



Verlorenvlei

Guidelines for Wetlands Management to Landowners in the Verlorenvlei Catchment





Working for Wetlands – Verlorenvlei Project

Working for Wetlands is a government programme managed by the South African National Biodiversity Institute (SANBI) on behalf of the national departments of Environmental Affairs and Tourism (DEAT), Water Affairs and Forestry (DWAF), and Agriculture, and forms part of the Expanded Public Works Programme (EPWP). While the programme's primary focus is wetland rehabilitation, the protection, rehabilitation and sustainable use of wetlands is simultaneously entrenched in the programme's core objectives. The Working for Wetlands programme was initiated in 2002 with the aim to oversee the rehabilitation of degraded wetlands throughout South Africa. To date 42 project areas have been identified for rehabilitative action.

Working for Wetlands and CapeNature entered into a partnership with landowners to begin rehabilitation interventions on the Verlorenvlei system in 2006. Rehabilitation work is centred on increasing water flow and enhancing natural flow through the system by removing unnatural flow impediments and clearing invasive alien vegetation. All of the work is taking place on privately owned land, which makes landowner involvement and responsibility a critical component of the success of rehabilitation in this project. Landowners along the Verlorenvlei system are the local custodians of the wetland and must take ownership of their natural environment. It is also extremely important that they understand the importance of managing the system.

Landowners' views



Smit Janse van Rensburg

"We farm with our descendants in mind and it is therefore important that all the stakeholders

get along and work together to address problems. CapeNature and I have had a good relationship for a number of years. The implementation of the Working for Wetlands project is an excellent idea because it not only creates job opportunities, but it is also geared towards the removal of invasive tree species that threaten the integrity of our wetlands. Stakeholders will in future have to consult each other in order to identify the most suitable action aimed at solving problems that are identified."



Jakobus Smith

"In accordance to the law, landowners are responsible for the removal of alien species on their properties. The work undertaken by the

Working for Wetlands Project, is beneficial to the landowners, because it is being done on their behalf. It is fantastic that the good work wouldn't stop here and that management is thinking strategically to ensure that the entire Verlorenvlei and the river that feeds it, are cleaned. With Verlorenvlei being declared as a Ramsar Wetlands of International Importance, it is important that the rest of the rivers that feed the wetland also receive some form of conservation status. We have to think of an innovative way to repair the areas that have been impacted upon."



What is a wetland and how does it work?

Wetlands are defined by the South African National Water Act (Act 36 of 1998) as '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 or would support vegetation typically adapted to life in saturated soils'. These include springs, pans, swamps, floodplains and lakes.

Wetlands comprise of three parts; namely uplands (terrestrial area), the riparian zone and the aquatic area (Figure 1). In addition to this, the estuary channel and lower vlei also meets the criteria under the National Water Act, because salinity penetration occurs in this region.

The uplands are the dry land surrounding a wetland, while the riparian zone is the strip of land and vegetation between the higher uplands and the shallower, wet areas. These areas are heavily vegetated with trees, grasses, brush and other types of plants. The

aquatic area is the wet area of the wetland. It can be either deep with lots of open water or shallow, with no open water at all.

Wetlands are often described as giant sponges that absorb water from many different sources during wet periods. The water is slowly released during dry periods and therefore reduces flooding, ease the impact of drought and recharge groundwater supplies.

Water flowing into a wetland from higher ground must move through the upland and riparian areas. These areas form 'barriers' that help to filter water as it passes through them. The plants and soils absorb chemicals, nutrients, sediments and other impurities from the water as it passes through.

Wetlands have extremely important functions including the storage of water, recharge of groundwater, storm protection, flood mitigation, shoreline stabilization and erosion control. Wetlands also produce goods that are of significant economic value such as clean water, fisheries, timber, peat, wildlife resources and tourism opportunities.

