

Saving the big fish

A successful conservation project in Lonavala near Pune offers hope to the endangered mahseer.

BY LYLE BAVADAM IN LONAVALA



PHOTOGRAPHY: TATA POWER

THE MAHSEER caught for stripping, which involves a firm but gentle palpation of the body to press out either the white "milk", which is milt or semen, or a golden ooz, which consists of eggs.

NOT many people know that one of the biggest conservation projects in India after Project Tiger is one dedicated to saving a species of fish. The mahseer-breeding programme has been operational for more than 40 years and has achieved notable success. The mahseer is still on the Red List of endangered species of the International Union for Conservation of Nature and Natural Resources (IUCN), but its population has grown in the safety of its conservation zone and thrived when reintroduced to its old haunts in the rivers of central and north-eastern

India. Crucially, for the fish's survival, it has responded well to hypophy- sation, which means induced breeding of pond-raised stock.

The mighty mahseer, as it is referred to, lives up to its name. One of the world's 20 mega fishes, it weighs 26 kilograms on average and can grow up to nine feet (2.7 metres). Its sheer size brought it the unwanted attention that almost drove it to extinction. A big favourite with anglers, it is called the freshwater tiger because of the fight it puts up when hooked. It is also a favourite with commercial fisheries and with fishermen.

The mahseer population, which was at one time abundant, started declining gradually in its natural habitat. The National Commission on Agriculture in its report in 1976, expressed unease at this and called for an extensive survey and biological investigation.

The biological investigations had already begun in 1970 in Tata Power's lakes in Lonavala in Pune district in Maharashtra, in the Western Ghats. The company approached C.V. Kulkarni, who was a former Director of Fisheries in Maharashtra, to help rehabilitate the species. The mahseer-breeding

programme was initiated in the Lonavala lakes in 1975.

Kulkarni dispelled the notion that the mahseer was unsuitable for fish culture. He believed that a continuous stocking programme on a large scale would resurrect the species, and thus began an *in situ* conservation project. In 42 years of this mission of conservation, much has been learnt about the mahseer. Most importantly, much knowledge has been gathered about hypophy- sation.

The power company's presence here is a century old as is obvious from the old stone construction of the Walvan dam. Behind its gigantic wall lies the artificially created lake from the dammed Indrayani river, and in the lake lies the past, present and future of the golden mahseer (*Tor putitora*) and the Deccan mahseer (*T. khudree*), which are both on the IUCN's Red List of endangered species (the second-most severe conservation status indicating that the species is at a high risk of extinction.)

ARTIFICIAL FERTILISATION

Kulkarni and his colleague S.N. Ogale launched the artificial fertilisation of *T. khudree*, which is considered the true mahseer. Its natural spawning grounds were discovered in the Lonavala lakes. These habitats were along the margins of the lakes where streams from adjoining hills would fall. Attracted by the sound and the highly oxygenated water, ready-to-breed fish would congregate in the area. Kulkarni and Ogale overcame the problem of collecting spawners by growing brooders, or



THE MAHSEER conservation facility at Lonavala. (Below) Mahseer fry and fingerlings are sent to different State governments and angling associations.



active breeders, in ponds. They have also been credited with developing the simplest system of hatching eggs in captivity using large cement ponds, wooden trays and perforated pipes for oxygenated water.

After the brooders were caught, they were kept in ponds, and their natural breeding environments were recreated for them. Vivek Vishwasrao, head of the biodiversity unit at Tata Power, says the natural condition under which the mahseer breeds is in the monsoon months and when there is a strong current. To create this feel, a 16-inch pipe goes straight from the dam to the tanks with brooders. The water rushing down simulates the waterfall and creates a strong current while showers placed all around create the effect of rain. The mahseer's biological clock respond to the "waterfall" and "rain"

and it begins to spawn. Over the years, a method of breeding the mahseer by stripping and artificial fertilisation has been developed. Local fishermen who are employees of the company use their intuitive intelligence to judge when the fish are ready to be stripped. (Stripping essentially involves a firm but gentle palpation of the body to press out either the white "milk", which is milt or semen, or a golden ooz, which consists of eggs.) In the monsoon, their natural breeding months, the fish are checked regularly. But the rest of the year the employees check only if they see a female chased by males, Vishwasrao says.

