

# Biodiversity and Ecosystem service priority area mapping

## KwaDukuza Biodiversity and Open Space Management Plan (BOSMaP)

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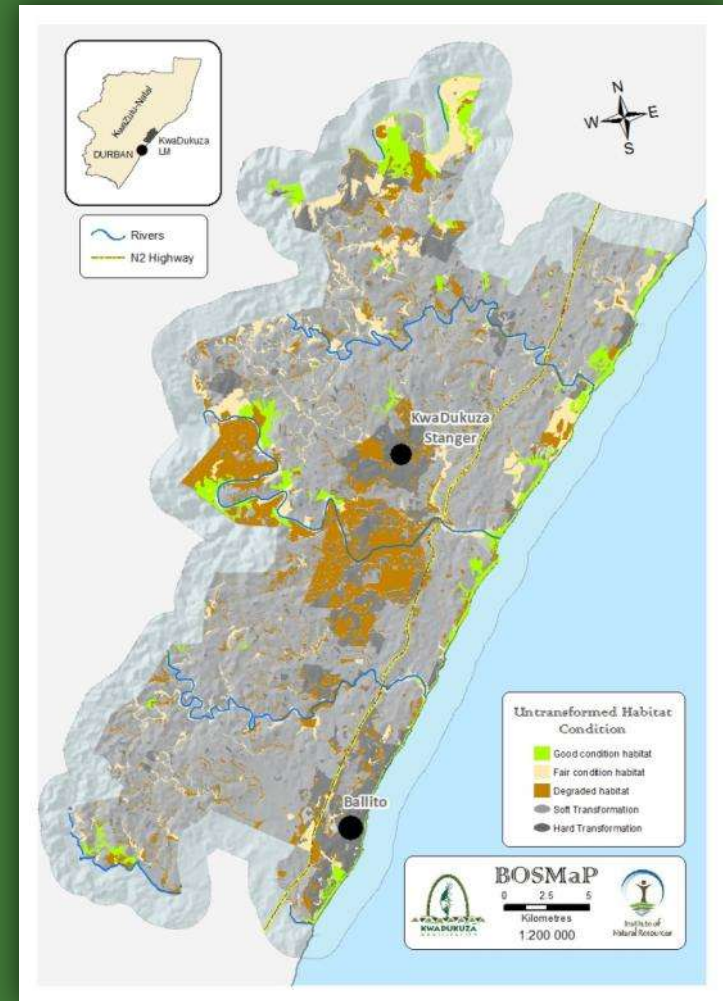
In memory

