of key species of plants and animals from the Atlas of Namibia scenes.

The coastal SEA GIS has been geo-referenced to Universal Transverse Mercator projection (UTM Zone 33) with WGS 84 datum. Most of the data shown have been processed as raster data at a resolution of 90 m to align with the digital topographic SRTM data. Orthorectified data on the coastline were available both as a vectorised coastline developed from aerial photos (courtesy BCLME Project) and ETM+ data from 2001 (University of Maryland). After checking the precision of the rectified coastline the ETM+ images (9 scenes) were chosen as the basis for mapping river courses, locate areas with prominent vegetation and map coastal wetlands, and as a basis for a rendering the coastal landscape as a high-resolution (28.5 m) backdrop for all mapped data. In order to create a "natural-like" rendition a 24-bit RGB-composite image of bands 7, 4 and 2 was made using linear stretch with saturation points. The 9 scenes were then combined into one 'seamless' image of the coastal regions by running a mosaic routine, which created a new image by spatially orienting the overlapping images and balancing the numeric characteristics of the image set based on the overlapping areas. In the resulting backdrop healthy vegetation shows as bright green, grass will appear green, pink areas represent barren soil, oranges and browns represent sparsely vegetated areas. Dry vegetation will be orange and water will be blue. Sands, soils and minerals are highlighted in a multitude of colours, and are generally rendered close to "natural like". The light-green spots inside the towns of Swakopmund and Walvis Bay indicate grassy land cover – e.g. cemeteries and golf courses.

The SRTM digital topographic data set was downloaded from NASA's web server in one meter vertical and 90 m horizontal resolution. Missing data in the SRTM data set were assimilated by interpolated SRTM 1 km data (NASA). The SRTM data were used to estimate the relief and topographic complexity of the coastal zone. The relief was measured as the slope of each grid cell based on the cell resolution and the values of the immediate neighbouring cells to the top, bottom, left and right of the cell in question using the following formula:

$$\text{Tangent} = \sqrt{\left(\frac{\text{right} - \text{left}}{\text{res} \cdot 2}\right)^2 + \left(\frac{\text{top} - \text{bottom}}{\text{res} \cdot 2}\right)^2}$$

which measures the tangent of the angle that has the maximum downhill slope; *left*, *right*, *top*, *bottom* are the attributes of the neighbouring cells and *res* is the cell resolution. The topographic complexity (F) was calculated for 7x7 kernels as: $F = (n-1)/(c-1)$, where *n* = number of different classes present in the kernel, *c* = number of cells.

The boundaries of the GIS are from the low-water mark to the eastern boundary of the Skeleton Coast National Park and the National West Coast Tourist Recreation Area. Only the north-western extreme of the Namib-Naukluft Park covering the south-western boundary of Erongo (Sandwich Harbour) is included.

The coastal SEA GIS has been divided into the following main themes, which are dealt with in the next chapters:

- Biodiversity: priority species, habitats
- Modelled priority areas for conservation
- Policies and plans
- Exploitable resources
- Current land use
- Modelled land use suitability
- Support and infrastructure: buildings in Swakopmund and Walvis Bay, aquifers, power grids, roads and rails

2.2 Support and infrastructure data

Table 2: List of geo-referenced digital data sources, formats and resolution for support and infrastructure data.

Data	Source	Format	Resolution
Regional government areas	Atlas of Namibia	Shapefile	Low
Park boundaries	Atlas of Namibia	Shapefile	Low
Roads and rails	General Surveyor, Roads Office	Shapefiles	High
Town administration zones	WB and Swakm. municipalities	CAD	high
Urban buildings	WB and Swakm. municipalities	CAD	high
Settlements	Atlas of Namibia	Shapefile	Medium
Aquifers	Atlas of Namibia	Shapefiles	Low
Power grids	Atlas of Namibia	Shapefiles	Low
Rivers	Digitised from ETM+	Shapefile	Medium

Updated information on the location of roads and rails were kindly made available by the General Surveyors and the Roads Authority offices. Although the roads data have been classified into different types of roads (e.g. trunk roads, dirt roads) all roads are currently included using the same symbology. The municipalities of Swakopmund and Walvis Bay kindly made their infrastructure data available to the coastal GIS. The data were transferred from autocad (Microstation) format to shapefiles. The data from Walvis Bay included the location of Peri-urban areas planned for various types of urban development. As no accurate data on the location of Namibian rivers exist the project decided to digitise the main rivers from the ETM+ composite image: Kuiseb, Khan, Swakop, Omaruru, Ugab, Huab, Koigab, Uniab, Hoanib, Hoarusib, Khumib and Kunene. The river courses were digitised as a line without demarcation of the river banks.

2.3. Biodiversity data

A wide range of data sources were available on the habitat characteristics of priority species from data on wetlands of international importance⁸¹, The Namibian Biodiversity Database⁸², The Atlas of Southern African Birds⁸³, The Tree atlas⁸⁴, The Atlas of Namibia⁸⁵, The Red Data Book of Namibian Plants⁸⁶, Observations by tour companies (N. Dreyer, Catamaran Charters pers. comm.), The Kunene Lion Project⁸⁷, data on red-listed mammals in Atlas of Namibia, experts on single target species (e.g. H. Skrypzeck, R. Braby) and PhD studies (C. Schultz, J. Lalley pers. comm.). A species was identified as a priority species if it met one of the following criteria:

- Endemic, rare or endangered
- Plant species functioning as key food for large herbivores
- Migratory species concentrated in Namibia

In table 3 are listed the 20 priority habitats identified on the basis of all available data on priority species together with information on data sources, formats and resolution used for mapping their geographical coverage. The 20 habitats were chosen on the basis of landscape characteristics known as important environmental drivers in relation to the movement of prioritised species of large mammals between Etosha and the coast, in relation to the distribution of prioritised species of birds and higher plants, and in relation to increased levels of diversity and endemism in plants, invertebrate and vertebrate animals^{83,84,86, 88}. The information about the importance of the escarpment and rock outcrops to endemism, rarity and diversity was obtained mainly from Simmons et al. 1998⁸⁸. Relationships between prioritised species and escarpment, rock outcrops and river beds have been taken from NNF, Curtis & Mannheimer (2005⁸⁴), Harrison (1997⁸³), Ryan et al. (1999⁸⁹), WWT Black Rhino project, WWT Brown Hyena Project and the Desert Lion Project. The distance to important habitats

⁸¹ Simmons, R.E., Barnes, K.N., Jarvis, A.M. & Robertson, A. 1999. *Important Bird Areas in Namibia*. DEA. Ministry of Environment & Tourism. Pp 68

⁸² <http://www.biodiversity.org.na>

⁸³ Harrison, J.A., Allan, D.G., Underhill, L.G., Herremans, M., Tree, A.J., Parker, V., Brown, C.J. (eds). *The Atlas of Southern African Birds*. Vols. 1 and 2. BirdLife South Africa, Johannesburg.

⁸⁴ Curtis, B.A. & Mannheimer, C.A., 2005. *Tree Atlas of Namibia*. Windhoek: National Botanical Research Institute. 688 pp.

⁸⁵ Mendelsohn, J., Jarvis, A., Roberts, C. & Robertson, T. 2002. *Atlas of Namibia : A portrait of the Land and it's People*. David Philip Publishers, Cape Town.

⁸⁶ LOOTS, S. 2005. *A Red Data Book of Namibian plants*. SABONET Report No. 38. 124 pp. ISBN 1-919976-16-7.

⁸⁷ <http://www.desertlion.info/>

⁸⁸ Simmons, R.E., Griffin, M., Griffin, R.E., Marais, E. & Kolberg, H. 1998. *Endemism in Namibia: patterns, processes and predictions*. *Biodiversity and Conservation* 7: 513-530

⁸⁹ Ryan, P.G., I. Hood, P. Bloomer, J. Komen, and T. Crowe 1999. *Barlow's Lark: a new species in the Karoo Lark *Certhilauda albescens* complex*. *Ibis* 140: 605-619.

like the Etosha Pan, the Escarpment and vegetated river beds was estimated as the Euclidean distance to river beds in which vegetation could be identified on the ETM+ image taken in February 2001.

Estimated fine-scale distributions of lichen communities in the Central Namib Desert in 2003 based on a Remote Sensing Classification Approach were kindly made available by Dr. Christoph Schultz at the German Aerospace Centre. The coarse-scale distribution of lichens mapped in the central part of the Skeleton Coast Park in 2004 was kindly made available by Dr. Jennifer Lalley at the University of the Witwatersrand Wits, South Africa. A buffer zone of 500 m was added to the lichen distribution to take account of their sensitivity to excavation/construction works. Data on the current core areas for breeding Damara terns were kindly made available by Rod Braby. High density areas were estimated by adding a 2500 m buffer to the breeding zone, except where the complexity of the terrain is unfavourable for breeding terns ($F > 0.3$) and in urban areas. The Atlas of Namibia data on large mammals were derived from point locations of sightings of elephants in the Hoanib River between 1981 and 2000, sampling blocks used for MET aerial censuses in 1998 and in 2000, MET Aerial census data for 1995, 1998 and 2000 and MET Farm game census data for 1998. A buffer of 1 km was added to the Wetlands of international importance, and a buffer of 2 km was added to the ephemeral rivers.

The mapped priority areas for conservation listed in Chapter 1.2.3 were combined into three classes of area importance:

1. Lower priority: one habitat present;
2. Medium priority: two habitats present;
3. High priority: ≥ 2 habitats present, or area hosts $\geq 1\%$ of bio-geographic population (endemic/migratory flyway).

Table 3: List of geo-referenced digital data sources, formats and resolution for biodiversity data.

Data	Source	Format	Resolution
Lichen fields	Christoph Schultz	Erdas Imagine Raster 8 bit	30 m
Welwitschia habitat	Atlas of Namibia	shapefile	low
Quiver tree habitat	Atlas of Namibia	shapefile	low
Mopane habitat	Atlas of Namibia	shapefile	low
Damara Tern key areas	Rod Braby pers. comm.	shapefile	medium
Fur seal colonies	Heidi Skrypzeck pers. comm.	shapefile	medium
Total herbivore medium abundance	Atlas of Namibia	shapefile	low
Elephant occurrence	Atlas of Namibia	shapefile	low
Lion density $> 0.004/\text{km}$	Atlas of Namibia	shapefile	low
Leopard density $> 0.005/\text{km}$	Atlas of Namibia	shapefile	low
Mountain zebra density $> 0.25/\text{km}^2$	Atlas of Namibia	shapefile	low
Wetlands of international importance	Digitised from ETM+	shapefile	high
Distance < 50 km from escarpment	calculated from Atlas of Namibia	raster file	high
Rock outcrops	Atlas of Namibia	shapefile	medium
Distance < 140 km from Etosha Pan	Calculated from Atlas of Namibia	raster file	high
Distance < 2 km from riverbeds	Calculated from digitised rivers	raster file	high
Distance < 50 km from Brandberg massif	Calculated from Atlas of Namibia	raster file	high
Vegetated areas	ETM+ February 2001	raster file	high
Rocky shoreline	Digitised from orthophoto - BCLME©	shapefile	high
Topographic complexity > 0.5	SRTM	raster	high

2.4. Other geophysical/biological data

A number of other GIS data, many of them available from the Atlas of Namibia, are highly relevant in relation to the SEA and DST and are therefore included in the coastal GIS. These data are listed in table 4.

Table 4: List of geo-referenced digital data sources, formats and quality for other geophysical and biological data.

Mountains	Atlas of Namibia + SRTM	raster file	high
Dominant soils	Atlas of Namibia	Shapefile	medium
% grass cover	Atlas of Namibia	Shapefile	low
% shrub cover	Atlas of Namibia	Shapefile	low
% tree cover	Atlas of Namibia	Shapefile	low
Number of fog days	Atlas of Namibia	Shapefile	low
Average annual rainfall	Atlas of Namibia	Shapefile	low
Average annual temperature	Atlas of Namibia	Shapefile	low
Variation in annual rainfall	Atlas of Namibia	Shapefile	low
Distance to coast	calculated from orthorectified coastline	raster file	high
Distance to roads and rails	calculated from General Surveyor data	raster file	high
Distance to settlements	calculated from ETM+ data and infrastructure data from municipalities	raster file	high
Average hrs sunshine/d	Atlas of Namibia	Shapefile	low
Average evaporation/y/m	Atlas of Namibia	Shapefile	low
Plant diversity	Atlas of Namibia	Shapefile	low
Relative humidity/most humid months	Atlas of Namibia	Shapefile	low
Max GVB	Atlas of Namibia	Shapefile	low
Altitude (m)	SRTM	Raster file	high
Relief (% slope)	SRTM	Raster file	high
Eastern Aspect of relief	SRTM	Raster file	high
Northern Aspect of relief	SRTM	Raster file	high

2.5. Data on policies and plans, exploitable resources and current land use

The data made available by the stakeholders have been used to map the spatial extent of current land uses, priority zones for development of land uses according to PPPs, the range of exploitable resources and current land use. The data are listed in Table 5.

