

Marine Brown Alga – *Nereia lophocladia*

December 2018, Primefact 192, Third edition
DPI Fisheries Threatened Species Unit

Introduction

Nereia lophocladia is a small brown algae that is typically less than 15 cm long. The species was initially described from Port Phillip Heads in Victoria in 1888, however it has not been observed in Victoria for more than a century since its discovery.

In 1980, a second population was discovered at Muttonbird Island off Coffs Harbour in NSW and was considered the only known remaining population of the species.

Targeted surveys for the species at Muttonbird Island and surrounding reefs in 2015 found multiple patches, which have been found each year since then. In 2018, wide-ranging surveys of *Nereia lophocladia* discovered new patches from Sawtell to Woolgoolga Headland, expanding the known distribution of the species.

Although the known range of *Nereia lophocladia* has expanded in recent years, it is still listed as a 'critically endangered' species in NSW under the *Fisheries Management Act 1994*. There are heavy penalties for harming, possessing, buying or selling it, or for damaging its habitat (see 'Legal implications').



Figure 1: A *Nereia lophocladia* growing on characteristic hard substrate (Photo: L. Mamo)

Description

Nereia lophocladia is one of four species in the genus *Nereia*. It is a small species, typically growing to less than 15 cm long, but may grow as large as 30 cm. It has seasonal alternating life history stages, in which it goes through a microscopic stage as well as a macroscopic (visible) stage. The macroscopic (visible) stage is observed only in winter to early summer (typically July to December). The gametophytes, or sexual phase in the life cycle, are microscopic and too small to be observed in the field.

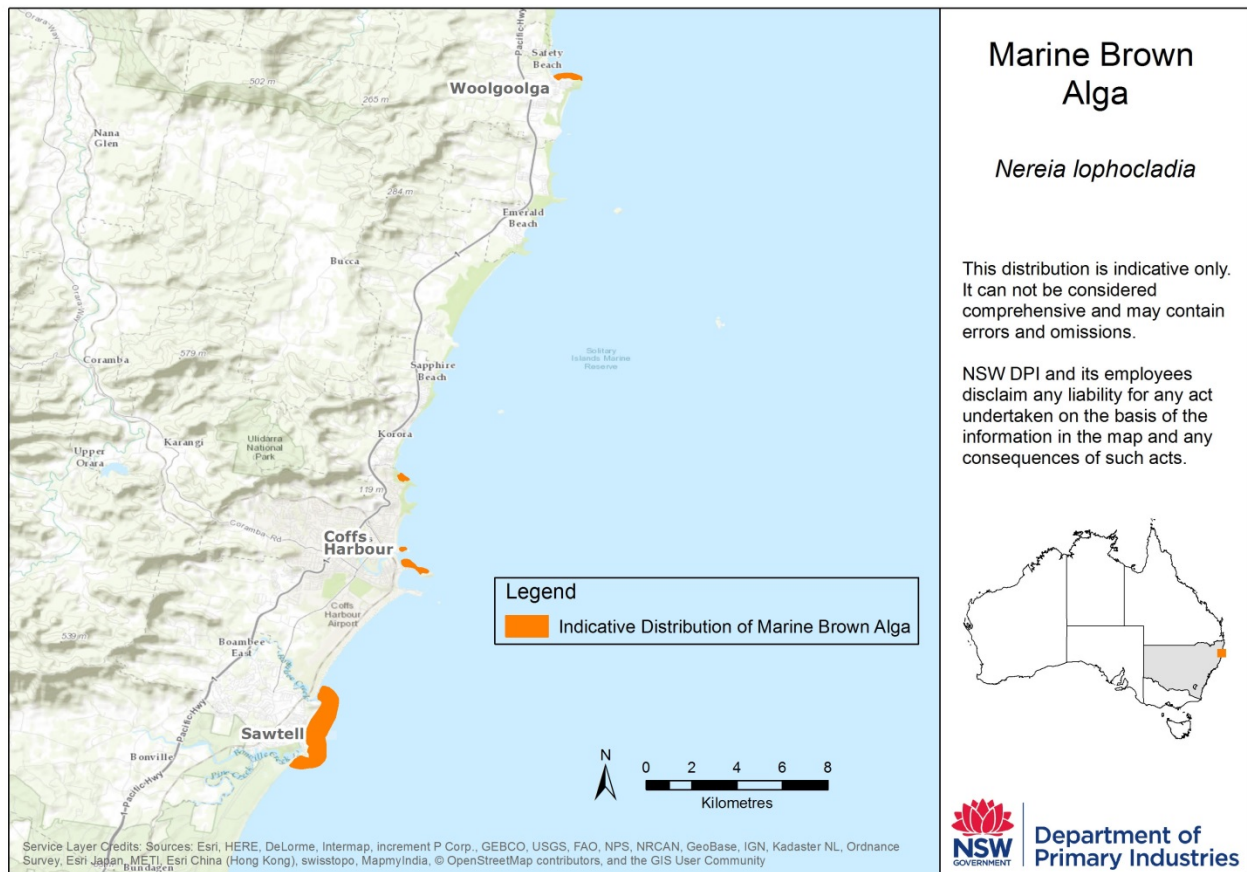


Figure 2: The indicative distribution of Marine Brown Alga, *Nereia lophocladia* (as of December 2018).