**Rob Scott-Shaw  
and  
Rob Karssing**

Ezemvelo KZN Wildlife

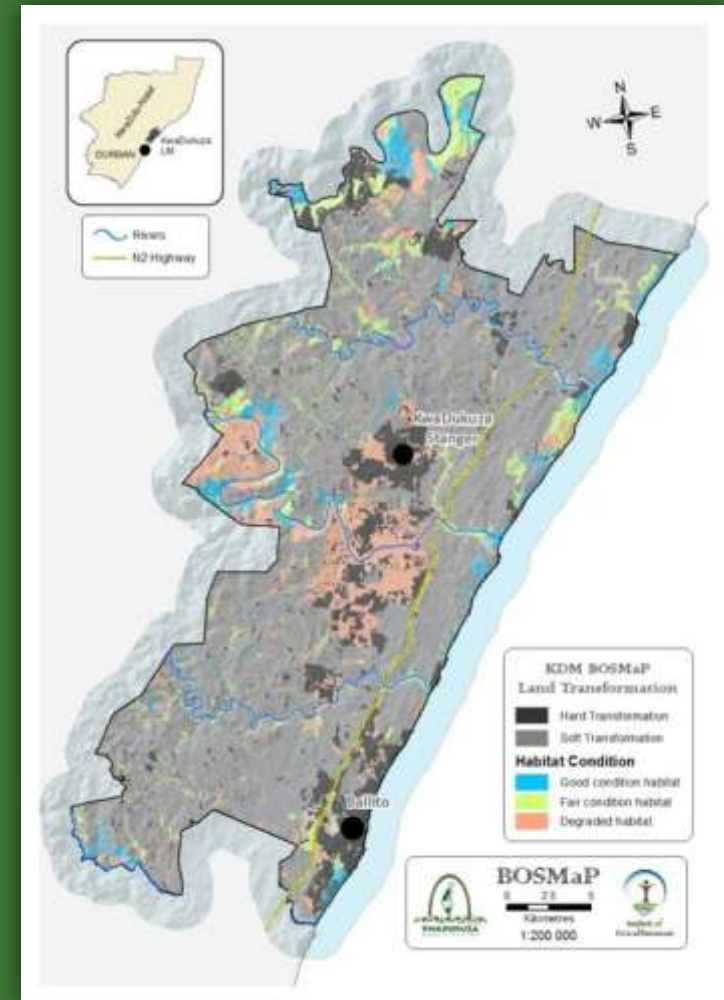
# KWADUKUZA MUNICIPALITY AT A GLANCE

- Highly transformed by sugar cane cultivation
- **24.4%** of municipal area is untransformed (not currently cultivated or developed) - 17949.6 Ha
- Of this **11.5%** is in fair or good condition – 8494.5 Ha
- There are **no protected areas** in the municipality and heavy development pressure is being exerted – particularly on the coast



# OBJECTIVES OF THE KWADUKUZA PROJECT

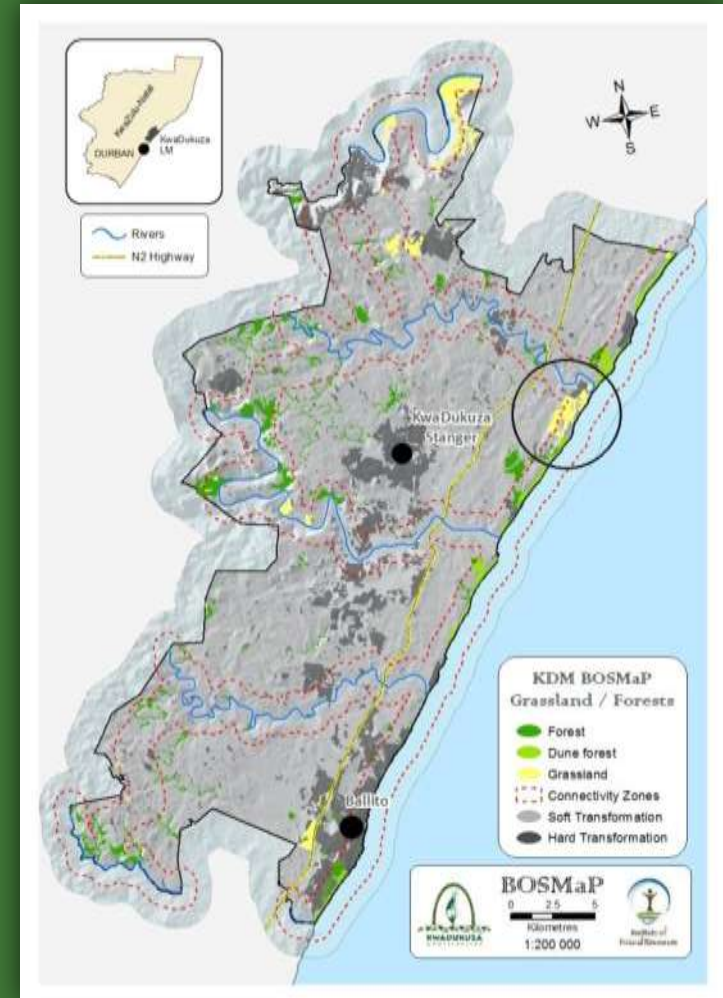
1. **Identify, map and classify** untransformed land in the municipality at a fine scale
2. **Understand** the value of the remaining untransformed open space in terms of:
  - a) Biodiversity and
  - b) ES / EI
3. **Provide a product** which allows the municipality to make informed decisions regarding development and conservation questions.



