

Project Concept: Tiger of the Water - Saving the Critically Endangered hump-backed mahseer

Project goal: To establish the necessary conservation action to prevent the extinction of the hump-backed mahseer through research, site conservation and captive breeding and reintroductions.

Summary

Project Mahseer is a collaborative initiative to conserve the enigmatic and highly threatened mighty mahseers of the family Cyprinidae. In doing so, the project will contribute towards the protection and sustainable management of some of Asia's most iconic river systems. The initial priority for Project Mahseer is the conservation and recovery of the hump-backed mahseer or 'the tiger of the water', a species endemic to the Cauvery river basin in southern India. Its population has plummeted since the turn of the century and it is now listed as Critically Endangered on the IUCN Red List of Threatened Species. Project Mahseer aims to deliver the necessary conservation actions to save this remarkable species and its habitat for future generations.

As a top-level predator, the hump-backed mahseer can be considered an 'umbrella species' - it plays a vital role in maintaining a natural balance of native flora and fauna and the functional integrity of linked ecosystems. Its large size also makes it an excellent candidate 'flagship species' to engage public awareness of the value and fragility of South Asia's rivers.

Location

Once common and distributed throughout South India's Cauvery River Basin, the hump-backed mahseer is now limited to just a handful of small isolated populations occupying only 10% of its original range. The Cauvery River basin is part of the wider Western Ghats biodiversity hotspot. The Western Ghats are made up of a mountain chain that extends along the west coast of India covering an area roughly 140,000 km².

These mountains, while less dramatic in height, are older than the Himalayas. It is designated as a UNESCO World Heritage Site and some of India's most charismatic species are found here including Bengal tigers (*Panthera tigris*) and Asian elephants (*Elephas maximus*).

However, as well as harbouring some of Asia's most iconic species, the Western Ghats is also a biodiversity hotspot and a globally significant centre of diversity and endemism for freshwater species (Molur *et al.* 2011). In total, there are 290 freshwater fish species, 65% of which are endemic to this region (Molur *et al.* 2011). The Western Ghats provide important hydrological and watershed functions, feeding rivers in the peninsular Indian states and many of the 245 million people living there. Yet despite their diversity and importance, approximately half of the fishes endemic to the Western Ghats are threatened with extinction (Molur *et al.* 2011).

Focal species: Qualifying as freshwater megafauna, the iconic hump-backed mahseer is the largest of all mahseers species. Capable of exceeding body lengths of 1.5 m and weights of 55 kg, this makes the hump-backed mahseer one of the largest freshwater fish in the world. Considering its enormous potential size, charismatic appearance, considerable importance within religious/cultural contexts and its global reverence amongst recreational anglers, it is astonishing that the scientific identity of the hump-backed mahseer had, until recently, remained a taxonomic enigma. Despite an awareness of the imperilled status of this majestic fish (Pinder *et al.* 2015), the lack of taxonomic clarity had, until recently, represented a major impediment to its

conservation. In June 2018, the scientific identity of the hump-backed mahseer was finally confirmed as *Tor remadevii* (Pinder et al. 2018), with an emergency IUCN Red List assessment resulting in this species being assessed as Critically Endangered. This makes the hump-backed mahseer the most endangered of all mahseer species and in need of immediate conservation action to prevent its extinction.

Threats: The decline in its population is considered to be due to multiple anthropogenic stressors, including habitat degradation through river engineering projects (e.g. dams), sand mining, pollution, water abstraction, and unsustainable harvesting methods (Pinder *et al.* 2018). In addition to these background threats, the well-intentioned effort to boost the population with the introduction of the non-native ‘blue-finned’ mahseer (*Tor khudree*) in the 1970s has acted as a catalyst in driving the decline of the hump-backed population. By the 1990s the population of the blue-finned mahseer was starting to establish and by the mid-2000s was considered to be an emerging threat as an invasive species, which has outcompeted the Cauvery’s own tiger of the water – the endemic hump-backed mahseer.

Conservation action: The hump-backed mahseer is in urgent need of conservation action. Shoal and its partners are developing a new programme of work to save this ‘tiger

of the water’ from extinction. The project will take a phased approach, engaging research institutes, the local government and conservation NGOs to better understand the species’ conservation status and to begin priority conservation actions to reverse the decline in their population. The project is envisaged to take place in four key phases:

1. **Phase 1: Develop a conservation action plan for the hump-backed mahseer:** This will require a meeting of all project partners as well as site visits to the Cauvery river basin and to mahseer hatcheries in SE Asia. The key objective will be to identify

priority sites for captive rearing and reintroduction, resource requirements, capacity building needs and ensure stakeholder engagement. This first phase of the project is envisioned to last 12 months a budget of £40,000.

2. **Phase 2: Hump-backed mahseer ecology and assessment of critical habitats and migration patterns:**

This phase of the project will involve training staff, tagging and tracking the movements of 60 hump-backed mahseer in the Moyar Valley to understand critical habitat requirements, home range, and seasonal movement patterns of hump-backed mahseer. This will also run in tandem with provision of enhanced protection and monitoring of remaining wild populations. This phase is estimated to last for 24 months and requires a budget of £140,000.

3. **Phase 3: Captive-breeding of hump-backed mahseer:**

This will involve producing juvenile hump-back mahseer in sufficient number which are capable of surviving in the wild and contributing to future generations. This phase will be key to the long-term recovery of the hump-backed mahseer population in the Cauvery River Basin. The aim would be for this work to be ongoing once it is initiated. The required budget for this work is £150,000.

4. **Phase 4: Release of captive-bred mahseer and population monitoring and conservation:**

This will involve transporting fish from hatcheries and training and outreach to local communities as well as post-release monitoring activities. Ongoing protection measures at release sites will also be important to protect the fish from overexploitation. This is envisioned to begin in February 2021 for an

initial 2-year period. The budget for this phase of the work is £30,000.

The first two phases of the project, aim to achieve the following outputs:

- A detailed understanding of the population status of the hump-backed Mahseer is attained.
- Genetics structure and gene flow between different populations of hump-backed mahseer is assessed and documented.
- Ecology of the hump-back mahseer and habitat requirements are understood and critical habitats along the Cauvery River are identified.
- A species restoration plan is developed with input from all key stakeholders.

Implementing Partner: The project will necessitate a wide level of stakeholder engagement and collaboration. There are four key initial partners in the project: Bournemouth University, Wildlife Institute of India, Kerala University of Fisheries and Ocean Studies, the Mahseer Trust and WWF- India. However, collaboration with local and central government as well as fish hatcheries and other NGOs will be vital to the long-term success of the project and conservation of the hump-backed mahseer.

Budget: The total budget required to implement the project is **£360,000**. This initial and most urgent funding need is to raise **£40,000** to support the development of an expert-led conservation action plan for the hump-backed mahseer. This will be critical to guiding the implementation of other phases of the project. A more detailed budget for each phase of the project is available upon request.

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References:

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