

Economy vs Environment: How Do We Protect Our Rivers?

The official launch of the national Biodiversity Strategy and Action Plan earlier this year underlined the importance of safeguarding the country's natural resources.

The report notes with particular concern that South Africa's rivers are poorly protected, and that the present status of many of these freshwater ecosystems are perturbing. Lani van Vuuren reports.

South Africa is a water-scarce country and, unsurprisingly, most of its freshwater resources are heavily utilised. All of the country's main rivers have been developed to some extent. In fact, the first National Spatial Biodiversity Assessment highlights the fact that

the country's river ecosystems are in a much poorer state overall than its terrestrial ecosystems.

The assessment of South Africa's main rivers (which make up about 45% of rivers in the country) found that 47% are moderately modified, while

23% can be considered irreversibly transformed in terms of their ability to support biodiversity, and are deemed unsuitable for conservation. Of the 120 main river types identified 84% are threatened – 54% critically endangered, 18% endangered and 12% vulnerable.

LONGITUDINAL NATURE

Protecting freshwater ecosystems has been historically challenging. According to Dr Dirk Roux of CSIR Natural Resources and the Environment, while protected areas provide a partial stop to freshwater habitat degradation and associated biodiversity loss, the design of protected areas is generally biased towards terrestrial biodiversity features, with freshwater ecosystems being addressed only incidentally as part of their inclusion with terrestrial reserves.

“Our biodiversity heritage is valuable first and foremost in ecological terms, but it also has an economic value that is often underestimated. If intelligently mobilised, it can serve the cause of development and poverty alleviation.”

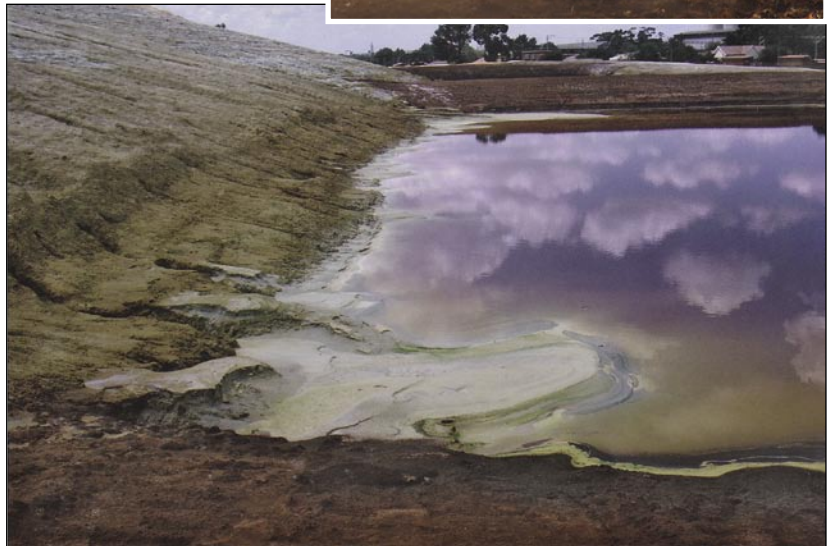
**Marthinus van Schalkwyk,
Minister of Environmental
Affairs & Tourism**

Another constraint is the longitudinal nature of rivers, which makes it difficult to include entire catchments or river lengths within formally protected areas. Conserving inland water ecosystems requires management of whole catchments, and it is seldom feasible to incorporate entire catchments into protected areas.

In fact, over 90% of all main rivers in the country fall completely outside Type 1 protected areas (national parks and nature reserves), while half of the remaining rivers form boundaries of protected areas. Thus, less than 5% of the main rivers in South Africa fall within protected areas, receiving protection on both sides.



