Towards a Management Plan for Orange River Estuary Ramsar Site

Preliminary Situation Assessment

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eco-pulse
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CSIR
our future through science

Focus of discussion

- Summary of situational assessment
- Way forward for addressing issues & developing a collaborative plan

Estuary Health Condition

VARIABLE	WEIGHT	SCORES FOR
Hydrology	25	58
Hydrodynamics and mouth condition	25	50
Water quality	25	72
Physical habitat alteration	25	86
HABITAT HEALTH SCORE		67
Microalgae	20	50
Macrophytes	20	50
Invertebrates	20	40
Fish	20	60
Birds	20	26
BIOTIC HEALTH SCORE		45
ESTUARINE HEALTH SCORE		56

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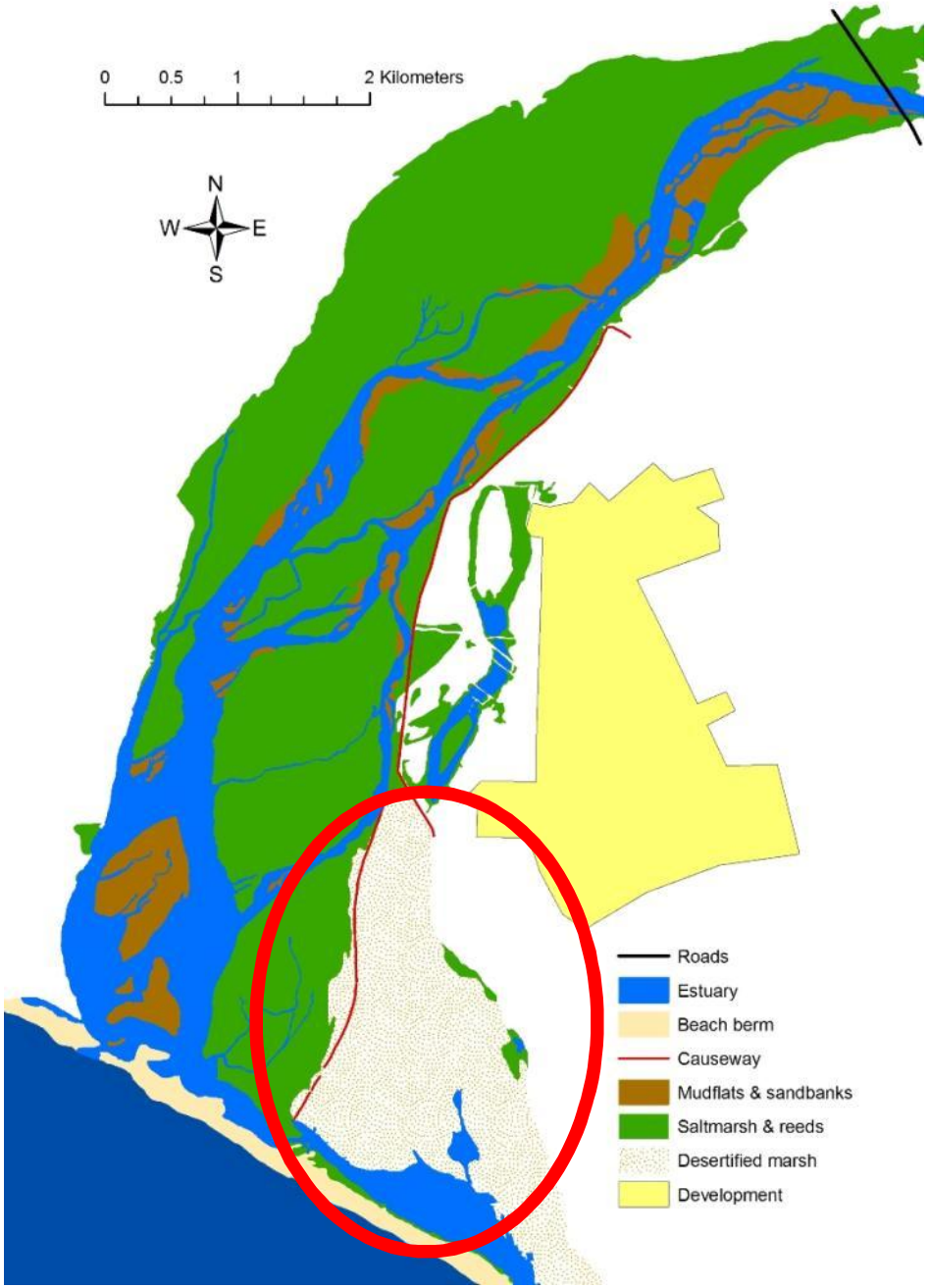
Present Ecological Category = D

