October 2015
The WRC operates in terms of the Water Research Act (Act 34 of 1971) and its mandate is to support water research and development as well as the building of a sustainable water research capacity in South Africa.

TECHNICAL BRIEF

Estuaries

Ecoclassification of temperate estuaries of South Africa

A completed Water Research Commission (WRC) study came up with a provisional ecoclassification of the temperate estuaries of South Africa.

Background

The National Water Act (NWA) mandates the classification of water resources (including estuaries) through the Water Resources Classification process. This process sets the management class (describing the degree of use and desired condition of a water resource), the freshwater quality and quantity allocation (the Reserve) and the Resource Quality Objectives for all water resources.

A major challenge in this process is the Ecoclassification of South Africa's diverse range of estuaries. Currently such information is available for only 15% of the country's estuaries.

The aim of this WRC project was to develop a desktop method for the Provisional EcoClassification for estuaries that provided for a comparative, regional scale assessment. The Provisional EcoClassification – in this context – refers to the present ecological status, the ecological importance and protection status, a Provisional Recommended Ecological Category (REC), as well as mitigation measures towards achieving the Provisional REC.

The desktop method was then applied to the estuaries of the cool and warm-temperate biogeographical regions of South Africa (Orange to Mbashe).

The desktop method

For the desktop method, stochastic and rule-based models were developed for the health assessment of a number of abiotic components, while the health assessment of the biotic components were reliant on available national-scale datasets and collated unpublished data, complemented by expert opinion.

In order to ensure alignment, this desktop method applied the same indices and rules as the official Ecological Water Requirement method for estuaries under the NWA.

The Provisional EcoClassification is guided by the PES which sets the minimum Provisional REC whereas the degree to which the Provisional REC needed to be elevated above the PES is determined by the ecological importance and protection status (current or desired) of a particular estuary.

Provisional EcoClassification

To validate the desktop method a Provisional EcoClassification of South Africa's temperate estuaries was conducted.

The investigation shows that overall 20% of the systems are considered to be in category A, 43% in category B, and 27% in categories C or D, with the remaining 10% in category E and F.

The category A and B estuaries are usually small systems in rural areas with few pressures. Larger systems were generally found to be in poorer condition as a result of pressures from their catchments, direct development in their estuary functional zones, as well as fishing pressures.

It should also be stressed that these larger systems generally are the more important fish nursery grounds and of higher economic ecological importance.

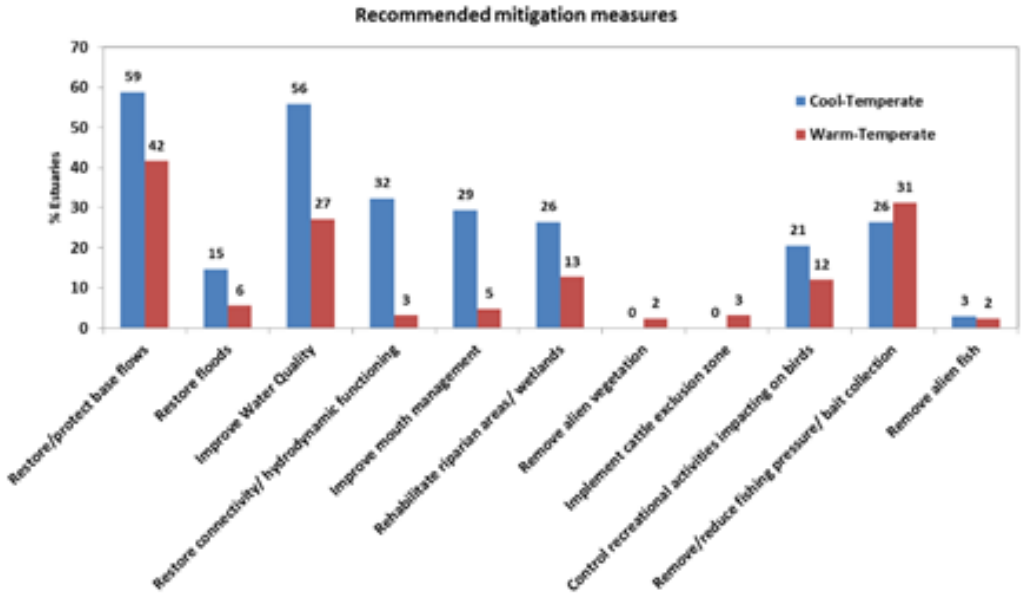
Estuarine importance

From an estuary importance perspective, 16% of the estuaries in the Temperate region are highly important, while 19% are rated as important. The remaining 64% are rated as of average to low importance.

Further, about 44% of Temperate estuaries are either in formally protected areas or form part of the core set of estuaries required to meet biodiversity targets for the region.

Recommended ecological category and recommended mitigation measures

The Provisional RECs derived for the Temperate estuaries, show that 36% of estuaries need to improve in health condition in order to achieve overarching biodiversity and related ecosystem services objectives.



In the Cool-Temperate region nearly 59% of estuaries require improvement, reflecting both the importance of these aquatic systems along this arid coastline and the severe pressure most of these estuaries are already under.

In contrast, only about 30% of estuaries in the Warm-Temperate region require intervention to achieve the Provisional REC.

From the water sector perspective, about 28% of estuaries in the Temperate region require some restoration in base flow condition (especially during the low flow period), while 34% needs improvement in water quality.

From the land-use and development sector outlook, 9% of systems require increased connectivity with the sea and/or improved hydrological functioning, while 10% requires an improvement in mouth management operations.
Nearly 16% of estuaries require rehabilitation of the riparian habitat and/or restoration of floodplain/wetland habitat, while 2% require the removal of alien vegetation. Further, 3% of systems require the implementation of cattle exclusion zones to protect estuarine vegetation (especially mangroves).

About 14% of systems require some control of recreational activities, such as boating or hiking, to reduce disturbance to birds. From the fisheries sector perspective, about 26% of estuaries require the reduction/removal of fishing effort, while about 3% of estuaries require the removal of alien fish species to allow for the recovery of indigenous populations.

Further reading:
To order the report, *Desktop provisional ecoclassification of the temperate estuaries of South Africa* (**Report No. 2187/1/15**) contact Publications at Tel: (012) 330-0340, Email: orders@wrc.org.za or Visit: www.wrc.org.za to download a free copy. .