

## Conserving the Critically Endangered Red Handfish

The Red Handfish (*Thymichthys politus*) is arguably one of the rarest marine fish species in the world, with an adult population estimated at about 100 in 2019.

The species used to be common across south-eastern Tasmania and on the north coast, and was collected and painted at the Port Arthur penal colony in the 1800s. But extensive surveys in the past 15 years at historical sighting locations across its former range found populations at only two patches of shallow rocky reef in Frederick Henry Bay, each less than 70 metres long.

### Conservation

The Red Handfish is listed under Australia's *Environment Protection and Biodiversity Conservation Act 1999* as Critically Endangered and is therefore protected in Tasmania. The International Union for the Conservation of Nature Red List of Threatened Species is being updated to recognise Red Handfish as Critically Endangered (considered to be facing extremely high risk of extinction in the wild).

The National Handfish Recovery Team coordinates research and conservation efforts for the Red Handfish, as well as for the Spotted Handfish and Ziebell's Handfish, through the Handfish Conservation Project ([handfish.org.au](http://handfish.org.au)).

### Habitat and biology

Red Handfish have distinctive, modified fins that resemble human hands, red coloration – from pale tan/orange to almost fully red – and variable mottling, spots and black markings on the body and fins. Lacking swim bladders, they use these modified fins to 'walk' across the seabed rather than swim.

The habitat at the sites of historical and remnant populations suggests that Red Handfish live on shallow rocky reefs that are



Red Handfish were once spread across south-eastern Tasmania (Image: Rick Stuart-Smith).

at least partially sheltered from prevailing swells, usually in depths of less than 10 m. They also appear to use seagrass areas adjacent to the reef, which may provide important nursery habitat for juveniles.

### Breeding

Red Handfish spawn during August–October and have complex but poorly understood reproductive behaviours. Females lay eggs at the base of seaweeds (such as *Caulerpa* spp.) or seagrass and stand guard until they hatch.

Unlike many marine species, which spend the early stages of their life as free-drifting larvae, Red Handfish hatch directly onto the seabed as fully metamorphosed juveniles 4–6 mm in length. They have poor dispersal capacity, and a limited ability to colonise new areas.

### Threats

Red Handfish are at risk because their population is small and fragmented. A major threat is the degradation of the diverse seaweed habitat (such as *Sargassum* spp.) that provides shelter. Other processes that affect their habitat (such as pollution, excessive nutrients, warming seas, and ecological interactions associated with sea urchins and their predators) represent

additional threats. Collection for the aquarium trade and introduced species are also potentially important threats.

## Research

The National Environmental Science Program Marine Biodiversity Hub is working with the University of Tasmania Institute for Marine and Antarctic Studies, CSIRO, Reef Life Survey, the Zoo and Aquarium Association, SEA LIFE Melbourne, Seahorse World, the Derwent Estuary Program, the Tasmanian Department of Primary Industries, Parks, Water and Environment, and National Resource Management South to address threats to the Red Handfish. Activities include monitoring, developing better search techniques, public

awareness, habitat management, and developing a captive breeding and re-seeding program.

Red Handfish are in a critical state. Captive rearing may provide an opportunity to stabilise and then rebuild this species, but we do not yet know whether this approach will be successful. Meanwhile, maintaining the two small remnant populations is critical to the short-term survival of this species. Thankfully there are several avenues for managing Red Handfish habitat.

## Further information

Dr Rick Stuart-Smith  
Institute for Marine and Antarctic Studies  
enquiries@reeflifesurvey.com

## Hub partners



The NESP Marine Biodiversity Hub is funded by the Australian Government's National Environmental Science Programme. Our goal is to assist decision-makers to understand, manage and conserve Australia's environment by funding world-class biodiversity science.

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## Key partners in Red Handfish research and conservation