3. MODELLING OF LAND USE SUITABILITY

The suitability of the different areas of the coastal regions has been modelled in high resolution (90 m) by integration of PPP data, exploitable resource ranges, current land uses, environmental data, and modelled biodiversity priority areas for conservation (see chapter 1.2.3) using multi-criteria evaluation. Multi-criteria evaluation enables trade-offs between economic, social and environmental issues, and in this way the end user will be able to use the modelled land use suitability data with background information and his or her own data to explore various development scenarios.

The multi-criteria evaluation method used was a weighted linear model with up to three constraints and several factors per land use with acceptance criteria defined by fuzzy membership functions⁹⁰. The fuzzy membership functions standardise scores for all factors to a fuzzy scale from 0 reflecting clearly poor conditions to 1 reflecting clearly suitable conditions for development. The use of fuzzy rather than accurate and quantitative criteria serves to reduce the decision risks (risk of making chance decisions), as in many cases the exact thresholds for suitable/unsuitable conditions are not well known. The fuzzy factors were applied using a cosine function with 2 control points, see table 6. The fuzzy environmental factors for each land use were then combined with information (if available) on exploitable resources, areas currently developed for urban land use, areas outlined by PPPs as priority development areas and the mapped priority areas/habitats for conservation. The four latter data sets were used as technical constraints to development; i.e. no development suitable if area outside PPP zone, in areas of no exploitable resources, or in urban land use zones or priority areas/habitats for conservation.

Table 5: Environmental factors and constraints used in the calculation of land use suitability. Unless otherwise mentioned the factors are given equal weight.

Land use/Factor	Constraint Conservation priority	Constraint Developed areas	Constraint Resources	Constraint PPPs	Factors Standardised with fuzzy factors (0-1)
Urban development	X			Swakopmund infrastructure data WB Peri Urban data	Low relief Access to water Access to power Access roads Adjacent settlement
Port development	X			Namport plan	Low relief Access to water Access to power Access roads Adjacent settlement Existing harbour facilities

⁹⁰ Alonso, W. 1968. *Predicting Best with Imperfect Data*. *Journal of the American Institute of Planners* 34: 248-255.

Land use/Factor	Constraint Conservation priority	Constraint Developed areas	Constraint Resources	Constraint PPPs	Factors Standardised with fuzzy factors (0-1)
Coastal resort development	X			Swakopmund infrastructure data WB Peri Urban data	Low relief Low altitude Access to water Access to power Access roads Adjacent settlement Access coast
Land-based fish farming	X	X Buffer 600 m from residential areas		MFMR Plan Erongo	Low relief Access to marked Low altitude Access to water Access to power Access roads Access coast
Marine fish farming	X	X Buffer 600 m from residential areas		MFMR Plan Erongo	Access to marked Access to water Access to power Access roads Access coast
Eco-tourism		X			Access roads High landscape complexity (> 0.5) Priority area for conservation
Beach recreation and tourism	X				Access to water Access to power Adjacent settlement (weight 0.4) Access coast (weight 0.4) Access roads
Dessert recreation and tourism	X				Access to water Access to power Adjacent settlement (weight 0.4) Access roads High landscape complexity (> 0.5)

Table 6: Environmental factors and control points used for transformation to fuzzy factors. Cosine functions were used for all factors, and for all factors but landscape diversity and priority areas for conservation the function form was monotonously decreasing.

Land use/Factor	Coastal slope	Altitude	Access water	Access power	Distance port	Distance settlement	Distance coast	Distance roads	Distance marked	Landscape diversity	Priority area for conservation
Urban development	A = 1° B = 10°		A = 1000m B = 25000m	A = 1000m B = 25000m	A = 1000m B = 25000m	A = 1000m B = 5000m		A = 500 m B = 10000m			
Port development	A = 1° B = 10°	A = 10m B = 100m	A = 1000m B = 25000m	A = 1000m B = 25000m	A = 1000m B = 25000m	A = 1000m B = 5000m	A = 500 m B = 2000m	A = 500 m B = 10000m			
Coastal resort development	A = 1° B = 10°	A = 10m B = 100m	A = 1000m B = 25000m	A = 1000m B = 25000m		A = 1000m B = 5000m	A = 500 m B = 2000m	A = 500 m B = 10000m			
Farming	A = 1° B = 10°		A = 1000m B = 25000m	A = 1000m B = 25000m				A = 500 m B = 10000m	A = 1000m B = 50000m		
Land-based fish farming	A = 1° B = 10°	A = 10m B = 100m	A = 1000m B = 25000m	A = 1000m B = 25000m			A = 500 m B = 2000m	A = 500 m B = 10000m	A = 1000m B = 50000m		
Marine fish farming			A = 1000m B = 25000m	A = 1000m B = 25000m			A = 500 m B = 2000m	A = 500 m B = 10000m	A = 1000m B = 50000m		
Eco-tourism								A = 500 m B = 10000m		A = 0.4 B = 0.6	A = 1 B = 5
Beach recreation and tourism			A = 1000m B = 25000m	A = 1000m B = 25000m		A = 1000m B = 5000m	A = 500 m B = 2000m	A = 500 m B = 10000m		A = 0.4 B = 0.6	
Dessert recreation and tourism			A = 1000m B = 25000m	A = 1000m B = 25000m		A = 1000m B = 50000m		A = 500 m B = 10000m		A = 0.4 B = 0.6	
Hydrocarbon extraction				A = 1000m B = 25000m				A = 500 m B = 10000m			
Mineral extraction-terrestrial				A = 1000m B = 25000m				A = 500 m B = 10000m			

APPENDIX II – FUNCTIONALITY OF THE SEA DECISION SUPPORT TOOL (DST)

One of the outcomes of the coastal SEA is the synthesis of PPPs and the GIS-based dissemination of information and data within the framework of a user-friendly, policy relevant and IT-based Decision Support Tool (DST). This chapter outlines the functionality of the GIS-based decision-support tool. The decision support tool respond to the increasingly difficult task of effective resource allocation for resource managers, not least at the regional level in Kunene and Erongo. In recent years, considerable interest has been focused on the use of GIS as a decision support system. The DST has the role of informing the decision making process on land use options in the two coastal regions, and does not provide decisions *per se*. As the GIS capacity of the primary end-users, the Regional Councils, is relatively low the DST has been developed as a stand-alone application, - either as a cluster of pdf files with results of the suitability maps for each land use type or as a collection of GIS files, encompassing all major results and background files, which can be viewed in the widely available ArcView 3.2 as well as in the freeware ArcExplorer.

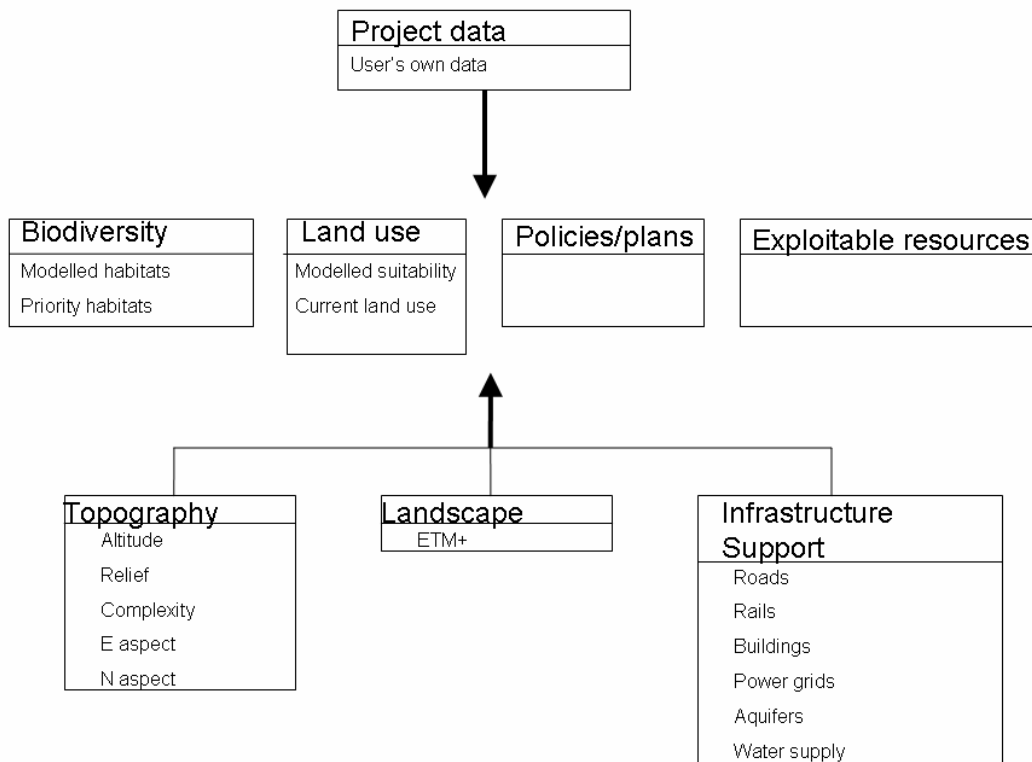


Figure 33: Design of the coastal DST, with main themes and data types supported.

The early version of the DST will be disseminated as a CD-ROM, which apart from the pdf-files and GIS files will also contain the SEA Final Report and a manual for using the maps in ArcView/ArcExplorer. Following this a longer-term solution for the DST needs to be developed, which ensures that the DST data and functions are available via the Web. In figure 1 the design of the DST has been sketched. In figure 2 the potential coastal DST Web server has been sketched. The DST Web service may be installed on a PC server at MET with copies residing on the PCs of other key institutions like the regional councils of Kunene and Erongo and the municipalities of Walvis Bay and Swakopmund. Following the finalisation of

the Strategic Environmental Assessment and DST for Karas and Hardap, the DST Web service could accommodate a full set of land-use suitability scenarios and background data for the entire Namibian coastline.

The coastal GIS will have a resolution of 90 m. This high resolution may result in some of the raster data include some 'salt and peber' effect, but on the other hand it serves to provide the end users with possibilities for resolving land use conflicts/solutions at the finest possible scale with the data at hand. The choice of regions and sub-regions and themes to display is different between the pdf and the ArcExplorer application. In the pdf maps showing pre-defined themes for the different sub-regions will be available, while in ArcExplorer the end user will be able to select any theme and any portion of the mapped coastal stretch of Kunene and Erongo for visualisation. The collection of GIS maps with ArcExplorer will make it possible for the local user to add his/her own project data in vector and raster format.

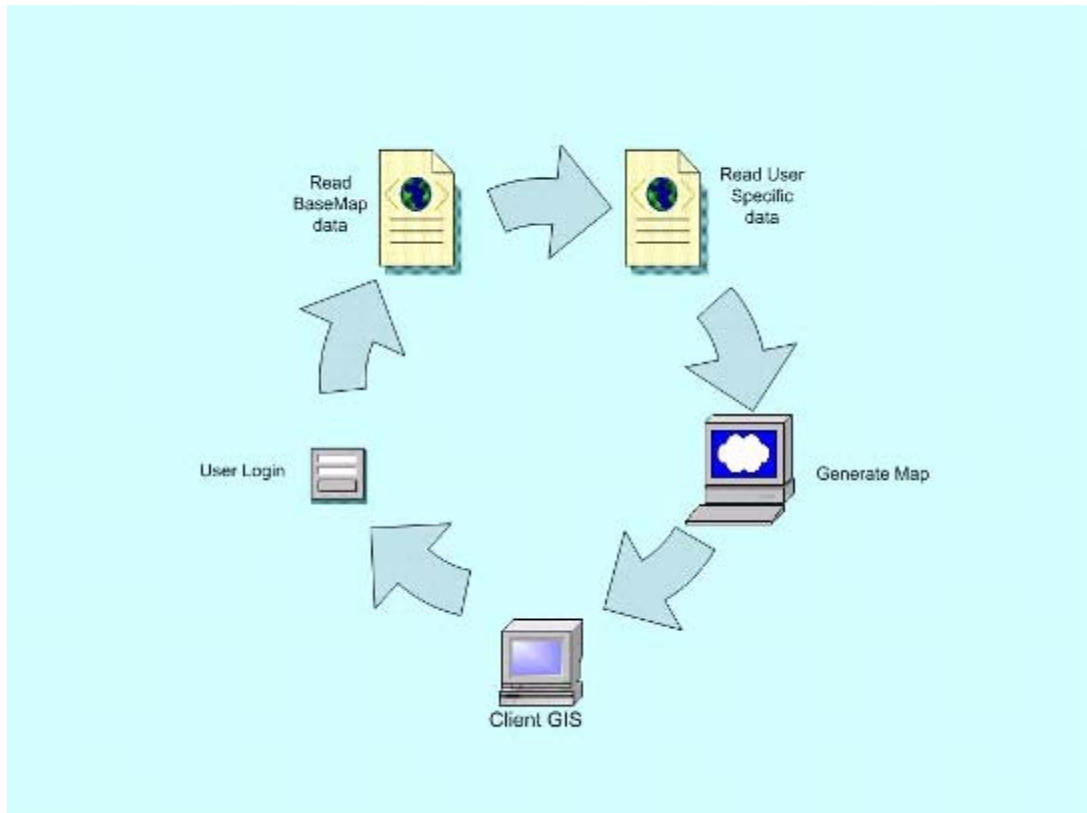


Figure 34: Sketch of the potential coastal DST Web server.

