

Thymichthys politus

Red Handfish

TASMANIAN THREATENED SPECIES LISTING STATEMENT



Image by Tyson Bessell

- Common name:** Red Handfish
- Scientific name:** *Thymichthys politus* (Richardson, 1844)
- Group:** Actinopterygii, Lophiiformes, Brachionichthyidae
- Status:** *Threatened Species Protection Act 1995:* **endangered**
Environment Protection and Biodiversity Conservation Act 1999: **Critically Endangered**
IUCN Red List: **Critically Endangered (pending)**
- Distribution:** Endemic status: **Endemic to Tasmania's eastern coast**
Tasmanian NRM Regions: **South**

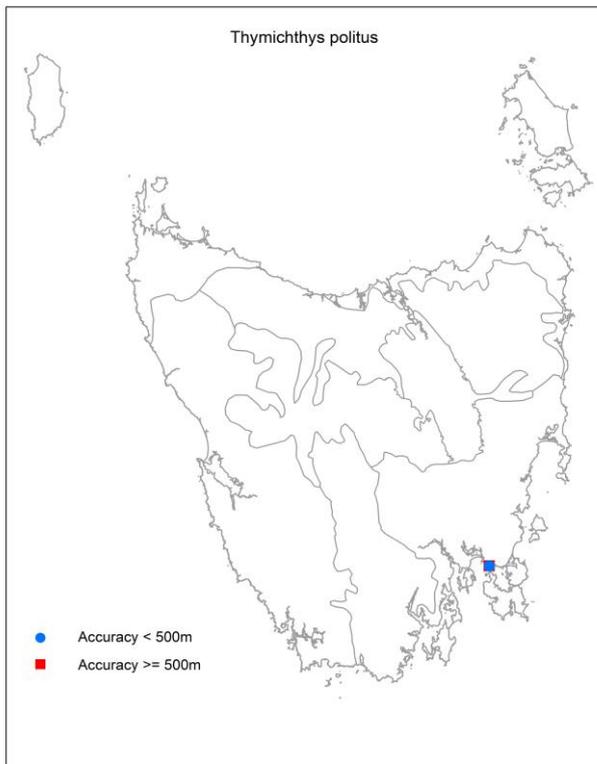


Figure 1. The current known extant distribution of the Red Handfish.



Plate 1. Red Handfish. Images by Rick Stuart-Smith (top) and Tyson Bessell (bottom).

SUMMARY

The Red Handfish (*Thymichthys politus*) is a small, benthic fish endemic to Tasmania and is one of three listed threatened handfish species.

The current known population (two colonies in close proximity) is approximately 100 individual adult fish.

Threats to the species include small population size, degradation and loss of habitat, poaching, stochastic events, and possibly warming seas.

A Recovery Team oversees a collaborative research and management effort aimed at improving the status of the species.

IDENTIFICATION AND ECOLOGY

Thymichthys politus (known as the Red Handfish) is a member of the fish family Brachionichthyidae, which comprises 14 extant species of which 11 occur in the seas around Tasmania.

The Red Handfish is a small and cryptic species. It is the smallest of the three threatened Tasmanian handfish species, with adults typically 7 – 9 cm in length (Handfish Conservation Project 2019). Sexual dimorphism is suspected (Bruce *et al.* 1997).

Despite its small size, the Red Handfish has a rather elongate and somewhat compressed body that tapers towards the tail. The skin is covered in small, flattened warts and most of the scales and associated spines of this species are embedded in the skin (Gledhill and Green, unpublished).

Despite its name, the Red Handfish can vary in colouration across a continuum of white/cream, orange and red tones and with patches of black and/or white on fins (R. Stuart-Smith, pers. com.). Examples of the colourations that have been observed include a solid bright red body and fin bases with the outer parts of the fins bluish and white, and another is a mottled pinkish colour with red patches and spots (Last and Gledhill 2009).

