

Freshwater ecosystems

Conservation biology of endangered freshwater fishes

A WRC-funded project aimed to provide a practical conservation plan to reduce threats for threatened freshwater fish species in the Olifants-Doring river system.

The need for fish conservation

There are approximately 120 species of fishes occurring in South Africa freshwaters, of which about 28 are recognised as threatened in the IUCN's Red Data list. In general, threats of aquatic systems and all aquatic species have been increasing.

This is reflected in a trend of increasing number of species included in the IUCN listings and the levels of these estimate threats. Despite this, few of South Africa's threatened freshwater fishes have dedicated conservation programmes aimed at realistically reducing threats and down-listing their conservation status.

This WRC-funded project focused on the Olifants-Doring river system, which straddles the western part of the freshwater fish conservation 'hotspot', with eight out of ten currently recognised species endemic and listed as threatened. Rivers in the fynbos region are also renowned for very high levels of aquatic macro-invertebrate diversity and endemism and for plant species diversity, encompassing two biomes that are international conservation hotspots, namely the Fynbos and Succulent Karoo.

Providing a practical conservation plan

Increasing impacts have been observed in the Olifants-Doring river system in recent years, including:

- Expanding ranges of alien fishes;
- New fish species invasions, such as carp;
- Over-abstraction of water during summer drought periods;
- Physical damage to habitats, such as the canalisation and bulldozing of stream beds;

Indigenous freshwater fish species of the Olifants-Doring River system

Scientific name	Common name	Conservation status
<i>Austroglanis barnardi</i>	Spotted rock catfish	Endangered
<i>Austroglanis gilli</i>	Clanwilliam rock catfish	Vulnerable
<i>Barbus anoplus</i>	Chubbyhead barb	Not threatened
<i>Barbus calidus</i>	Clanwilliam redbfin	Critically endangered
<i>Barbus serra</i>	Clanwilliam sawfin	Endangered
<i>Labeo seeberi</i>	Clanwilliam sandfish	Endangered
<i>Labeobarbus capensis</i>	Clanwilliam yellowfish	Vulnerable
<i>Pseudobarbus phlegethon</i>	Fiery redbfin	Endangered
<i>Galaxias zebratus</i>	Cape Galaxias	Data deficient
<i>Barbus erubescens</i>	Twee River redbfin	Critically endangered

- Damage to riparian zones through farming encroachment; and
- Varied pollution of waters from municipal and agricultural activities.

These impacts have already resulted in extinctions of some tributary populations of endemic fishes, and as impacts are increasing, the likelihood of further population extinctions and even entire species extinctions seems high. Specific actions are needed in order to halt and reverse these processes.

This WRC project aimed to provide a practical conservation action plan to reduce threats for three threatened endemic species in the Olifants-Doorn river system based on a multi-disciplinary scientific approach. These fishes are the critically-endangered Twee River redbfin, the endangered Barnard's rock catfish, and the vulnerable Clanwilliam rock catfish. These species were selected based on their current conservation status and the level of knowledge about them.

The aim of the project were, among others, to improve the conservation of the three fish species over the short-term to medium-term period by producing detailed chapters on

the conservation biology of each species; to improve the overall conservation status of aquatic environments in the Olifants-Doorn system; to involve conservators and scientists in formulating and implementing conservation action plans; and to develop a conservation action plan.

This was achieved by undertaking the following:

- Synthesising current knowledge;
- Filling in key knowledge gaps with specific research projects;
- Producing a series of specialist scientific reports;
- Conducting a workshop with specialists and local CapeNature conservators to discuss specialist reports and overall conservation issues; and
- Using the above reports and workshop discussions to develop species chapters and the overall conservation action plan.

Introducing innovation in conservation

It is believed that the project has been innovative in various ways. Firstly, the multidisciplinary approach in terms of

fish conservation biology is possibly the first of its kind for a comprehensive conservation assessment of an African fish species. Secondly, the report has used a multidisciplinary approach at the aquatic ecosystem faunal level, which integrates the needs of each taxon group in the development of a conservation action plan. Thirdly, the project while based on scientific method, is specifically aimed at producing a practical conservation management plan. Lastly, the conservation authority (CapeNature) that has the leading responsibility for implementation of conservation actions has been intimately involved with most aspects of the science in this report, and in drawing up the conservation plan.

Further reading:

To order the report. *Conservation biology of endangered freshwater fishes – Linking conservation of endangered freshwater fishes with river conservation, focusing on the Cederberg* (**Report No. KV 305/12**), contact Publications at Tel: (012) 330-0340, Email: orders@wrc.org.za, or Visit: www.wrc.org.za to download a free copy.