

No Stocking Filler

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Introduction

Let us be in no doubt, rivers are under huge and growing threat ⁽¹⁾ despite the apparent clean-ups seen under the recent virus pandemic lockdown measures. Yet the reliance on clean water for health and the focus on how rural communities rely upon rivers for food and building materials has done little to move public debate away from the development versus conservation agenda 'struggle'.

My interest is in Mahseer, large fish of genus *Tor*, members of the cyprinid or carp family. Endemic to most rivers of India, and ideal candidates as umbrella species and indicators of ecosystem health due to their role as predators, their need for highly oxygenated water flows and migratory habits for spawning purposes. For those who don't know about them, they can be large, with mature individuals of at least two Indian species capable of growing to over 45 kg, they have been subject to many fables throughout written history, with records of exploits of those trying to catch them dating back to King Someshwara III in the Chalukya dynasty and paintings of them appearing on pottery from the Harappan civilisation. Given the absence of bones of Mahseer in midden pits of Harappan cities, although there are bones of almost every other fish species and evidence of equipment capable of catching powerful fish, it has long been concluded that these fish are the original sacred animal that should not be eaten. The links between Mahseer and matsya, an incarnation of Vishnu, adds to this legend.

Under pressure

While rivers are exploited mercilessly for water, power and minerals, with the associated threats to ecosystem stability, fish tend to go about their lives unseen. However, there are signs that species diversity is being lost, even as we continue to discover brand new species ⁽²⁾, thus adding to overall biodiversity richness.

Dam building is cited as one of the most pernicious dangers to Mahseer, as the fish lose their ability to migrate for spawning. Another unexpected effect of dams is the subtle rise in river temperature, which spells danger for multiple species, quite apart from its role in climate change. Sand extraction not only changes flow regimes and denudes groundwater, it also removes vital habitat for multiple species upon which Mahseer may predate. Destructive fishing methods are often singled out as the most important threat to endangered fish as well as other vulnerable animals like river dolphins, otters, turtles and crocodiles, however, it is likely that compared to dams and industrial effluent, the impacts are more localised. One of the most unusual threats is that of conservation, specifically, releasing fish bred in captivity as a conservation strategy.

Research over 40 years in Kali Gandaki River, a sub-basin of the Ganges basin, has shown that from a situation where there were three species of Mahseer in the river, there is now only one. Previously, *Tor tor*, the red-finned Mahseer, was the dominant species, with *Tor putitora*, the Himalayan golden Mahseer in second place and *Tor mosal*, the copper Mahseer a distant third. Is it coincidence that artificial breeding and stocking of the golden Mahseer has happened in many tributaries of the Ganges over the same period of time?⁽³⁾

Another interesting facet of this debate is that Bhimtal Lake, now one of the hot-beds of Mahseer breeding in India, only achieved that distinction because of fish stocking. In the 1850s and 1870s, anglers stationed in the Kumaon hills wanted to be able to catch Mahseer for sport. Fish were taken up the hill and released into the lake in two tranches. The lesson that should have been learned is that once introduced, the Mahseer, whether through direct predation or competition for resources, wiped out the endemic cyprinid species, which was probably *Naziritor chelynoides*, also known as a 'lesser' Mahseer.

"Gradually the mahsir have reduced the numbers of the other fish until it is a rare circumstance to catch a 'lake-fish' with the fly", said Mr Walker in 1888.⁽⁴⁾

Of course, as with many other extinction events, we will never know what we, or the environment lost there.

Why release fish?

"There are concerns, that stocking may cause undue risks to the ecological functioning of water bodies, potentially leading to a loss of biodiversity and altered ecological status."⁽⁵⁾ According to the Wild Trout Trust of the UK, a body with many years' understanding of working to rehabilitate river habitats and using fish release as a conservation tool.

Indeed, many bodies have clear guidelines about how and when to release animals into the wild for conservation. In India, the National Wildlife Action Plan⁽⁶⁾ lays out the criteria under which native species can be released. These include: establishing why the population has fallen and needs reinforcement; stabilising habitat requirements; ensuring stock is sourced appropriately; understanding what impact the release will have on other species using the same habitat; and long-term monitoring of the population to establish success, failure or unexpected consequence.

It has been shown through several studies, most recently through a commission from Ministry of Jal Shakti for National Mission for Clean Ganga⁽⁷⁾ that golden Mahseer have unique and distinct genetic traits in separate populations. That is to say, fish living in one river of a wider basin are not exactly the

same as those living in a neighbouring river, let alone those in the western tributaries of River Indus compared to those in the far eastern tributaries of Brahmaputra.

