

HELPING HANDFISH

Picture: Reef Life Survey.

THERE IS CAUTIOUS OPTIMISM FOR THE FUTURE OF THIS ENDANGERED SPECIES

THE spotted handfish (*Brachionichthys hirsutus*) is a small, slow-moving anglerfish that prefers to "walk" on its fins rather than swim. Their hand-like pectoral fins, curious walking behaviour and colourful patterns give them significant appeal. The lower reaches of the Derwent estuary is the only place in the world where spotted handfish are found.



Red handfish. Picture: Rick Stuart-Smith.

What is it?

Spotted handfish grow to a maximum size of 15cm and each has a unique pattern of orange, brown or blackish spots on a white or cream-coloured background. It is possible to differentiate between photos of individual fish. Spotted handfish are found mainly over sandy sediments in water depths of 5-10m and their diet includes small crustaceans and worms.

Spotted handfish tend to occur as separate breeding colonies and, at the time of writing, fewer than 10 colonies are known to exist. They typically spawn during September and October and lay an interconnected mass of 80-250 eggs on semi-rigid vertical objects attached to the sea floor, such as the stalked ascidian (sea tulip), sponges, seagrasses or seaweed. The female stands guard over the egg mass for the 7-8 weeks until hatching.

Handfish hatch as fully-formed juveniles and appear to remain in the general vicinity of spawning. This has two important consequences. First, mixing between colonies is restricted and thus a reduction in spawning success may seriously impact a colony. Second, the ability for handfish to recolonise areas from which they have been displaced is likely to be low.

Handfish habitat

Handfish are found only in eastern and southern Australia. In 2010 nine new species of handfish were described by CSIRO scientists, bringing the total to 14. Six of these are found only in Tasmania, including the endangered spotted handfish. They are highly vulnerable to environmental change due to

their scarcity, patchy distribution, life history strategy, low breeding rate and poor dispersal ability. Introduced species, pollution, siltation, fishing practices that drag over the sea floor, sea-temperature rise and coastal development can all affect these rare fish.

Species in decline

First collected by the French explorer Francois Peron in the 1790s and formally described by naturalist Bernard Germain de Lacepede in 1804, the spotted handfish was one of the earliest named fish from Australian waters. Throughout the 1960s, 70s and early 80s these fish were frequently sighted by divers along the eastern and western shores of the Derwent. Ironically, it was sometimes referred to as the common handfish. Extensive surveys in 1994 and 1996 located only a handful of specimens and subsequent surveys have identified nine locations in the Derwent estuary which are home to local populations of the spotted handfish.

The cause of the decline is unclear. Factors may include the introduction of the predatory northern Pacific seastar, loss of critical habitat due to increasingly silty sediments and water quality degradation. The northern Pacific seastar is now abundant in many areas where spotted handfish were previously common. These seastars have not yet been observed feeding on spotted handfish egg masses, but they do prey on the stalked ascidian commonly used as a spawning substrate within the Derwent.

Management actions

Spotted handfish are protected under State and Federal Government legislation, and a plan has been prepared to guide management actions for its recovery as well as two other threatened Tasmanian handfish species. Since 1996, a number of actions

have been carried out in accordance with various earlier recovery plans, with support from the both governments, the CSIRO and NRM South. These include the collection of baseline biological data, examination of habitat requirements, development of techniques to assess population size and stability, monitoring of known colonies, surveys of new potential habitat and the establishment of captive husbandry protocols.

Between 1996 and 1999 a captive breeding program was trialled by the CSIRO, resulting in 185 juvenile spotted handfish being released into the wild in 1999. CSIRO scientists have also developed methods to improve spawning success in the wild using a combination of artificial spawning substrates (vertical plastic rods embedded in the seafloor) and natural substrates (transplanted algae).

A grant awarded to the Derwent Estuary Program by the Federal Government's Caring for Our Country program is supporting additional surveys and improvements to spawning substrate at three sites in the Derwent estuary. This work – being undertaken by volunteer divers in collaboration with the Australian ReefLife Survey Program, CSIRO, the Institute of Marine and Antarctic Science, Veolia Environmental Services and Aquenal Pty Ltd – has already yielded some exciting results with indications of population expansion at two spotted handfish local populations identified on the western shore.

Cautious optimism

There have been significant improvements in the treatment of sewage, industrial wastes and stormwater discharged to the Derwent estuary as a result of more than \$100 million invested by industries and local governments in the last decade. It is hoped that these

environmental improvements – combined with targeted recovery actions to improve handfish spawning success – will lead to the recovery of this unique species over time.



Spotted handfish guarding its eggs. Picture: Mark Green.

Derwent Estuary Program

The Derwent Estuary Program (DEP) is a regional partnership between Local Government, the State Government, businesses, scientists and conservation groups to restore and promote the Derwent estuary. It was awarded the National RiverPrize in 2010 for achievements in reducing water pollution, conserving habitats and species, monitoring river health and promoting greater use and enjoyment of the foreshore.

Find out more

- **CSIRO**
www.csiro.au/multimedia/Handfish-walking-to-extinction.html
www.csiro.au/news/New-species-for-disappearing-handfish-family.html
- **Tasmanian Marine Life**
www.tudc.org.au/news/marinelifephp
- **Derwent Estuary Program**
www.derwentestuary.org.au
- **ReefLifeSurvey**
www.reeflifesurvey.com



A stripey spotted handfish and juvenile. Picture: Mark Green.

