WETLAND REHABILITATION

Pietersieliekloof wetland rehabilitation project – Investing in the future

A multimillion Rand wetland rehabilitation project has contributed to the conservation of endemic fauna and flora in the Agulhus Plain. Article by Heidi Nieuwoudt, Piet-Louis Grundling, Lana du Toit and Farai Tererai.



The Agulhas Plain is an area of high biological diversity. More than 1 750 plant species are found on the plain, with many being endemic. The Agulhas Plain supports one of the largest areas of lowland fynbos and renosterveld habitats in the world.

A remarkably rich invertebrate fauna is also found in the area. The whole of the Agulhas Plain is considered an important bird area and is divided into three – the Overstrand, Overberg Wheatbelt and De Hoop Nature Reserve. Sixteen species of frogs have been recorded in and around Agulhas Plain, of which three are threatened. These are *Amietrophrynus pantherinus* (Western Leopard Toad – endangered), *Microbatrachella capensis* (Micro Frog – critically endangered) and *Xenopus gilli* (Cape platanna – endangered).

Agulhas is further home to at least ten indigenous fish species, of which seven are marine and the remainder freshwater. A number of sub-catchments in the Agulhas area have been identified as Freshwater Ecosystem Priority Area (FEPA) fish sanctuaries, fish support areas (FSAs) or catchments important for fish migration. The Agulhas Plain is therefore a priority area for rehabilitation and conservation.

Current restoration work by Working for Wetlands focuses on



the Pietersielieskloof wetland system, an unchannelled valleybottom forming part of the broad Nuwejaars wetland complex. The Pietersielieskloof tributary rises as numerous branched mountain streams on the Bredasdorp Mountains. The mountain streams flow into typically unchannelled valley-bottom wetlands as they flow out of the mountains onto flatter ground. The Nuwejaars and many other wetlands in the Algulhas National Park have been identified as priority wetlands within the Agulhas Plain, being palmiet wetlands that are only found in South Africa. The system is located in quaternary G50B, and the Southern Folded Mountains aquatic ecoregion within the Overberg District Municipality, Western Cape.

These wetlands contain deep peat stores over which wetland vegetation grows, primarily palmiet (*Prionium serratum*), restios, sedges (such as *Juncus lomatophyllus*), leucadendrons, *Psoralea pinnata, Pennisetum macrourum* and *Berzelia* species. Sanctuary is provided for *Sandelia capensis* (Cape kurper), *Pseudobarbus* species (redfins), and *Galaxias* species (galaxiid). Fish found in the Pietersielieskloof wetland was identified as the critically endangered and endemic red-finned minnow, and the risk factor and rewards of the rehabilitation of these wetlands increased substantially.

A combination of inapt catchment land-use and wetland degradation by invasive alien plants, anthropogenic draining and road crossings has led to erosion and the subsequent rapid loss of peat from the Pietersielieskloof system over the past 12 years. Significant erosion occurred in 2006, and since then, many of the eroded areas have been invaded by alien vegetation. The wetlands have almost entirely lost their unchannelled valleybottom characteristics. Headcut erosion caused the wetland to drain and prevented the migration of fish.

The Working for Wetlands project endeavoured to arrest erosion by building various structures, such as chute-drop inlets, to restore the wetland and regain ecosystem functions such as water and carbon storage, base flow maintenance and biodiversity conservation. Wetland rehabilitation is often constrained by poorly developed methodologies and associated high costs. This project presented a balance between innovation and cost optimisation.

Traditionally, huge and costly concrete or gabion structures with large construction footprints are used to address massive erosion gullies. Such big structural interventions take long to construct and cause considerable soil disturbance which provide invasive alien plants an opportunity to invade the area. This project applied the highly innovative "softer" and low cost interventions – chute-drop inlets to address big erosion head-cuts, with great success.

Unique methodologies were applied from planning and implementation, to monitoring and evaluation. Large interventions such as weirs, are known for fragmenting freshwater habitats, but this intervention maintained continuity. In light of limited resources for wetland rehabilitation and conservation it is envisaged that the experiences from this project may be applied elsewhere in the country in order to expand the Working for Wetlands rehabilitation footprint.



Main site construction in progress.

This project made a valuable contribution to the environment and community alike. With an investment of about R2.8 million, it contributed to the protection of the endemic Palmiet peatland system and its associated rich biodiversity; in particular the future and survival of the red-finned minnow. Sustained base flow was restored to the benefit of the local communities towards the village of Elim, as well as farmers by protecting local water storage.

Improved water security contributes to ecotourism in the Agulhas National Park; and mitigation of climate change effects. The restoration has potential to enhance the carbon storage capacity of the peatland, thus contributing further to the mitigation of climate change effects. A total of 44 people from the Elim and neighbouring communities were employed and trained during the 7 898 person days of this project. The return on investment in providing water security to the people and land, and the contribution to the prevention of local extinction of the red-finned minnow – priceless.

The techniques developed here will also be rolled out in other palmiet wetland systems in South Africa. In particular in the Kromme and Gamtoos River Catchments where wetlands in these catchments are important in flood attenuation, base flow maintenance and sediment filtration upstream of large impoundments such as the Churchill Dam supplying water to the Nelson Mandela Metro (Port Elizabeth). This is of note given the Ramsar theme for World Wetlands Day 2018: Wetlands for a Sustainable Urban Future. We need to conserve wetlands in river catchments important to urban water supply.



The beginning of work to address two erosion headcuts just upstream of the main site.



Completion of work to address two headcuts just upstream of the main site – SUCCESS!