

## **Indigenous vegetation along our rivers is valuable natural infrastructure and should not be removed**

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The integrity of many of our Garden Route rivers is being threatened by a new problem: residents removing natural indigenous vegetation between their properties and the river or ocean. The reasons cited are to protect properties against vagrants who hide amongst the trees and bushes or to remove unruly vegetation to open up views of the water, thereby hoping to increase the value of their properties or their visitors' experiences. The latest trend is to remove trees and shrubs in public spaces like the Garden Route National Park. Apart from being completely illegal, these are selfish acts that not only destroy nature's infrastructure by creating flood risks, but also impact on other people's experiences of nature and removes habitat for our wildlife.

Imagine installing a gabion or concrete wall to protect your property, a public park or the road in front of your house from flood damage. Then one day someone decides they don't like it; perhaps the infrastructure obstructs their views, looks ugly to them or they're worried about vagrants hiding behind it. The person starts hacking at the wall, unpacking the gabions or cutting their baskets open, making them useless. When you approach them they explain that it's their right to do this - the infrastructure is inconvenient to them. You would immediately think such a person is misguided, selfish or a vandal and try to stop them or call the police to arrest them, wouldn't you? Natural vegetation growing on river banks is no different to engineered infrastructure, only better: it also provides habitat for birds, insects and other wildlife.

The scientific evidence of the value of natural trees and shrubs on riverbanks is ample and undeniable. Research done by students of Nelson Mandela University, CSIR and SANParks, supported by thorough reviews of the international scientific literature, clearly show that:

- Natural vegetation stabilizes river banks and protects them against erosion. This prevents widening of rivers, acting like ecosystem engineers.
- Those indigenous trees and shrubs that are adapted to river banks have unusually flood-resistant root systems. They are not easily uprooted by floods and their roots can stabilize banks up to 4m high.
- Mats of tree and shrub roots play a critical role to keep river banks together, strengthening their resistance to floods and trapping soil particles drifting by.
- Root mats can increase erosion resistance by up to 20 000 (twenty thousand) times, compared to riverbanks without root mats. This effect is much stronger when natural trees and shrubs with different root depths grow on riverbanks. Floodplains with natural vegetation are between 80 and 150% less erodible than floodplains used for planted pastures or crops.
- Above-ground stems, trunks and branches of trees slow down the speed of flooding rivers. This prevents the river from breaching its banks and forming side-channels.
- Natural vegetation absorbs pollution and keeps rivers clean. It prevents impurities and effluent from flowing directly into rivers.
- When indigenous vegetation is removed, the gaps are most often filled by invasive alien plants. This creates fire risks, compromises water quality and reduces erosion

resistance because exotic trees don't have the same flood-resistant root systems as indigenous plants that are adapted to growing next to rivers. Exotic plants also suck much more water from rivers. This reduces natural flow.

- Rivers are not just water channels. They are living ecosystems, filled with insect, fish and amphibian life. Trees on river banks provide shade and regulate water temperatures to enable many different small creatures to survive and flourish. In a warming climate, their role in providing shelter for humans enjoying the river will become more and more important.
- Riverine vegetation is a haven for wildlife, providing places to roost, nest, breed and feed for an incredible variety of birds. Rivers and their associated trees are vital to the survival of mammals such as otters that breed and seek refuge amongst the natural cavities. This magnificent variety also provides great enjoyment to many residents who love birds and appreciate indigenous trees for their beauty and existence, and plays a big role in attracting tourists to the Garden Route. Visitors to Tsitsikamma National Park gave the presence of Knysna touracos (loeries) as their most important reason for staying longer in the Park.

It's clear that removing natural vegetation on river banks weakens the ability of a river to regulate floods. Removing nature's infrastructure also destroys wildlife habitat, creates gaps for invasive alien plants. This diminishes other people's enjoyment of nature and is bad for the tourism industry. One is not allowed to do this on one's own property without a permit, but doing it in a public place such as a National Park is completely unacceptable and illegal.

Fortunately, most residents who live next to our rivers appreciate the value of nature's infrastructure and therefore leave the vegetation intact. The small minority who clear indigenous trees and shrubs between their homes and the water's edge should think twice. Selfless behaviour is the mainstay of a caring community. And besides, paying a hefty fine is seldom pleasant.

### **Further reading**

Gurnell, A. 2014. Plants as river system engineers. *Earth Surface Processes and Landforms* 39:4–25. Freely accessible at <https://onlinelibrary.wiley.com/doi/full/10.1002/esp.3397>

O'Farrell, P. and co-authors, 2015. *Building resilient landscapes by linking social networks and social capital to ecological infrastructure*. WRC Report No K5 2267, Water Research Commission, Pretoria. Accessible at <http://sru.mandela.ac.za/sru/media/Store/images/K5-2267-Final-deliverable-31082015.pdf>