Trout stocking controversy - part 1

Why the Salt River at the Crags (Southern Cape Region) should not be stocked with fish

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Introduction

The proposed stocking of brown trout into the middle Salt River as part of a proposed fishing lodge development at The Crags was discussed in detail by Nick James in an article in the previous issue of *Piscator* . Since that article, an Environmental Impact Assessment (EIA) has been completed for the proposed development, including detailed reports on freshwater fishes and aquatic macro-invertebrates of the Salt River. Both studies came up with interesting and valuable findings - the former showed that no freshwater fish occur in this river while the latter showed that the river has a remarkable community of aquatic macro-invertebrates. The Western Cape Nature Conservation Board (WCNCB) has assisted the Department of Environmental and Cultural Affairs and Sport (the Department tasked with evaluating EIA'S) in evaluating this application and associated reports.

The proposed development put the conservation and wise use of our rivers in the spotlight. This is because the working policy of the WCNCB with regard to river conservation and fish stockings is that fish species may only be stocked into rivers and catchments where they currently legally occur. However, the EIA process allows applicants to submit proposals in conflict with these policies provided that any potential impacts are fully investigated. It is then up to the decision makers to decide whether the existing policy should still be enforced or departed from.

This article summarises some of the recent findings of these EIA specialist reports for the benefit of the membership of the Cape Piscatorial Society. The key question with the information that follows is what would be the right approach to take for the ecological benefit of the Salt River and its associated catchment?

The unique Salt River

The Salt River, above its estuary, is not exciting for the angler who is primarily interested in catching fish. Two detailed fish surveys in the last 12 months indicate that the river does not have primary freshwater fishes (see Bok 2000, 2001) although it is likely that eels are present. Any angler visiting this beautiful river who is not a true nature conservationist would find it barren and in need of stocking of his favourite fish species. However, the Salt River is far from barren. The surveys and subsequent reports (Barber-James 2000, de Moor & Barber-James 2001) have shown that this river is home to a remarkable variety of

aquatic invertebrates, including several genera new to science! Why is this the case? There are four major reasons:

1. Rivers of the Cape Floral Kingdom into which most of the Western Cape falls have the greatest diversity of the aquatic insect orders *Plecoptera, Trichoptera, Megaloptera* and the family *Teloganodidae in Ephemeroptera* in southern Africa. The major reason for this is that these organisms thrive in rivers with good flow, high water quality and low nutrient concentrations. The Salt River matches these requirements perfectly.

2. These diverse aquatic macro-invertebrates have evolved in the Salt River without predation pressure from freshwater fishes. Consequently these animals could mature and walk and swim about more openly in pools and riffles without the threat of being eaten by a fast moving predator.

3. The region in general has been isolated for a long time and has given rise to endemics across many taxa - the Cape's freshwater fish and invertebrates are a reflection of this diversity and endemicity.

4. Biogeographically the region is very ancient and has linkages with other southern landmasses that previously formed a supercontinent, Gondwanaland. No major catastrophies such as glaciation, flooding or major drought have influenced the biota in the cool temperate southern regions of Australia, New Zealand, South America and Africa for the past 100 million years. Consequently the extant fauna and flora today represent the relict remains of a once widespread biota extending across temperate Gondwanaland. With the long period of isolation from the other southern continents remarkable evolutionary events have resulted in a large diversity of biota.

De Moor & Barber-James (2001) were amazed and excited by the findings from their macro-invertebrate surveys of this river, which yielded new genera of the families *Baetidae, Teloganodidae, Dipseudopsidae* and altogether 11 new species. Remarkably rivers on either side of the Salt River i.e. the Groot and Keurbooms rivers do have healthy communities of freshwater fishes including Cape Galaxias *Galaxias zebratus*, Cape kurper *Sandelia capensis* and Eastern Cape redfin *Pseudobarbus afer*. Why the Salt River has remained free of freshwater fish despite its close association with rivers with abundant fish communities is another subject that requires further research and would make for a separate article.

Potential impacts of trout

The proposal of the developers is to introduce brown trout into the middle Salt River below waterfall barriers to make a proposed fishing lodge viable in this area.

It has long been argued that rainbow and brown trout have little negative impact on the indigenous fauna of rivers they are stocked into. However there is compelling evidence worldwide that they can have a significant detrimental impact on both indigenous fishes and aquatic macro-invertebrates. For example, they have had major impacts on small indigenous freshwater fishes in both Australia and New Zealand (see Townsend & Crowl 1991, Townsend 1996, Lintermans 2000). Recent studies in southern Africa show that they have dramatically reduced numbers of the Drakensberg redfin minnow *Pseudobarbus*

quathlambe in Lesotho (Bills pers. comm.) and were probably responsible for the large-scale reduction of redfin minnows following their introduction into the streams of the south-western Cape (Hey 1926).

