Australian Coral Reef Society Inc
Promoting the scientific study of Australian coral reefs
austcoralreefsoc@gmail.com
www.australiancoralreefsociety.org

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Submission by the Australian Coral Reef Society to the Department of Agriculture, Water and the Environment regarding:

Sea Cucumber Fishery (East Coast) – Status report for reassessment

Key recommendations:

- The *Sea Cucumber Fishery (East Coast)* upholds the CITES listings of the black teatfish (*Holothuria whitmaei*) and white teatfish (*Holothuria fuscogilva*),
- The black teatfish fishery is not approved for 'wildlife trade operation',
- The white teatfish fishery is not approved for 'wildlife trade operation',
- The recent (2019) reopening of the black teatfish fishery is reversed, and
- Management considers antagonistic effects of ocean warming on winter spawning.

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 organisation of scientists and conservationists studying coral reefs. A great proportion of ACRS members conduct research on Australia's Great Barrier Reef (GBR), including several prominent sea cucumber experts. Based on current scientific consensus, the ACRS advises the Department of Agriculture, Water and the Environment to strongly reconsider harvesting sea cucumbers of the 'teatfish' group for export.

The *Sea Cucumber Fishery (East Coast)* is open for reassessment as two species currently harvested (the black teatfish (BT), *Holothuria whitmaei*, and white teatfish (WT), *H. fuscogilva*) are to be listed on CITES Appendix II (FAO 2019); effective from 28th August 2020. Appendix II lists species not necessarily threatened with extinction, but in which trade must be controlled in order to avoid utilization incompatible with their survival. This listing will restrict the trade and export of these two teatfish. To continue to harvest BT and WT for export, the fishery must be reassessed for 'wildlife trade operation' approval under Part 13A of the *Environment Protection and Biodiversity Conservation Act 1999*.

The ACRS strongly supports the CITES listings and protection of both teatfish species, which have been listed as Endangered (*H. whitmaei*) and Vulnerable (*H. fuscogilva*) on the IUCN Red List of Threatened Species for ~6 years (Conand et al. 2014). Both the IUCN and CITES listings provide evidence that teatfish are exceptionally vulnerable to fisheries pressure, not just on the GBR, but globally. BT and WT have a low reproductive capacity, slow growth, and thus, low recovery rates (Uthicke et al. 2004). In 2013, the IUCN listed BT as Endangered as the population had declined by 60–90% across ~70% of its global range (Conand et al. 2013a). Similarly, the WT (Vulnerable) experienced a population decline of 60–80% across ~30% of its global range (Conand et al. 2013b). These declines are likely greater today as their global populations continue to be fished (FAO 2019).

Sea cucumbers, including the BT and WT, are ecologically important organisms, known as keystone species, that reduce anoxia and algal overgrowth on coral reefs (Michio et al. 2003; Lee et al. 2018) through bioturbation and carbonate processing (Uthicke & Klumpp 1998, Uthicke 1999, 2001, Wolkenhauer et al. 2010, Schneider et al. 2011, 2013, Lee et al. 2017, Wolfe & Byrne 2017a, Wolfe

et al. 2018). The important roles that commercially exploited sea cucumbers play in ecosystem functioning will be substantially reduced, and ultimately lost, if their populations are comprised by overfishing (Purcell et al. 2016). Removal of large quantities of sea cucumbers from the reef environment will likely lead to critical and unforeseen impacts on the broader reef ecosystem.

On the GBR, the BT fishery was closed for two decades (1999–2018) as BT densities had reduced to ~25% of natural levels (Uthicke and Benzie 2001). Within this period (2004-present), the *Sea Cucumber Fishery (East Coast)* has operated under a rotational zoning scheme (RZS). This divides the fishery into zones that can only be fished once every three years (Lowden 2005), restricting fishing effort over space and time. While the RZS has been suggested to be beneficial (Plagányi et al. 2015), it is likely not best-practice for sea cucumbers (Eriksson and Byrne 2015; Purcell et al. 2015). Once fished, population recovery is dependent on the remaining density of reproductive adults and life-history parameters, which are largely unknown for most species of sea cucumber (Friedman et al. 2011), including the species of concern here. The capacity to sustainably harvest BT under the RZS is unknown as this fishery has been closed since its implementation, until now. It is unlikely that the three-year 'fallow period' under the RZS provides a sufficient recovery period for the BT, which has slow growth (<200 g y^{-1}) and poor recruitment (Uthicke et al. 2004).

