





# Kouga Catchment Enters Rehab

*A pilot project in the Eastern Cape is exploring ways of rehabilitating riparian zones after alien-clearing. Sue Matthews reports.*

Tucked away in the foothills of the Eastern Cape's Kouga River catchment are two tiny tributaries – the Baviaans and Heuningnes rivers. Despite their lowly stature and remote location, these waterways are the focal points of a hive of activity, having been selected as the study site for a pilot partnership project between WWF, Working for Water and Working for Wetlands. The Kouga Riparian Rehabilitation Project will be used as a platform to develop best management practices for the rehabilitation of riparian zones following the clearing of invasive alien plants.

"The Kouga catchment was chosen for the pilot project because it was identified as a priority system by the CSIR in the State of the Rivers report," explains Rodney February, head of WWF's freshwater programme. "It also feeds the Kouga Dam, which provides much of the water supply for Port Elizabeth, and is close to the Baviaanskloof Mega-Reserve, an important conservation area."

A healthy riparian zone – the area along the riverbank – is not only vital to a river's ecological functioning, but also helps regulate flows. Natural riparian vegetation provides habitat for creatures that live in or move

through the river corridor, reduces erosion by stabilising the banks, and filters sediment and nutrients from the surrounding landscape. And, as is the case elsewhere in the catchment, it has a sponge effect, absorbing water and releasing it slowly over time, resulting in a more constant river flow.

By contrast, invasive alien plants – particularly tall trees such as pines, gums and wattles – have higher water requirements than the indigenous vegetation they replace, so infestations in catchment areas and riparian zones generally reduce total runoff and hence river flow. The trees tend

**Left:** A Working for Water team member finishes clearing a plot in the Baviaans River valley. Behind him, a stand of young black wattle trees await the same fate.

**Right:** Denuded slopes are testimony to the intensive alien-clearing work being conducted in the Kouga catchment.



Sue Matthews



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*Japie Buckle of Working for Wetlands explains how the black wattle invasion of the Baviaans River valley has caused headcut erosion and a deeply incised river channel. Subject to an EIA, a weir will be installed to raise the channel bed so that riparian vegetation can be planted.*

to fall over when the river is in spate, ripping out sections of the bank and causing blockages that lead to further damage to the river channel. What's more, wattles are nitrogen-fixing plants that increase nitrate levels in the soil, excluding indigenous vegetation that is adapted to nutrient-poor

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soils – such as the fynbos of the Cape Floristic Region – and allowing the alien invaders to form dense monocultures. With little groundcover to bind the soil, erosion increases, resulting in siltation downstream.

Both the Baviaans and Heuningnes River valleys are heavily invaded by the black wattle, *Acacia mearnsii*. Working for Water teams cleared and then burnt the Baviaans several years ago, and two follow-up operations involving herbicide spraying and slashing of regrowth have since been conducted, but the wattle has re-invaded in force. Beneath its bright green canopy, the valley floor is brown and barren.

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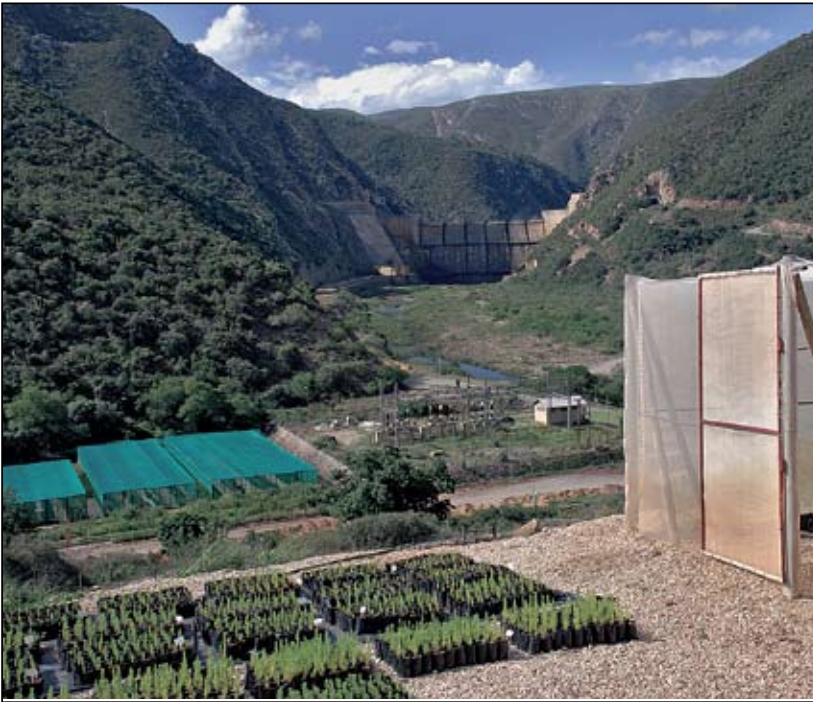
and now there's evidence of severe erosion in the riparian zone,” says Saskia Fourie, project manager for the Kouga Riparian Rehabilitation Project. “It's clear that active intervention is needed to restore ecological functioning.”