Habitat and Ecology

Nereia lophocladia is found on hard substrate at the sand/reef interface on the seabed in about 3 - 12 m depth of water.

Knowledge of the species' biology and ecology is only just emerging due to very few sightings prior to 2015.

Nereia lophocladia is thought to have limited dispersal capabilities; although it was recently observed exclusively covering a decorator crab which may assist with dispersing the algae (Figure 3).



Figure 3: A decorator crab covered in the critically endangered *Nereia lophocladia*. Movement of these crabs into other locations may promote the establishment of new habitats for *Nereia lophocladia*. (Photo taken from Coleman et al. 2018)

Why is *Nereia lophocladia* threatened?

- The reason for the disappearance of *Nereia lophocladia* from Victoria is unknown. However, a reduction in numbers at Coffs Harbour was initially attributed to the construction of a breakwall that joins Muttonbird Island to the mainland.
- There is also anecdotal evidence of an increase in sea urchins that could be causing large scale grazing pressure on the north side of the Island.
- *Nereia lophocladia* is a potential target for illegal aquarium collectors.
- *Nereia lophocladia* is also threatened by sand movement following storms or coastal development.



Figure 4: A *Nereia lophocladia* (Photo: L. Mamo)

Conservation and recovery actions

- Minimising or mitigating the impacts of coastal infrastructure works within the vicinity of the species, including during recent upgrades of the Coffs Harbour breakwall.
- Most locations where *Nereia lophocladia* has been observed are within the

Solitary Islands Marine Park. The zoning plan of the marine park provides a high level of environmental protection for those locations.

- Further research is being conducted into the distribution, biology and ecology of the species.
- Research and management is successfully being undertaken through collaborative partnerships with government and universities.
- Research findings are being published in scientific journals and the outcomes are being communicated to the general public and local communities.
- Any sightings of the species are encouraged to be reported to the DPI Threatened Species Sightings online form:

www.dpi.nsw.gov.au/fishing/species-protection/report-it

Legal implications

It is illegal to collect and keep, buy, sell, possess or harm *Nereia lophocladia* (or any other threatened species in NSW) without a specific permit, licence or other appropriate approval, and significant penalties apply. For critically endangered species these penalties can include fines of up to \$220,000 and up to 2 years in prison.

There can also be significant penalties for causing damage to the habitat of a threatened species without approval through such actions as dredging and construction.

The impact of developments or activities that require consent or approval (in accordance with the *Environmental Planning and Assessment Act 1979* and

Fisheries Management Act 1994) must be assessed and considered by consent or determining authorities. Where such actions are likely to result in a significant impact on a threatened species or its habitat, a detailed species impact statement must be prepared.

Strategies that have been adopted for promoting the recovery of *Nereia lophocladia* to a position of viability in nature are set out in a [Priorities Action Statement](#).

Biography and further reading

Coleman M.A., Kelaher B.P., Mamo L.T., Yee N.R., Dwyer P.G. and Smith S.D.A (2018) Critically endangered algal couture. *Journal of Biodiversity & Endangered Species*, **6**: 213. DOI 10.4172/2332-2543.1000213

Fisheries Scientific Committee (2007) Final Determination, *Nereia lophocladia* Marine brown alga.

Mamo L.T., Kelaher B.P., Coleman M.A. and Dwyer P.G. (2018) Protecting threatened species from coastal infrastructure upgrades: The importance of evidence-based conservation. *Ocean and Coastal Management* **165**: 161-166.

Yee N.R., Finley L., Roberts A., Kelaher B. and Millar A.J.K. (2017) Re-discovery of the critically endangered marine brown alga, *Nereia lophocladia* (Order Sporochnales) at Coffs Harbour, NSW, Australia. Short Communication, *Marine Biodiversity*, DOI 10.1007/s12526-017-0796-y

Yee N.R., Millar A.J.K., Marchant A. and Peters A. (2003) Phylogenetic relationships between genera of the Sporochnales

(Phaeophyceae) as inferred from plastic DNA sequences. *3rd European Phycological Congress*.

For further information

See the NSW DPI website:

www.dpi.nsw.gov.au

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Figures 5 and 6 (above): Recent sightings of *Nereia lophocladia* (Photos: B. Kelaher)