



A team led by Barry Bruce has produced the right conditions for spawning and rearing handfish in artificial tanks.

Handfish back from the brink

Research into the breeding and biology of the tiny spotted handfish may save from extinction the first Australian marine fish listed as endangered under the Federal Endangered Species Protection Act.

The spotted handfish was one of the earliest Australian marine fish collected (in the late 1790s) and was first described in 1804. It grows to 150 millimetres in length and is noted for its superb colouring and its tendency to 'walk' over the sea floor on leg-like fins.

Until the mid 1980s, the handfish was common throughout the lower Derwent Estuary and adjoining bays and channels, but has since declined in distribution and abundance. It was protected under State Fisheries Legislation in 1995, and was listed under the Federal Endangered Species Act in 1996.

Concerns over dwindling numbers prompted the formation of a 'handfish recovery team', with representatives from CSIRO, the Tasmanian departments of Primary Industry and Fisheries and Environment and Land Management, the University of Tasmania, Environment Australia, the Hobart Ports Corporation and the Tasmanian Conservation Trust.

CSIRO marine biologist Barry Bruce says before the recovery project began, little was known about the handfish, or even whether any remained. The reasons for its decline were unknown, although the spread of the northern Pacific Seastar was thought to be a factor. Habitat modification through urban, rural and industrial development of the Derwent system were other possible causes.

Research on the spotted handfish began with funding from Environment Australia in early 1996. So far it has involved surveys to locate remnants of former handfish populations in the Derwent Estuary, and monitoring of these colonies to study its biology and habitat. Captive husbandry techniques have also been developed in collaboration with the Tasmanian Department of Primary Industries and Fisheries at Taroona.

The goals of the captive breeding program have been to gather further information on the reproductive biology of

spotted handfish, as well as to provide an insurance policy should the species continue to decline in the wild, or should reintroduction be required.

Bruce says the handfish has turned out to be an ideal species to work with. They are small, slow moving, and recognisable individually by their unique spotted patterns. This enables easy monitoring of individual growth rates, movement patterns and estimates of population size and age structure.

It is now known that spotted handfish have a low breeding capacity, the female laying only 80-250 very large eggs which are held together by threads and generally attached to the seafloor. The female guards the egg mass which takes six to seven weeks to hatch and is highly susceptible to disturbance.

Despite these difficulties, Bruce and his colleague Mark Green have produced for the first time the right conditions for spawning and rearing of juveniles in artificial tanks. They have bred 35 juveniles from two adult pairs.

'Although there are still many gaps in our understanding of the spotted handfish and

what affects them, the information we have gathered to date has now been used to develop a recovery plan for them,' Bruce says.

The plan includes the following strategies:

- establish the biological characteristics affecting the dynamics of handfish colonies and their response to changes in the environment;
- establish a way of assessing population size and stability;
- investigate causes of the species' decline;
- develop a population response model to assess timeframes and the progress of recovery and the implications of population size, and to identify and reduce major uncertainties in the recovery process; and
- take immediate steps to enhance spawning areas, further develop captive breeding techniques and trial reintroductions.

'We hope that with the collaboration of all the groups involved, the handfish will be around for a long time to come,' Bruce says.

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