Figures 3 to 8 show examples of theme selection from the coastal SEA GIS in ArcView/ArcGIS. The selection of data and use of the early version of the DST in ArcExplorer are detailed in the Manual.

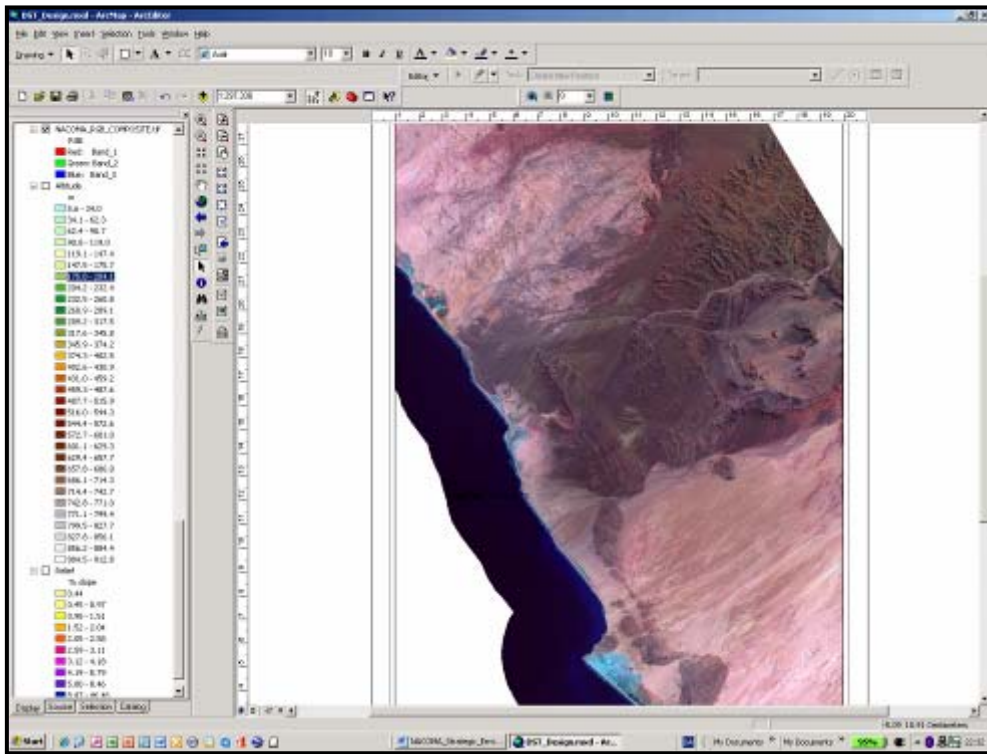


Figure 35: Background theme selection – here the ETM+ composite showing the coastal landscape image in 28.5 m resolution.

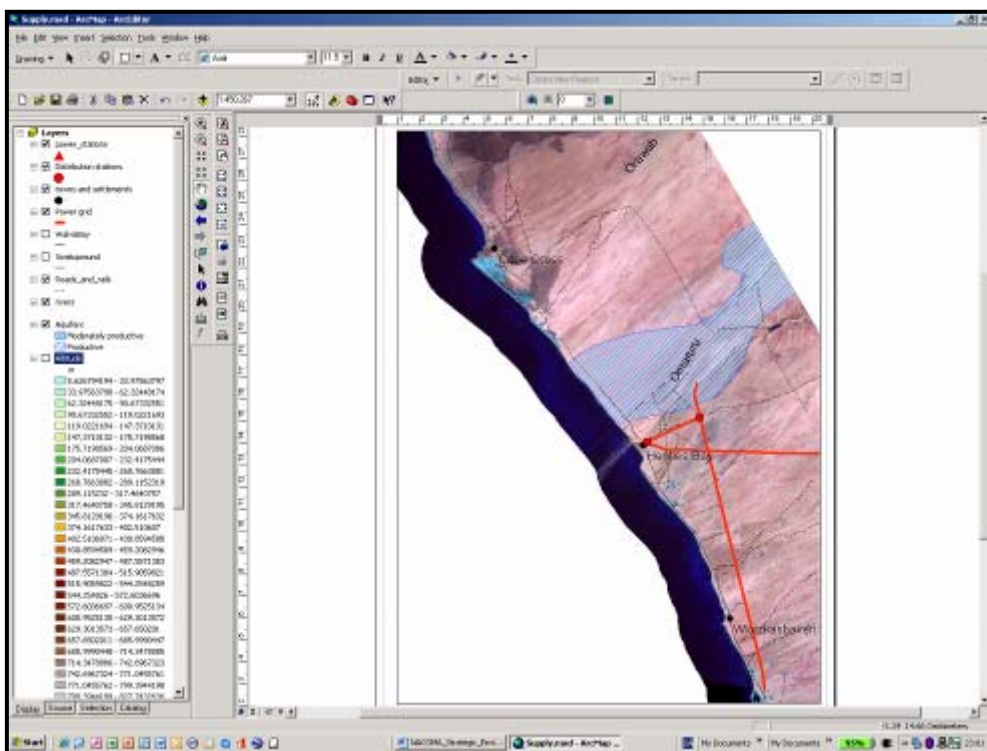


Figure 36: Selection of infrastructure and support themes – here towns and settlements, roads and rails, rivers, aquifers, power and distribution stations and power grid.

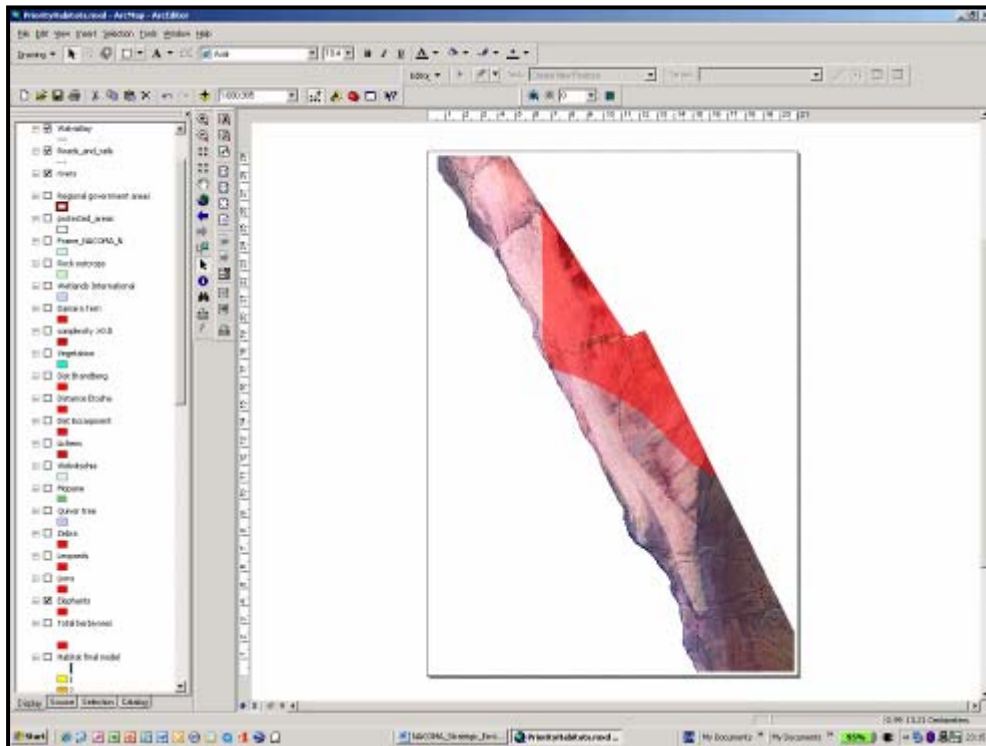


Figure 37: Selection of biodiversity (habitat) themes – here area with regular occurrence of elephant.

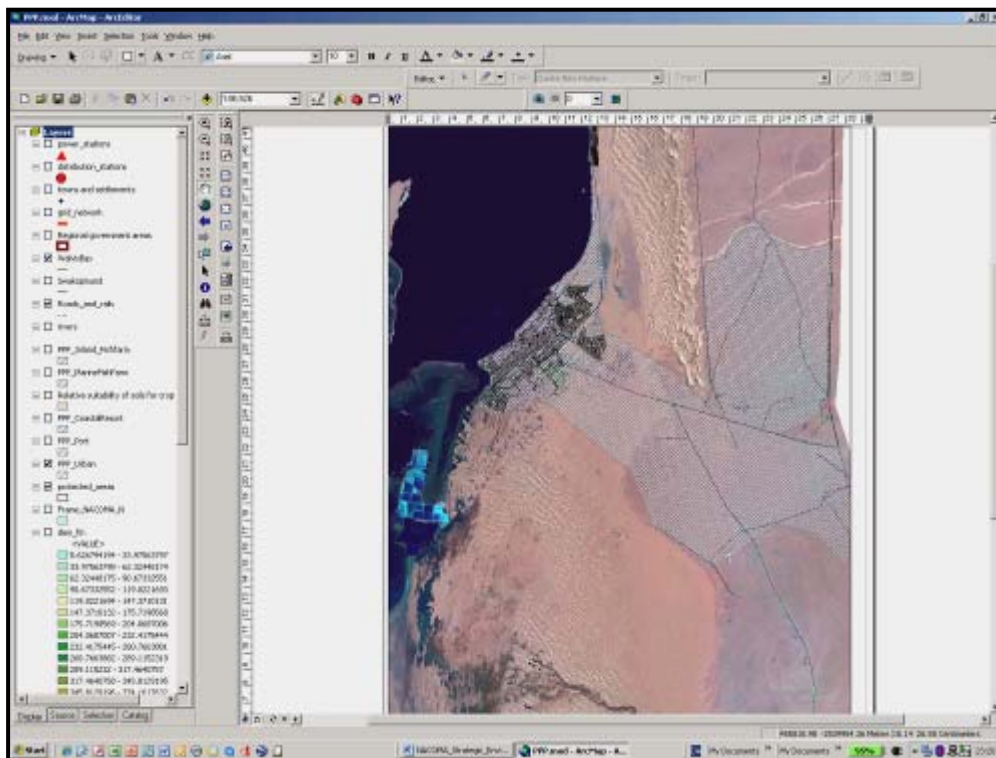


Figure 38: Selection of PPP themes – here the area planned for urban development around Walvis Bay.

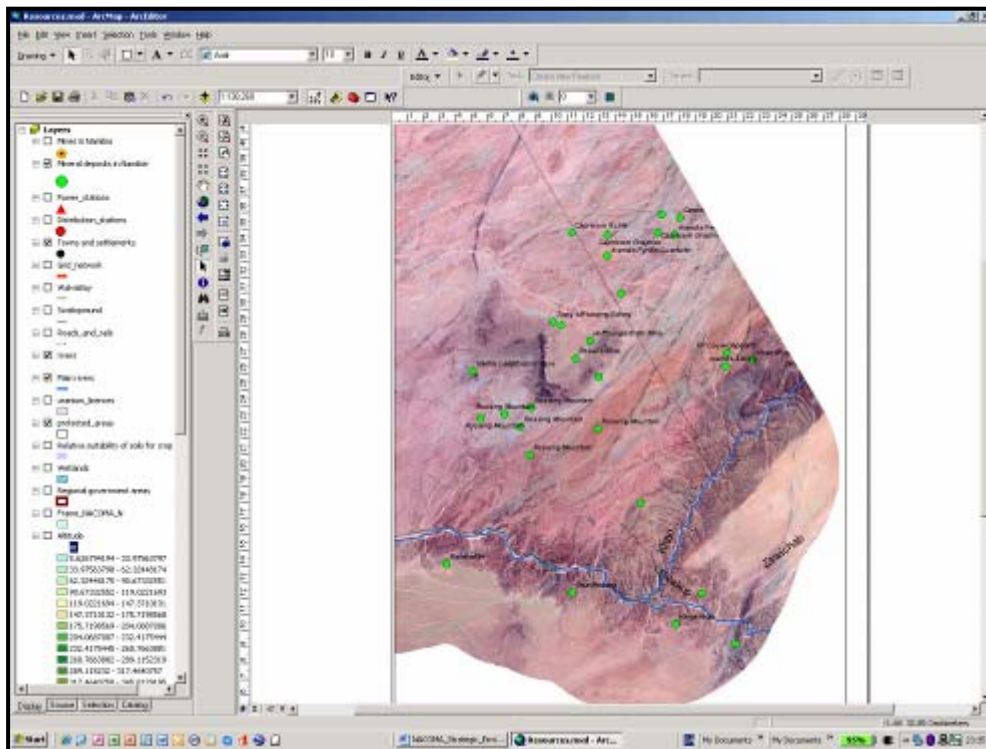


Figure 39: Selection of themes on exploitable resources – here mineral deposits near Swakop river.