Golden Mahseer have also been shown to have natal homing tendencies, the same as Atlantic salmon, which return to their birth river to spawn. A telemetry study ⁽⁸⁾ on the Mangde and Drangme Rivers of Bhutan, both part of the Manas River sub-basin, demonstrated how and to where the Mahseer move upstream when it is time to spawn. The question arising from this study is: to what extent would the natural breeding strategies of the Mahseer be disrupted by the introduction of stock that had not been bred in the same river? It is yet to be shown, but is highly likely that introductions of artificially-bred stock will disrupt the successful breeding of native stocks. In short: introducing fish where native stocks are still breeding will probably damage at the least, if not totally end, natural recruitment.

Given the Ministry of Environment, Forests and Climate Change and Central Zoo Authority guidelines as stated above, it seems remarkable that the most commonly used conservation strategy is based on constant stocking over a period of 10 years. In essence, the guidelines which may help to stabilise native populations are ignored in favour of throwing ever larger numbers of fish in a river until some stick.

Set the controls

In India, the Central Zoo Authority “coordinates... planned conservation breeding programmes and ex-situ research... for conservation of species for complementing in-situ conservation efforts in the country.” Specifically, part of their remit is to “ensure maintenance of studbooks of endangered species of wild animals bred in captivity.” There are no Mahseer, indeed, no fish, in the approved list of animals allowed to be bred for conservation.

Not only Mahseer, but other fish, many known as highly invasive alien species, like European common carp, African tilapia, Chinese silver and bighead carp and South American pacu have all been deliberately released into water bodies by individuals, angling groups and, all too often, State Fishery Departments.

The role of State Wildlife or Biodiversity Boards in this is not entirely clear, but their oversight is definitely at fault. Indeed, the entire regulatory hierarchy is a mismatch of, on the one hand: conflicting areas of control, and on the other: spaces in between, where responsibilities are not clearly defined. Like in rivers, and for fish as wildlife. ⁽⁹⁾

Some of the most fragile species on the planet are under threat because of these invaders. Not only fish, but disease-controlling insects like dragonflies and caddis flies, likewise, amphibians and snakes which play roles in pest control, are all in jeopardy because of fish stocking.

Mahseer are, still, little known in their exact habits and even down to species identification. There is vast opportunity for study of these fish in the wild, yet these critical studies are hamstrung by lack of funding, while money continues to pour into artificial breeding programmes.

During a recent series of meetings to discuss the effects of COVID-19 lockdown measures on river habitats, a team from Mahseer Trust got down to talking fish stocking with representatives of Fauna and Flora International ⁽¹⁰⁾. We were discussing how uncontrolled releases of inappropriate Mahseer species in Nagaland, Arunachal Pradesh and Manipur would impact upon the fish diversity of Myanmar.

While the climate emergency continues to drive unimaginable change to some of the world's most important rivers, which may see vital lifelines like the Ganges and Brahmaputra (¹) dry up in very short time, to take liberties with lower stretches and tributaries seems like folly. Allowing state actors to play fast-and-loose with unique and threatened biodiversity is one more nail in the health of river environments and may even be a cause for conflict across borders. It is, surely, time to move from watching Fishery Departments making a mockery of CZA guidelines to a system of complete and easily recognisable authority for those responsible, and swift sanctions for those who transgress, on behalf of all those who rely upon stable ecosystems.

As the Food and Agriculture Organisation puts it, so succinctly: “There are four main types of environmental interventions: protection; restoration/rehabilitation; mitigation and intensification, and some or all of these may involve the stocking of fish. The current trend in the stocking of open waters in Asia tends to be pursued uncritically with limited evaluation of its impact, both in terms of cost-effectiveness, environmental consequences and social impact.” (²)

Tor putitora, the golden Mahseer, inhabits all three of India's major trans-Himalayan river basins: Indus, Ganges and Brahmaputra. There are moves afoot to create a conservation initiative across the entire Brahmaputra basin, with this majestic fish as the flagship. Given its migratory habits and broad range, it could be a powerful link between India, Pakistan, Nepal, Bhutan, Myanmar and China. It should, most definitely, be understood between all of these nations that conservation work on this fish in any country will have impacts upon the biodiversity of the others within a shared river basin. Attention to requisite local laws and international treaties, alongside broad transboundary cooperation are urgently needed, particularly if these treaties and obligations are ignored by in-country governmental agencies, which may ultimately add to wider geopolitical tensions.

While artificial breeding of Mahseer fish is an important technique and may be useful in a correctly-monitored programme, at present, it has to be seen for what it has really become: farming. Given recent news about (and widespread condemnation of) Myanmar Forest Department plans to breed threatened species in captivity, in a bid to relieve pressure from wild stocks (³), and ongoing battles against wildlife trafficking (⁴) which equally apply to Mahseer as an ornamental fish, this mighty ‘tiger of the river’ which is free to move between countries should be assisted to live its natural life, by working to protect river habitat. There can be many benefits, not only to wildlife and people through rehabilitating flowing rivers, but also by demonstrating that misguided subversion of conservation norms and laws will not be allowed, either for environmental security of the host country or state, or for its potential to damage relations with geographical neighbours.

References

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