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## Benefits and opportunity costs of Australia's Coral Sea marine protected area: A precautionary tale

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### ABSTRACT

The paper analyses the benefits and costs of the Coral Sea Marine Reserve which, together with the contiguous Great Barrier Reef World Heritage Area, creates the largest marine protected area in the world. The benefits are found to be minimal, in both anthropocentric and ecocentric terms. Nevertheless establishment and management costs could be in the order of \$A20 million and \$A13 million, respectively. Meanwhile, serious depletion of the vital fish stocks of the largest tuna fishery in the world in the Western and Central Pacific Ocean—in which Australia is a management partner—continues, as does the rapid erosion of the unique and outstanding values of the Great Barrier Reef. It is concluded that current investment in the creation and management of the Coral Sea Reserve—in the face of the demonstrably urgent needs for investment in the management of marine resources in the near region and in Australia – is problematic.

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### 1. Introduction

In 1998, the Australian Government and state and territory governments agreed to develop the National Representative System of Marine Protected Areas (NRSMPA) and in 2002 Australia joined other nations at the World Summit on Sustainable Development in committing to establish networks of representative protected areas within their maritime jurisdictions by 2012.

The main goals of the National Strategy for the Conservation of Australia's Biological Diversity are to protect biological diversity and to maintain ecological processes and systems. In the marine environment, the NRSMPA is a centrepiece of this national approach to the conservation of marine ecosystems, habitats and species, forming part of an integrated strategy for marine conservation and management.

Australia's Oceans Policy of 1999 outlines commitments and actions to the ongoing establishment of the NRSMPA for conservation purposes and to give regional security for industry access to ocean resources and their sustainable use. The integration of environmental, economic, social and cultural ocean uses is fundamental to the broad principles established in the Oceans Policy [1].

The Coral Sea MPA of 0.99 million km<sup>2</sup> is by far the largest in the network and together with the existing and contiguous Great Barrier Reef Marine Park will create the largest marine reserve in the world, covering 1.3 million km<sup>2</sup> [2] (Fig. 1). According to

Australian Environment Minister Burke [4], the Coral Sea is the jewel in the crown of the proposed Australian network of marine protected areas (MPAs). It supports critical nesting sites for the green turtle and is renowned for its diversity of big predatory fish and sharks, and all the Coral Sea reefs are protected.

The paper analyses the benefits and costs of the Coral Sea MPA given its overwhelming size and the importance attached to it; Section 2 outlines the methods adopted.

### 2. The benefits and costs of the Coral Sea Marine Reserve (CSMR)

The analysis focuses on the conservation benefits afforded by the reduction in the removal of commercial fishing and fish, both target and bycatch species.

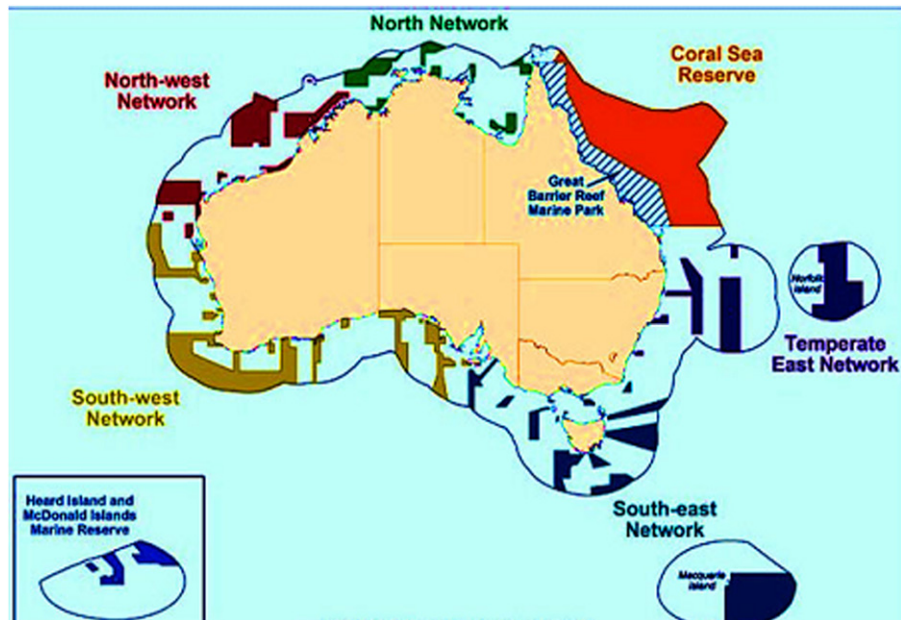
The criteria adopted in this paper for the removal of fisheries from the CSMR are as follows:

1. The fishery displaced by the Reserve has no alternative or very limited alternative fishing grounds.
2. The fishery displaced by the Reserve has alternative fishing grounds but the effort transferred to those grounds and the increase in intensity of effort would likely affect the viability of all operators in the fishery.

The Commonwealth administered fisheries that meet the criteria for removal from the Reserve are the Demersal Trawl, Demersal Longline of the Coral Sea Fishery, which are displaced from all zones, and the Eastern Tuna and Billfish Fishery (ETBF), a

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**Fig. 1.** Proposed network of Marine Protected Areas, Australia. The Coral Sea Marine Reserve covers hectares 990,000 km<sup>2</sup>, extending eastwards from the boundary of the Great Barrier Reef Marine Park to the limit of Australia's territorial waters. The Great Barrier Reef and the Coral Sea Reserve will together constitute the largest marine protected area in the world. (Note that the South East Marine Region was established in 2007.) *Source:* [3].

**Table 1**

Weight and gross value of production of Commonwealth and Queensland fisheries removed from the Coral Sea Marine Reserve.  
*Sources:* [6,46].

Jurisdiction/ fishery	Average 2001–2010			Year 2009–2010		
	Tonnes catch removed	Percentage removed	GVP removed S'000	Tonnes catch removed, year 2009–2010	Estimate of GVP removed S'000, year 2009–2010	Number of operators, vessels or permits affected, year 2009–2010
<b>Commonwealth</b>						
Coral Sea fishery						
Demersal longline	39.6	97.6	118			
Demersal Trawl	27.4	98.2	146.1	4	17	Four vessels and 16 permits in total
Dropline	6.0	17.3	62.1			
Handline/rod & Trap & troll	12.1	(not available)	71.1			
Eastern Tuna and Billfish	627.4	9.6	3566.1	417	3391.5	One operator with four vessel permits in the Coral Sea Zone, plus other vessel permits with a total catch equivalent to one average operator
<b>Queensland</b>						
Deep water fin fish fishery	13.4	Average 2000–2010 25.9	98.4	12.95	Year 2009–2010 95	Vessels four; commercial licences seven, active four in 2009–2010
<b>Grand total GVP removed S'000</b>			<b>3963.4</b>		<b>3503.5</b>	

pelagic longline fishery. In the latter, one business with four vessels is responsible for much of the pelagic longlining removed from the proposed Reserve. There are other vessels marginally affected with a catch equivalent to one average vessel (Table 1).

Of the Queensland government administered fisheries in the proposal only the Deep Water Fin Fish Fishery (DWFFF) is affected to any degree. Removal of 25% of this fishery prevents displacement to other grounds already fished (Table 1).

### 2.1. Estimating the benefits

The benefits are in two parts, anthropocentric and ecocentric, based on the typology of Angulo-Valdés and Hatcher [5, Table 1]. The potential anthropocentric benefits in this case are mainly in the form of a reduction in overfishing. The ecocentric benefits examined are: recovery of depleted populations; prevention of loss of vulnerable species, long-lived species, low reproductive species and migratory species; and habitat benefits.

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