

The creation of highly protected co-designed marine parks for Christmas and Cocos (Keeling) Islands.

A submission to Parks Australia in response to the marine park proposal.



**CENTRE FOR
CONSERVATION
GEOGRAPHY**

Strategic Tools and Conservation Innovation

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We acknowledge the Traditional Owners of the lands and seas we live on and in the regions we research and write about. We pay respect to their elders past and present. We celebrate the enduring connections of Traditional Owners to their country and their deep knowledge of land and sea.

CENTRE FOR CONSERVATION GEOGRAPHY

The Centre for Conservation Geography (conservationgeography.org) is a research group established in June 2011 to provide expert technical support and advice to government and non-government decision-makers and stakeholders. We focus on applying world's best practice in decision support to planning for biodiversity conservation. Our main areas of expertise are marine and terrestrial protected area planning, including protected area performance assessment, cost-efficient conservation priority setting and planning for multiple objectives (e.g. carbon sequestration and biodiversity conservation).

Based in Australia, our goal is to build a multi-disciplinary team capable of providing support to conservation decisions across the world's ecoregions. We currently have projects in Australia, Canada, and the Southern Ocean.



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EXECUTIVE SUMMARY

The proposed marine parks in Australia's Indian Ocean Territories, around Christmas and Cocos (Keeling) Islands, as currently designed, will rank among the world's premier marine parks.

It is extremely encouraging that the Government is working collaboratively with the island communities to co-design these marine parks to meet local aspirations and recognise the significant cultural values and ongoing connections to the Indian Ocean.

The Centre for Conservation Geography commends the Government on the proposed park designs – particularly the large marine national park protection zones in the offshore areas. The large national park zones represent a major advance for marine conservation in Australia, by:

- demonstrating world's best practice in marine park design
- substantially increasing the coverage of marine national park protection in Australia
- advancing progress towards a comprehensive, adequate, and representative reserve system of marine parks in Australia
- increasing protection for pelagic and migratory marine species and deep-sea habitats, including many threatened species, fragile ecosystems, and unique habitats
- protecting 38% of the world's only known spawning grounds for the critically endangered southern bluefin tuna
- fostering resilience to climate change impacts.

The large national park zones will also help sustain productive fisheries by serving as replenishment areas. The high seas surrounding the proposed marine parks are heavily fished by international fleets. The proposed parks will strengthen protection in the highly biodiverse, highly exploited, and inadequately protected Indo-Pacific region, without negatively impacting the existing Australian commercial fisheries, which have not operated in the area since 2013 [1].

The proposed habitat protection (yellow) zones in the near-shore areas (around the islands) reflect the local community aspirations and highlight the importance of the marine environment for local economies, food security, cultural and religious practices. The changes made to the green zones from the draft proposal at Trannie's Beach and The Rip are supported by the local Cocos (Keeling) Islands community, displaying best practice in co-design of the marine park. It is important that the ongoing design and future management of the marine park, and fisheries management plans, be done with the local community as co-decision makers, not stakeholders. This will ensure better outcomes for the community and greater compliance to park zoning, ultimately leading to better environmental outcomes.

The vast majority of public comments to the draft proposal strongly supported the marine park design, with 78% of the unique submissions and 99% of total submissions in support of the proposed marine parks, particularly the large offshore green zones. The strong support for the marine park proposals was based on the benefits the marine parks will provide for the species and habitats present and the improvements to Australia's marine protected areas network, while allowing sustainable use of the inshore waters by the locals. Only 6 of the 15,244 submissions were unsupportive of the proposed zoning of the marine parks.

1. INTRODUCTION

This submission is a response to the “Proclamation proposal for the establishment of marine parks in Australia’s Indian Ocean Territories (IOT) (Christmas Island and Cocos (Keeling) Islands)”. These marine park proposals have been co-designed with the residents of Christmas and Cocos (Keeling) Islands, in consultation with other stakeholders, and a draft released for public comment – a process we endorse.

The draft proposal for the marine parks received 15,244 public submissions. Most respondents (99%) strongly supported the marine park design, particularly the large sanctuary zones offshore. The draft proposal had 60 unique submissions and 15,184 campaign submissions. 85% of the unique submissions (51 submissions) supported the proposed offshore green zones, with 47 supportive of the government’s draft proposal, and 4 wanting increased sanctuary in the inshore area. There were 4 unique submissions from the Western Tuna and Billfish Fishery concession holders and fishing representative bodies (2 each). These submissions did not support the large green zones offshore. The strong support for the large, well-protected marine parks in the Indian Ocean Territories highlights the public support for marine parks in Australian waters.