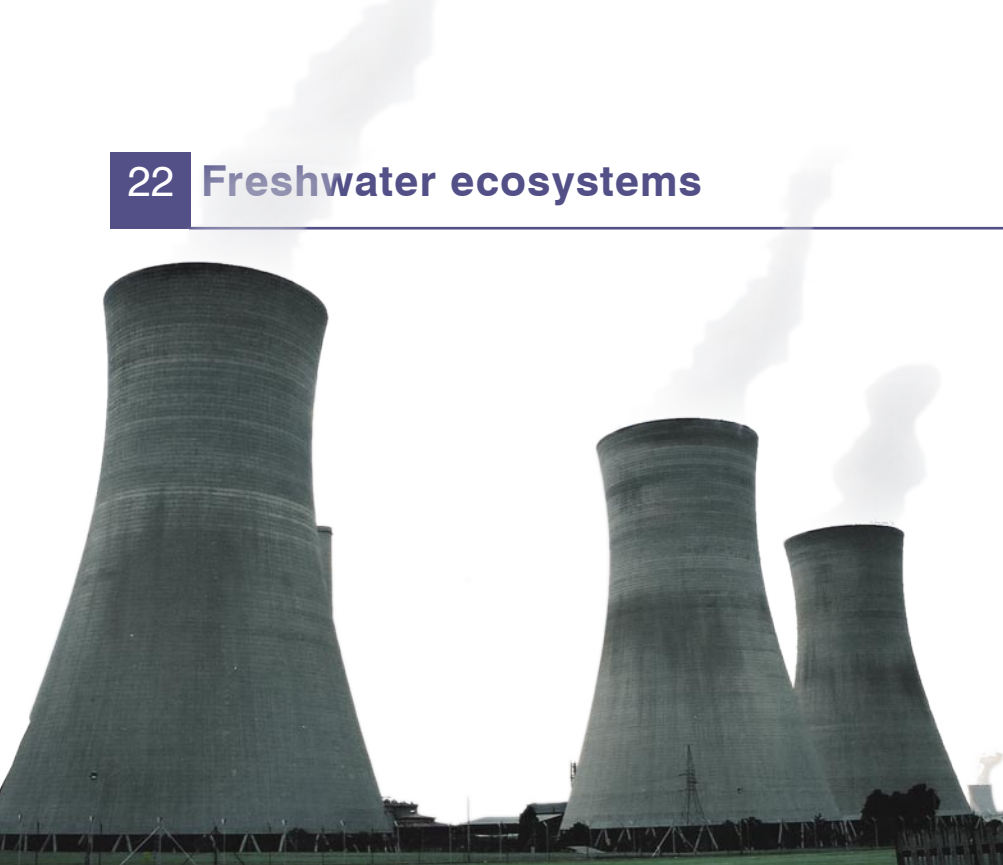
The main impacts on South Africa's rivers include over-abstraction of water, impacts of dams, pollution, alien invasive organisms and inappropriate land management (such as the destruction of natural vegetation along riverbanks).



ECONOMY VS ENVIRONMENT

There is no doubt that South Africa's hard-working rivers will continue to do so, as underscored by this year's theme for National Water Week,

“Water for Growth & Development”. As Dr Roux points out trade-offs are inevitably required between protecting inland water ecosystems (achieving biodiversity conservation) and achieving socio-economic development. “The question is how many



Being among the 30 most water-scarce countries in the world means South Africa has to balance carefully its economic development versus the safeguarding of its freshwater ecosystems.

inland water ecosystems should reflect a high level of protection (natural and good states) to claim that South Africa is effectively conserving the biodiversity associated with these systems? Also which ecosystems are most suited for, and will give the best returns when included in a national design for inland water conservation."

To date, national conservation targets for inland water ecosystems have not been addressed in national policy and legislation. There is no operational guidance regarding the desirable number of ecosystems to be conserved or the mechanisms through which conservation should be achieved.

The fate of the country's water resources relies on an integrated approach to managing water and land to achieve ecological and socio-economic sustainability, notes Dr Roux. "We need to pay increased attention to managing rivers for meeting immediate social and economic needs as well as maintaining their long-term functioning to meet the needs of future generations."

NATIONAL TARGETS

Dr Roux explains that there are several core objectives which are imperative to achieving inland biodiversity conservation. The first is to set quantitative conservation targets. Internationally, it has been recommended that a minimum of 20% of a country's natural aquatic resources should be protected.

