THE UNION OF GREEN AND GREY

REVEGETATING ENGINEERED BANKS ON THE CAMPHERSDRIFT RIVER

by Jackie Dabrowski

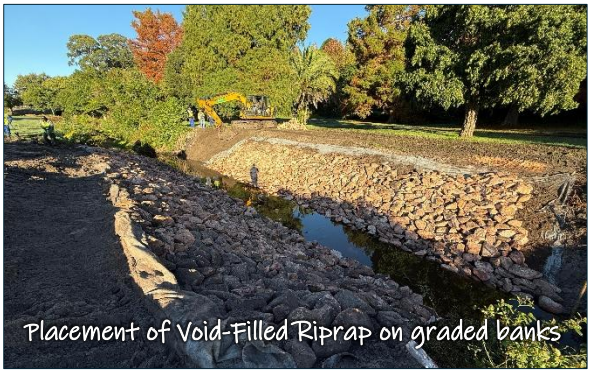
Confluent Environmental was appointed to undertake revegetation of engineered riverbanks along extensive sections of the Camphersdrift River in George, South Africa.'

Originally a channelled valley-bottom wetland with significant peat deposits, the Camphersdrift Wetland has begun to function more as a river with a structured riparian zone. This is due to high intensity flooding events coupled with impacts of urbanisation.

Unfortunately, a 1:150-year rainfall event in November 2021 resulted in significant erosion of peat and washed away large sections of the channel banks, rendering residential property and a municipal pipeline at risk of failure if the banks were not stabilised.

Appointed by the George Municipality, Lukhozi, the consulting engineers, used a combination of methods including grading the banks, gabions, reno mattresses and Void-Filled Riprap (VFR) to stabilise the banks. Urwhebo e-Transand, the civil contractors, undertook the works, and implemented the engineering plans, leaving a final surface of topsoil protected by soil-saver matting for us to work with.

Confluent Environmental were tasked with revegetating the riparian zone in this novel, man-made habitat.



Placement of Void-Filled Riprap on graded banks

VFR covered with topsoil and soil-saver matting

Project Aims

Our aim was to revegetate the banks using plants that:

- ✓ Are indigenous, pioneer species;
- ✓ Are already present along the river;
- ✓ Establish rapidly;
- ✓ Are representative of a transition from Southern Afrotemperate Forest to Garden Route Shale Fynbos;
- ✓ Will promote rehabilitation of a functional riparian zone;
- ✓ Provide shading for the river to moderate temperature;
- ✓ Are robust to flooding below floodlines;
- ✓ Are suitable for the man-made substrates into which they are planted;
- ✓ Will facilitate bank stabilisation to reduce flood damage in the future;
- ✓ Promote biodiversity.

Plant Selection & Placement

Over **2 000** individual plants of at least **40 different species** were selected, placed, planted and watered over an area of more than 4 500 sqm in sections along the riverbanks.

Plant selection and placement was site- and substrate-specific. Local nurseries in George were used to source plants, as well as a few wetland plants that were rescued prior to works on the site.

Plants ranged from small plugs where space was limited (e.g. in soil-filled reno mattresses) to 2L – 4L size plants in areas where deeper soil was available, such as VFR.

<u>Plant species list</u>

Afrocarpus falcatus
Agathosma ovata
Anisodontea scabrosa
Apodytes dimidiata
Aristea ecklonii
Aristida junciformis
Athanasia dentata
Buddleja salvifolia
Chrysanthemoides monilifer
Cliffortia graminea
Clutia pulchella
Curtisia dentata
Cynodon dactylon
Ekebergia capensis
Euryops virgineus
Gomphocarpus fruticosus
Halleria lucida
Helichrysum cymosum
Helichrysum petiolare
Ilex mitis
Isolepis prolifera
Juncus lomatophyllus
Kniphofia uvaria
Leonotis leonurus
Metalasia muricata
Ortholobeum fruticans
Pelargonium cordifolium
Phylica ericoides
Psoralea affinis
Rhamnus prinoides
Selago corymbosa
Stenotaphrum secondatum
Struthiola dodecandra
Trimeria grandifolia
Virgilia oroboides
Wachendorfia thyrsiflora
Zantedeschia aethiopica

confluent
biodiversity specialists

The Process

The sequence of images below depicts the process through site establishment, to plant selection and placement, mulching and watering, and finally – conclusion of the establishment phase.

It wasn't long before plants started flowering and the bugs were back!

Care & Maintenance

We dug a circular mound of soil around every plant to help capture water, especially on steeper slopes where runoff rates would be higher.

Organic mulch from a local tree feller (supplied by The Branch Manager) was applied in thick layers around each plant to prevent moisture loss and suppress weeds. Mulch was also lightly scattered over grass seeded areas to protect germinating seedlings.

Plants were watered several times to encourage establishment and planting concluded in October, typically the peak rainfall month in George. The rapid establishment of plants was encouraged to facilitate shading as parts of the project area have exposed slopes with little protection from wind and sun – as in the below picture.

Basic weeding to remove species that could smother or out-compete the new plants targeted plants like *Chenopodium album* and *Raphanus raphanistrum*.

Our Team

Our core planting team consisted of four South African Xhosa-speaking men who were part-time employed. They learnt a variety of skills during this project and developed a sincere appreciation for the river system being restored, and the plant species they've come to know.