The proposed marine parks will help safeguard one of ‘the most unique and threatened marine bioregions in Australia’ [2], a region that, with the exception of small marine areas in the existing national parks, is not yet included in the National Reserve System of Marine Protected Areas.

The proposal for large marine national park zones provides a high level of protection for most of the area’s natural values, including protection in each subregion, various depth ranges, 8 proposed key ecological features, 3 proposed biologically important areas, and many threatened species and fragile habitats. When declared, they will become world-class marine parks within a region subjected to heavy exploitation and overfishing.

The proposed habitat protection zones in the inshore sections of the marine parks will support access to important local fishing areas, allowing for continued subsistence/community and small-scale fishing in the area, safeguarding the local residents’ culture and a primary food source (Figure 1). The marine parks will have little to no negative impact on the existing commercial fishing operations for Australia, which have not been operational in the IOT exclusive economic zone (EEZ) for 8 years (since 2013), with no recorded fishing activity documented since pre 2007 [3].

CCG commends the marine park design process, the proposed designs, and the emphasis on supporting additional research on the IOT marine environment. The current marine park proposal would be a strong commitment to marine conservation from Australia, and would create Australia’s second biggest, and best protected marine park to date, comparable on an international level for protection levels in the marine parks. In this submission we explain and outline the many compelling science-based reasons for the proposed level of marine national park protection, and the importance of participatory governance to ensure the proposed marine parks will optimise the environmental, social, and economic benefits.

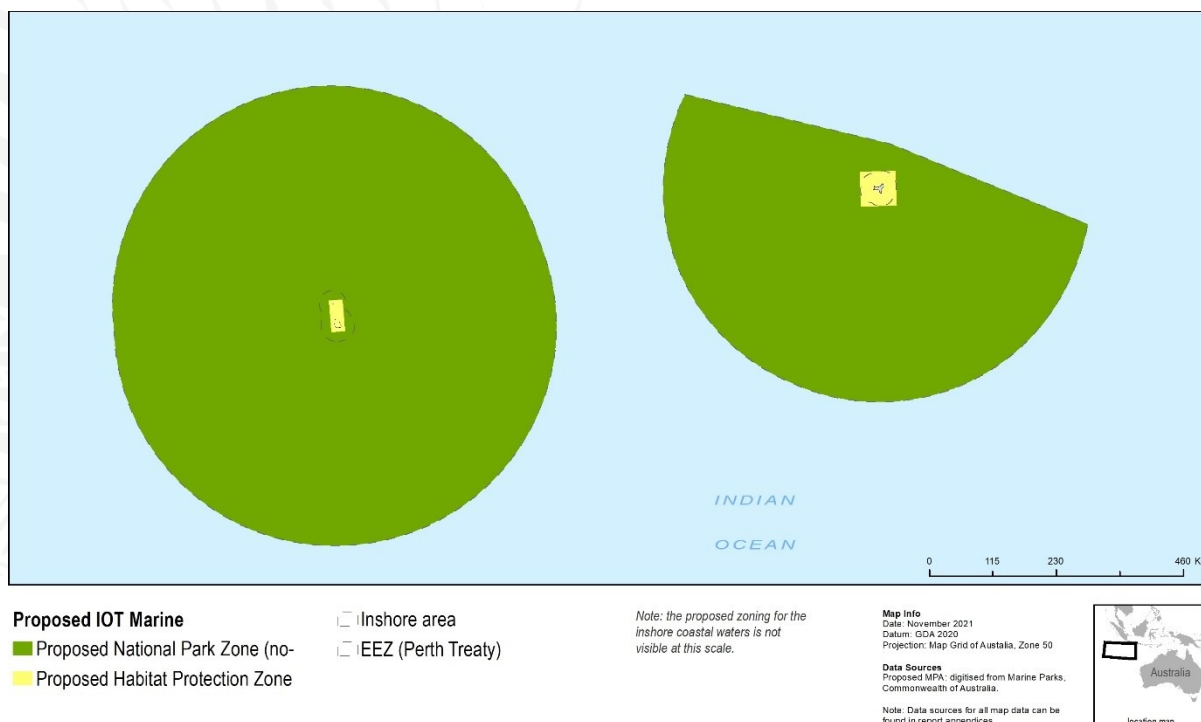


Figure 1. The proposed zoning for Australia's Indian Ocean Territory Marine Parks.

