

# Stocking of Predatory Fish for Recreational Fishing

(Stocking of fish species into systems in which they don't belong.)

By

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The stocking of rivers and dams with predominantly exotic fish for recreational fishing is an activity which occurs on a worldwide scale. These stockings have taken place primarily to attract sports anglers into specific areas where there may either be access to good potential fishing waters and an angling demand for the stocked fish species. Stocking in this way makes sports angling a very lucrative business because very little consideration for the conservation of the systems given. Although some fish stockings endeavours have conservation authority consent, most of the fish stocking are unauthorised and carried out by individuals for recreational sport fishing. Some species which are moved around the world from catchment to catchment include Largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), brook trout (*Salvelinus fontinalis*), northern pike (*Esox lucius*), walleye (*Stizostedion vitreum*) striped bass (*Morone saxatilis*) and the common carp (*Cyprinus carpio*). These stocking have resulted in a homogenous fish fauna in many North American, Europe and African counties because most of these stocked predaceous fish replace the indigenous fish occurring in that specific ecological niche. International ecosystem conservation and management is shifting from being focused on supporting recreational fishing along with ecosystem functioning to the conservation of and maintenance of indigenous biodiversity and ecosystem functioning alone.

Southern Africa has approximately between 350 and 400 species of freshwater fishes (according to research carried out by SAIAB, Grahamstown). We are not sure of the exact amount of fishes because we are still discovering new species and are realising that we have been making mistakes by calling two or more species the same thing. The new South African National Environmental Management Act: Biodiversity Act recognises all of South Africa's species and genetic differences within species as national biodiversity which is to be managed and conserved. One of the greatest threats to this diversity of freshwater species in Southern Africa is the introduction of exotic (from regions out of Southern Africa) fishes or non-endemic fishes (from the region which are moved into areas they did not previously occur in) introduced into areas in which they have not historically occurred. By relocating species this national biodiversity is threatened and now there are legal implications to the movement of fishes into non-endemic ecosystems. But these objectives can only be reached if the recreational sports fishermen are encourage helping conserve and protect our natural fish species.

## The implications to moving fishes between catchments and stocking fish

Each ecosystem contains an assemblage of fish species which all occupy specific ecological niches (place and function/purpose of that species in the ecosystem) of the systems. These niches result in a specific type of ecosystem which functions in a specific way. If additional species are introduced into these systems the natural balance, or so to speak, of the ecosystem is disrupted and a change or ecosystem shift occurs. These shifts often result in some ecological niches being removed from the system or the new species out compete local endemic species for ecological niches. The result is often evident in the form of a loss in the number of species or at least a significant reduction in numbers of species.

### Positive implications:

1. Relocating fish into systems can save species from the brink of extinction. EXAMPLE: A critically endangered population of a small barb the Twee River Redfin from the Western Cape (*Barbus erubescens*) has been relocated successfully into isolated 'controlled' systems in the same catchment. This relocation may save this species from extinction

Stocking the same or different species into the system can support impacted populations of fishes. EXAMPLE: The Letaba River in Limpopo historically contained a healthy population of the Bushveld Small-scale Yellowfish (*Labeobarbus polylepis*) which has become locally extinct. Following the local extinction of this species other organisms in the system have been impacted as a result of gap in the ecological functioning of the system where the ecological niche which this species occupied has been removed. By relocating the same species from another system into the Letaba River that ecological niche may be re-established and the ecological functioning of the system may return to a state more comparable to the historical unimpacted state.

## Negative implications

1. Unfortunately the more common effects of the translocation of exotic or non-endemic species are the negative impacts. The most dominant direct impact is direct predation of the species on local species. Once again we have to raise the unfortunate impacts of the Trout and Bass groups of fishes in South Africa. Although the predation impacts of these fishes in some systems are controlled, the general predation impacts of these fishes are widely known. In systems to varying degrees these species out compete the local species and then begin to dominate the systems. The critically endangered state of the Twee River Redfin from Western Cape (*Barbus erubescens*) can largely be attributed to the out competition of and dominance of Small Mouth Bass (*Micropterus dolomieu*) in the Twee River system. This type of impact does not exclude some indigenous culprits. The common Sharptooth Catfish (*Clarias gariepinus*) has had severe impacts on systems in which they did not historically occur. One example is the Elands River in Mpumalanga. This river is isolated from the rest of the Crocodile River catchment by a complex waterfall system. In order to attempt to establish a functioning ecosystem in the new Ngodwana Dam in the Elands River system Sharptooth Catfish were introduced along with another at least seven non-endemic or exotic species. Some Sharptooth Catfish individuals have now established themselves in the Elands River and impacts are starting to become evident.

2. Sometimes less obvious but just as if not more important is the impacts of interbreeding. After the introduction of the Nile Tilapia (*Oreochromis niloticus*) into systems in Southern Africa many species have become threatened. These threatened species include the Kariba Tilapia (*Oreochromis mortimeri*) and the Treespot Tilapia (*Oreochromis andersonii*). Both these species have become critically endangered in the Zambezi system as a direct result of the introduction of and now dominance of the Nile Tilapia. One more species which may be closer to home is the new threatened status of the Mozambique Tilapia or 'Bloukurper' (*Oreochromis mossambicus*) again as a result of the introduction of the Nile Tilapia.

3. Indirect impacts include impacts such as habitat destruction. The Carp (*Cyprinus carpio*) feeds by digging in the bottom sediments of rivers and lakes. This feeding behaviour stirs up silt releasing nutrients into the system (pest in the Hartebeespoort Dam) and fouling up the breeding beds of other species.

4. Indirect impacts by competition for food and spawning area's for example. Again the predacious species introduced into Southern Africa such as the Trout and Bass groups of fishes out-compete indigenous species. Similarly species mentioned such as Carp and the Nile Tilapia compete with indigenous species for spawning beds.

Finally an implication of the movement of fishes between catchments which is not really evident is the transport of diseases and parasites for example. Many exotic parasites such as the common Fish Lice (*Argulus japonicus*) and the Tapeworm (*Bothriocephalus acheilognathi*), which infects many local Cyprinids, have been introduced on species introduced into local waters. The impact of these parasites is not well understood but research is underway to determine these impacts.

It is time for the world and specifically South African anglers to realise the value indigenous fishes can offer. International anglers are beginning to come to South Africa to seek out some indigenous freshwater fisheries like a big Yellowfish in the Vaal River for example. They have access to the majority of the other angling species abroad and are now looking to us for that classic 'African' experience. How many international fishermen have ever caught a 50 kg catfish or an 11kg Largemouth Yellowfish. So think about the fish species which you are moving around the country and specifically what local species can offer. You'd be surprised just how much our own predacious species can offer and how much support you'd find by conservation friendly anglers and conservation enthusiasts and authorities. We all want what's best for these shrinking resources and we just want you to consider alternative methods to promoting angling activities in your areas. We can only conserve the genetic biodiversity of our fish in South Africa if all the fishermen in South Africa become proud of our indigenous fish species and begin to conserve them in their own ways. Remember we don't want to frown on established or existing angling activities but by continuing to move these exotic species around you are continuing to drive our precious proudly South African species into extinction. This is a crime committed against all South African and our decedents .