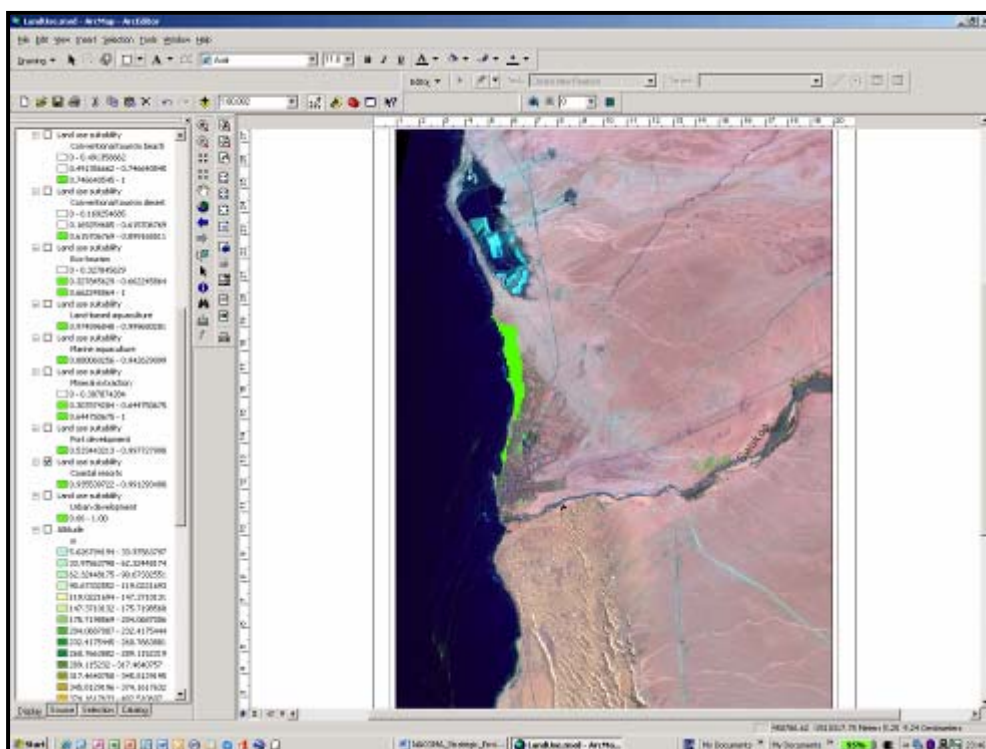


Figure 40: Selection of land use themes – here modelled suitability for beach resorts near Swakopmund.

APPENDIX III – AVAILABLE MAPS (SELECTED EXAMPLES)

1. BACKGROUND ‘LANDSCAPE’ AND TOPOGRAPHIC MAPS

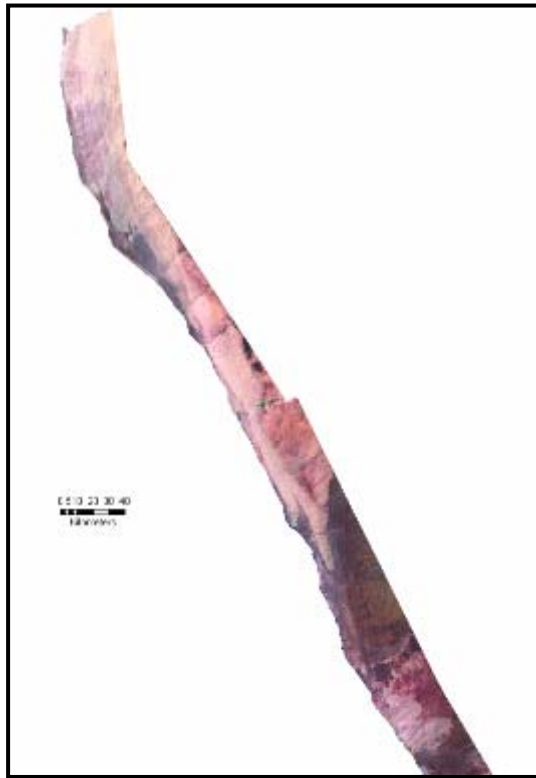


Figure 41: Composite ETM+ (Feb 2001) of Kunene.



Figure 42: Composite ETM+ (Feb 2001) of Erongo.

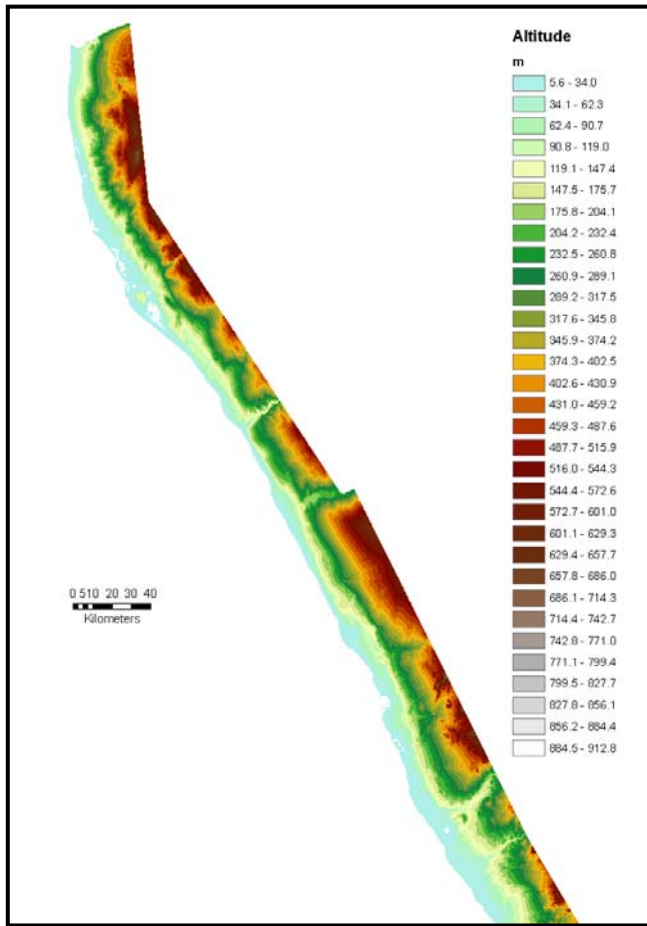


Figure 43: Altitude (SRTM data) of Kunene.



Figure 44: Altitude (SRTM data) of Erongo.

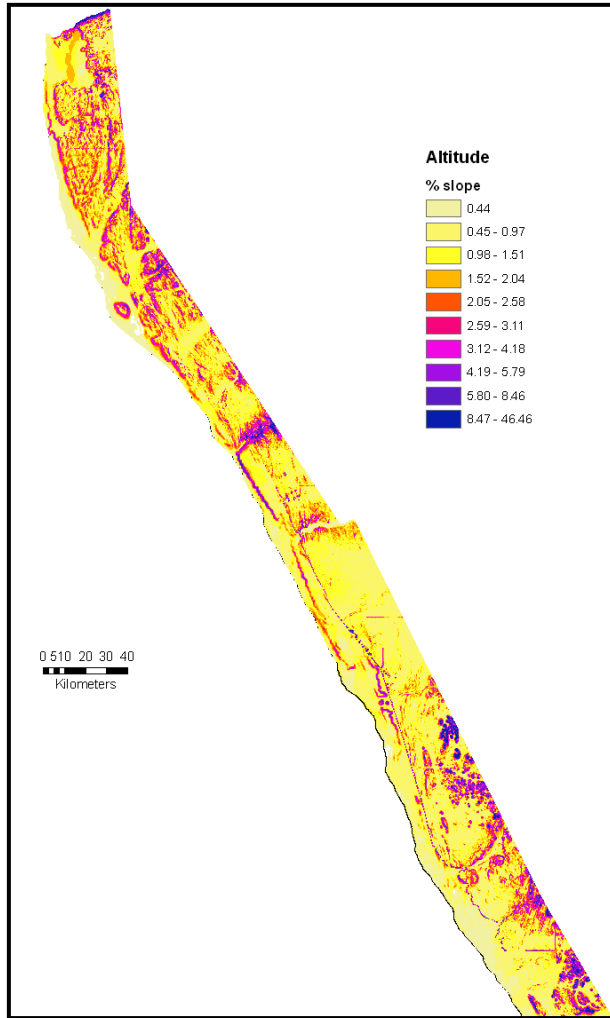


Figure 45: Relief (% slope) of Kunene.

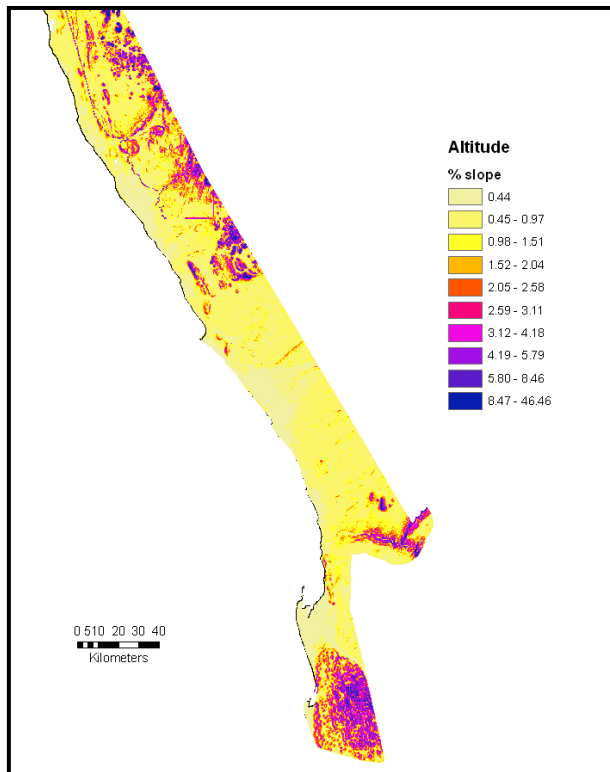


Figure 46: Relief (% slope) of Erongo.

2. SUPPORT AND INFRASTRUCTURE MAPS

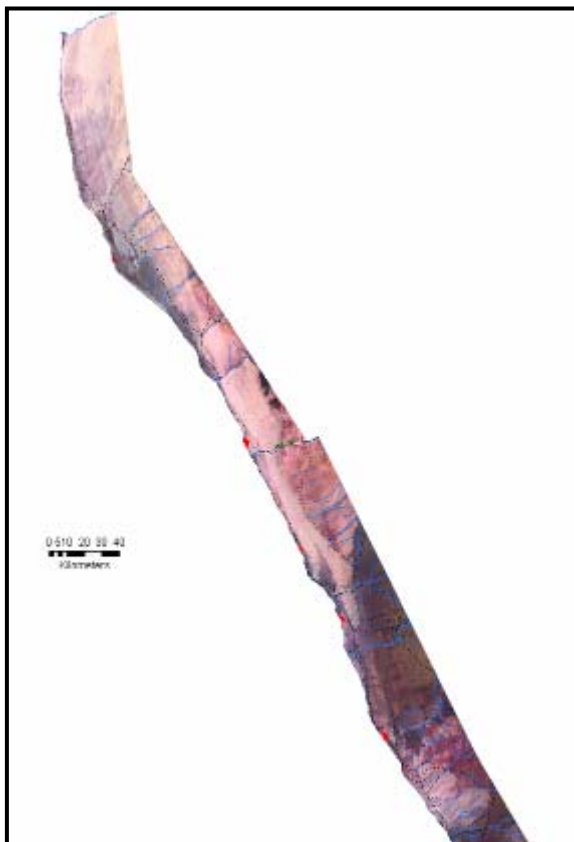


Figure 47: Roads, rails, settlements and rivers in Kunene.



Figure 48: Roads, rails, settlements and rivers in Erongo.



Figure 49: Infrastructure of Swakopmund.



Figure 50: Infrastructure of Walvis Bay.

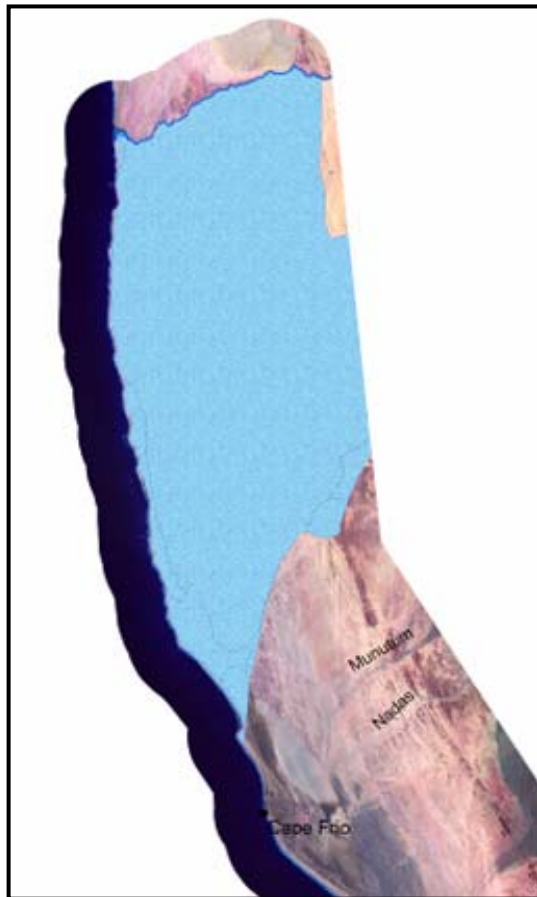


Figure 51: Aquifer at Cape Fria.

