



**The Cape Critical Rivers Project –
CONSERVING RIVERS, SAVING SPECIES**

Bruce Paxton

The perilous state of two freshwater fish species in the Cape floristic region has spawned a partnership project to protect them and the rivers they inhabit. Article by Sue Matthews.

The Cape Critical Rivers Project is being steered by the Endangered Wildlife Trust, which has taken up the reins in response to capacity constraints at the provincial conservation agencies. The project has its origins in Biodiversity Management Plans for Species, or BMP-S, which have been drafted for the threatened Clanwilliam sandfish (*Labeo seeberi*) and Barrydale redfin (*Pseudobarbus burchelli*).

Norms and standards for the development of BMP-S, aimed at ensuring the long-term survival in nature of the species concerned, were published under the National Environmental Management: Biodiversity Act in March 2009. To date, final versions of BMP-S have been gazetted for only three species – the black rhino, Albany cycad and the medicinally valuable geranium *Pelargonium sidoides* – with a draft BMP-S for the African penguin gazetted for comment.

Dr Bruce Paxton of the Freshwater Consulting Group was lead author of the BMP-S for Clanwilliam sandfish, developed for the Northern Cape

Department of Environment and Nature Conservation (DENC) and Cape Nature in the Western Cape, with funding from WWF-SA's Table Mountain Fund. The Clanwilliam sandfish is one of eight fish species that are endemic to the Olifants-Doring catchment, which straddles the two provinces, and all eight are on the IUCN Red List of threatened species.

Dr Paxton initially studied the distribution and threats facing three of these species – the Clanwilliam sandfish, Clanwilliam yellowfish and sawfin – back in 2001, and explains that the reason for selecting the sandfish for a BMP-S was because existing conservation initiatives aimed at protecting these other two high-priority species would not be effective for the sandfish.

While apparently abundant in the upper and middle reaches of the Olifants River in the 1930s, the fish has not been recorded there since 1958, and now occurs only in the Doring River and some of its tributaries. Although the construction of the Clanwilliam and Bulshoek dams on the Olifants River are partly to blame – having disrupted spawning migrations and degraded instream habitat – it was predation by invasive alien fish, such as smallmouth bass and bluegill sunfish, that exacted the heaviest toll.

Adult sandfish are today restricted

to the northern reaches of the Doring River main stem, and juvenile fish surviving long enough to recruit to the adult population are known to occur only in the Koebee-Oorlogskloof tributary, where bass and bluegill have not penetrated very far upstream. In fact, the river canyon in the Oorlogskloof Nature Reserve, a DENC-managed reserve just south of Nieuwoudtville, is considered to shelter the only viable breeding population of the species. So imagine the consternation when it was discovered in 2010 that another alien fish, banded tilapia, which had been introduced to the municipal Nieuwoudtville Dam, had escaped during a flood, and had invaded sandfish breeding habitat in the Oorlogskloof River!

“While apparently abundant in the upper and middle reaches of the Olifants River in the 1930s, the fish has not been recorded there since 1958, and now occurs only in the Doring River and some of its tributaries.”

This was the trigger for developing the BMP-S, which was completed in October 2011. However, by July of this year it had not yet been submitted to the Department of Environmental Affairs for approval and gazetting, largely due to the DENC's concerns about their capacity to implement it.

“The DENC has only one aquatic scientist for the entire province,” explains Dr Paxton. “Also, the sandfish is not an economically important species, so it is not high on their list of priorities. But in the interim, by working with the Endangered Wildlife Trust we are managing to get a number of the actions in the BMP-S done.”

Some 300 km south-east of the Oorlogskloof canyon, as the crow



Jeremy Shelton

Left: Dr Bruce Paxton of the Freshwater Consulting Group.

Right: The Barrydale redfin is now recognised as a genetically distinct lineage of these Burchell's redfin.

flies, is the Tradouw River's spectacular ravine, which provides a passage through the Langeberg mountains, separating the Klein Karoo interior from the coastal plain. Here the critically endangered Barrydale redbfin, now recognised as a genetically distinct lineage of Burchell's redbfin *Pseudobarbus burchelli*, faces a real risk of extinction. It is known to occur only in the upper reaches of the Tradouw River and the adjacent Huis River above the town of Barrydale, and is subject to a suite of threats. Not only do all three of the invasive species mentioned earlier occur in the Barrydale redbfin's range, but its habitat has been degraded by pollution, bulldozing of riverbanks, and excessive water abstraction.