An introduction to Verlorenvlei

South Africa currently has 19 sites that have been declared as Ramsar Wetlands of International Importance. During 1991 Verlorenvlei was declared as one of these sites. Verlorenvlei is one of the largest wetlands in the Western Cape (1 500 ha). It is considered

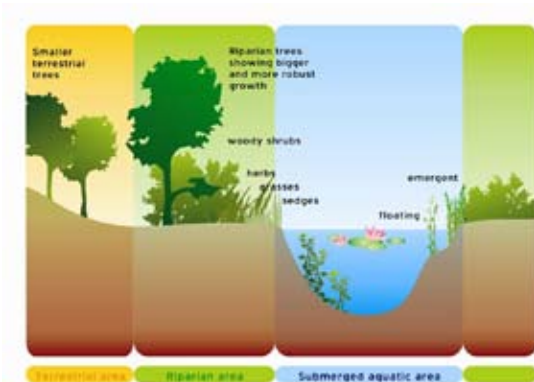


Figure 1: A typical wetland



to be one of the most unique ecosystems in South Africa, because it is one of the country's few coastal, fresh water lakes.

Verlorenvlei is surrounded by dramatic topography and straddles the transition zone between the Succulent Karoo and Fynbos biomes, resulting in high species diversity including the endangered Leipoldville Sand Fynbos.

It is also one of the ten most important habitats for wading birds in the south-western region of the Cape Province and is home to the endemic Berg River "Verlorenvlei" redbfin. The lake is approximately 13,5 km long and approximately 1,4 km wide. The Verlorenvlei Wetlands is between one and five metres above mean sea level. Its surface area is estimated to be 1 890 km² or 198 000 ha.

The average depth of the open water area of the lake is between two and three metres with a maximum depth of five meters. A small estuarine channel of about 2,6 km connects the lake to the sea. The entire channel is very shallow (about 0.5 m deep), tending to inhibit free water circulation.

The mouth is predominantly closed by a sandbar overlying a rocky sill. The estuarine channel may be reduced to a few series of stagnant saline pools during summer droughts. When good rains provide sufficient water, the channel fills and the bar is overtopped. The outflowing water scours the sandbar away, thus permitting some tidal interactions, with saline water penetrating Verlorenvlei on significant spring tides and during storm surges.

Tidal exchange continues until the velocity of the outflow water decreases sufficiently so as to allow the accretion of a sandbar at the mouth. Although the lake is fed by three rivers, the Hol, Kruismans and KromAntonies, which merge to form the Verlorenvlei River, its primary source is groundwater.

The area surrounding the lake is privately owned and is mostly used for agricultural activities such as the planting of crops (potatoes and Rooibos) and grazing for cattle, goats and sheep. The lake is owned by the state and managed by CapeNature.

The importance of Verlorenvlei

Verlorenvlei not only supports a rich biodiversity, but is also of economical, historical, cultural, archaeological and architectural value. Given that tourism is one of the leading sources of income globally, Verlorenvlei has the potential to become one of the main tourist attractions on the West Coast.

Value to the community

Verlorenvlei offers tourists a variety of recreational opportunities including fishing, bird watching and kayaking. The area is also well-known for its "waterblommetjies" – a unique South African delicatessen.

Verlorenvlei represents about 30% of the available habitat to estuarine fish on the west coast. In terms of fishery yields, Verlorenvlei contributes approximately R3,03 million to the value of the inshore fisheries annually. This represents 30% of the estuarine contribution to the value of the inshore marine fisheries on



Verlorenvlei has the potential to become one of the main tourist attractions on the West Coast.

the west coast. This income stream can be increased if Verlorenvlei's nursery function is protected and remain pristine.

Verlorenvlei provides valuable grazing lands for cattle, sheep and goats during the summer months and water for irrigating of cultivated land.

Historical places of interest

Interesting places to visit in the Verlorenvlei area are Baboon Point and the Elands Bay Cave and the Diepkloof/Witklip/Grootdrift complex, which include caves and rock art. Two series of shell middens can be seen, one extending along the coast southwards from the mouth of the lake and the other northwards.

The archeologically sites near Verlorenvlei provide a record of prehistoric settlements in the area. A significant amount of artefacts have been found in the Verlorenvlei area, suggesting that man has been in this area more or less continuously for the last 100 000 years.

Elands Bay Cave is one of the most significant archaeological sites in southern Africa.

Excavations at the cave (and other sites close by) have already provided important data on palaeo-environmental changes such as the rise and fall in sea level over the past 10 000 years.

At least ninety rock art sites are found in the areas surrounding Verlorenvlei, most of them in the Table Mountain Group outcrops along the southern bank of the vlei. Analyses of the art show that this was an important area for both the hunter-gatherers and the herding peoples.