The men wade into the ponds with gill nets and corner the 1-1.5-foot-long fish and gently hold them upside down to inspect their bellies. Sometimes it is the trickle of semen



MAHSEER FRY.



THE MAHSEER in a net before stripping.

or the size of the belly or just a plain flash of knowledge that tells them that the brooder fish is ready to be stripped. The men know whether the eggs are mature or not just like they can differentiate between a male fish, which has an elongated body, and a female, which is rounder.

The milt is spread over the eggs in the hatcheries—large trays of water that are kept aerated with gentle jets of water that fall into the tanks from perforated pipes. Each tray has about 20,000-30,000 eggs and sperm. The facility at Walvan has the capacity to hatch one million eggs at a time. The eggs are closely watched for their quality. Good eggs are golden. Bad ones are grey or black and are immediately sucked out with a pipette or ink dropper to prevent infection. Fertilised eggs hatch after 60-96 hours; the hatchlings wriggle free of their egg cases and move freely in water as soon as they are born. There is a 90 per cent survival rate from eggs to hatchlings. For the first six to 10 days, they go through a quiet phase, huddling in corners with their heads away from light, and their tails vibrating to keep them afloat. In the wild this would be their most vulnerable period, and this is probably a survival technique. They are slow

growers. At one month, the fry measure about 1 cm. They have long left behind their quiescent phase and zestfully swim around in the trays. At 4-6 months they are a bit plumper but about the same length. At this stage the fry are ready to go off to their new homes. For the next 12 hours they are not fed so that they do not produce any waste matter. Precisely 1,000 of them are sucked up and introduced into a tin can with water that has been treated with an anti-fungal agent to prevent disease transfer. Extra oxygen is pumped into a plastic-bag-lined tin can, the mouth of the bag tied with nothing more than *sutti* (twine), and the tin is labelled 'Take Care. Live Fish'. This is sent off to the Fisheries Department, which deposes an official who will be the fry's escort until they are released into their new homes. Amazingly, the survival rate of the journey is 100 per cent.

Around two and a half to three lakh fry are released every year into the Lonavala lakes too. Brooders are also released regularly as part of the restocking process. The Walvan hatchery has the biggest breeding stock in India and its work is recognised globally. Fry and fingerlings are sent to different State govern-

ments and angling associations and have been sent even to Laos to restock the Mekong river.

EARLIER ATTEMPTS

In the mid 1970s, efforts at breeding were tried in Dehradun (now in Uttarakhand), especially for the golden mahseer, but they were in vain. Kulkarni and Ogale introduced 500 fingerlings of the golden mahseer into the Lonavala lakes in 1992. They flourished, and the first mature female was caught in 1997 and put in the breeding tank.

In his paper 'Mahseer breeding and conservation and possibilities of commercial culture: The Indian Experience', Ogale writes: "The very first attempt to breed two pairs of golden mahseer at Lonavala with a single dose of ovaprim [a synthetic spawning hormone] was successful. Brooders were released in circular spawning tanks after injecting them with ovaprim. In both the experiments, stripping had to be done after 12 hours (Ogale, 1997). During the 1997 breeding season, *Tor khudree* and *Tor mussullah* [hump-backed mahseer] were also bred with a single dose of ovaprim. Since then there has been a steady progress in the development of technique and the TPCL [Tata Power Company Limited] farm has produced 2,17,000 fry/fingerlings from 2,81,000 eggs of *Tor putitora* at Lonavala till May 2001. Hatching success has been over 90%." The descendants of those 500 fingerlings continue to flourish in the Lonavala lakes.

While much has been done to reintroduce the mahseer into the wild, it still remains on the IUCN's list of endangered species. While artificial breeding has helped, the real proof that people are ready to support successful conservation programmes is when a species is allowed to live without threat in its natural environment. Stricter enforcement of fishing, banning explosives and the poison used to kill schools of fish, stopping the killing of brood fish, and preservation of the mahseer's natural habitat are simultaneous actions required if the mahseer is to be mighty again. □