# FINE SCALE MAPPING

- Untransformed areas categorised at 4 levels

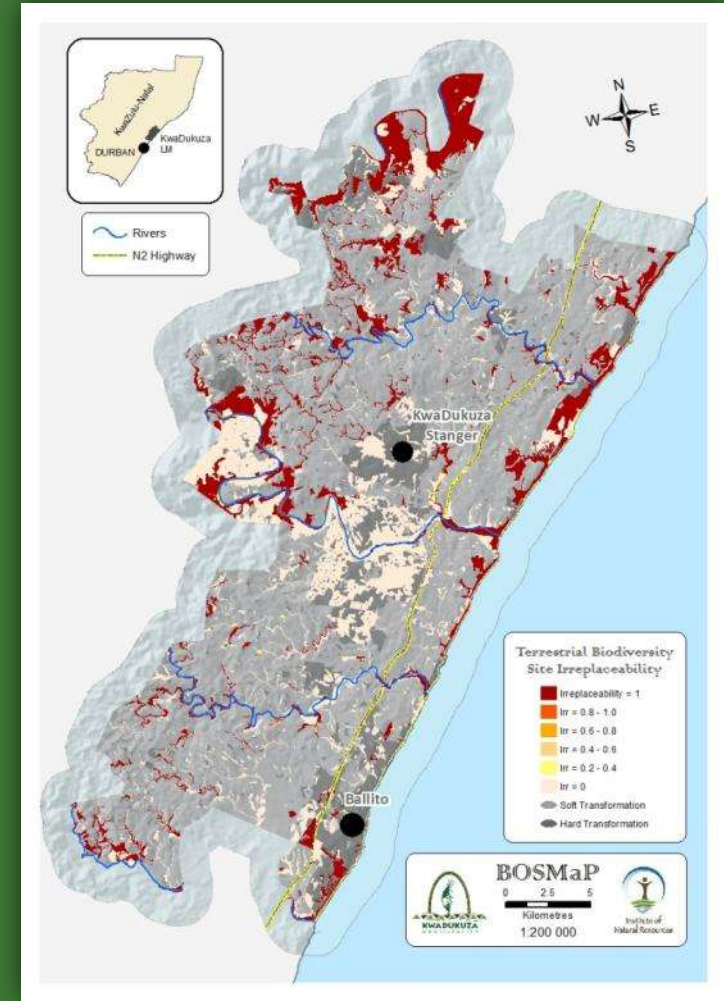
1. Functional group  
(terrestrial/wetlands/riparian/estuary functional zones)
2. Structural group  
(grassland, dune forest, bushland etc.)
3. Vegetation type  
(EKZNW vegetation type)
4. Condition  
(Good, Fair, Degraded, Transformed)





# BIODIVERSITY ASSESSMENT

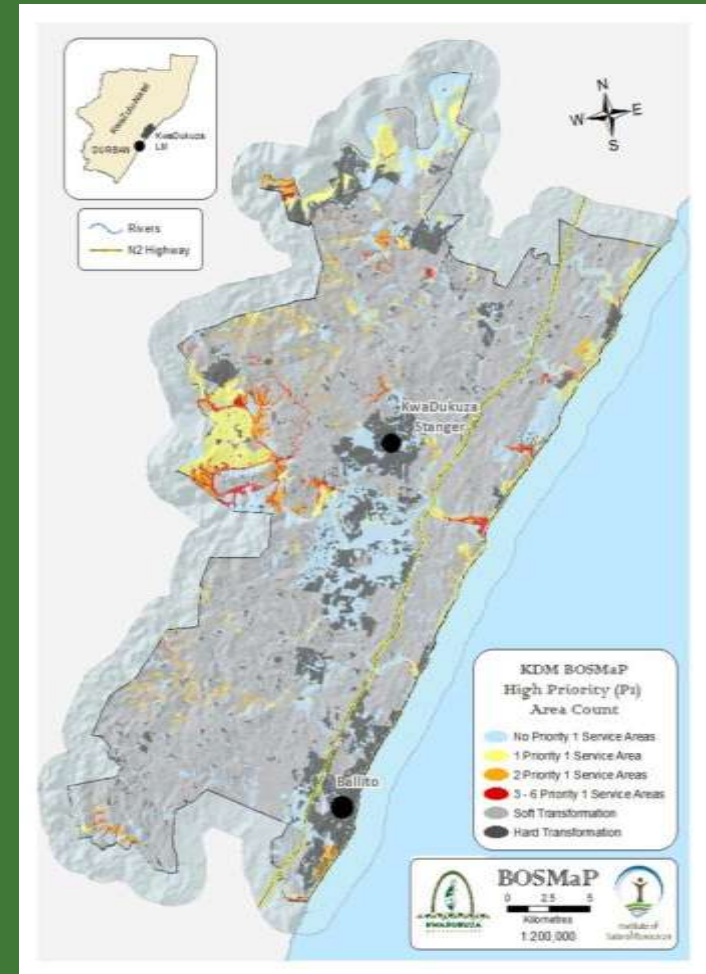
- Fine scale systematic conservation plan used to assess the value of remaining patches.
- Many important (threatened or endemic) species are also associated with remnant habitat in KwaDukuza – Identified through existing databases and expert consultation
- Much of the remnant habitat is identified as critical (irreplaceability 1).



