



Green grow the rushes – o!

The Papekuils wetland in the Breede Valley, with the river glimpsed in front of the Hex River Mountains and Fonteintjiesberg.

Exploring the Breede valley's Papekuils wetland revealed a feast of rushes and wetland flowers mixed with a spice of surprises

BY ANNABEL MARIAN HORN, NICK HELME, LIZ DAY, PHIL MCLEAN & WILNA KLOPPERS

IT IS A WARM OCTOBER SPRING day and we are in the Breede valley at Papekuils wetland, south of Worcester and north of the Brandvlei dam.

The Western Cape government's Department of Environmental Affairs and Development Planning wants to explore what value this wetland provides to the valley's ecosystem. We are a mix of representatives from the department and from SRK Consulting, which has been appointed to carry out this project. We are pleased to see high water levels in the channels after unseasonably late winter rains – and some of the plants beginning to flower.

Until about 250 years ago, hippos and elephants roamed here. Over tens of thousands of years, they caused many

of the depressions and channels which are still present.

To the east are the 2 000-metre-high peaks of the Hex River Mountains. To the west, the Slanghoek and Du Toits Kloof Mountains only recently lost their crowns of snow.

We are not tackling the whole surviving 982 hectares of this wetland today, just five sites in one of our four study areas. This 1.5km transect through a mosaic of Breede sand fynbos (found on well-drained acid sands in the upper Breede River valley) and Cape lowland freshwater wetlands has riches in store for us – as long as we are prepared to brave the channels on our way to the deeper Breede River.



ZANELE JAM-JAM MARCH

PLANT MOSAICS

The plant diversity of these wetlands is thought to be a remnant of what was once more widespread in the catchment. Cape lowland freshwater wetland is a very broad vegetation type found throughout the Cape region wherever there are mountainous catchments, typically with sandstone peaks and ridges.

The Holsloot River, now regulated by the Stettynskloof dam, drains into this wetland. Groundwater seepage and overflows from the Smalblaar and Hartbees Rivers, after these have joined the Breede, also help support the wetland and its plants.

Flooding here varies in both quantity

and timing (hydroperiod). Along with the almost flat landscape that varies by less than five metres in elevation and the very diverse soil types, this all helps to create many diverse habitats and plant communities that live in them, like a mosaic of interesting jewels.

Soils range from windblown and flood-dispersed sands to sandy or loamy soils embedded in sandstone cobble or underlying salt-rich clays. Then there is every combination of these soils that you could imagine . . .

A STEW OF WATER LOVERS

Vineyards have replaced the wetlands on the north-western side of the

Papenkuils wetland. We are not particularly surprised that at our first site, a wet channel shows signs of nutrient enrichment – phosphates and nitrates from fertilisers and animal manures – typically resulting from farming.

The wet channel is a place of rushes, true to the wetland's name, Papenkuils. In it, we find finger rush (*Eleocharis limosa*), African river grass (*Pennisetum macrourum*) and rush (*Juncus cephalotes*).

With these are a sedge (*Cyperus fastigiatus*), the delicate flowers of the Cape star or watersterretjie (*Pauridia aquatica*) and the only fully aquatic crassula, the floating *Crassula natans*. We also find ivy vlei weed (*Nidorella ivifolia*) on better-drained sands.



Water dilemma

There will always be competition for water between the natural environment and people who need to use water themselves and for farming.

Water is diverted from the Holsloot River into the Brandvlei canal to flow into the Brandvlei dam for agricultural use, following an earlier diversion from the Smalblaar River (known higher in the catchment as the Molenaars) into the Holsloot River. In future, capacity to pump water to the Brandvlei dam from the Breede River below the Papekuils wetland might increase. Extracting water below these wetlands will ensure that they can survive and continue providing ecoservices.

Phil McLean, Zahn van Wyngaard and SRK's Simon Lorentz work an auger to sample soil along the transect to understand soil characteristics linked to the plant communities and wetlands.

ANNABEL MARIAN HORN



(Above left) watersterretjie (*Pauridia aquatica*) and (right) palmiet (*Prionium serratum*).

In the wet channel also is narrow-leaf waterblommetjie (*Aponogeton angustifolius*). Local people collect it and the larger *A. distachyos* to sell as the key ingredient of waterblommetjie bredie.

Aponogeton angustifolius is found only in lowland wetlands from Gouda to Worcester to Cape Town, and the Papenkuils system possibly makes up as much as 30% of the global population. It commonly occurs in seasonally flooded habitat throughout the Papenkuils wetland, sometimes alongside the larger *A. distachyos* although the latter tends to prefer deeper water.

WATER MEADOW

Our second site on this transect is a water meadow, where the vegetation is very short – probably because it has been grazed by cattle. This flooded meadow has soils made up of a mixture of sand, silt and clay (loams) that are salt rich, with many salt-tolerant plants (halophytes).

Plants from a range of families grow here – from Aizoaceae, Asparagaceae and Asteraceae to Iridaceae and Juncaceae. Brass buttons (*Cotula coronopifolia*) grow among kweekgras (*Cynodon dactylon*), creeping saltmarsh vygie (*Lampranthus debilis*) and seaside rush grass (*Sporobolus virginicus*), a

salt-marsh plant that can be found around the world. Here we also note spike rush (*Juncus kraussii*), Cape rice grass (*Stipa capensis*), aandblom (*Hesperantha falcata*), vlei viooltjie (*Lachenalia contaminata*), chincherinchee (*Ornithogalum thyrsoides*) and prostrate Cape weed (*Arctotheca prostrata*).

