Australian Coral Reef Society Inc
Promoting the scientific study of Australian coral reefs

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Submission by the Australian Coral Reef Society Inc to the NSW Fisheries Scientific Committee regarding:

Listing the Cauliflower Soft Coral (*Dendronephthya australis*) as an Endangered Species

The Australian Coral Reef Society (ACRS) has played an active role in coral reef research and conservation since 1922. The Society is the world's oldest organization of scientists and conservationists studying coral reefs. Recent population declines of Cauliflower Soft Coral (*Dendronephthya australis*) from anchor damage, fishing line entanglement, and coastal development are threatening the persistence of the species. Thus, the ACRS strongly supports listing *Dendronephthya australis* as endangered under the Fisheries Management Act 1994.

Dendronephthya australis is a soft coral associated with sponge gardens that is endemic to New South Wales, and serves as critical habitat for the endangered White's seahorse, *Hippocampus whitei* (Harasti et al., 2014). In addition, habitats with *D. australis* have significantly higher associated biodiversity than nearby sand, seagrass, and sponge habitats lacking *D. australis* (Poulos et al., 2013). Not only is *D. australis* ecologically important, but it also has high social value. The species is prized by divers as a rare sight, particularly in the Sydney area where populations are sparse, and for its aesthetics, growth form and being a coral in a largely kelp-based system (Turnbull, pers. coms.).

Dendronephthya australis is found in sheltered waters with strong tidal flow such as ports, estuaries, and bays; areas that are highly susceptible to human impacts. The highest population densities of *D. australis* occur in Port Stephens, and colonies are restricted to soft benthic habitats within 6.4 km of the estuary mouth (Poulos et al., 2016). Considering preferred depth, benthic habitat type, seafloor slope, and maximum current velocity, models run by Poulos et al. (2016) found that only 1.5% of the east basin of Port Stephens is suitable habitat for *D. australis*, and nearly all suitable habitat is outside of Sanctuary Zones. The Port Stephens region has recently experienced massive declines in *D. australis*, with up to 95% of populations destroyed by sand inundation and an improperly placed mooring block, which had flow-on effects that reduced populations of *H. whitei* (Harasti, 2016). In addition, *D. australis* are easily damaged by boat anchors and fishing line, and can be impacted by grazing from predatory molluscs (Davis et al., 2018; Poulos et al., 2013).

Unfortunately, less published work exists about *D. australis* habitat availability in other estuaries, such as Botany Bay and Port Jackson. In Botany Bay, there is a population of *D. australis* ~100 m Southeast of Bare Island, which is situated in sponge gardens in 10 m of water on top of large boulders (Steinberg and Turnbull, pers. obs.). The Bare Island population generally does not host seahorses but does provide habitat for at least 30 species of macroinvertebrates (Steinberg unpublished data) and many other benthic species, including juvenile snapper, wobbegong sharks, and blue gropers (Steinberg pers. obs.). In December of 2020, Turnbull and Steinberg observed significant damage to the Bare Island population, with either predation or disease suspected. Follow up dives in early February 2020 revealed that over 50% of *D. australis* colonies were destroyed, and several that remained suffered from severe stalk necrosis (Turnbull and Steinberg unpublished data). There was also evidence of new recruitment but follow up surveys are required to ascertain population regrowth.

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In Port Jackson, historic populations are inferred by speaking with members of dive clubs in the Sydney area. In the 1960s and '70s, there were large populations in Balmoral, Fairlight, and Watson's Bay, but follow up surveys in 2018 found only the occasional scattered colony at the latter two locations (Turnbull and Steinberg pers. obs.). *Dendronephthya australis* has been functionally extirpated from Port Jackson, and as such can no longer provide vital ecosystem services, such as habitat for *H. whitei*. Restoration efforts are urgently needed, but little is known about *D. australis* in Port Jackson, which presents significant challenges. Fortunately, restoration efforts are ongoing in Port Stephens, and will provide important information on how to proceed in the more heavily impacted Port Jackson and Botany Bay (Harasti, pers. comm.).

Listing *D. australis* as endangered would greatly benefit conservation and restoration efforts across the state by increasing the protections that can be afforded to the species. In fact, the ACRS believe that without additional protections, *D. australis* is at high risk of additional extirpations or even extinction. Implementing sanctuary and no-anchor zones over known populations in Botany Bay, Port Jackson, and Port Stephens would reduce the threats from anchor damage and fishing entanglement, and limiting or eliminating dredging would reduce impacts from possible sand shifting events (Harasti, 2016; Poulos et al., 2013). Several port developments have been suggested for Botany Bay, including an "aquatic monument" to Captain Cook, complete with ferry wharves, and a cruise ship terminal, both of which would require extensive dredging (Gorrey, 2019; Sas, 2018). Sand shifting of this magnitude could be devastating to the already denuded populations, and listing *D. australis* as endangered would give managers a better chance at protection and recovery. Additionally, listing the species as endangered would increase the funds available for ongoing restoration efforts, thereby improving the chances of successful restoration in Port Stephens and extending restoration to other impacted locations.

Dendronephthya australis is a critical part of New South Wales marine habitat and is under threat from human activities, notably boating, fishing, and dredging. As the species prefers the sheltered, high flow waters of ports and estuaries that are in constant contact with human-induced stressors, additional protection is necessary for potential recovery. Listing the species as endangered would aid both conservation and restoration efforts and increase the efficacy of ongoing conservation and restoration projects. As such, the ACRS strongly supports the listing of *D. australis* as an endangered species under the Fisheries Management Act 1994.

ACRS would be happy to provide additional information as required.

Sincerely,

Dr Anna Scott
President, Australian Coral Reef Society

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