Benefits to agriculture

Wetlands and agriculture are closely linked, dating back to the prehistoric period. Long before humans learned to grow food, they depended, at least partly, on wetlands for their sustenance. Today, about 35% of the Sandveld land area is under agriculture. Wetlands occupy less than 1% of the Sandveld.

Wetlands are a vital part of the water resource – especially in an arid area like the Sandveld with an average rainfall figure of between 200 – 300mm per year. Wetlands also reduce flood damage and the severity of droughts because it regulates the flow of water through the catchment area.

Floodwater can be stored in their porous soils or as surface water. In addition, wetland vegetation slows down floodwater. By retaining water during the rainfall season and then slowly releasing it during the dry season,



wetlands maintain river flows for longer periods. This means that there is always water available for irrigation.

The vegetation around wetlands prevents or reduces erosion. They bind and stabilise the soil with their roots and deposit plant matter, which in turn reduces water flow speed and traps sediments. As a result downstream flows are cleaner, and less likely to silt up dams and pumps, or require costly filtration. The vegetation also provides grazing for cattle, goats and sheep.

Value to biodiversity

South Africa is the third most biodiverse country in the world. Farmers and communities surrounding wetland areas are custodians of these areas and can play a leading role in the protection of biodiversity.

Fish species

It is estimated that Verlorenvlei is home to 14 fish species from nine families. Four of these are entirely dependent on estuaries to complete their lifecycle. The estuarine round-herring, breeds and spends its entire lifecycle in the estuarine environment whereas, the white steenbras, flathead mullet and freshwater mullet are dependent on estuaries as nursery areas for at least their first year of life.

A further three species namely the common harder, white stumpnose and Knysna sandgoby are at least partially dependent on estuaries. In all, 44% of the fish species recorded or expected to occur in Verlorenvlei can be regarded as either partially or completely dependent on estuaries for their survival.

All nine of the remaining species are freshwater species. Three of these, the Cape galaxias, Cape kurper and Berg River “Verlorenvlei” redbfin are endemic to the southwestern Cape. Six, the Mozambique Tilapia, carp, banded tilapia, smallmouth bass, largemouth bass and tench are introduced species.

Six of the estuarine fish and three of the freshwater fish recorded in Verlorenvlei, are South African or southwestern Cape endemics. In all, the fish assemblage of Verlorenvlei with its high proportion of endemics and low diversity is typical of coastal and estuarine lakes on the west and southern coasts of South Africa.

Bird species

Verlorenvlei provides feeding, nesting and resting facilities to more than 75 different bird species and is one of the ten most important wetlands for wading birds in the south-western Cape Province, supporting over a thousand waders of more than eleven different species.

Approximately 200 pelicans - more than 25% of the South-Western Cape population – assemble on the lake to feed. The white pelican – considered to be endangered in South Africa – breeds at only two sites; namely Dassen Island along the West Coast and Lake St Lucia in KwaZulu-Natal.

Other threatened birds that can be sighted at Verlorenvlei include the African fish eagle, flamingos, the Caspian tern, the little bittern and the great crested grebe. Spoonbills and glossy ibises, which are uncommon in the south-western Cape, are also found in the area. In November 2007 CapeNature unveiled



a bird hide structure at Vensterklip, allowing the public access to Verlorenvlei for the first time. This initiative formed part of the Working for Wetlands project implemented by CapeNature.

Threats to Verlorenvlei and implications for management

The biggest threats to Verlorenvlei are a lack of best practice in agriculture, climate change and invasive alien species.

Agriculture

Irrigation, water abstraction and land clearance

The main agricultural driver in the Sandveld is potato farming. Large areas of land have been cleared around Verlorenvlei to plant and grow potatoes, a water intensive undertaking. For this

reason it is crucial that groundwater is monitored regularly by all farmers in the Verlorenvlei system.

The problem with ground water levels is greatly exacerbated during times of low rainfall when groundwater levels drop due to reduced recharge. Deep borehole pumps on the other hand can still access groundwater – so they continue functioning, drawing the water table even deeper, impacting the environment and ultimately the recharge to wetlands.

What can I do to help?

- Monitor groundwater use regularly;
- Monitor groundwater levels regularly;
- Provide relevant information to the local Water Users Association (WUA) in order to ensure sustainable management of these resources by all; and
- Support your local WUA.