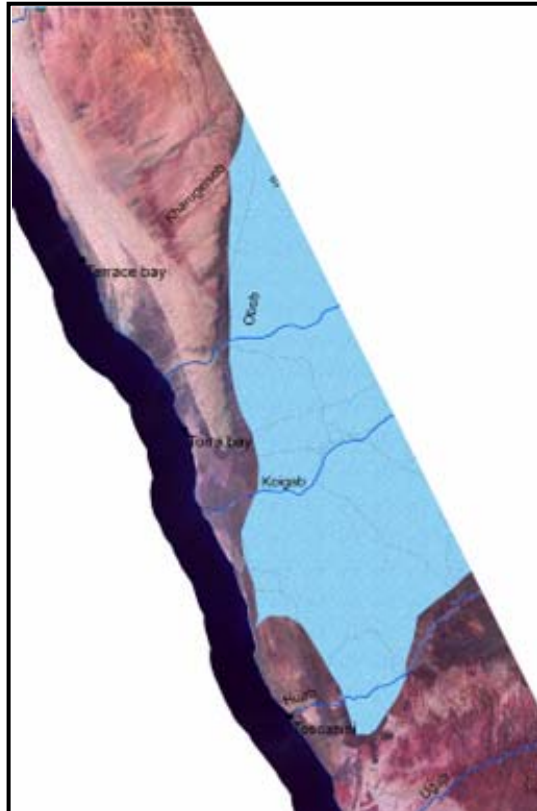


Figure 52: Aquifer at Torra Bay.

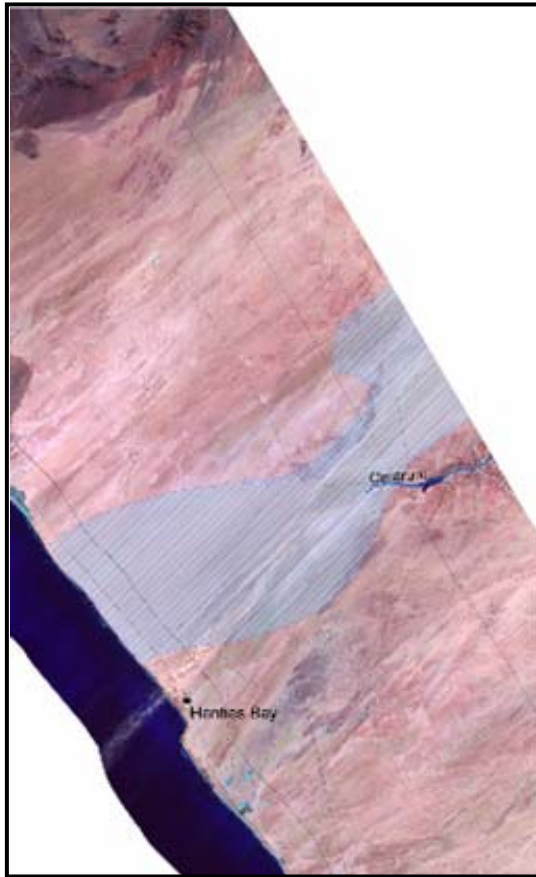


Figure 53: Aquifer at Henties Bay.

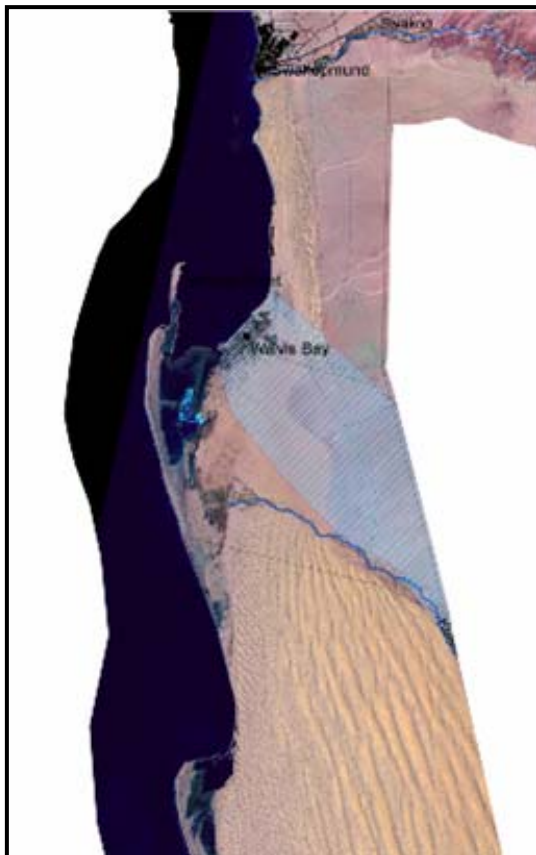


Figure 54: Aquifer at Walvis Bay.

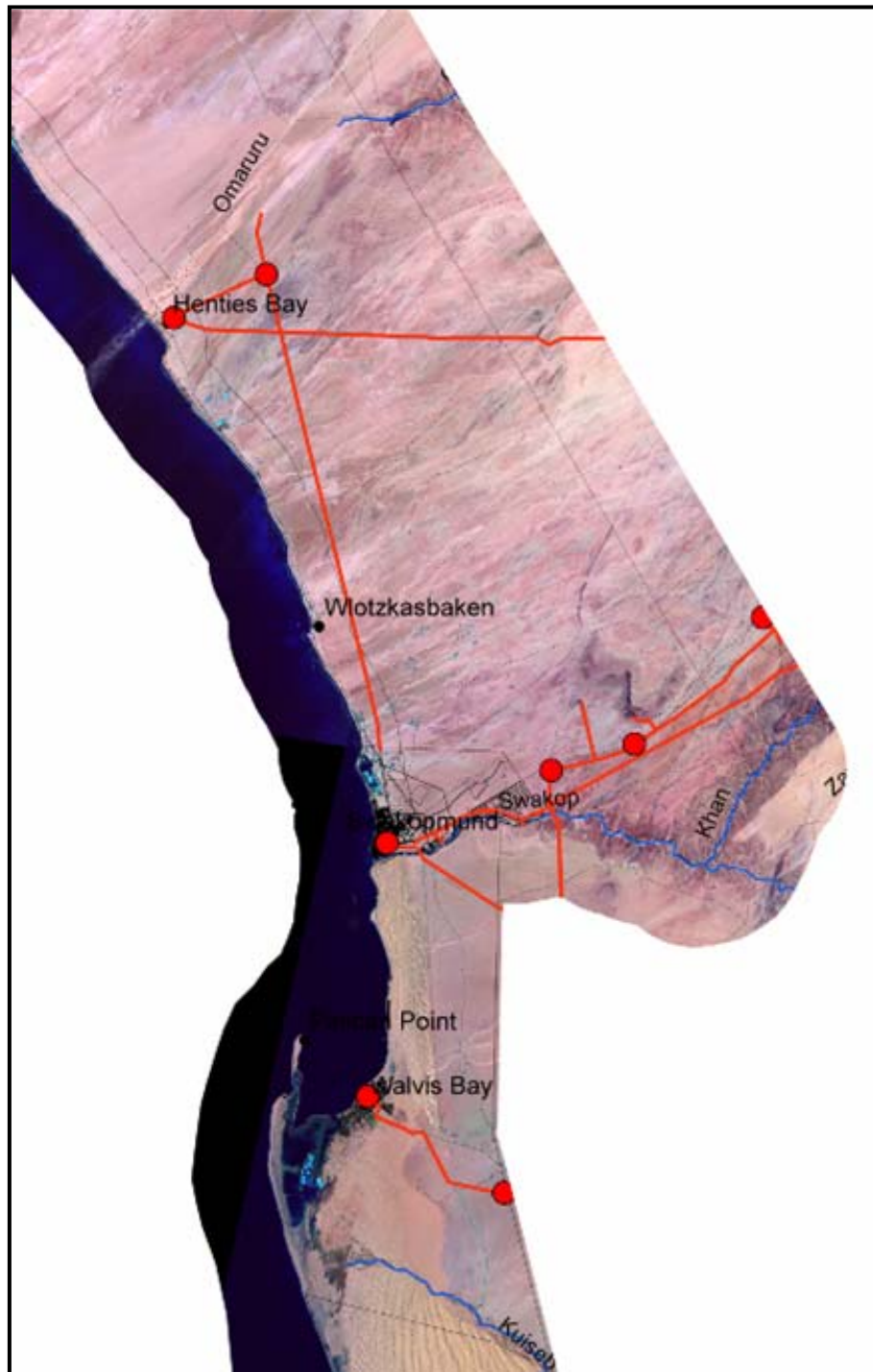


Figure 55: Power supply grid in Erongo.

3. BIODIVERSITY (PRIORITY HABITATS) MAPS

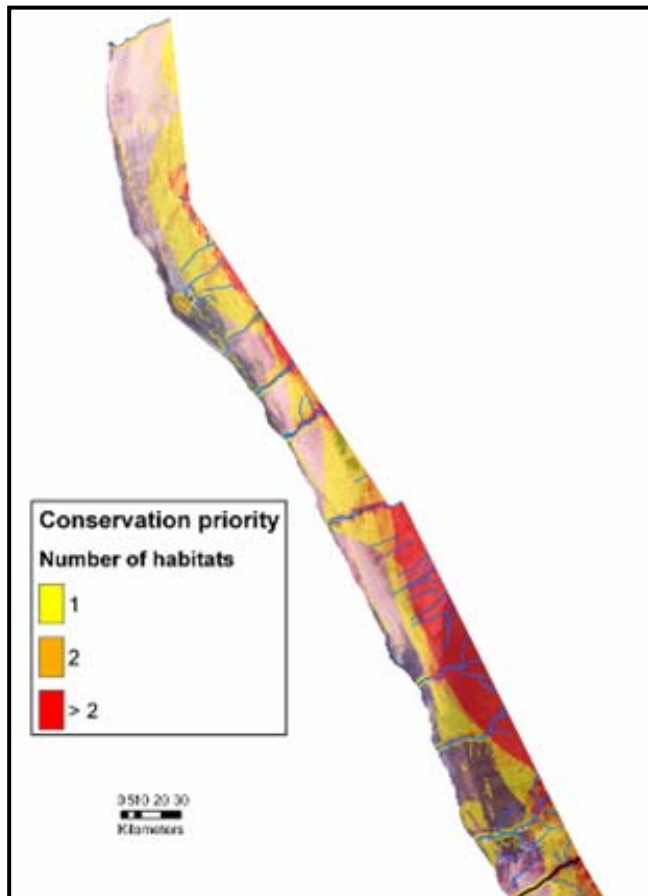


Figure 56: Modelled priority areas for conservation in Kunene.

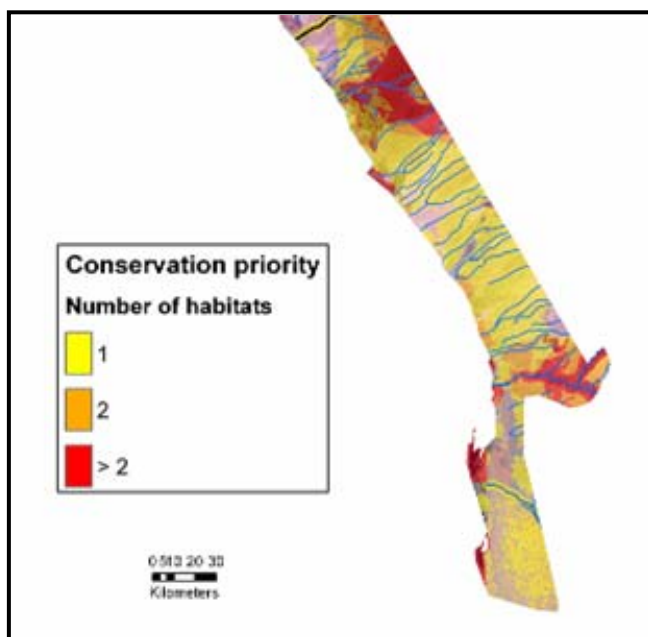


Figure 57: Modelled priority areas for conservation in Erongo.

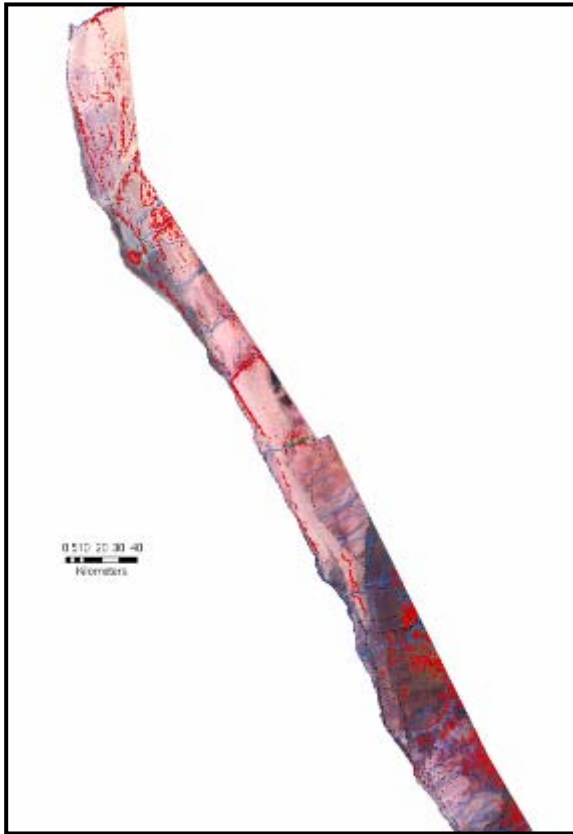


Figure 58: Topographic complexity in Kunene.