Regardless, the BT fishery on the GBR reopened last year (2019) following a series of surveys that suggested their populations had recovered (Knuckey and Koopman 2016). We believe these actions are premature given only eight survey sites from the recent report (Knuckey and Koopman 2016) overlapped with the previous research that prompted the fishery's closure (Uthicke and Benzie 2001). Of the sites that overlapped, four showed increases in BT densities between 2001 and 2016, two remained similar, while BT populations declined at two sites. At one of these sites (Little Broadhurst Reef, Central GBR, which is open to fishing), BT populations declined by 63%. Given the lack of overlapping survey sites, and mixed results among them, we strongly oppose the recent opening of the BT fishery, even with a species-specific total allowable catch (TAC) of 30 tons per annum. In addition, the ACRS is concerned that fisheries limitations for BT (minimum size limit and TAC) are not outlined in Tables 1 and 2 of the *Sea Cucumber Fishery (East Coast) – Status report for reassessment* given the BT fishery is currently active.

In contrast to the BT, the WT fishery has not yet experienced a closure. After the BT fishery was closed, the WT became a key target of the *Sea Cucumber Fishery (East Coast),* without information on population densities and catches. This led to a 40% decline in the catch of WT between 2000 and 2011 (Eriksson and Byrne 2015), meaning WT catches, and likely populations, were in decline under the RZS (Purcell et al. 2015). However, the WT fishery is now suggested to be sustainable (Roelofs et al. 2018), perhaps due to the introduction of a species-specific total allowable catch (TAC) to 53 tons per annum.

Given the current 'sustainable' status of the WT fishery on the GBR, the ACRS is concerned that export of the WT may be granted. We strongly advise against this. The CITES listing for all three teatfish species (including one not present on the GBR, *H. nobilis*) was granted because of their identifiable morphology (i.e. 'teats') (FAO 2019). Protection of all three teatfish, as recommended in the CITES Appendix II listing, is advised to reduce misidentification and black-market trade among teatfish species. Any export of WT and BT from the GBR fishery is strongly advised against.

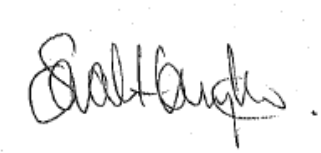
Rising average sea temperatures should also be factored into considerations for the management of this fishery. As reported in the 2019 Great Barrier Reef Outlook Report (pg 231):

"Sea cucumbers spawn in winter and when water is cooler and have low recruitment rates. In 2015, the BT was assessed as one of the most vulnerable key Torres Strait fisheries species to a variety of climate change pressures. This is due to its limited mobility, high exposure to warmer waters on the shallow reef areas and generally low adaptive capacity (Johnson and Welch 2016). Any rise in water temperature is likely to restrict or prevent spawning (Welch et al. 2014), undermining the resilience of this species and the important nutrient cycling process it performs".

A key component of the 'Performance Measurement System' of the *Sea Cucumber Fishery (East Coast)* is to "protect endangered and threatened species". The IUCN and CITES listings of BT and WT reflect historical declines in their densities locally (GBR) and globally. Overfishing led to a fisheries closure for the BT on the GBR in the past. Yet, with a lack of robust evidence of population recovery, the BT fishery has reopened. The ACRS strongly advise that the CITES listings of both teatfish (*H. whitmaei* and *H. fuscogilva*) are upheld to afford the full protection of these species without export approval. Given global patterns of serial depletion in sea cucumber fisheries (Eriksson and Byrne 2015), the CITES listings for both species of teatfish provides an important opportunity for Australian coastal fisheries managers to lead by example in the conservation and protection of a global species at risk.

The ACRS is happy to provide additional information as required.

Sincerely,



Associate Professor Sarah Hamylton

President, Australian Coral Reef Society

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