These targets should preferably be set and endorsed at national level. Provincial and local governments make daily decisions about land use based on the political boundaries of their particular jurisdictions, clarifies Dr Roux. "These political demarcations rarely if ever follow natural patterns of biodiversity occurrence. Without appropriate information at relevant spatial scales, provincial and local governments may unknowingly make decisions that result in the degradation or destruction of some of the best examples of the country or region's ecosystems."

These national targets can then be cascaded down to sub-national implementation levels. It is also

essential to review these targets over time as our understanding of the effects of human activity on biodiversity grows.

BIODIVERSITY FOR TODAY & TOMORROW

The second objective is to select freshwater ecosystems for conservation that are representative of the full spectrum of inland water biodiversity that exists in South Africa. Surface water resources are a manifestation of the landscapes that they drain. Catchment geology, climate, vegetation types, and landscape change dictate the character of inland water ecosystems in terms of flow pattern, channel morphology, temperature and nutrient regimes and substratum (bedrock). These variables, in turn, control the biological attributes of water resources. Accordingly, inland water biodiversity can be represented, at least at a coarse level, by the diversity of the landscape in which they occur.

Both the present and future conservation of freshwater ecosystems need to be ensured. "Conserving species and habitats provides a snapshot of the biodiversity that currently exists. If we wish this biodiversity to persist and naturally evolve over time, we also need to be certain that populations, communities and ecosystems that are both viable and of high ecological integrity are selected; natural ecological processes and disturbance regimes such as floods are operating within their natural ranges of variability, and the size of a conservation design is sufficient to allow recovery from natural disturbances," notes Dr Roux.

Another objective is to establish a network of inland water conservation areas. Rather than being areas where no use of the resource is allowed, these areas would be based on a philosophy of multiple land-use options that support a conservation objective (such as non-transformational



The protection of terrestrial ecosystems has historically taken precedence over the protection of inland freshwater ecosystems. Less than 5% of the main rivers in South Africa fall within protected areas.

agriculture). To protect the functional elements of freshwater ecosystems, whole river systems should, wherever possible, be selected for contributing towards the national conservation target.

Lastly, the value of a conservation design can only be realised through its effective application. Dr Roux explains: "For freshwater biodiversity conservation to be practiced in reality requires the translation of science into awareness, political will and necessary capacities. Stakeholders, including the public, need to have the necessary knowledge as well as the emotional and financial commitment for conservation of rivers to succeed. It is therefore critical that all stakeholders be part of the decision-making process right from the start."

Dr Roux adds that conservation of inland water biodiversity will not receive due attention and resources if it is not reflected as a line function in the business plans and budgets of responsible agencies. Cooperative governance is also crucial. "No single organisation can claim the ability to

implement an inland water conservation plan in all its facets on its own. The integrated nature of inland water conservation planning and implementation requires the combination of a highly diverse and specialised cluster of skills, and spans the mandates of a number of sectors and spheres of governments."

The value of South Africa's freshwater biodiversity must never be underestimated. It is only through a long and complex process, with commitment from all stakeholders, that the right mechanisms will be put in place to safeguard our precious natural resources for future generations.

For more information:

- *South African National Spatial Biodiversity Assessment 2004: Summary Report and River Component* (www.sanbi.org.za/biodiversity/nsba)
- To view the South African National Biodiversity Strategy & Action Plan go to www.deat.gov.za
- *Discussion Paper on Cross-Sector Policy Objectives for Conserving South Africa's*

HOW ARE RIVERS CLASSIFIED?



The classes of the water resources classification system, as proposed by the National Water Resources Strategy are described as follows:

- ♦ **Natural** – Human activity has caused no or minimal changes to the historically natural structure and functioning of biological communities, hydrological characteristics, chemical concentrations and the bed, banks and channel of the resource.
- ♦ **Moderately used or impacted** – Resource conditions are slightly to moderately altered from the Natural class due to the impact of human activity and water use.
- ♦ **Heavily used or impacted** – Resource conditions are significantly changed from the Natural class due to human activity and water use, but are nonetheless ecologically sustainable.
- ♦ **Unacceptably degraded** – Water resources that are ecologically unsustainable due to over-exploitation.

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