Indirect benefits of wetlands

- *Water purification*
- *Flood reduction*
- *Sustained streamflow*
- *Groundwater discharge and recharge*
- *Erosion control*
- *Biodiversity benefits and ecosystem services (See p 15)*

Figure 2: Verlorenvlei Wetland system.



Canals

Canals desiccate wetlands and result in encroachment by terrestrial vegetation, including invasive alien species. Canals are used to divert water flowing into a drainage furrow causing severe problems including:

- The flow of water is channelled or concentrated and less spread out, which means that water flows faster through the wetlands, weakening most of the wetland's functions;
- Wetlands are less able to prevent erosion;
- The risk of flood damage increases;
- Water filtration and purification are less effective if the water is drained through single canals. This results in poorer water quality downstream. Chemicals and other toxic substances which have previously been removed out of the water can be released back if the sediments are disturbed, or if flow patterns are changed;
- Drying out of wetlands increase alien plant growth in absence of water logged conditions; and
- Canals can dry out wetlands, thus reducing soil organic matter and increasing the risk of underground fires and soil acidity.

What can I do to help?

- Assess if historic canals are present on the farm;
- Plug all canals to avoid erosion and to encourage re-wetting of wetland;
- Contact your local Working for Wetlands agent for extension support;
- Utilize more water efficient pipelines as an alternative to canals; and
- Avoid future wetland channelling.

Groundwater contamination

Groundwater can be contaminated because of agricultural chemicals entering the system and released back into the water. As a result bird, fish and plant life are severely affected through nitrification of the water. This can lead to algal blooms which poisons wildlife especially water birds. Nitrification also promotes the abnormal growth and abundance of certain water plant species.

Although Verlorenvlei is fed by three rivers, it is mainly groundwater driven, which means that it is a slow moving valley bottom system. In the absence of large herbivores there are no natural forces to create water channels through the reeds or control reed growth. This results in poor water flow causing sediment build-up in the wetland.

Buffer strips between lands and natural water streams and wetlands are recommended to minimize the contamination potential of chemicals. Normally buffer strips of 50 - 70 m are recommended.

What can I do to help?

- Incorporate buffer strips between agricultural fields and natural water systems;
- Follow best practice regarding fertilization of agricultural fields to prevent possible ground water contamination and save on production costs; and
- Know your soils – undertake regular soil sample monitoring.



Avoid burning of wetlands as burning could impair wetland functioning

Grazing practices

Wetlands are highly productive systems and are preferred areas for grazing because of its abundant vegetation. However, overstocking the wetland can lead to hardening of the soil and reduced plant cover, which in turn reduces the amount of infiltration of water, in turn reducing groundwater recharge, increasing flood damage and reducing dry season flows. The biggest concern is the damage that is done to the root systems, which are shredded by animal hooves as they move through the wetland. Overgrazing and trampling destroys cover plants that inhibits winter erosion. It is therefore essential that farmers manage the number of livestock as well as the time of grazing during the drier summer months.

What can I do to help?

- Adhere to your local stocking rates as prescribed by the local agricultural extension officer;
- Avoid grazing a wetland for the two years following a fire to allow the regeneration of vegetation;
- Avoid overgrazing during dry summer months as this can cause insufficient plant cover for the following wet season, increasing the risk of erosion; and

- Avoid footpath trampling caused by livestock to minimize the risk of erosion.

Fire management

Although veld fires are not common in the area, they can have a significant impact on biodiversity. In terms of the National Veld and Forest Act (Act 101 of 1998) each landowner is responsible for the prevention and management of all fires that occur on his/her land. Assistance with compliance with the regulations is provided where landowners and their neighbours formed the Greater Cederberg Fire Protection Association.

It is essential to plan fire breaks carefully. Every property must have a system of fire breaks in place. The breaks must be on the boundary of the property unless there is an exemption granted by the Minister or an agreement with the adjoining landowner that the firebreak be located somewhere else within a Fire Protection Association (FPA);

Do not allow livestock to graze natural areas in the first two years following a fire. All plants are very vulnerable to grazing pressure by domestic stock in the first two years after a fire, and regeneration will be up to 70% better if grazing pressure is removed completely for the key first two years.



What can I do to help?

- Avoid burning of wetlands as burning could impair wetland functioning;
- Avoid grazing a wetland for the two years following a fire to allow the regeneration of vegetation; and
- Join the local FPA.