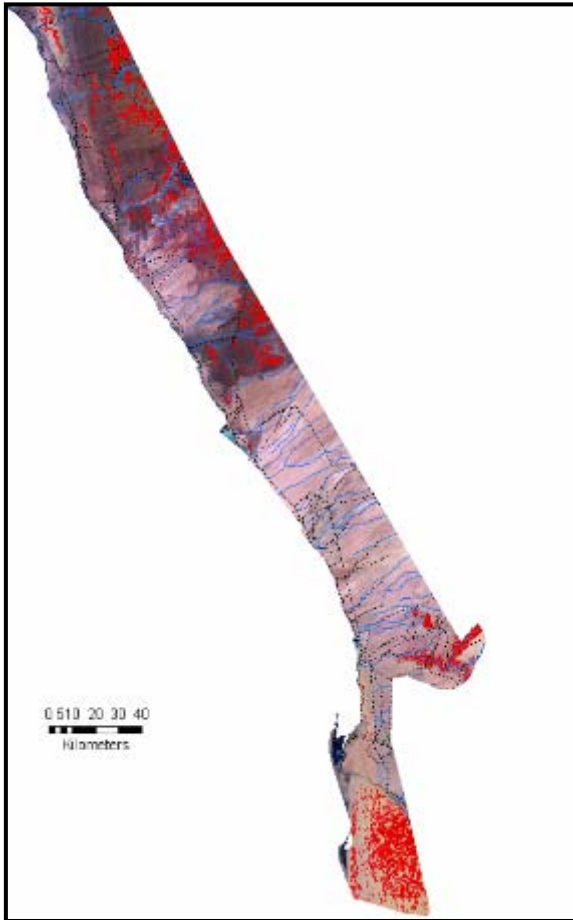


Figure 59: Topographic complexity in Erongo.

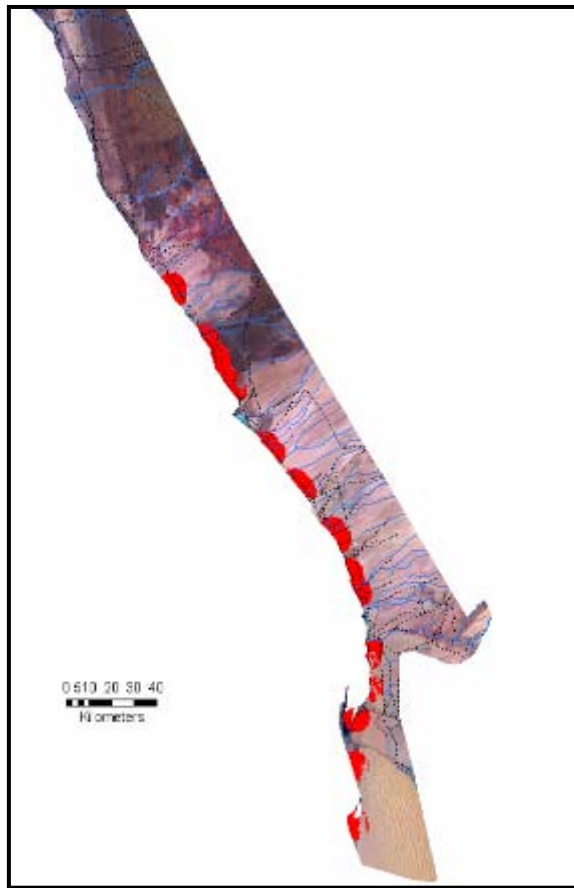


Figure 60. High-density areas for breeding Damara terns.

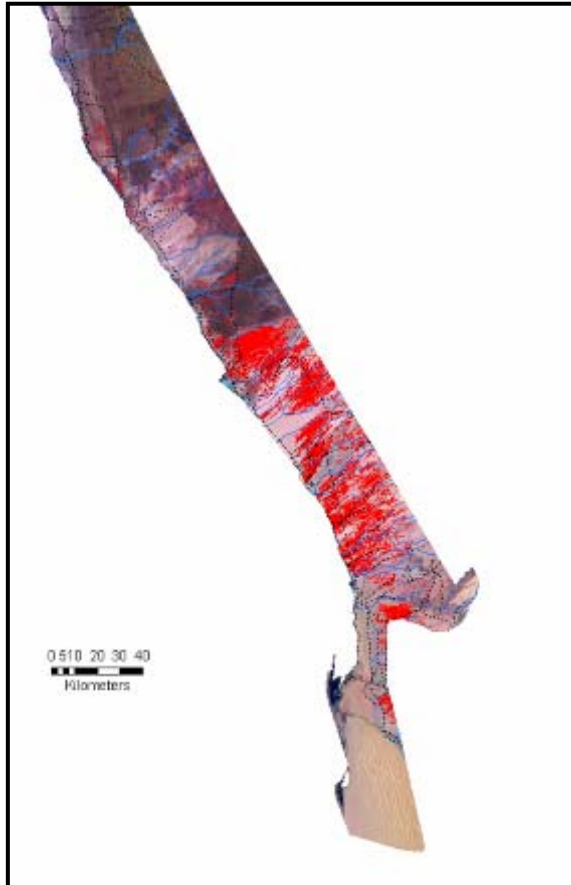


Figure 61: Lichen fields in Central Namib 2003.

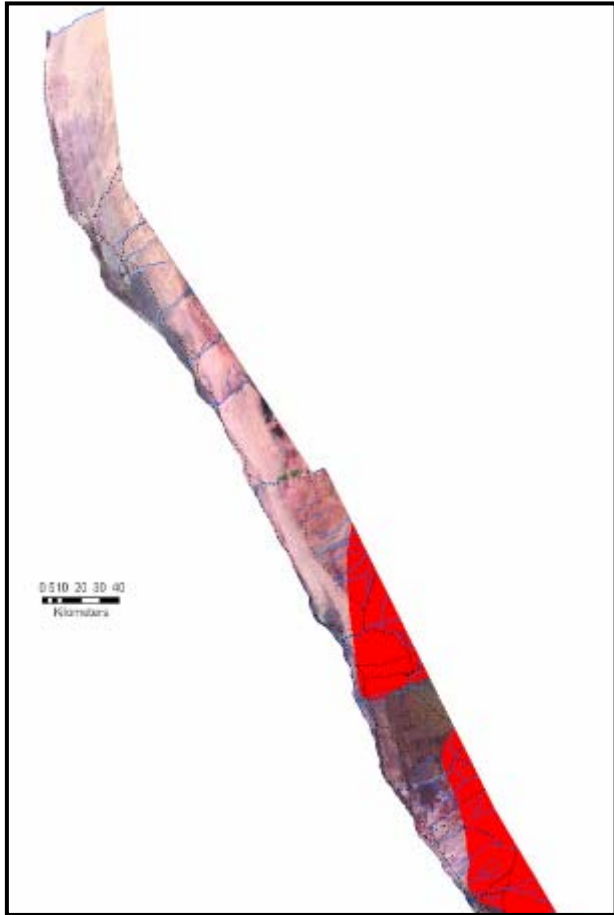


Figure 62: *Welwitschia* habitat in Kunene.

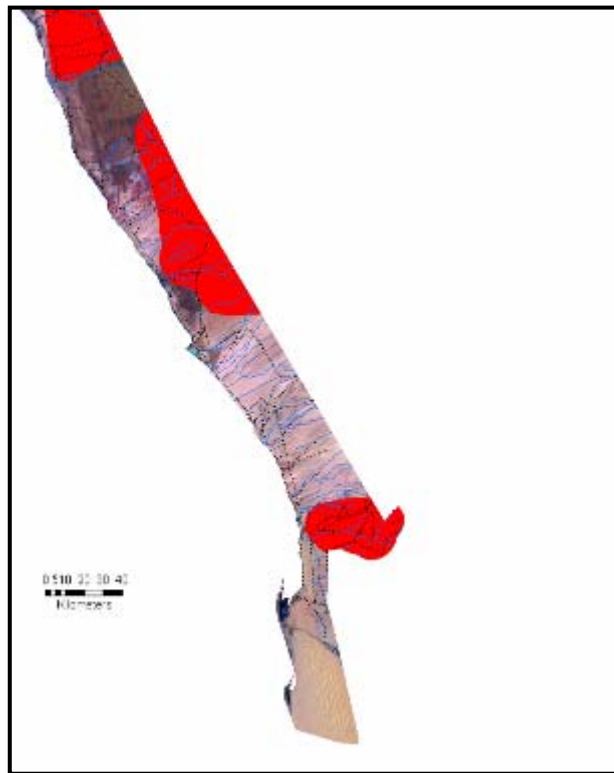


Figure 63: *Welwitschia* habitat in Erongo.

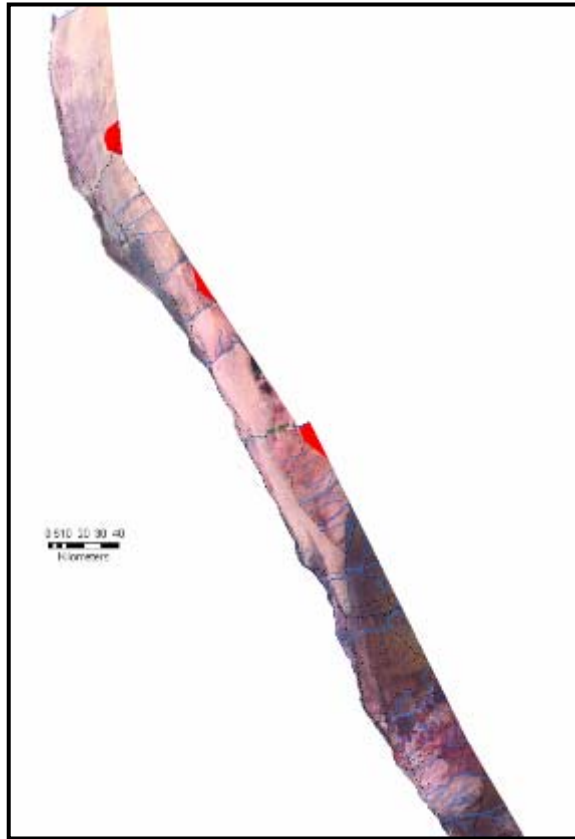


Figure 64: Mopane habitat in Kunene.

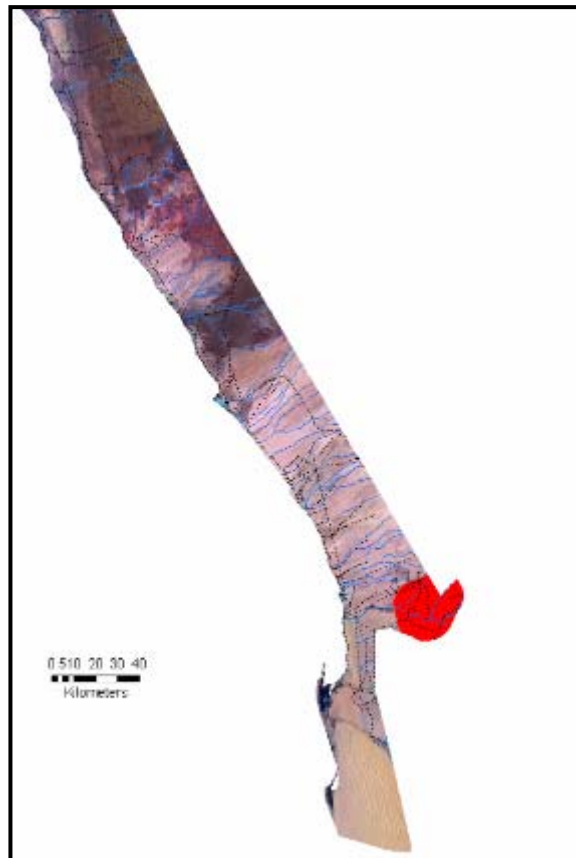


Figure 65: Quiver tree habitat in Erongo.

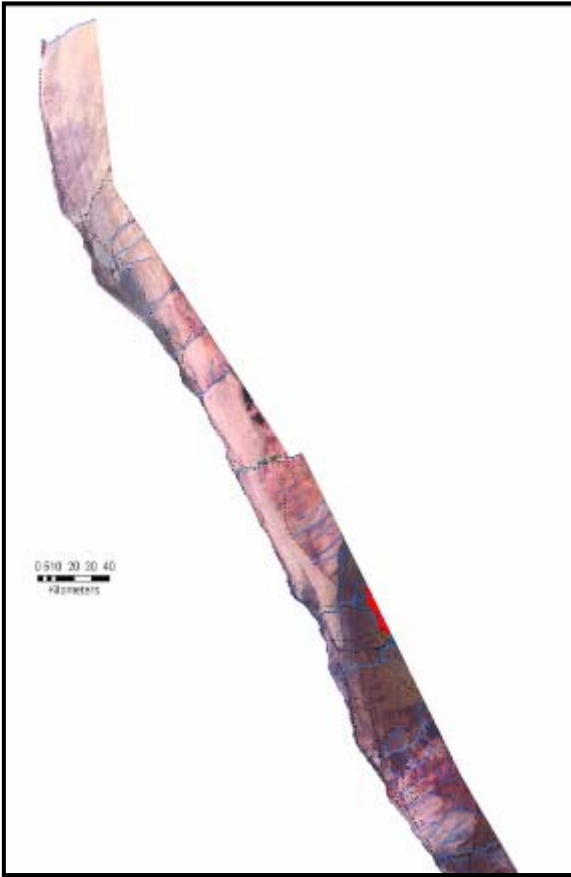


Figure 66: Zebra habitat in Kunene.