RECOMMENDATIONS

- We strongly recommend that the Australian Government proceed with establishing the proposed marine parks in collaboration with the local Christmas and Cocos (Keeling) Islands communities, recognising the critical role the marine parks will play in developing a comprehensive, adequate, and representative marine park network for Australia's marine estate
- we commend the approach taken in the consultation and co-design of the proposed marine parks with the communities of Christmas and Cocos (Keeling) Islands, and support the current proposal to establish habitat protection zones in the near shore areas surrounding the islands in line with community aspirations.
- we encourage ongoing scientific research, including the development of a bioregional assessment of the natural values of the region to inform future management decisions for the marine parks
- we recommend the marine park design retains the large sanctuary areas offshore, protecting key habitats and species in the over-exploited and under-protected Indo-Pacific region.

2. GOVERNANCE CONSIDERATIONS FOR BEST PRACTICE MARINE PARK MANAGEMENT

The co-design process for the marine parks shows the enhancement of Australia's marine park design process, where there is inclusion of local communities as co-designers, not just stakeholders. Respecting and integrating their rights and interests is an essential element of successful marine conservation efforts in the region [4]. We commend the approach taken in the consultation and co-design of the marine parks with the communities of both Christmas and Cocos (Keeling) Islands. Designing and planning these marine parks with the communities in a proactive and participatory manner is vital to ensure successful environmental conservation outcomes that are consistent with local aspirations, rights, and interests in the marine environment.

Traditional local communities of Christmas and Cocos (Keeling) Islands have strong interests in, and rights over the surrounding marine environment and resources. The marine parks proclamation proposal rightly recognises that 'the ocean forms a vital part of their identities, cultures and lifestyles, particularly the inshore waters that surround these islands'[5]. The marine environment is an essential part of local economies, food security, recreational, cultural and religious practices. The proposed marine parks provide an opportunity to establish high level protection across the offshore waters with minimal social and economic impacts.

We support the current proposal, including the changes made from the draft proposal to establish habitat protection (yellow) zones in the near shore areas surrounding the islands and small national park (green) zones at Trannie's Beach and The Rip, in line with community aspirations. We recognise the importance of the process by which the boundaries of these near shore yellow and green zones are defined and amended by the local communities themselves, which allow for the continuation of subsistence and recreational fishing practices, while protecting and promoting the IOT as a unique eco-tourism destinations in Australia.

2.1. The importance of participatory governance as a core foundation for successful marine parks in the IOT

Participatory governance integrates top down government led approaches to conservation with bottom up processes that support community-based governance and decentralise decision-making to include local communities [6]. Standard practice, both internationally and in Australian law and policy, recognises traditional local communities as partners in all stages of the planning, design, and management of marine parks [4,6–10]. Careful consideration of social, cultural, economic, and institutional aspects of local community interests from the earliest point of conception is recognised as a key factor in the establishment of stable and effective management for any protected area [4,11].

Evidence demonstrates that these participatory approaches not only enhance conservation outcomes, but result in important social benefits when established through community involvement, collaborative management and incorporation of culture into marine park management strategies [4,6]. These realisations have led to an understanding of the desirability of undertaking participatory processes in all stages of consultation, design, implementation, management and monitoring.

Community involvement and support is a cornerstone of effective marine parks [12]. One of the strengths of the proposed IOT marine park zoning is that it supports continued community use of locally valued marine resources while protecting the large offshore areas in marine national park zones. This community-driven process is likely to result in high levels of compliance.

Engagement of relevant communities and stakeholders from the start of the process enhances information exchange, encourages accountability of experts and authorities, builds confidence in the decision-making process, and allows collaborative discussion among stakeholder groups, leading to mutually acceptable solutions [4,6,13]. The human factors that influence the acceptance and ultimate success of a marine park include a high level of participation; effective governance; co-building of knowledge (scientific and vernacular/local knowledge); and the role of rights and customs [11].

These approaches are particularly pertinent to the circumstances of Christmas and Cocos (Keeling) Islands and their unique traditional communities. Providing opportunities for participatory governance is critical to meeting government commitments as well the aspirations of these communities for self-determination and a more central role in decision-making over their marine environment and resources.