Soil erosion

Soil erosion – often caused by the diversion of water through canals and furrows – causes the loss of the fertile layer of topsoil. Eroded soil can cause the depletion of oxygen in water and can harm the aquatic environment.

Depending on the environment, soil erosion can be reduced greatly by managing the numbers and times that animals are allowed to graze. Farmers should also avoid frequent fires and should eradicate all alien vegetation which

inhibits the growth of wetland vegetation.

What can I do to help?

- Avoid burning wetlands;
- Avoid overgrazing of wetlands;
- Avoid channelling of wetlands; and
- Protect your wetlands integrity and health to ensure effective delivery of ecosystem services such as improved water quality and quantity, erosion control and flood attenuation.

Climate change

The implementation of effective management practices is essential to combat the potential harmful effects of climate change on the environment. In a recent study conducted for Potato SA, which focused on the Northern Sandveld, climate change models predict a reduction in April and August rainfall figures, a

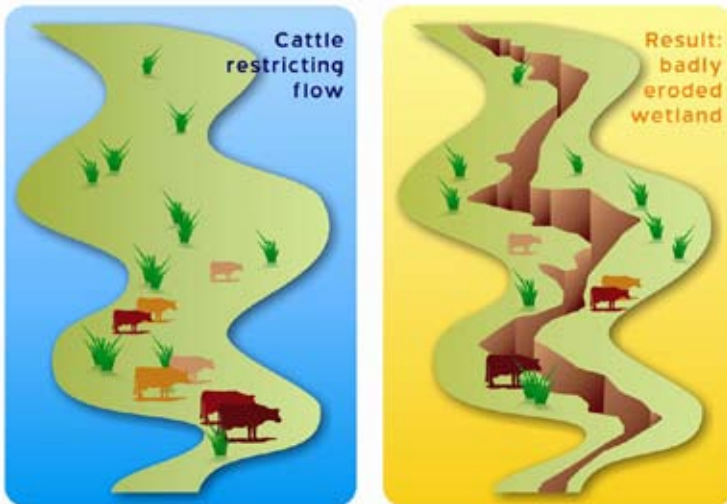


Figure 3: Overgrazing destroy wetlands



rise in average temperatures and a reduction in groundwater recharge.

Apart from changes in temperature, rainfall and groundwater recharge, climate change will also have an impact on the populations, ranges, migration patterns and seasonal and reproductive behaviour of animals and birds. These effects are likely to become more apparent and extensive as the climate continues to change.

The existence of natural corridors in the landscape is critically important for accommodating the ecological effects of climate change: these sites have a crucial role to play in allowing the geographical ranges of species to alter in response to climate change. The ecological services that nature provides to people are also important.

What can I do to help?

- Familiarize yourself with the concept of climate change;
- Start discussions on possible climate change impacts with your local agricultural industry representatives and farmers associations; and
- Support local landscape initiatives such as the Greater Cederberg Biodiversity Corridor (GCBC) in response to global climate change.

Alien invasive species

Alien fish species

The biggest problem associated with the introduction of alien fish species to an environment is the fact that they have no

natural enemies and are therefore often allowed to breed unchecked. This poses a threat to indigenous species because of limited food supplies, predation and changes to the habitat.

Six freshwater species have been introduced into Verlorenvlei since the 1930's. The last species to be introduced was the Mozambique tilapia (*Oreochromis mossambicus*) and the Common Carp (*Cyprinus carpio*) in 1967.

Both these species are flourishing, while many indigenous fish species such as the endemic Berg River "Verlorenvlei" redfin (*Pseudobarbus burgi*), Cape kurper (*Sandelia capensis*) and Cape galaxias (*Galaxias zebratus*) that were once abundant throughout the catchment are disappearing.

One of the most effective ways to deal with the threat posed by alien fish species is to identify and manage sanctuaries or refuge areas for indigenous fish.

What can I do to help?

- Familiarize yourself with the species that occur in your section of the wetland;
- Do not move fish between different water systems;
- Help educate the local community on the negative impact of alien fish in the Verlorenvlei system; and
- Support alien fish removal efforts

Vegetation

The primary invasive species in the area are *Acacia saligna* (Port Jackson), *Acacia cyclops* (rooikrans), *Eucalyptus* species (gums), *Sesbania* and *Prosopis*.



Working for Wetlands initially cleared 926 hectares of alien vegetation. In terms of the Conservation of Agricultural Resources Act (Act 43 of 1983) landowners are obliged to clear their land of listed invasive alien plants.