# ECOSYSTEM SERVICE ASSESSMENT

- Important ES areas (Priority areas) identified based on:
  - Areas of demand
  - Areas of supply

	Demand						
Supply	Very high	High	Moderate to High	Low to Moderate	Low	Very low	No demand
Very high	Priority 1	Priority 1	Priority 1	Priority 1	Priority 2	Priority 3	
High	Priority 1	Priority 1	Priority 1	Priority 2	Priority 2	Priority 3	
Moderate to High	Priority 1	Priority 1	Priority 2	Priority 2	Priority 2	Priority 3	
Low to Moderate	Priority 1	Priority 2	Priority 2	Priority 2	Priority 3	Priority 3	
Low	Priority 2	Priority 2	Priority 2	Priority 3	Priority 3	Priority 3	
Very low	Priority 3	Priority 3	Priority 3	Priority 3	Priority 3	Priority 3	
No supply							



# ECOSYSTEM SERVICE ASSESSMENT

**Supply** of ecosystem goods and services assessment based on:

1. Fine scale mapping - Level 2 (structural) vegetation categorisation
2. Expert opinion – scoring workshop





# ECOSYSTEM SERVICE ASSESSMENT

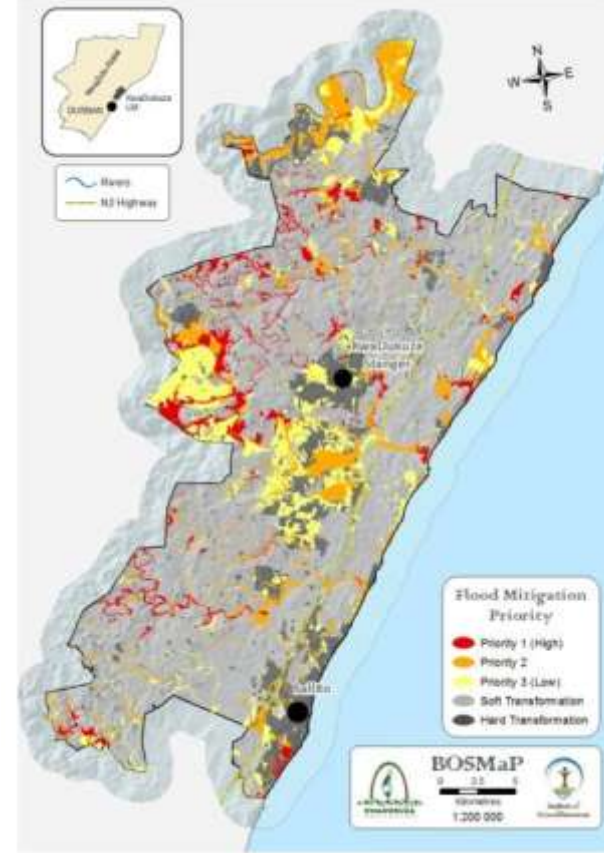
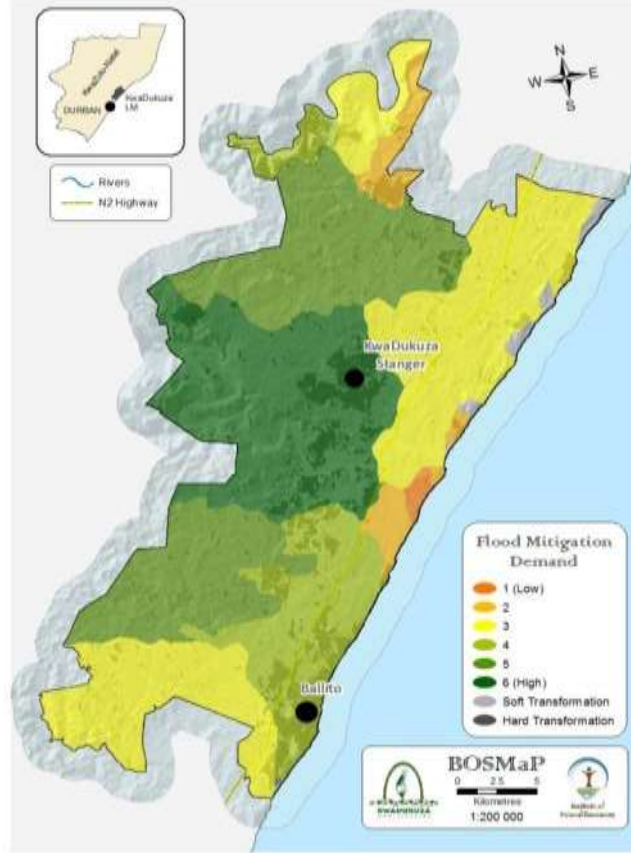
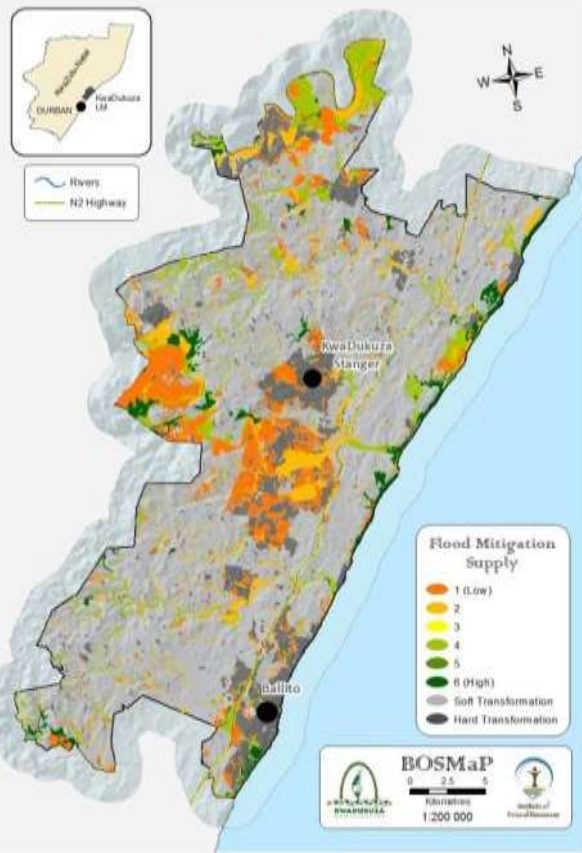
**Demand** for ecosystem goods and services assessed based on:

1. A variety of data sets were used to model and identify areas where demand for services is located and which supply areas are supplying the demand.