2.2. Regional context underpinning the importance of participatory governance

A shared legacy of colonial injustices gives additional prominence to the social dimensions of any proposal for marine conservation in this region. Notwithstanding diverse histories and a distance of nearly 1,000 km separating the Christmas and Cocos (Keeling) Islands, they share a strong discontent regarding the inadequacy of consultation in the management of their affairs by government agencies in mainland Australia [14,15]. Respectful engagement of the region's local communities is especially important when considering the region's chequered colonial histories, Australian government commitments to address governance shortfalls in the region, and the long-standing aspirations for self-determination and a more central role in decision making [16–18].

In particular the Australian government has a longstanding commitment to recognise and respect the traditions of the Cocos Malay community that extends to their close connection and reliance on the marine environment and its resources for social, cultural, religious and economic purposes¹ [16].

This context creates a strong imperative on the Federal government to ensure effective and culturally appropriate mechanisms for partnership with local communities in any marine conservation in the region. Where participatory governance is implemented well, there are significant opportunities for social benefits to arise from the establishment of marine parks in the region that will enhance and complement the environmental objectives [19–21].

The importance of ensuring that the communities of Christmas and Cocos (Keeling) Islands continue to play a central role in the planning, design, management and monitoring of the proposed marine parks particularly in the near shore areas is vital to ensure its long-term success. Because of the emphasis on community-led reserve design for the marine parks, it is more likely that compliance to the zoning rules will be high. The application of a co-design framework is a good achievement in

¹ *While the Australian government has not formally extended the same acknowledgement to the Malay and Chinese populations of Christmas Island, there is a strong interconnection between the Malay population, as well significant reliance on the marine environment and resources by the communities on Christmas Island.*

securing world class protection in zoning and in increasing the potential for compliance from the residents.

RECOMMENDATIONS

- We commend the approach taken in the consultation and co-design of the proposed marine parks with the communities of both Christmas and Cocos Island, and support the current proposal to establish habitat protection (yellow) zones in the near shore areas and marine national park (green) zones in the offshore areas surrounding the islands, in line with community aspirations.
- The Government must ensure that the communities of Christmas and Cocos (Keeling) Islands continue to play a central role in the planning, design, management and monitoring of the proposed marine parks, and in any fisheries management plans for the region.

3. THE BENEFITS OF THE PROPOSED LARGE MARINE NATIONAL PARK ZONES IN AUSTRALIA'S IOT

The draft zoning plan for the proposed IOT marine parks specifies marine national park protection for over 98% of the proposed Christmas Island marine park and 99% of the Cocos (Keeling) Islands marine park. These large marine national park zones represent a major advance for marine conservation in Australia by:

- demonstrating world's best practice in marine park design
- substantially increasing the extent of marine national park protection in Australia
- strengthening protection in the heavily exploited Indo-Pacific region
- optimising protection for pelagic and migratory species, including many threatened species
- protecting globally under-protected, and fragile seamount habitats
- fostering resilience to climate change
- helping sustain productive fisheries in Australia's EEZ
- achieving cost-effective conservation.

With the large marine national park zones, the proposed marine parks will rank among the world's premier marine parks, and support Australia's commitment to conservation outcomes and targets nationally and internationally.

The proposed IOT marine parks are demonstrative of decades of science promoting the benefits of large fully protected areas, while still allowing equitable access to the local community inshore fishing grounds. Very large MPAs (>100,000 km²) are increasingly recognised as a key tool for addressing larger-scale issues of sustainability, including overfishing of pelagic and migratory species. They often cover large amounts of core habitats, or key life stages of migratory species, and offer refuge to overfished species [22]. The large, offshore national park zones cover large amounts of core habitats and key life stages of migratory species, and offer refuge to overfished species [22], acting as a refuge in otherwise poorly regulated and overfished high seas.

The large sanctuary areas in the proposed marine parks are by far the best approach towards achieving conservation objectives and optimising the protection of the natural values [23]. While partially protected areas can provide some benefits by restricting specific activities (e.g. banning trawling to prevent habitat destruction), as well as cultural benefits, in general they are of limited benefit for biodiversity conservation [2].

The proposed marine parks cover one of the most under-protected marine environments globally. Compared to other marine environments, pelagic environments have relatively few regulatory mechanisms in place targeting biodiversity conservation, with most management actions associated with fisheries. The challenges of pelagic area conservation are extensive, and the proposed IOT marine parks are a significant step towards enhancing conservation benefits for the pelagic environment globally, demonstrating world's best practice in protected area design in the planet's last frontier of conservation management [24].