It is essential that these invasive plants are removed where possible. Invasive alien plants can impact negatively on biodiversity because they use significantly more water than indigenous vegetation; they represent a modification/loss of natural habitat; and alien vegetation burns at much higher temperatures than indigenous vegetation posing a greater danger to wildlife, humans and soil structure during veld fires.

What can I do to help?

- Be aware that alien control is a long term strategy;
- Start to identify the distribution of alien species in your area;
- Begin clearing the lighter infested and upstream areas first;
- Collaborate with neighbours to implement a wider strategy;
- Monitor and record all actions for follow-up purposes; and
- Continue follow-up actions where alien clearing on the property has taken place.

Estuary mouth

Artificial breeding can have many ecological repercussions including the interruption of breeding cycles, missing of fish recruitment windows and decrease productivity. It is therefore of the utmost importance that this activity is not allowed unless a detailed Reserve study (under the National Water Act)

or an Environmental Impact Assessment study (under national Environmental Management Act 107 of 1998) proves that it is essential for the ecology.

Verlorenvlei's biodiversity depends on its sporadic connection to the marine environment, which in turn is dependant on the total inflow from surface and groundwater to the system. Therefore, to ensure regular mouth open conditions it is of the utmost importance that the freshwater be sparingly used in the catchment and that agricultural practices including irrigation and removal of alien vegetation supports this endeavour.

What can I do to help?

- Be aware of the important functions of an estuary.

How to improve incorrect management practices in wetlands

The implementation of effective water resource management, combined with land use management strategies can halt the damage caused by agriculture and other human activities.

Potatoes SA, the Rooibos Council and CapeNature joined forces to compile biodiversity and best practice guidelines for industry to stimulate greater awareness amongst producers in favour of responsible farming practices.

These guidelines aim to limit the impact of production systems on the natural resources, promote ecologically sustainable farming practices and promote conservation of biodiversity.



The implementation of effective water resource management, combined with land use management strategies can halt the damage caused by agriculture and other human activities.

Existing projects to increase water flow to Verlorenvlei and catchment

CapeNature and its stakeholders are committed to the preservation of the Verlorenvlei wetland while taking cognizance of the needs of the community. Over the years several projects have been launched to protect Verlorenvlei. These are:

- Working for Wetlands;
- Department of Agriculture Landcare;
- Biodiversity Best Practices for Potatoes and Rooibos;
- Water Users Association; and
- Greater Cederberg Biodiversity Corridor.

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More about wetlands

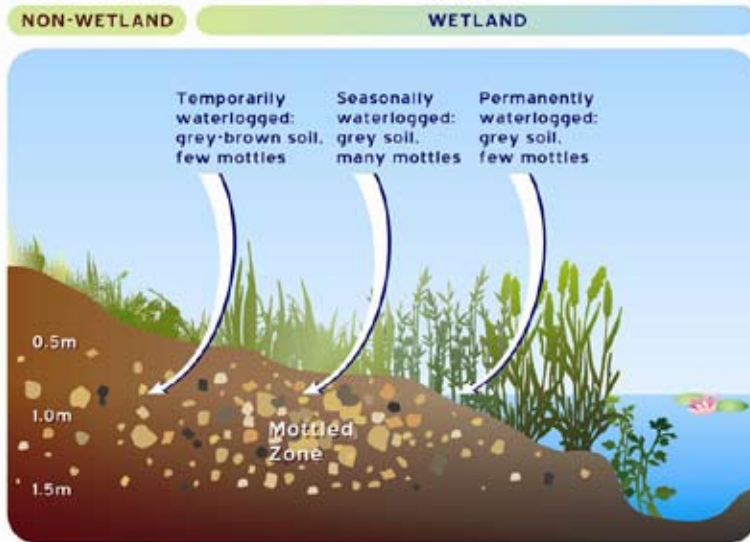


Figure 4: Wetlands are identified by a combination of soil types and plant species. Illustrated above is a cross section through a valley bottom wetland. The vegetation in these wetlands is generally important in binding soil and preventing erosion. Valley bottom wetlands may contribute significantly to slowing down flood waters and reducing the severity of floods.