2. Benefits are often enjoyed away from the service supply areas – demand is often spatially offset.



# ECOSYSTEM SERVICE ASSESSMENT



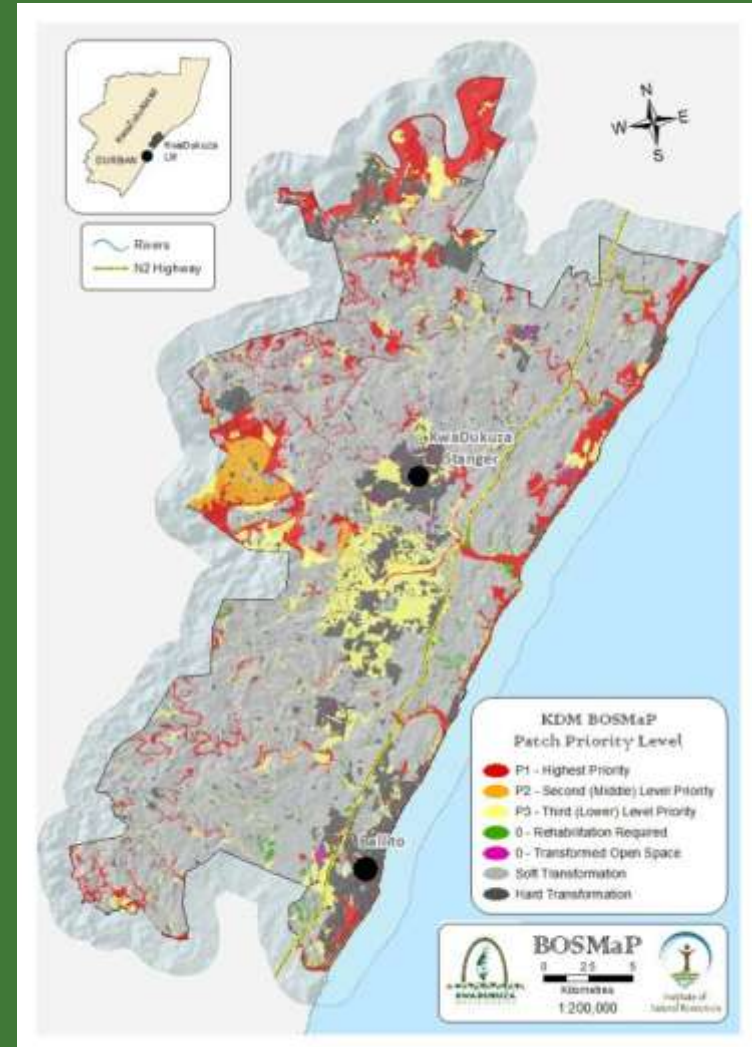
# IMPORTANT OPEN SPACES

Important Open spaces are thus areas that are important for :

1. biodiversity conservation and/or
2. ecosystem service delivery.

The Biodiversity and Open Space Management Plan (BOSMaP) combines these to identify priority open space areas

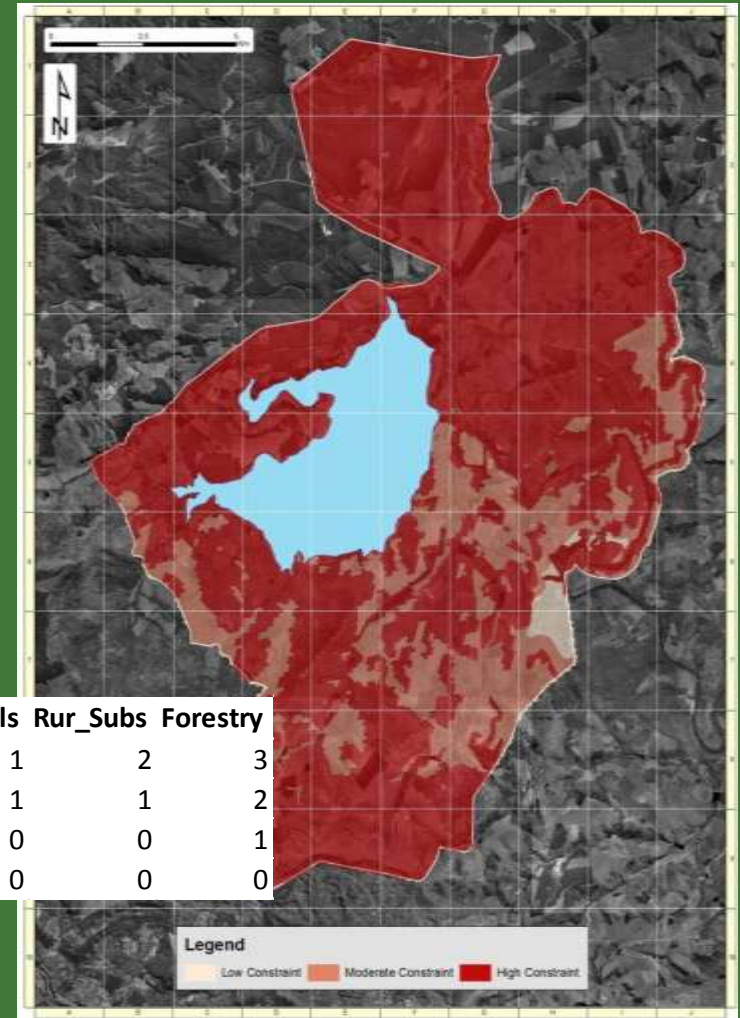
		Ecosystem Service Priority Score			
		1	2	3	0
Biodiversity Priority Score	1	1	1	1	2
	2	1	2	2	2
	3	1	2	3	3
	0	2	2	3	0