In this case the drafting of the BMP-S was undertaken by Cape Nature and the South African Institute of Aquatic Biodiversity, based in Grahamstown. It has not yet been finalised, but progress on implementing its conservation actions is expected to accelerate with the Endangered Wildlife Trust's appointment of a field officer for the Cape

Critical Rivers Project.

"I have been working on the project since July, doing the on-the-ground extension work," reports Alwyn Lubbe. "Much of this involves raising awareness about the threat of exotic species to our indigenous fish populations. I will be visiting individual farmers, but also engaging with farmers' associations and water boards."

"The impression I have got so far is that people are very much aware of the importance of conserving the natural system, which they depend upon from an agricultural point of view. They don't mean to do any harm, but want fish in their farm dams for various reasons – fish eat nuisance algae and mosquito larvae, and they also provide food and recreation. The people I've spoken to are receptive to lower risk alternatives, but we need to think about how to give them viable ones," notes Lubbe.

Dr Paxton notes that the project has a broader objective than Clanwilliam sandfish and Barrydale redbfin conservation, as it is looking at the implementation of the ecological Reserve, but focusing in on

ivers that support threatened fish species. Apart from the Tradouw and Koebee-Oorlogskloof systems, it includes the whole of the Koue Bokkeveld.

"The Koue Bokkeveld supplies the Doring River, especially over low-flow periods, and it is one of the most highly developed agricultural areas in the Western Cape, being a very important export area for deciduous fruit such as apples and pears," he says.

In 2006, the Olifants-Doring catchment was one of the first in the country to have a completed Comprehensive Reserve Determination and, as of 2012, has been classified according to the Water Resource Classification System.

"We want to use the Koue Bokkeveld sub-catchment area as a case study, so we have installed two loggers – one on the Twee River, which is home to the critically endangered Twee River redbfin, and the other on the Riet River – both of which flow via the Groot River into the Doring River. The loggers are piezometers that measure water pressure as a



Martine Jordaen of CapeNature and volunteer, Klaus Menck, view their first sandfish after five days of sampling the Doring River.

Bruce Paxton

substitute for water depth. We have put them in a stable cross-section of the river, and will then model the hydrology as a 'quick and dirty' way of getting data. Of course, one can get much more accurate readings from a gauging weir, but we feel there is no way to monitor the reserve effectively if we need a million Rand for each river in the country! We have put in a proposal to the Water Research Commission for a project that would allow us to contract in the necessary specialists for the hydraulic modelling."

Loggers have been installed in both of the other study systems too. In the Tradouw area the two loggers in the Huis River have revealed that so much water is being abstracted for use in Barrydale that about a kilometre of redfin habitat has been lost. In the Oorlogskloof, flows are being monitored to increase understanding about conditions needed to maintain a breeding population of sandfish.

"During our next survey of the Doring catchment in September, we are to identify a tributary system that is free of invasion by bass and bluegill, where we can translocate sandfish and establish an extra breeding population," notes Dr Paxton. "One of the areas we are looking at is the Biedouw River, as juvenile sandfish were seen there two years ago by Riaan van der Walt, CapeNature's freshwater stewardship manager in the area. It is also one of 13 Western Cape rivers that have recently been identified as priority rivers for alien fish eradication."

Translocation was one of 14 actions identified in the BMP-S, and has become one of the highest priorities. "First we need to get a handle on the population genetics though, and Dr Ruhan Slabbert from the University of Stellenbosch has expressed interest in doing that. The other actions aimed at increasing understanding of the fish's biology will probably be put on the backburner, because at this stage the urgency of the conservation measures outweigh them."



Bruce Paxton

"People are very much aware of the importance of conserving the natural system."

"The big question is whether the fish will stay in the river once we introduce them, because the Clanwilliam sandfish is primarily a mainstem species that migrates over long distances," adds Dr Paxton. "It is an experiment, and the Cape Critical Rivers Project provides us with the opportunity to do it."

The EWT Cape Critical Rivers Project is funded by SOS-Save our Species (an IUCN, GEF and World Bank coalition) and the Elizabeth Wakeman Henderson Charitable Foundation. □

Above: The project team surveying the Doring River at Uitspankraal, near the confluence of the Biedouw River. Thirty years ago, when sandfish were still abundant, this was an important breeding site.

Below: The remote Koebee River in the Northern Cape. The last remaining viable population of sandfish can be found upstream, in the Oorlogskloof.



Bruce Paxton