Red Handfish are a slow moving, benthic fish that use their hand-like fins to “walk” along the seafloor, rather than swim (although they possess a limited capacity to swim over short distances).

The Red Handfish feeds on small crustaceans and worms (Kuitert 1996).

Handfish depend upon vertical structures for use as spawning substrate. Unlike the Spotted Handfish, which use stalked ascidians upon which to deposit eggs, the Red Handfish prefer to spawn amongst green algae (in particular, *Caulerpa simpliciuscula*) and seagrass. Red Handfish egg masses comprise around 30 – 60 eggs and are spawned in late spring (Bruce *et al.* 1997), producing far fewer eggs than the Spotted Handfish which produce egg masses of between 80 – 200 eggs (Last and Bruce 1996-97). An adult Red Handfish (it is assumed to be the mother) guards the egg mass for a period of 7 – 8 weeks until the fully-formed young hatch. Upon hatching, the young are approximately 6 – 7 mm in length (Pogonoski *et al.* 2002).

Survey techniques

Surveying for Red Handfish should be systematic. Diver-based surveys are recommended and should be undertaken by suitably experienced personnel. Any development-related proposals near to known (current and historic) populations should be informed by appropriate best-practice surveys.

Confusing species

The Red Handfish is not easily confused with other handfish species due to their small size and distinctive appearance.

DISTRIBUTION AND HABITAT

The Red Handfish is endemic to the east coast of Tasmania. There are historical records from sites off Port Arthur, Fortescue Bay, Lobster Point, the Forestier Peninsula and north coast of Tasmania, but they are now only known to occur in two small areas near Primrose Sands.

Red Handfish have a strong association with reefs but may inhabit a variety of locations including: the top of rocks, amongst macroalgae, in sandy areas between rocks and the reef-sand and on sediments with seagrass and weed clumps near reefs – but all within a depth distribution ranging from 1 to 20 m (Commonwealth of Australia 2015).

Due to their small population size and small and disjunct distribution, all areas within which Red Handfish have been found (and around these areas) are considered vital habitat for the species' survival.

POPULATION PARAMETERS

The species was once abundant in places along the south-east coast but is now one of the rarest marine fish species in the world (Marine Biodiversity Hub 2019a).

At time of preparation of this Listing Statement, only two small colonies are known, both in Frederick Henry Bay (Marine Biodiversity Hub 2019b). The most recent estimates, based on extrapolation of observations, suggest that there are likely to be approximately 100 adult Red Handfish in existence (T. Bessell, pers. com.); although no formal population estimate has been possible to date.

RESERVATION STATUS

Both known extant colonies are within Frederick Henry Bay, which is not a reserved area.

CONSERVATION STATUS

The Red Handfish was listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) in 2004 and was uplisted to Critically Endangered in 2012 based on Criterion 2 (its geographic distribution is precarious for the survival of the species and is very restricted, restricted or limited) (Threatened Species Scientific Committee 2011).

In 2016, the species was added to Schedule 3 (extant endangered species) of the *Threatened Species Protection Act 1995*. Eligibility for this listing was based on Criteria B (extent of occurrence and/or area of occupancy), form 1 (severely fragmented or known to exist at no more than five locations), forms 2c, d and e (continuing decline in: area, extent and/or quality of habitat; number of locations or subpopulations, and; number of mature individuals).

THREATS, LIMITING FACTORS & MANAGEMENT ISSUES

Threats, limiting factors and management issues for Red Handfish include:

Degradation and loss of habitat: The most significant threat to Red Handfish is the increase in the abundance of sea urchins which has resulted in significant overgrazing of the algae upon which the Red Handfish depends. The causes of sea urchin density increase on multiple occasions in the last two decades are unknown, but likely includes a reduction in rock lobsters through fishing. Research is being conducted to improve our understanding of sea urchin ecology and their impacts, including population surveys and barren extent and the trial of control measures. Other threats include: pollution and siltation; inappropriate development that may result in direct disturbance of Red Handfish or adversely affect its habitat; and possibly increasing water temperatures. Coastal developments, particularly those that involve dredging have the potential to impact the Red Handfish which live in shallow coastal environments.

