

3.3.2 Terrestrial Ecosystem Types

Vegetation types as discussed above do not adequately represent the nature of functioning of some of the more conspicuous ecosystems of the study area that consist of a set of interacting vegetation types and supported animal biota. The description of vegetation types is therefore complemented with an account of a selection of the ecosystem types that are significant within the study area. An ecosystem is defined as a set of plant and animal communities through which energy and materials flow. Continued delivery of goods and services requires that the pattern of interaction of component vegetation types and other organisms is maintained.

The **dune cordon** is a conspicuous feature for almost the entire length of the KwaZulu-Natal coastline, presenting the highest vegetated dunes in the world at Mapelane. It is a dynamic entity which continues to grow through accretion of sand from the oceans in some places, and erosion and loss of sand to the sea in other places, along this stretch of coastline. The latter mentioned are expected to become increasingly vulnerable to erosion with increasing sea-level rise. A substantial portion of the coastline within the study area is considered to be regressive, and hence this region may be at particular risk. In addition, cirques are formed by sub-surface flow of fresh water resulting in localised collapse of the seaward-facing dune slope to form a vertical wall and near horizontal bed that supports wetland vegetation.

Coastal grassland was the most characteristic ecosystem of the Maputaland Coastal plain before extensive transformation to plantation forestry and sugarcane farming took place. Owing to the extent of loss of this vegetation, it is now a *national conservation priority*. This grassland occurs primarily on geologically recent marine sandy deposits, whose topography varies conspicuously across the study area in relation to local landscape agents. In some parts there are mini-dunes and intervening swales; in other places fluvial erosion has created extended slopes. In some places the shallow water table expresses itself as hygrophilous grassland in many places, these units grading into adjacent grassland; while in other places the height of the water table results in permanent pans or wetlands. This scale of topographical variation in relation to water availability also reflects soil texture as fines accumulate in low-lying areas, while wind and water action remove fines from dune crests. Grassland, hygrophilous grassland, small pans and vleis all function as a single system that interacts closely with adjacent wetland and forest systems. The hallmark of coastal grassland is the phenomenal plant diversity it contains.

ISSUES:

- Urban expansion is rapidly destroying grassland ecosystems.
- Changes in the hydrological regime of the area influence the status of these systems.
- Climate change will further increase the risk of grasslands as increasing carbon dioxide levels encourage the establishment of woody vegetation thereby negatively affecting their structure and functioning
- The dune cordon is a significant ecosystem type which is at risk in the region.

3.3.3 Aquatic and Estuarine Ecosystem Types

There are three critically important ecosystem types in the area that are under development pressure:

There are nine **freshwater wetland systems** in the study area. They are spatially related to each other and to processes that happen at the landscape scale and can therefore not be considered in isolation of each other. Their position in the landscape are related to the hydrological regime, sediment source and rate of sedimentation as well as to substrate characteristics. One of these wetland types, Papyrus Swamp, have been highlighted as occupying a very unusual and narrow suite of habitat conditions and therefore has a *very high national conservation status*.

The **river systems**: the Mhlathuze and Nseleni Rivers comprises the primary drainage system of the study area, they are linked to the main water bodies in the area, Lake Mzingazi, the Harbour Estuary and the Mhlathuze Estuary (Sanctuary). These water bodies are also linked to another via channels so that Lake Mzingazi flows into the Harbour and the Sanctuary and the Harbour transfer water to and fro, depending on the tide and the runoff. Lake Nsezi and Cubhu also drains to the Sanctuary. These water bodies and their associated drainage systems are spatially related to each other and to processes that happen at the landscape scale and can therefore not be considered in isolation of each other. Together they constitute an ecosystem that plays a significant role in the maintenance of ecosystem goods and services and should therefore be considered in the management of the area, particularly the open spaces that encompass the drainage system and the development areas that impact on the natural system and its ability to sustain itself.

The **estuary system** comprises of two estuarine entities, namely the northern deep-water Port Estuary and the southern Sanctuary Estuary. The natural functioning of the original estuary may have been impaired but there are features and characteristics in the Richards Bay Port Estuary that emphasize the ecological significance of this area as an ecosystem type with strong linkages to the Sanctuary Estuary.

The Port Estuary has an important role in providing refuges, nursery grounds and feeding areas for marine and estuarine dependent organisms and parts of the port are rated as nationally important aquatic ecosystems. Up to 40% of the Tugela Bank prawn stock spends their juvenile stage in the Port of Richards Bay. Features with national conservation significance in this estuary include:

- Old established mangrove stands (remnants of the original estuary);
- Intertidal mudflats;
- Intertidal sandflats; and
- The Bhizolo/Manzamyama Canal Complex.