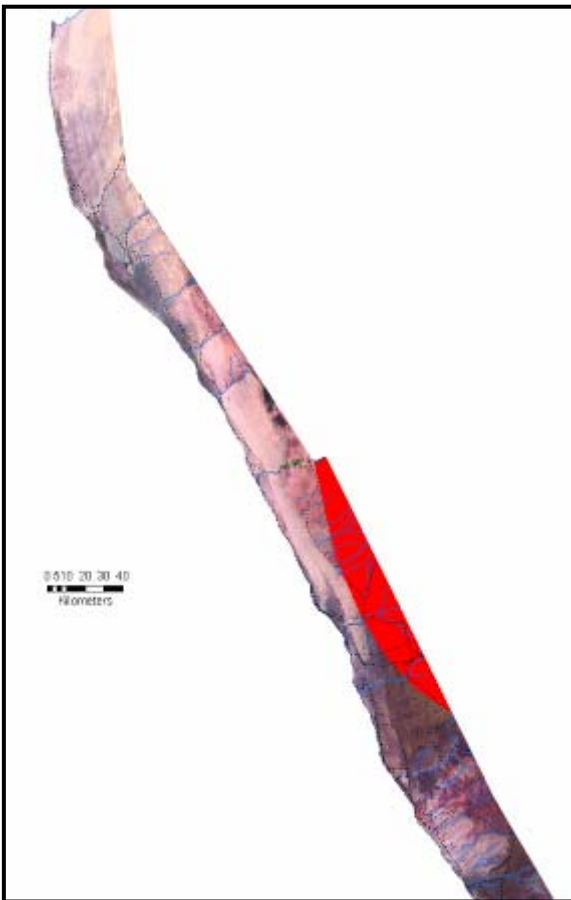


Figure 67: Leopard habitat in Kunene.

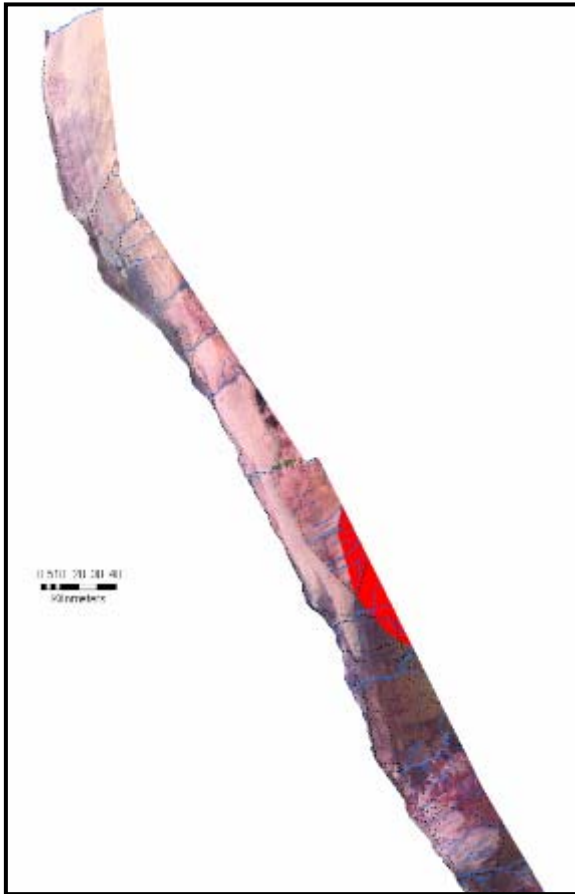


Figure 68: Lion habitat in Kunene.

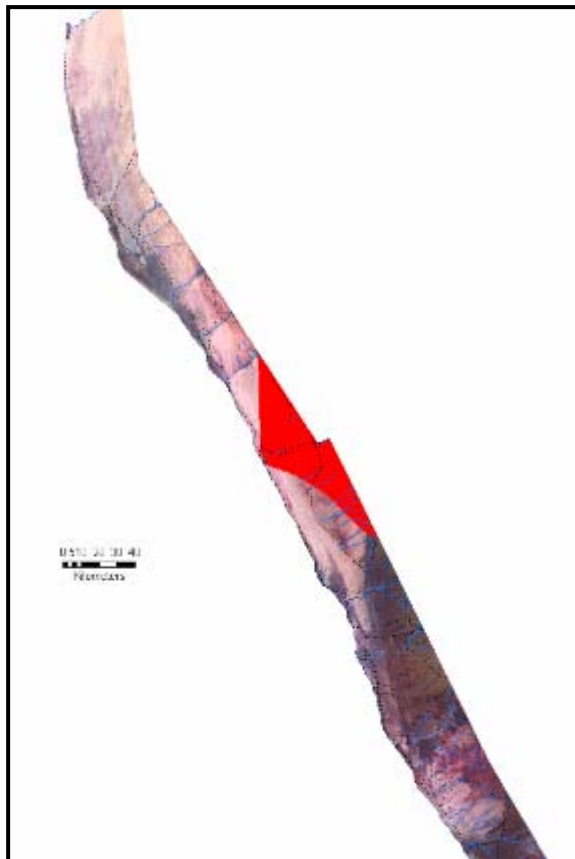


Figure 69: Elephant habitat in Kunene.

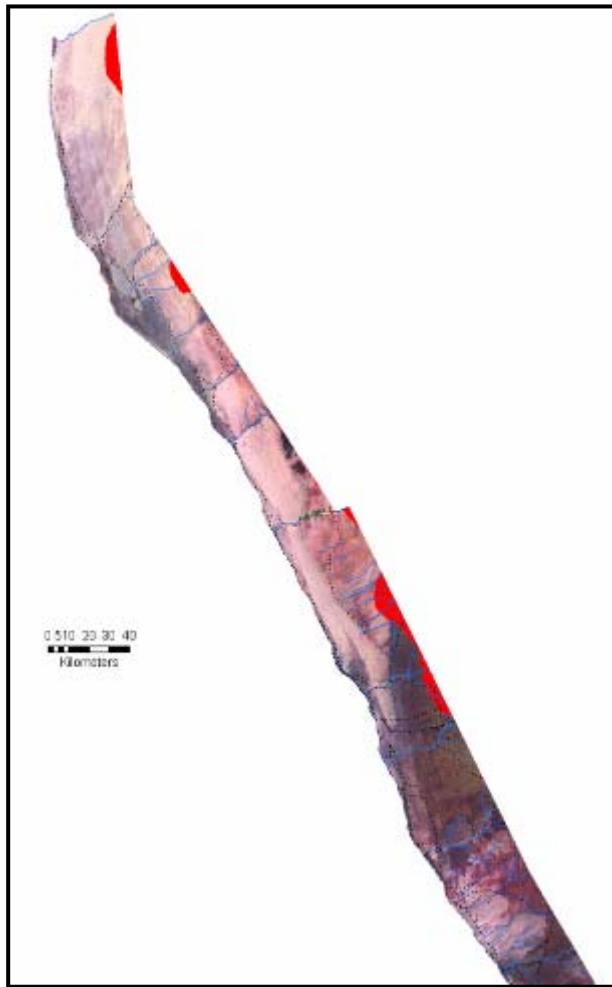


Figure 70: Large herbivore habitat in Kunene.

4. MAPS OF POLICIES AND PLANS



Figure 71: MFMR Plan for land-based aquaculture at Pelican Point.



Figure 72: MFMR Plan for land-based aquaculture between Walvis Bay and Swakopmund.



Figure 73: MFMR Plan for land-based aquaculture between Mile 4 Saltworks and Henties Bay.



Figure 74: MFMR Plan for marine aquaculture at Pelican Point.

5. EXPLOITABLE RESOURCES

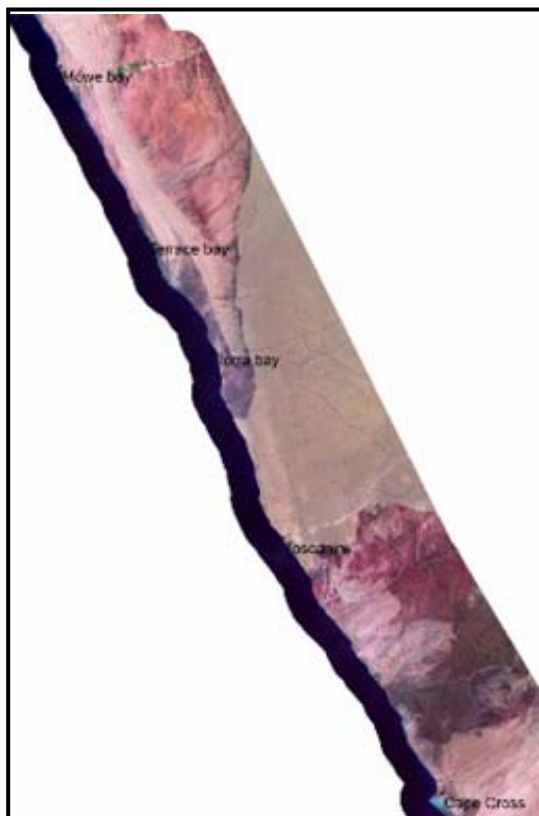


Figure 75: Area of farming potential in Kunene.

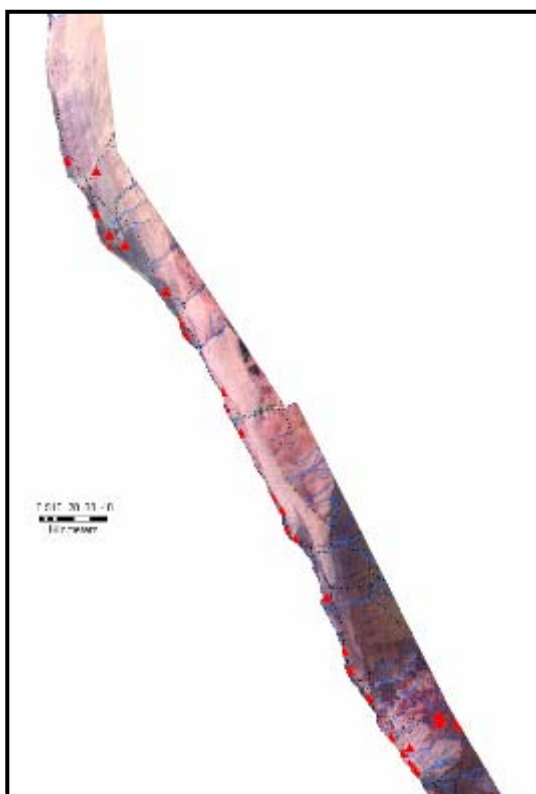


Figure 76: Mineral deposits in Kunene.

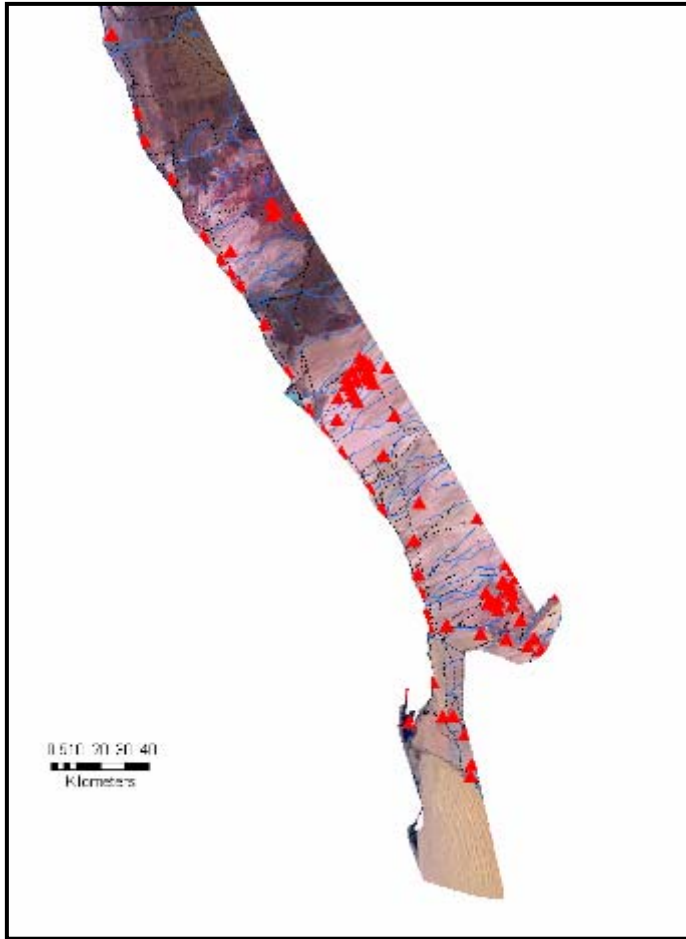


Figure 77: Mineral deposits in Erongo.