# WHERE TO NOW – MUNICIPAL USE OF THE PRODUCT

1. Including the BOSMaP in mainstream municipal planning (SDF)
2. Potential for characterisation of development types and their specific impacts?

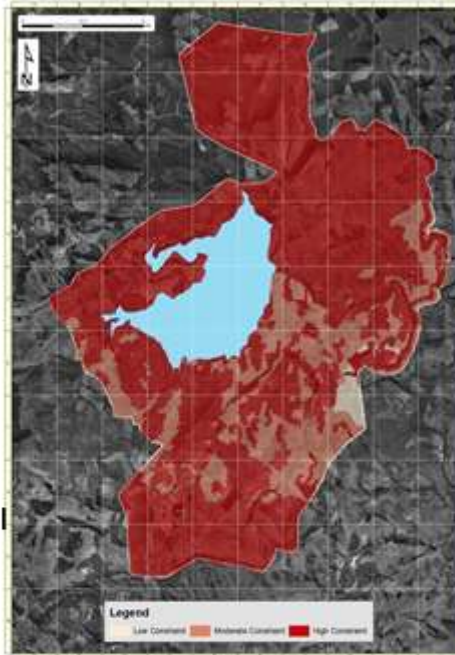


Const_Cat	Feature	Ext_Crop	Int_Crop	Int_Animals	Ext_Animals	Rur_Sub	Forestry
Terrestrial Biodiversity	Irreplaceability 1	3	3	3	1	2	3
Terrestrial Biodiversity	Irreplaceability 2	2	2	2	1	1	2
Terrestrial Biodiversity	Irreplaceability 3	1	1	1	0	0	1
Terrestrial Biodiversity	Irreplaceability 4	0	0	0	0	0	0



# WHERE TO NOW – DEVELOPMENT CHARACTERISATION ?

## *Light Industry*



### **Land use description**

Light industry is characterised by manufacturing uses which are compatible with land uses permitted in adjacent more sensitive land use zones, such as residential, mixed-use and open space zones. Light industry permits manufacturing activities that usually do not involve significant vibration, noise, odour, or high volume of automobile and truck traffic. Warehousing of materials considered non-toxic or non-hazardous are permitted in buildings in this zone, with possible conditions. Outdoor storage, as an ancillary use, would be extremely limited if not outright prohibited. Office uses would be permitted with conditions in this zone. (e.g. with a Consent Use Procedure.

### **Typical impacts**

- Development footprint
  - Biodiversity
  - Agriculture
  - Wetlands
  - Cultural features
- Associated impacts
  - Increased traffic

### **Planning guidelines**

**Compatible land uses:** Light industry is considered relatively compatible with other commercial and industrial land uses. Residential is unlikely to be impacted significantly.

**Application requirements:** High Constraint Areas are related largely to footprint impacts. The footprint of development should thus be subject to appropriate environmental authorisation procedures.

# STUDY LIMITATIONS / WEAKNESSES

- Limited species records for this area – modeled distributions thus used with limited groundtruthing.
- Planning units – Level 3/4 classification areas used for biodiversity assessment, when combining with ecosystem service areas, this becomes messy....
- Modeling of ecosystem service demand not based on public participation – Budget constraints.....

# ACKNOWLEDGEMENTS

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Mr Steve Woodhall - Author, Field Guide to Butterflies of South Africa, Random House Struik Publishers, Cape Town

Dr Doug Harebottle SABAP 2 Project manager at the Animal Demography Unit - University of Cape Town.

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Mr Johan Marais of Reptile Ventures – Author. A complete guide to the snakes of southern Africa, Struik Publishers,  
Cape Town