Recommended Ecological Category = C+

Saltmarsh

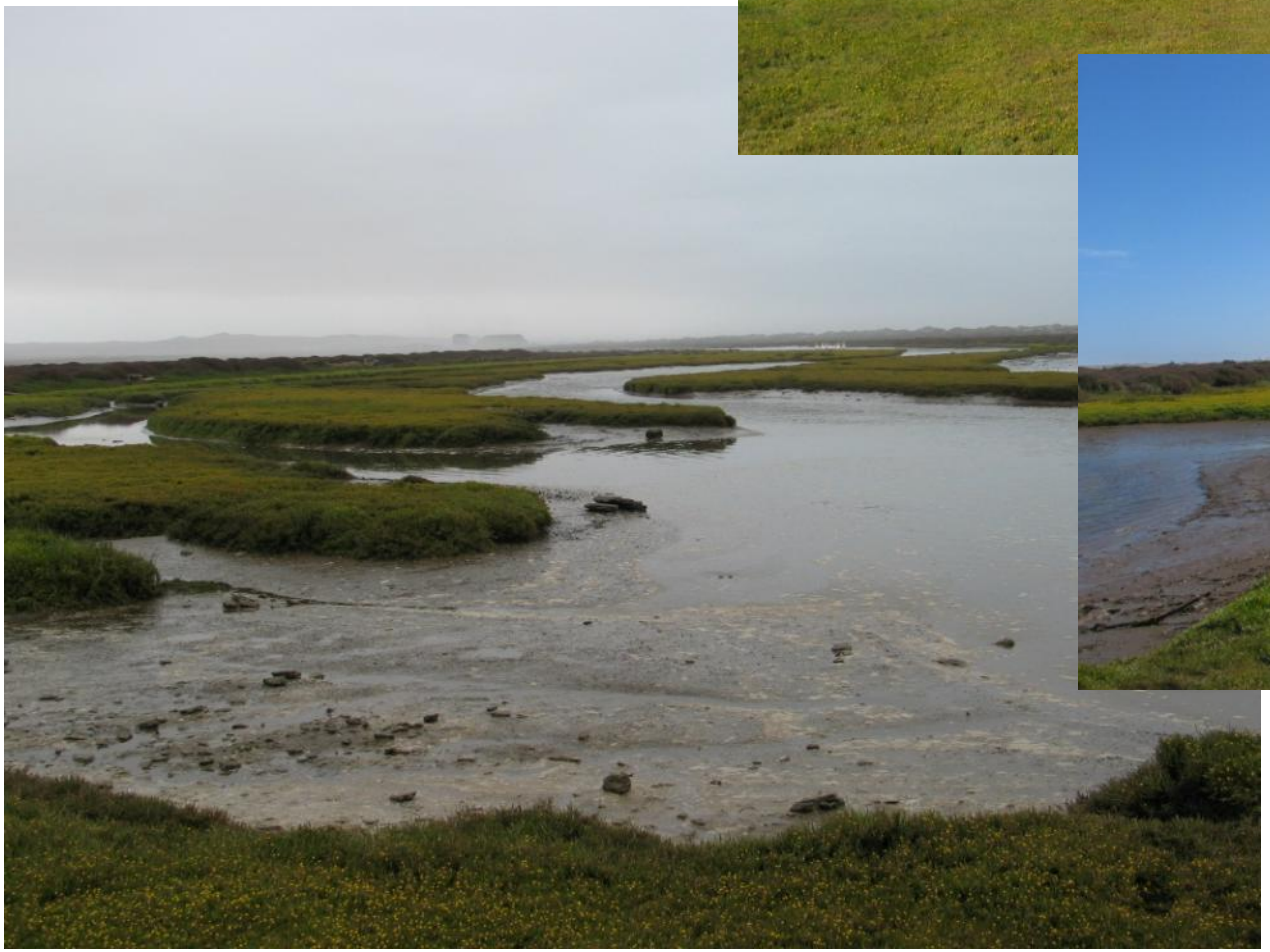
-

Area of concern decimated saltmashes



Variety of estuarine habitat types

Rehabilitated area near mouth where causeway was opened



Key Ecosystem services

- Migration corridor and breeding ground for birds
- Fish nursery habitat
- Recreation and tourism (natural appreciation, recreation, aesthetics)
- Recreational (and subsistence) fisheries
- Nutrients supply
- Grazing to livestock and wildlife
- Freshwater flows to sea (supplying nutrients & sediment to the marine environment)

Key Threats: Land use & infrastructure

- **Causeway:** A causeway through the salt marsh for easy access to the beach from Alexander Bay.
- **Mining operations:** Fine material from the Alexkor slimes dam and overburden removal is transported by wind into the salt marsh & saline seepage water has discharged into the peripheral salt marsh (resulting in hypersalinity).
- **Artificial breaching:** The location is strongly influenced by the position where the mouth was breached (artificially or natural).
- **Riparian Infrastructure for flood control measures:** Dykes protect Alexkor agricultural land from flooding. The dykes cut off flood channels that used to extend into the salt. Dykes were also constructed by Namdeb to protect the golf course from flooding. Dykes on both banks cause constriction of flow during floods.