6. LAND USE MAPS

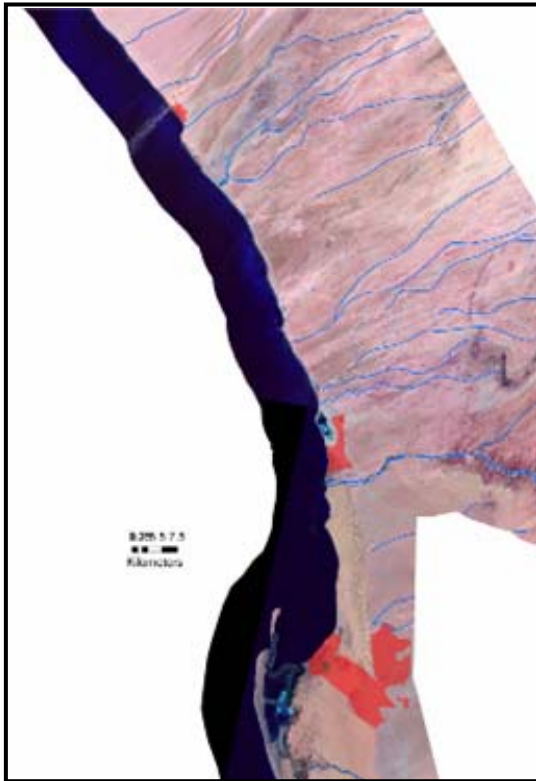


Figure 78: Modelled suitable areas for urban development in Erongo.

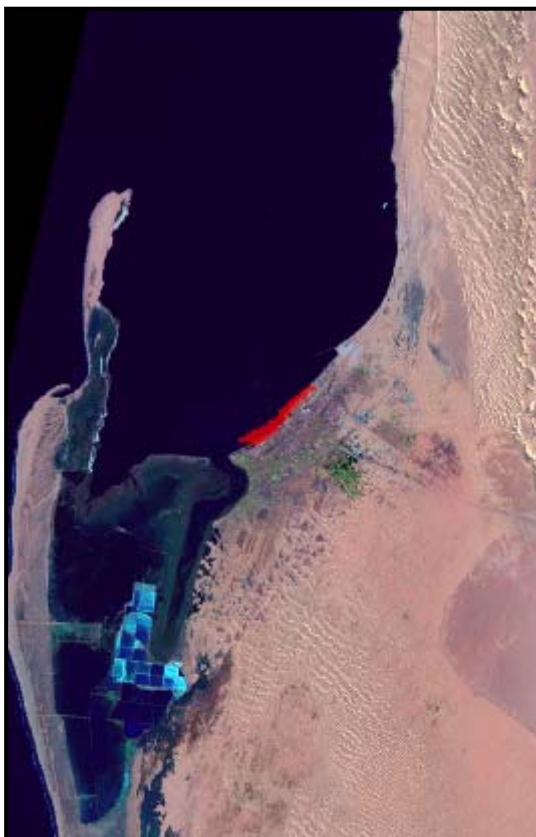


Figure 79: Modelled suitable areas for port development in Walvis Bay.

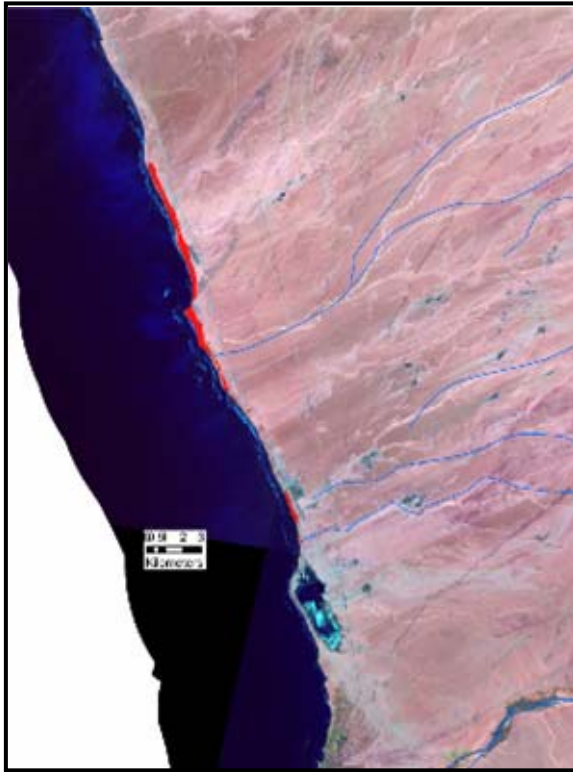


Figure 80: Modelled suitable areas for development of land-based aquaculture in northern Erongo.

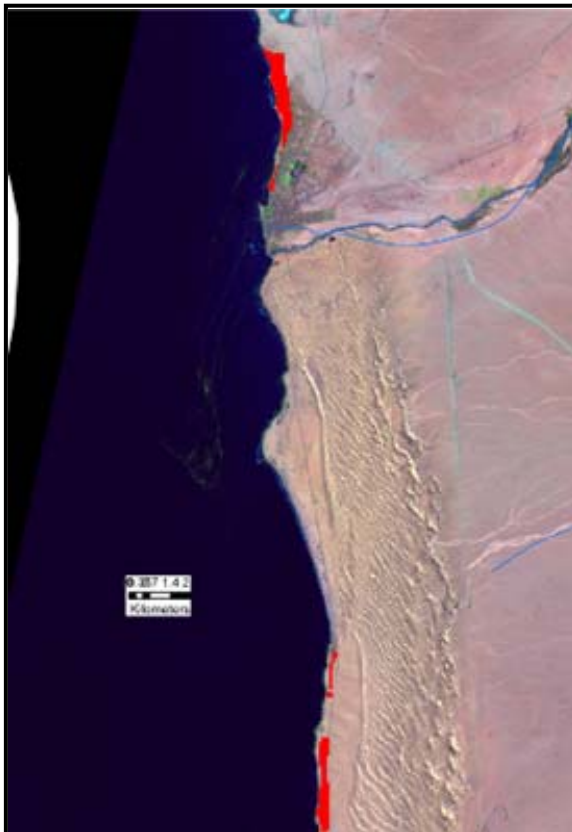


Figure 81: Modelled suitable areas for development of beach resorts in southern Erongo.

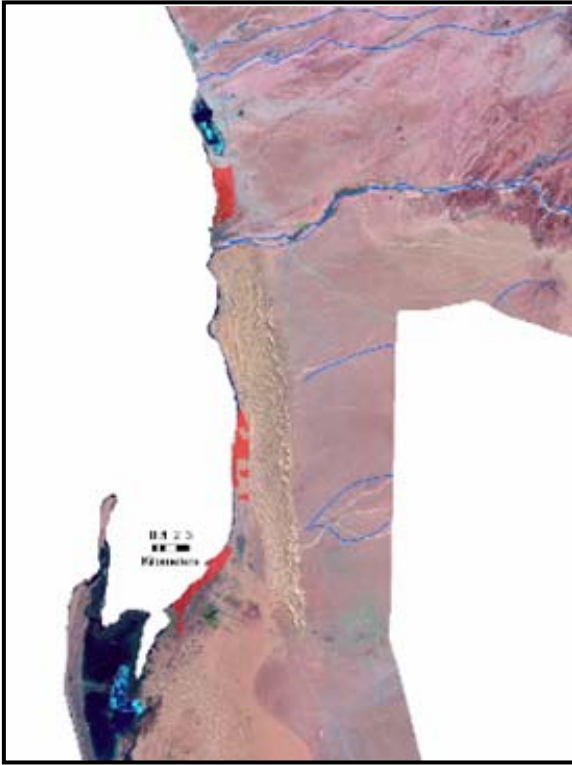


Figure 82: Modelled suitable areas for development of beach tourism in southern Erongo.

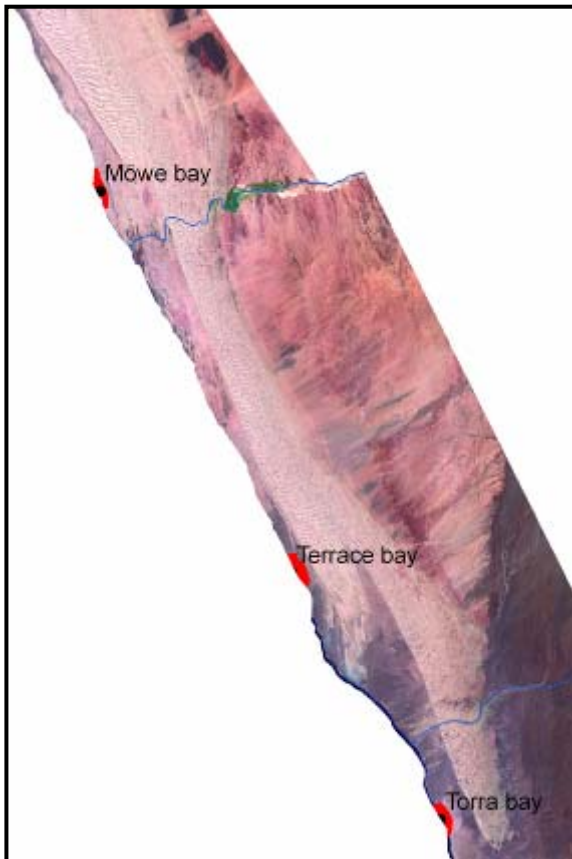


Figure 83: Modelled suitable areas for development of tourism in Kunene.

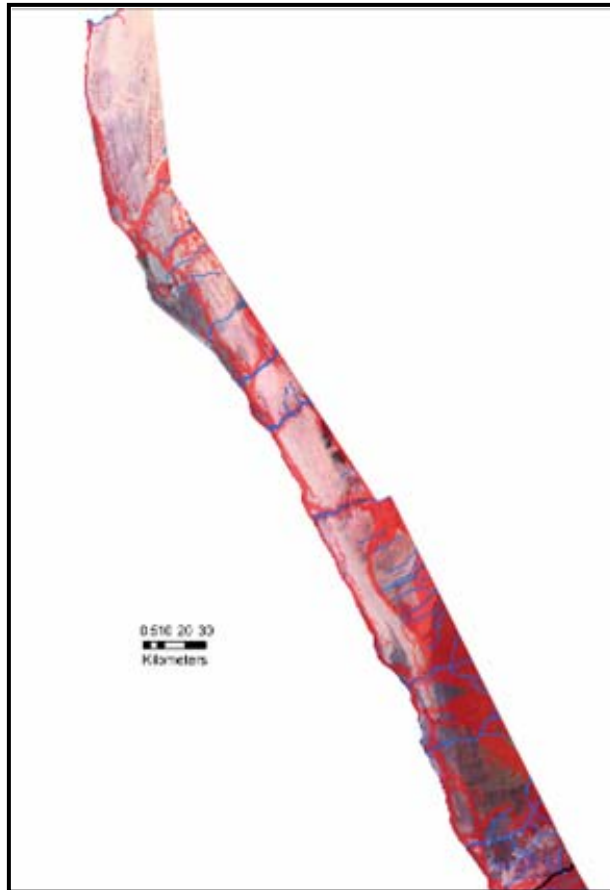


Figure 84: Modelled suitable areas for development of eco-tourism in Kunene.

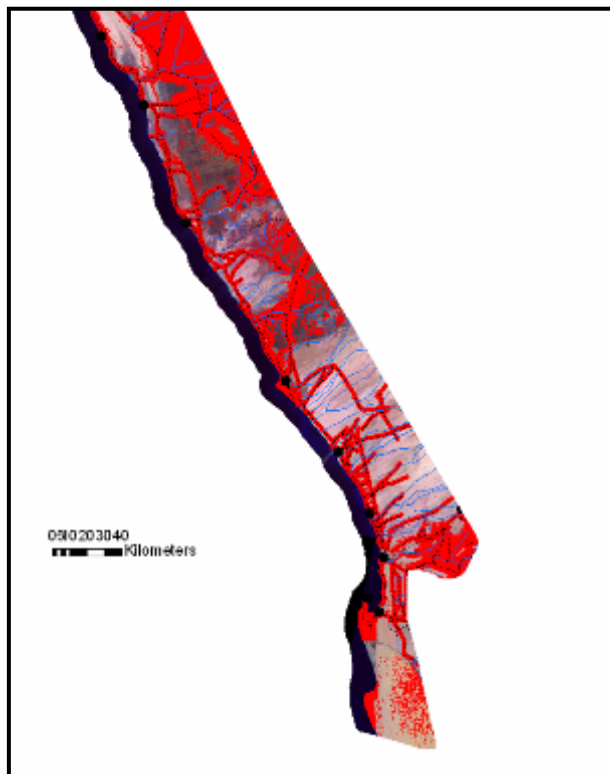


Figure 85: Modelled suitable areas for development of eco-tourism in Erongo.