

Wetlands – treasure troves in disguise

By Michelle Nel

Why are wetlands so important? What exactly is a ‘wetland’? David Lindley of the Mondi Wetland Programme lets you into some startling secrets.

Why should the average Joe give a damn about wetlands? Because wetlands are *money*! Yes, those (often) stinking, swampy systems – which range from springs, seeps, mires and bogs in the mountains, to midland marshes and floodplains, to coastal lakes, mangrove swamps and estuaries at the interface with the sea – have an enormous monetary value and make huge, direct contributions to national economies and the creation of wealth.

Nature – one of the most respected scientific journals in the world – reported recently that worldwide, wetlands are worth some \$4.9 trillion (over R30 trillion) a year! Why are they so valuable? Because they manage our water for free. Wetlands hold back water during floods and release it during dry periods. And in a dry country like South Africa, this is crucial. By regulating water flows during floods, wetlands reduce flood damage and help prevent soil erosion. Wetlands also purify water by acting as natural filters and trapping pollutants, which include heavy metals and disease-causing bacteria and viruses. In addition to these valuable water management functions, wetlands are treasure troves of biodiversity. When taking in to account the enormous range of wetland types, from seeps to coral reefs, the biological diversity of wetlands ranks with that of rainforests.

Wetlands are vitally important to our national economy and to the well being of all South Africans. When the real value of their free ‘service’ is calculated, one realises that wetlands save South Africa millions of Rands each year. But are these free services recognised and respected? Of course not. Like everything that is free and beautiful, wetlands are often taken for granted or abused. We have lost an estimated 50% in South Africa already. This is predominantly through unwise development (pave paradise and put up a parking lot) and poor land management (the drain surgeons).

What exactly is a wetland?

So now that you know their value, you’re going to want to know if you’ve got some of these treasure troves lurking on your land. But what exactly is a wetland? A wetland is a family name given to a whole lot of different wetland types that occur from the top to the bottom of the catchment. They include springs and seeps, marshes, floodplains, swamp forests, mangrove swamps and estuaries and all these are connected by rivers and riparian areas.

According to the South African Water Act a wetland is “land which is transitional between terrestrial and aquatic systems, where the water table is usually at or near the surface or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil”.

There are three criteria for a piece of land to be classified as a wetland:

- The **soil must be saturated** (waterlogged soils) for long enough for anaerobic conditions to develop. Anaerobic conditions occur when there is no or very little oxygen present in the soil.
- These conditions favour the growth of **water loving plants** (hydrophytes)
- A **high water table** that results in the saturated soil conditions.

Wetlands are found wherever the landform (topography) or geology slows down or obstructs the movement of water through a catchment (for example where the landform is very flat) causing the surface soil layers in the wetland area to be temporarily, seasonally or permanently waterlogged. Geology plays a role in the formation of wetlands in two main ways:

- A geological obstruction may resist downward erosion, resulting in extensive flat areas where water accumulates if there is enough surface or groundwater. This obstruction often consists of very hard erosion-resistant rock, such as dolerite, but alluvial soil deposits may also act as an obstruction. An obstruction may even be caused through geological faulting, as is the case in the Okavango Delta.
- Impervious material close to the surface forces groundwater to discharge upwards. Wetlands that form around these areas are called seeps.

The three features of wetlands

1. Waterlogged soils

As soil becomes increasingly wet, water starts to fill the spaces between soil particles. When all the spaces are filled with water the soil is said to be saturated. In wetlands the water persists or drains away very slowly and the soil flooded for long periods. Depending on factors such as temperature, it usually takes a week or so for the plant roots and other living organisms in the soil to use up the oxygen, causing anaerobic conditions to develop. If the soil is saturated and the anaerobic zone is within the upper 50 cm of soil (the main rooting zone) it is generally close enough to the soil surface to significantly influence the plants growing in the soil. This will cause the area to develop characteristics of a wetland.

Anaerobic conditions affect organic matter in the soil. The wettest parts of the wetland, which are most anaerobic, tend to have the highest amounts of organic matter. Low temperatures also promote organic matter accumulation. Soil with a very high organic matter content is referred to as peat. In cold areas such as Ireland and Canada, peat is common but is also found in some permanently wet areas in South Africa.

2. Hydrophytes

Hydrophytic plants are plants that have adapted to surviving in waterlogged soils. They generally have a rooting depth of 50 cm, and therefore need to be in contact with the water table at this depth, or less.

3. High water table

In most parts of the landscape the water table lies many metres below the soil surface. However, in wetlands the water table usually lies close to or above the soil surface. Do all wetlands have similar water regimes ('water regime' is a term used to describe how the wetness of the soil changes over time)? Not at all. Wetlands range from permanently waterlogged areas, which remain flooded or saturated to the surface for the entire year, to temporarily waterlogged areas, which are flooded or saturated close to the soil surface for only a few weeks in the year (but still long enough to develop anaerobic conditions and encourage the growth of water loving plants).

Treasure types

Stream sources: These include stream source springs, seepage slopes and seepage plains. These are easily overlooked as wetlands and because they are often the only green 'oases' in the dry season, are heavily utilised for water and grazing. The Drakensberg Park has many examples of stream source settings and has been declared a Ramsar site (Ramsar is a protective convention for wetlands of international importance).

Basins: These include the depressions, fringes and open water of pans, dams and lakes. These may not always be recognised as wetlands especially when they are dry. Ramsar sites include Barberspan (North West Province), Lake Sibaya (KwaZulu-Natal) and De Hoop Vlei (Western Cape).

Plains: These have gentle slopes and can occur anywhere in the landscape except on top of mountains. They include swamps, vleis or wet meadows, marshes, and floodplains. A plains setting Ramsar site is the Blesbokspruit (Gauteng), Nylsvlei (Limpopo), Umgeni Vlei (KwaZulu-Natal), or Ntsikeni Vlei (Eastern Cape).

Streambanks: These include channels, walls and forests along rivers and streams.

Estuaries: Estuaries (the tidal part of river mouths), lagoons (normally closed river mouths) and non-tidal open river mouths. Ramsar sites include the Orange River Mouth (Northern Cape), Kosi system (KwaZulu-Natal), St Lucia system (KwaZulu-Natal), Velorenvlei (Western Cape) and Wilderness Lakes (Western Cape).

Marine: These include inter-tidal and sub-tidal zones, and coastal bays. Ramsar sites include Langebaan (Western Cape) and the coral reefs of Tongaland (KwaZulu-Natal).