There are a number of possible reasons for the poor recovery of indigenous vegetation, and a combination of these is probably to blame. The repeated and perhaps excessive use of herbicide – or just poor timing – may have played a role, while the controlled burn may have been too intense due to the high fuel load of the felled trees. Very hot fires are known to alter soil properties and destroy the seeds of indigenous plants. Or perhaps the culprits were overly frequent fires in the past, when the land was used for grazing stock.

“Black wattle has probably been in this area for the last 50 or 60 years, because farmers were given its seed to provide a source of firewood,” explains Japie Buckle, Working for Wetlands' Eastern Cape coordinator. “Farmers typically also burnt their land every few years and then used the first green flush, six weeks after the fire, for grazing. You not only lose reseeder species if you burn too frequently, but many germinating plants were probably eaten by grazers, so the indigenous seedbank may have diminished over time. Plus wattles like disturbed areas, and their ability to fix nitrogen gives them a competitive advantage over fynbos species.”

The black wattle trees in the Heuningnes River valley are larger and the stands less dense as they have not previously been cleared, yet they are equally devoid of undergrowth. A comparison between three different clearing techniques – fell and stack, fell and chip, and fell and burn – as well as follow-up work with and without herbicide application, will be undertaken as part of the project, to determine which methods promote most natural recovery.





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*The Kouga Dam wall forms an impressive backdrop to the indigenous plant nursery. Plants are transferred from seed rooms to the shade houses, and then put outside during the 'hardening off' phase to toughen them up.*

Before clearing the Heuningnes, however, two gauging weirs will be constructed in the river channel to measure base flow and the reaction to rain events. Once data has been collected for a year or two, the wattles will be cleared and the effect on river flow will be monitored.

The main focus of the project, though, is to develop and test rehabilitation methods, so the recovery of riparian vegetation following seed-sowing and low-, medium- and high-density planting treatments will be compared.

"In previous research I found that indigenous commercial grasses were very effective at suppressing wattle regrowth from the seedbank," explains Fourie. "So we will weigh up the costs of sowing commercial grasses versus using herbicides in a cost-benefit analysis."


Other indigenous plants for the rehabilitation work are being cultivated at a nursery set up by Working for Water on DWAF land near the Kouga Dam wall. The nursery is

managed by horticulturalist Vicky Wilman, and currently employs some 50 people drawn from local communities. It also supplies plants for other fynbos and subtropical thicket rehabilitation projects within Working for Water's Eastern Cape Restoration Programme. Seeds, cuttings and root stocks are collected close to the sites to be rehabilitated, and brought back to the nursery for propagation.

As with all Working for Water projects, there is a strong emphasis on skills development. Some nursery workers are being given horticultural training, while others are being

taught rehabilitation techniques.

"The idea is that after two years they'll be able to form their own business units and supply plants to other landowners undertaking riparian rehabilitation projects," says Wilman.

Since one of the primary aims of the Kouga Riparian Rehabilitation Project is to stimulate the rehabilitation of South Africa's riparian zones, it is likely that their skills will be in high demand. 



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*An enthusiastic nursery worker fills a seedling tray with pelargonium cuttings.*