Key Threats: Water Quality & Quantity

- **Flow modification through damming, regulation of flows and hydropower generation.** Runoff reduced by >50%.
  - Occurrence & magnitude of large floods - significantly reduced.
  - Occurrence & magnitude of smaller floods (1:1 -1:10 years) - greatly reduced.
  - Low flow during the winter months – linked mouth closure and back-flooding - significantly increased because of releases from the dams
- **Diffuse wastewater disposal**
  - Agricultural activities in the catchment - inorganic nutrients (nitrogen and phosphate).
  - Occasional algal blooms (Spitskop Dam) - excessive nutrient loading. These blooms make there way downstream resulting in anoxic waters reaching the Orange River Estuary.
  - Wastewater discharges from the mining activities at Alexander Bay also tend to modify interstitial/groundwater salinity levels in the saltmarsh areas.

Key Threats: Over-exploitation of living resources

- **Over-grazing**
  - Grazing of the floodplain seems to be sustainable - concern that grazing of the severely degraded saltmashes would further reduce there viability.
  - There is also a concern regarding a herd of “wild cattle” that roams both the South African and Namibian side. Uncontrolled escalation of these stock numbers could represent a severe future pressure for the estuary. *(Please confirm as we are unsure if this is still an issue)*
- **Fishing activities**
  - Significant fishing effort at the mouth and some set- lines (long-lining) in the middle reaches from both side.

Key Threats

Key activities & associated problems

CATEGORY	ACTIVITY	PROBLEM								
		Siltation	Physical habitat alteration/ destruction	Alteration of salinity regime	Eutrophication	Toxic chemical pollution	Microbial contamination	Littering	Suspended solids	Direct Alteration of biomass/species
Land-use & Infrastructure Development	Road Infrastructure (cuaseway)	×	×	×	×				×	
	Riparian Infrastructure	×	×	×					×	
	Mining	×	×			×			×	×
	Artificial breaching	×	×	×					×	×
Water Quantity & Quality	Flow modification (water abstraction & hydropower generation		×	×	×					
	Wastewater disposal (sewage)				×	×	×			
	Wastewater disposal (mining return flow)			×	×	×	×			×
Living Marine Resources	Livestock grazing of riparian zone	×	×						×	×
	Fishing of indigenous fish species							×		×

Impacts & socio-economic issues problems

ENVIRONMENTAL IMPACTS AND SOCIO-ECONOMIC CONSEQUENCES	PROBLEM								
	Siltation	Habitat alteration	Alteration of salinity regime	Eutrophication	Toxic chemical pollution	Microbial contamination	Littering	Suspended solids	Alteration of biomass/ species
ENVIRONMENTAL IMPACTS									
Modification/loss in species composition	×	×	×	×	×	×		×	×
Smothering of benthic communities	×	×		×			×	×	
Entanglement of organisms (e.g. birds)							×		
Chronic effects on biota			×	×	×	×		×	
Mortality (acute effects) on biota			×	×	×	×		×	
Harmful algal blooms			×	×					
Anoxic conditions		×		×					
Pathogenic infections in biota				×	×	×			
PUBLIC HEALTH & SAFETY									
Human health - recreational activities		×		×	×	×			
Human health - seafood				×	×	×			
FOOD SECURITY & POVERTY									
Loss in quality of seafood products				×	×	×		×	×
Loss of fisheries resources and revenue		×	×	×	×	×		×	×
OTHER SOCIO-ECONOMIC IMPACT									
Loss of aesthetic value (e.g. for tourism)	×	×		×	×		×	×	×
Loss of coastal real estate		×		×		×	×	×	×

Legislation & responsible departments/authorities

CATEGORY	ACTIVITY	RELEVANT LEGISLATION	RESPONSIBLE DEPARTMENT/ AUTHORITY
Land-use & Infrastructure Development	Road Infrastructure	: Municipal systems Act 2000 (IDPs)	Dept. Provincial and Local Government/Local Authorities
		:	.....
	Riparian Infrastructure	: Municipal Systems Act 2000 (IDPs)	Dept. Provincial and Local Government/Local Authorities
		:	.....
	Mining	: Mineral and Petroleum Resources Development Act 2002	Dept Minerals (DM)
		: Minerals (Prospecting and Mining) Act 1992	Ministry Mines and Energy (MME)
	Artificial breaching	: NWA 1998/ICMA 2008	Dept Water Affairs (DWA)/Dept. Environmental Affairs (DEA)
		:	.....

