

Wetland Assessments

Introduction

Wetlands play an integral role in the health of water resources across the world through their provision of a number of ecosystem services that enhance water quality, minimise the flood risks, regulate streamflow, protect and maintain biodiversity and store carbon. In Africa, many wetlands also provide direct-use resources integral to the survival of rural and impoverished communities.

Unfortunately, in South Africa, and Africa in general, unrestrained urban, industrial and agricultural development coupled with increasing rural and urban populations and their demands over the last 100 years has resulted in the substantial transformation and loss of wetland ecosystems.

Fortunately, wetlands are now protected ecosystems under the National Water Act (Act 36 of 1998) and their disturbance or development is prohibited without the consent of the National Department of Water Affairs (DWA).

In addition, activities in and around wetlands are also regulated through the National Environmental Management Act (Act 107 of 1998), as administered by the provincial and national Departments of Environmental Affairs.



With the promulgation of these two Acts, public and private developer's across the country are now required to accurately delineate the boundaries of all wetlands on their properties and assess the impacts of their proposed developments on the health of these wetlands and their ecosystem services. These studies are used to inform the environmental assessment process and assist in the planning of rehabilitation interventions.

SiVEST Environmental Division offers specialist wetland ecological services covering all areas of wetland identification,

assessment and management. Our ecologists have extensive experience both within South Africa, as well as throughout Southern Africa and have undertaken numerous studies across all spheres of development.



Services Offered

SiVEST offer the following specialist wetland services:

- Wetland Delineation Studies.
- Wetland Ecosystem Services Assessment.
- Wetland Health Assessment.
- Wetland Impact Assessment.
- Wetland Rehabilitation and Management Plans.
- Wetland Alien Plant Control and Eradication Programmes.
- DWA Water Use Licence Applications.

Wetland Delineation Studies

Wetland delineation involves the accurate delineation of the outer boundary and different hydromorphic zones of a wetland. These zones are delineated using field methods that involve the identification of hydric soil markers like gleying and the presence of mottles that indicate the extent of a wetland. In addition, the presence of wetland vegetation, soil form and landscape setting are also used to confirm and interpret the presence and extent of a wetland. Once determined, the wetland boundary is accurately recorded using a Global Positioning System (GPS) and mapped using ArcViewGIS for inclusion in development plans. This discipline also involves the determination of recommended appropriate wetland buffer zones.

Wetland Ecosystem Services Assessment

Wetland Ecosystem Services Assessments are undertaken using the WET-EcoServices

Tool developed by Kotze *et al* (2009). WET-EcoServices is a technique for rapidly assessing the level of ecosystem services provided by wetlands. Such assessments give an indication of the value of wetlands to better inform following activities:

- Prioritize for the allocation of management and rehabilitation resources across a set of wetlands.
- Assess potential and actual ecosystem service outcomes of wetland rehabilitation projects.
- Plan catchment management to determine the relative importance of individual wetlands in a catchment context.
- Flag important ecosystem services in a Basic Assessment or an Environmental Impact Assessment.
- Educate and raise awareness of the value of wetlands.
- Flag important ecosystem services that need to be considered when managing an individual wetland.



Wetland Health Assessment

Wetland Health Assessments are undertaken using the WET-Health Tool developed by McFarlane *et al* (2009). Wetland health is defined as the measure of the deviation of a wetland from its natural condition. The WET-Health tool measures the deviation from the natural reference condition for three components of health; hydrology, geomorphology and vegetation. These components are assessed individually in separate modules to produce three scores that correlate to a particular health category. The WET-Health adds value to the following activities:

- State of Environment Assessment.
- Environmental Impact Assessment.
- Wetland rehabilitation and management.
- Contribution to ecological reserve determination studies.

Wetland Impact Assessment

Wetland Impact Assessments take the health assessment a step further by assessing the significance of a particular impact on wetland health. These findings are then able to feed directly into Basic Assessments and EIA's. Wetland impact assessments utilise an impact methodology developed by SiVEST that determines significance and acceptability.