A SPICY INCOMER

Our third stop is a site in a subsidiary channel, with fairly tall, seasonally flooded vegetation that is not yet heavily grazed by cattle. We find the sedges (*Juncus cephalotes*, and *J. oxycarpus*) and then their relative, sweet galingale (*Cyperus longus*). This is also a sedge but indigenous to western Europe although not invasive.

The roots of sweet galingale can be eaten and it was much used as a spice in the kitchens of north-western Europe back in mediaeval times. Was it perhaps specially planted here in times past by settlers for use in savoury dishes?

We find three more sedges – *Isolepis hystrix* and *I. levynsiana* as well as large populations of the rare and poorly known *Isolepis pusilla*. This grows in water that is about 10 to 20 centimetres deep, flowering just as the floodwaters subside.

On nutrient-poor sands grows the small sundew (*Drosera trinervia*), with its sticky globules that trap insects that are absorbed by the plant for their nitrogen content. Vlei viooltjie (*Lachenalia contaminata*) carpet the veld and even the rare white vlei iris (*Geissorhiza geminata*) is found here. This water-loving bulb was previously known only from the Slanghoek Valley, Tulbagh and the Leeurivier floodplain in the Koue Bokkeveld. It is not at all common in any of those areas, so this is a significant find.

PALMIET MARKER

The fourth site is only about 10 metres southeast of a palmiet channel and has been heavily grazed by cattle. We chose it for the range of habitats present within 20 metres.

We see the difference in vegetation between well-drained sands and seasonally wet sands, for example. The well-drained sands support slangbos (*Seriphium plumosum*), *Aspalathus acanthoclada*, all day grass lily (*Caesia sabulosa*), tortoise berry (*Muraltia spinosa*) and the sandveld kabong (*Lapeirousia anceps*). The seasonally wet sands, by contrast, have the characteristic rushes, *Juncus cephalotes* and *J. oxycarpus*.



(Clockwise from top left) the edible narrow-leaf waterblommetjie (*Aponogeton angustifolius*); the rare white vlei iris (*Geissorhiza geminata*); the sundew (*Drosera trinervia*); the floating *Crassula natans*, the only fully aquatic member of this large genus of succulents and annuals; and the vlei viooltjie (*Lachenalia contaminata*).



NICK HELME

Walking through dense palmiet stands and two-metre deep channels proves challenging.

VELD FLAVOURS

About halfway along the transect, we come to the fifth site. It is in an area which is not heavily grazed and where the sands are fairly well drained with a few typical wetland elements.

We find Cape wire grass (*Tenaxia stricta*), perennial veldgrass (*Ehrharta calycina*), straight sorrel (*Oxalis recticaulis*), the poorly known *Restio helenae* with its curved spikelets, golden cudweed (*Helichrysum moesianum*), false hairgrass (*Pentameris airoides*) and the blue lady's hand (*Cyanella hyacinthoides*). Finally, we gather a handful of veld flavour – the edible fig (*Carpobrotus edulis*), vleikanol with its edible bulbs (*Watsonia meriana*), and the highly palatable rooigras (*Themeda triandra*).

ELUSIVE LILY

Our sixth site has seasonally wet but well-drained sands, dominated by African river grass and Indian sedge (*Ficinia indica*). On some dry sand, we find the curious, vineleaf stork's bill (*Pelargonium lobatum*) with multi-lobed leaves, star of the veld daisies (*Ursinia anthemoides* and *U. chrysanthemoides*) and zonkwastriet (*Willdenowia teres*).

The flat leaves of the candelabra lily (*Brunsvigia orientalis*) are visible but its bright red flowers will appear only at the end of the summer, attracting sunbird pollinators.

NO DUNKING!

At the final sites, we reach channels dense with palmiet (*Prionium serratum*). The palmiet is tough and is the ideal plant to break the speed of floodwaters and to prevent erosion of riverbanks.

The palmiet's half-floating stems prove challenging to cross. The deciding moment comes when we reach the deep water of the main Breede channel. We retrace our steps and beat a retreat. Nobody is keen to swim their way across! 🌿

Annabel Marian Horn (annabel.horn@westerncape.gov.za), Phil McLean and Wilna Kloppers are in the Pollution & Chemicals Management Directorate of the Western Cape Department of Environmental Affairs & Development Planning. Nick Helme (<https://www.inaturalist.org/calendar/botaneek/2020/10/27>) is a botanical consultant specialising in the greater Cape floristic region. Liz Day is an ecologist with Liz Day Consulting.

4 reasons to protect wetlands

1. Wetlands are considered one of the most threatened ecosystems both globally and in South Africa.
2. The vegetation and soil structure of wetlands allows water to circulate through them. This provides ecosystem services because the water quality is enhanced as it passes through the system, which also stores and slowly releases water.
3. Wetlands are resilient in many ways but vulnerable to developments that divert water away from them, such as urbanisation and agriculture.
4. Wetlands are vital biodiversity assets, sustaining a variety of animals and plants specific to the wetland community.