This development proposal looks at the proposed introduction of brown trout into a fish-less stream dominated by a remarkable and diverse community of aquatic macro-invertebrates. Both brown and rainbow trout predominantly eat aquatic invertebrates and are known to have had significant negative impacts of these organisms following their introduction into new waters. This is particularly true in countries such as New Zealand that have lacked a top-level fish predator such as brown trout and have relatively species-poor aquatic faunal communities (Townsend 1996). It is also true in terms of the impact of trout on the community composition of aquatic invertebrates i.e. the number and abundance of each species in the community before and after the introduction of trout. Studies by Healey (1984) (in de Moor & Bruton, 1988) showed that the introduction of brown tout in a moorland stream resulted in a decline in the number of species present with rare or occasional species being eliminated. Studies in Australia by Fletcher (1979, in Arthington 1991) have shown that densities of Tasmanian mountain shrimps and several species of *Plecoptera* and *Trichoptera* declined in streams stocked with brown trout. Research done by Samways (1994) in South Africa has implicated trout in the substantial reduction of synlestid damselflies in streams with trout compared to streams without trout.

So do we allow trout to be stocked in the Salt River or not?

The argument for introducing trout into the Salt River is to make the proposed fishing lodge and its associated development more viable. The developer argues that fly fishing will bring in urgently needed revenue to pay for eradication of invasive alien vegetation such as black wattle *Acacia mearnsii* which is rapidly invading parts of the Salt River as well as clearing Hakea which is a major problem in the upper catchment. This argument has merit if it was the only option open. This is not the case. Many private land-owners in South Africa make a handsome living out of the biodiversity value and aesthetic beauty of their properties alone. These individuals are making an ever-growing contribution to conservation in South Africa by keeping their properties as natural as possible and not introducing new alien invasive species on their properties as a means of justifying their activities.

However, true conservationists and environmentally friendly anglers, would have extreme difficulty in supporting the introduction of any fish species into this stream. This is because sustained stockings of fishes into this near pristine environment are most likely to have a major impact on its highly conservation worthy macro-invertebrate community, resulting in the probable loss of several species.

South Africa has few whole catchments without freshwater fishes and hence must conserve wisely those that are left for the benefit of future generations who are likely to be increasingly aware of South Africa's rich and unique natural heritage.

To quote De Moor & Barber-James (2001); "The rivers of the South Western and Southern Cape that have no fish species, serve as reservoirs of ancient endemic macro-invertebrates...". "Furthermore, the aquatic insects show a high degree of ecological specialisa-

The middle section of the Salt River after the fires of 1999. In the foreground are invasive Hakea with their seed pods intact.

The Hol stream tributary of the Salt River showing how the natural vegetation is being replaced by invasive black wattle.

tion and visible active behaviour of larva and nymphs running around on boulders and bedrock in the river. The complete lack of freshwater fishes in this river system, make these assemblages of species in the Salt and Wit Rivers very susceptible to specialised fish predation". " We would like to suggest that special measures should be taken to preserve the Salt and Wit Rivers as an aquatic insect sanctuary or nature reserve." It would furthermore be valuable if sponsorship could be found to survey more of the streams in the southern Cape. It is important to find out more about the biodiversity of these ecologically unique streams, to save what remains of the ancient relict fauna.

Conclusion

It is very important that we take a holistic approach to this proposal. If we allow trout or any other freshwater fish species to be stocked into a river of this sensitivity and importance where do we draw the line in future? This is the very difficult and challenging job of a nature conservation agency. Anglers and land-owners can make our job much easier by supporting our objectives and acknowledging that each species in a river has a right to its place in the sun.

It is essential that fly fishers and anglers think broader than tackle, tactics and catchable fishes if they want to regard themselves as environmentally friendly fishers. Does South Africa really need new trout, bass, yellowfish, barbel or tilapia waters? Do we need more problems than we already have with the rivers and fishes we treasure? I believe there is enough already for all to enjoy. There is, however, a critical need for us to conserve, appreciate and wisely look after what we have left. The Western Cape is unique in having the diverse and unique Cape Floral Kingdom, one of the worlds six Floral Kingdoms. When one thinks of 'Floral Kingdom' one usually thinks only of the plants, but in fact, it is the assemblage of plants, insects (both terrestrial and aquatic) and other living organisms that contribute to the functioning and continued coexistence of species. This unique natural heritage is irreplaceable; it has taken millions of years to evolve and if properly nurtured will provide valuable life support services to us all such as the provision of clear and abundant water

The challenge for the developer should be to investigate other more acceptable options for income generation to help fund the eradication of invasive alien plants such as black wattle and Hakea on his property. This is a costly and time-consuming exercise. The Western Cape Nature Conservation Board will encourage The Working for Water Programme and South African National Parks to help the developer keep the upper Salt River catchment free of these pest species.

References

The author of this article can be contacted for the references given above.

"No angler merely watches nature in a passive way. He enters into its very existence."

John Bailey, Reflections on the water's edge.