Wetland Rehabilitation Plans

A wetland rehabilitation plan is a detailed plan that guides the planning and implementation of appropriate rehabilitation interventions. The Wetland Rehabilitation plans include the following:

- Identification of the most appropriate rehabilitation interventions for each wetland unit utilising the WET-RehabMethods Tool developed by Russell (2009).
- Provide detail on each rehabilitation intervention including the design detail of the earthen, gabion and/or concrete structures selected to achieve the rehabilitation goals.
- Provide detailed measures for the ongoing management of each wetland unit including protocols to deal with potential operational disturbances to the wetlands.
- Design a monitoring programme for assessing the success of the rehabilitation interventions.
- Design a monitoring programme for assessing the success of the rehabilitation and management programme.



Wetland Alien Plant Control and Eradication Programmes

One of the biggest threats to biodiversity is alien plant infestation. Control of these plants is critical as they spread rapidly and develop infestations that are environmentally detrimental and in some cases, result in large areas of land becoming agriculturally unviable.

Management of alien plants involves recommendations regarding removal techniques, controls of re-infestation and a rehabilitation plan.

DWA Water Use Licenses

As a rapidly developing nation, construction and infrastructure often clashes with wetlands and wetland habitat. In cases where the infilling of loss of wetland area has been approved these cases water use licences are required from the DWA before such development can be undertaken. These licences are required over and above any environmental authorisation.



RECENT PROJECTS

Strategic Projects

- **Cornubia Mixed Use Development** in the eThekweni Municipality (Tongaat Hulett Developments & eThekweni Municipality) - Wetland Delineation, Functional Assessment and Impact Assessment Studies
- **Renishaw Estate Environmental Management Framework** in the eThekweni & Umdoni Municipalities (Crookes Brothers Limited) - Desktop Wetland Delineation/Inventory.
- **Greater Clarence Strategic Environmental Assessment** – Development of a wetland inventory and wetland assessment.
- **Kwadukuza Strategic Environmental Assessment** – identification of wetland strategic treats.

Infrastructure and Housing

- **Ngcebo Bulk Water Pipeline** (Umgeni Water). 90km Bulk water supply pipeline routing between the Tugela River and Stanger, KwaDukuza.
- **Kao Diamond Mine – Lesotho** (SSI-Bohlweki) – wetland assessment and revision of wetland related aspects of the Environmental management Plan.
- **Spoornet Coal-link 132kV Powerlines** (Transnet) - Desktop Wetland Assessment.
- **Eskom Project Lima** - proposed pump-storage scheme in Mpumalanga - Wetland Assessment.
- **Transnet's 88km New Multi Products Pipeline (NMPP)** project between Kendal (Mpumalanga) and Waltloo east of Pretoria - Wetland Delineation and Assessment.

- **Transnet's 77km New Multi Products Pipeline (NMPP)** EIA project between Jameson Park and Langlaagte, Johannesburg - Wetland Delineation and Assessment.
- **Proposed Combined Cycle Gas Turbine Power Plant** in the Majuba Area, Mpumalanga - Wetland Delineation and Functional Assessment.
- **Ethanol Plant, Chisumbanje, Zimbabwe** - Wetland Delineation and Impact Assessment.
- **Foskor, Richards Bay** (SRK Consulting) – Wetland Delineation, health and Functional Assessment as part of the planned phosphoric acid plant expansion plans.

Rehabilitation and Monitoring

- **Trenance Park Housing Project** (eThekweni Municipality) – Compilation of a wetland rehabilitation plan for this low-cost housing project.
- **Mpola Housing Project, eThekweni Municipality** (SRK Consulting) – Rehabilitation and Management Plan for this municipal housing project.
- **Philani Valley Housing Project, eThekweni Municipality** (Stedone) – Wetland rehabilitation and monitoring for this low-cost residential development
- **Kinderstrand Residential Estate** – Development of a wetland rehabilitation and management plan for this up-market housing estate.
- **Afrocon Industrial Node – Mkhambathini Municipality** – Wetland Rehabilitation and Stormwater Management Plan for this large industrial development.
- **Zimbali Lakes Golf Estate** (Tongaat Hulett & IFA Hotels) – Wetland rehabilitation planning and monitoring for the commercial, residential and golf course components of this estate ■

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