The Sanctuary estuary comprises mangrove forest, *Phragmites australis* reed beds, an open water area containing *Zostera* stands, mudflats and salt marshes. The Sanctuary contains the largest mangrove forest in South Africa, which has developed during the past 30 years as a consequence of sedimentation processes due to large-scale land transformation. Mangrove progression has reportedly ceased, indicating that the system is stabilizing. The Mhlathuze Estuary is rated as a nationally important aquatic ecosystem particularly for fish and birds.

ISSUES:

- Wetland systems, river systems, the Port Estuary and the Sanctuary Estuary contain critical habitats that are of national significance and under severe development pressure.
- The marine and coastal systems adjoining the study area are highly sensitive to land-based activities occurring within the study area.
- Invasion alien species threatens biodiversity.

3.3.4 Red Data Species

The greater Msunduzi Municipal Area supports a total of **174** Red Data species, which is probably amongst the highest in the country for an area of its size. This remarkable concentration of Red Data Species is one of the main reasons that most of the remaining percentage of its surface area under indigenous cover is considered largely *irreplaceable* by the Ezemvelo KZN Wildlife for meeting its conservation objectives in the province. The table below reflects the number of recorded red data species in the main ecosystem types of the area. It provides a broad guideline of the relative importance of different ecosystems and should not be used as a basis on its own for decision-making.

Table 4: Red Data Species in the main ecosystem types of the study area

Vegetation type	Red data species (significance)	Conservation target
Grasslands	124	100% if found to occur in the study area following a detailed survey. Conservation of a substantial portion of the remaining natural asset in this region is required if biodiversity conservation objectives are to be pursued.
Forests	90	
Nseleni River-Lake Nsezi system	79	
Large wetlands	55	
Estuaries	28	
Lakes	18	
Mhlathuze River	11	
Swamp forests	9	

Figure 23 illustrates that the potential spatial distribution of Red Data Species in the study area is in direct conflict with the opportunities for industrial development.

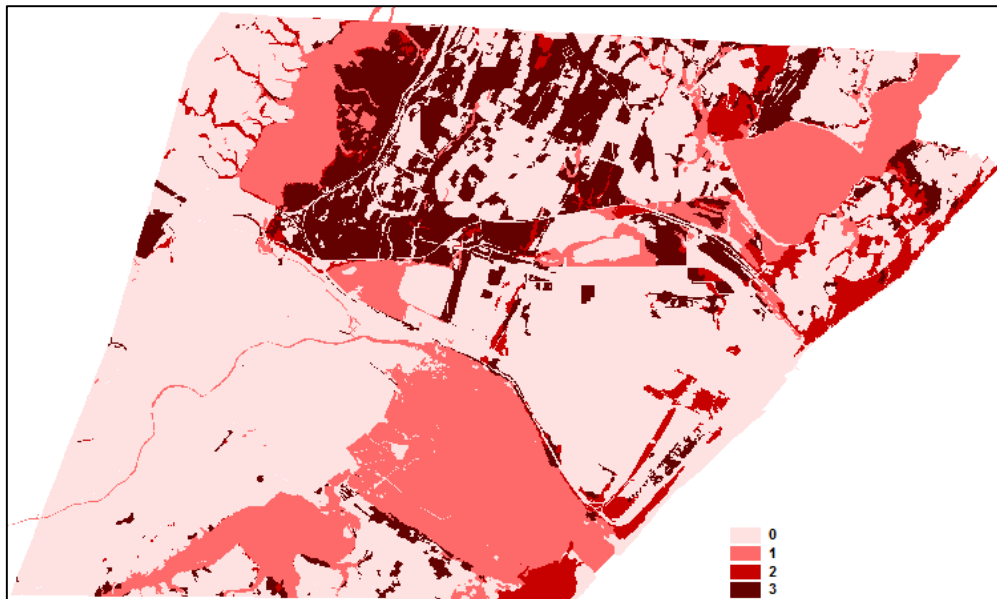


Figure 23: Red Data Species Distribution (desktop)

ISSUES:

- All of the remaining ecosystem types in the study area are important for supporting Red Data Species.
- Grasslands are critically important for meeting conservation objectives, and remain as a highly contentious issue that is in direct conflict with industrial development.