Legislation & responsible departments/authorities

CATEGORY	ACTIVITY	RELEVANT LEGISLATION	RESPONSIBLE DEPARTMENT/ AUTHORITY
Water Quantity & Quality	Water flow modification	: NWA 1998, Water Services Act and Municipal Systems Act 2000 (IDPs)	DWA/Local Authorities
		: National Water Resources Management Act 2004	Ministry Agriculture, Water and Forestry (MAWF)
	Wastewater disposal (sewage)	: NWA 1998, Water Services Act and Municipal Systems Act 2000 (IDPs)	DWA /DEA/Local Authorities
		: National Water Resources Management Act 2004	MAWF
	Wastewater disposal (mining return flow)	: NWA 1998/ Mineral and Petroleum Resources Development Act 2002	DWA/ DAFF
		: Minerals (Prospecting and Mining) Act 1992/National Water Resources Management Act 2004	MME/MAWF
Living Marine Resources	Livestock grazing of riparian zone	: CARA 1983/ MLRA 1998	Dept. Agriculture, Forestry and Fisheries (DAFF)
		:	.....
	Gill netting of indigenous fish species	: MLRA 1998	DAFF
		:	.....

Impacts, status of legislation & management initiatives

CATEGORY	ACTIVITY	"IMPACT"		"RESPONSE"	
		Ecological	Socio-Economic	Legislation	Management Responses
Land-use & Infrastructure Development	Road Infrastructure	H	M	M	M / H
	Riparian Infrastructure	H	H	M	L
	Mining	H	H	L	L
	Artificial breaching	M	M	M	L
Water Quantity & Quality	Water flow modification	H	L	H	L
	Wastewater disposal (sewage)	L	L	H	L
	Wastewater disposal (mining return flow)	H	L	L	L
Living Marine Resources	Livestock grazing of riparian zone	M	H	M	L
	Gill netting of indigenous fish species	L	L	M	L

Orange River Mouth Transfrontier Conservation Area

Vision

To restore, conserve and enhance the ecological characteristics, and to advocate wise-use of the Orange River Mouth Transfrontier Conservation Area (ORMTRS).

Goals and objectives

- To restore and manage the ecological character and functional integrity of the ORMTRS to a functioning wetland system.
- To conserve the biodiversity, life-support systems and ecological processes of the ORMTRS.
- To preserve the cultural and historical heritage and aesthetic values of the ORMTRS.
- To advocate and manage the ORMTRS in a manner that is compatible with the Ramsar concept of wise-use.

Key Recommendations

- Institutional matters & funding
- Comprehensive Ecological Water Requirement Study
- Setting of Resource Quality Objectives (Balancing social & ecological needs)
- Improved flow gauging and recalibration of 1993 – 1996
- Operating rules of dams
- Restrict wind blown dust and sand
- Remove the causeway

Key Recommendations

- Rehabilitating the saltmarsh
- Restrict or prohibit illegal activities - hunting of wildlife and waterfowl in Ramsar site & impose restrictions on aircraft flying over the ORE
- Control exploitation of fish
- Waterbird research and monitoring
- Ecological Water Requirement of the Marine Environment
- Provide statutory protection to the Orange River Estuary in the form of the Orange River Mouth Transfrontier Conservation Area.
- Until there has been an improvement in the ecological status of the Orange River Estuary, it should remain on the Montreux Record


Oppenheimer Bridge ~10km upstream


Brandkaros (35 km upstream)

Overwash August 2004

Orange Estuary Mouth

Significant tidal penetration:

- 0.4 m (Mean tidal range)
- 1.0 m (Spring tide range)

Study Gaps

- **Need more information on Namibian and local legislation**
- **Need summaries (1/4 page) on Existing initiatives – e.g. Working for Wetlands?**
- **Institutional structures – e.g. Summary paragraphs needed on the ORM committee structure, mandate and participants**

Way forward…

- Finalize Situational Assessment
- Develop Orange Estuary Management Plan – in consultation with stakeholders
- Develop fully functional cross-boundary institutional structure (including mandates & resources)
- Statuary protection – Orange River Mouth Transfrontier Conservation Area (ORMTRS).
- Link up with Orange-Kunene initiative – WWF/DAFF/DEA
- Lobby DWA for COMPREHESIVE Orange Estuary Ecological Water Requirement (and RQOs) including marine needs
- Extend Ramsar boundaries

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