Low number of colonies and small population size: The small population size is a limiting factor on the recovery of the species. Small populations are more at risk from low genetic diversity and the impact of threatening processes and stochastic events.

Direct human impact: A potential threat is physical damage to the Red Handfish and its habitat through actions such as trampling at low tide, boat propeller wash disturbing handfish eggs, anchoring, and accidental damage during sea urchin harvesting or recreational lobster and abalone harvest.

Illegal collection: Due to their charismatic appearance Red Handfish are likely to be highly sought after by collectors. Due to the extremely small population size, any illegal collection for the purposes of personal aquaria or the aquarium trade would be a significant threat to this species.

Climate change: An increase in water temperatures is a potential threat (Gledhill and Green, unpublished). Warmer water temperatures may impact upon Red Handfish survival and and/or reproductive capacity, directly and/or indirectly. Climate change may also lead to increased severe weather events which may dislodge spawning substrate and degrade habitat (K. Gowlett-Holmes, pers. com.).

MANAGEMENT STRATEGY

Management objectives

The first objective for the management of the Red Handfish is to increase the understanding of its biology and ecology in order to best target management and conservation actions. More specific objectives include putting appropriate measures in place to manage the key threats and to maintain or improve habitat quality in key locations (Commonwealth of Australia 2015).

What has been done?

Population surveys: Surveys for the Red Handfish have been undertaken, although these have mostly been opportunistic. While targeted survey effort has been significant, there is currently no long-term systematic population monitoring framework in place. Further effort is required to determine whether any other populations remain but have not yet been found.

Captive husbandry trial: *Ex-situ* breeding and restocking of wild populations has been identified as a priority for bolstering current populations and possibly re-establishing populations at sites previously occupied. A preliminary captive husbandry and head-starting trial has been started, but more experimental aquaculture research is needed to progress this priority. The captive trial has also provided the opportunity to raise awareness of the plight of the species through public display and awareness information sessions.

Community awareness: In 2018, the Handfish Conservation Project (<https://handfish.org.au>) was established to raise awareness and funds to further handfish research and conservation management efforts. A Red Handfish Fact Sheet is also available from the NESP Marine Biodiversity Hub website (<https://www.nespmarine.edu.au/fact-sheets>).

What is needed?

- Consider options for the active conservation and management of the species and its habitat;
- Improve knowledge of the distribution, abundance population trends, sea urchin densities and habitat condition – undertake regular, standardised, systematic surveys of known and potential habitat;
- Identify threats and factors limiting expansion of colonies and colonisation of potential habitat;
- Implement, monitor, review and adapt conservation and management actions based on the best information available;
- Continue investigations into optimal captive husbandry requirements and subsequent establishment of a managed captive breeding program (if suitable) to act as an insurance population and source of fish for endorsed release to the wild projects;

- Ensure regulators of developments that may impact on areas of known or potential habitat consider the needs of the species during assessment processes.

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- Prepared:** October 2019 by the Threatened Species Section under the provisions of the Tasmanian *Threatened Species Protection Act 1995*. Published in 2020.
- Cite as:** Threatened Species Section (2020). *Listing Statement for Thymichthys politus* (Red Handfish). Department of Primary Industries, Parks, Water and Environment, Tasmania.
- View:** www.dpipwe.tas.gov.au/threatenedspecieslists
- Contact details:** Threatened Species Section, Department of Primary Industries, Parks, Water and Environment, GPO Box 44, Hobart, Tasmania, Australia, 7001. Phone: 1300 368 550.
- Permit:** A permit is required under the *Tasmanian Threatened Species Protection Act 1995* to knowingly “take” (which includes kill, injure, catch, damage, destroy and collect), keep, trade in or process any specimen of a listed species.