Terrestrial	Temporarily waterlogged	Seasonally waterlogged	Permanently waterlogged
<ul style="list-style-type: none"> • Some erosion • No base flow • No residual pools • Terrestrial plants • No mottles • No wetland vegetation 	<ul style="list-style-type: none"> • Yellow-brown soils • Few mottles • Mixture of terrestrial and wetland plants • Some wetland vegetation • Intermittent base flow 	<ul style="list-style-type: none"> • Mixture of wetland and terrestrial grasses • Significant wetland vegetation (Hydrophilic grasses and sedges) • Deposition of coarse material • Seasonal base flow • Often residual pools • Grey soils • Many mottles 	<ul style="list-style-type: none"> • Significant wetland vegetation (sedges, reeds, bulrushes) • Permanent base flow • Grey soils • Few mottles



Verlorenvlei creating employment opportunities

Did you know?

Greater Cederberg Biodiversity Corridor

Verlorenvlei forms part of the Sandveld Core Corridor, which represents the western section of the Greater Cederberg Biodiversity Corridor (GCBC). The GCBC project was launched by CapeNature in 2004 and is primarily a landscape initiative to restore connectivity in fragmented landscapes to reduce the effects of climate change. This is done by encouraging the voluntary participation of land owners, communities and the private sector to expand conservation areas on privately owned and communal land to support the free movement of plant and animal species. The planning domain of the GCBC stretches from Elands Bay in the west, the Tankwa Karoo National Park in the east, Nieuwoudtville in the north and the Groot Winterhoek Wilderness area in the south.

The Ramsar Convention

The Ramsar Convention on Wetlands is an intergovernmental treaty adopted on 2 February 1971 in the Iranian city of Ramsar, on the southern shore of the Caspian Sea. The Ramsar Convention on Wetlands is an intergovernmental treaty whose mission is “the conservation and wise use of all wetlands through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world”. As of June 2007, 155 nations have joined the Convention as Contracting Parties, and more than 1 700 wetlands around the world, covering over 151 million hectares, have been designated for inclusion in the Ramsar List of Wetlands of International Importance. South Africa was one of the first signatories of the Ramsar Convention and currently has 19 sites that have been declared as Ramsar Wetlands of International Importance.

Ecosystem services

Ecosystem services include products like clean drinking water and processes such as the decomposition of wastes. Ecosystem services are distinct from other ecosystem products and functions because there is human demand for these natural assets. Services can be subdivided into five categories: provisioning such as the production of food and water; regulating, such as the control of climate and disease; supporting, such as nutrient cycles and crop pollination; cultural, such as spiritual and recreational benefits; and preserving, which includes guarding against uncertainty through the maintenance of diversity.



Verlorenvlei wetland

Wetlands legislation

Activities in wetlands are restricted in terms of the Conservation of Agricultural Resources Act and the National Water Act (section 21 and 22).

The following guidelines apply:

1. Identify and delineate wetlands during winter months. Some wetlands are not easily identified during the dry summer. Wetlands are identified by a combination of soil types and plant species;
2. Keep natural buffer areas of 50 – 75m around wetlands free of alien plants and irrigated crops;
3. Do not restrict or block the water supply to a wetland.
4. Take care not to modify or disturb the catchment of a wetland for example by road construction as this may lead to increased run-off and possible erosion of the wetland;
5. Do not over abstract or divert surface or groundwater feeding into a wetland, which may cause it to dry up. High-yielding boreholes should not be sunk in or near wetlands;
6. Dam construction within wetlands transforms the wetland into a permanent water body, resulting in the loss of the important wetland “sponge” habitat.
Dams should thus be constructed outside wetlands and stream channels. (DWAFA authorisation/registration required.)
7. Avoid sitting pollution sources like waste disposal sites, domestic effluent, etc. near wetlands.
8. Regularly clear wetlands of evasive alien plants, taking care not to disturb the soil (i.e. do not use heavy machinery);
9. All modifications of water flow in or through a wetland are illegal. Disturbed wetlands can often be successfully restored by returning the flow to its original state through closing of drainage ditches and trenches;
10. Certain wetlands (especially grassy floodplains) can be grazed, provided that no over-grazing occurs, and that it is done in the correct season (December to April).
11. Most wetlands should ideally be fenced off and kept free of grazing, and this applies especially to those on acid stands (all those within Leopoldville Sand Fynbos). Grazing large stock in wetlands in winter and spring can cause severe erosion and loss of biodiversity, and is not recommended.