3.1. Achieving world's best practice marine conservation

THE PROPOSED IOT MARINE PARKS DEMONSTRATE WORLD'S BEST PRACTICE IN MARINE NATIONAL PARK PROTECTION AND WOULD BE AMONG THE WORLD'S PREMIER MARINE PARKS.

The proposed large marine national park areas meet the widely recommended minimum 30% level of full protection [25–29] – at a bioregional and subregional level for most ecosystems and habitats present. At a provincial bioregional level, the marine national park zones will protect more than 98% of the Christmas Island Province and 99% of the Cocos (Keeling) Islands Province in Australia's EEZ [30]. The high level of protection offered will place it among the world's premier marine protected areas (MPAs), with a large and continuous sanctuary protection. It will be one of Australia's leading marine parks in terms of total area, and national park protection (Table 1).

Large, fully protected areas are by far the most effective type of MPA for biodiversity conservation [23,31]. Large, fully protected MPAs offer stronger protection relative to other zones (i.e. IUCN categories III–VI), can increase and maintain the biomass and structure of fish assemblages, protect and restore ecosystems to a more complex and resilient state, and protect species and habitats from ongoing pressures and threats [32,33]. Large MPAs offer many advantages over smaller MPAs, They are able to spatially cover biologically connected and diverse ecosystems, protecting and benefitting both sedentary and sessile species, as well as migratory species or species with large home ranges [34].

Table 1. Levels of full protection in the largest marine protected areas in the world and Australia

Marine protected area	Full protection, area (km ²)	Full protection, proportion of MPA (%)
Papahānaumokuākea (US)	1,508,730	100
Pitcairn Islands (South Pacific)	832,694	100
Macquarie Island (AUS)	160,999	100
Christmas Island Marine Park (AUS)[^]	273,163	98.6
Cocos (Keeling) Islands Marine Park (AUS)[^]	465,849	99.7
Ross Sea Region (CCAMLR)	1,606,529	79
Great Barrier Reef Marine Park (AUS)	115,025	33
Coral Sea Marine Park (AUS)	238,391	24

Source: <https://mpatlas.org/countries/list>

Notes: [^]Area figures calculated using Asia South Albers Equal Area Conic projection. These figures may differ slightly from official government figures.

THE PROPOSED IOT MARINE PARKS WILL SUBSTANTIALLY EXPAND AUSTRALIA’S MARINE NATIONAL PARK NETWORK.

Despite having the world’s third-largest marine EEZ and the second-largest network of marine protected areas (with 37% of the EEZ in a marine park [35]), Australia has only the ninth-largest percentage coverage of fully protected marine parks [36], meaning that less than 10% of Australia’s oceans are fully protected in sanctuary areas. Australia therefore falls short of best practice, and the level of protection needed to achieve conservation goals [36]. The proposed IOT marine parks will help to increase Australia’s level of marine national park protection of the EEZ from the current 9% to 17% (Table 2).

Table 2. Global ranking of % of Nations EEZs fully protected marine area

Country	Current global rank	Global rank (with proposed MPAs)	Total MPA area (km ²)	Total fully protected area (km ²)	% of EEZ fully protected
Palau	1	1 -	614,807	477,462	78
Mauritius	2	2 -	2,203,542	637,916	29
United Kingdom	3	3 -	5,879,220	1,591,855	27
United States	4	4 -	12,205,918	2,815,495	23
Seychelles	5	6 ↓	1,341,50	199,256	15
Chile	6	7 ↓	3,668,776	451,121	12
Kiribati	7	8 ↓	3,440,22	395,133	11
Argentina	8	9 ↓	2,860,40	315,918	11
Australia	9	5 ↑	8,994,340 (current) 9,738,479 (combined proposal)	918,381 (current) 1,657,394 (combined proposal) [29,31–37]	10 (current) 17 (with proposal)
Mexico	10	10 -	3,187,013	149,52	4.7

Source: <https://mpAtlas.org/countries/list>

3.2. Key improvements to Australia’s national marine reserve system from the proposed marine parks

Currently the IOT bioregions are significantly underrepresented in Australia’s national marine reserve network, without any significant marine park coverage. The addition of the two large marine national park areas will greatly improve overall representation for Australia’s marine reserve network, including representation of the key ecological features and unique values [37]. The proposed marine parks showcase the commitment to creating a comprehensive, adequate, and representative marine reserve network in Australia’s marine estate. The marine parks will increase the number of bioregions in Australia’s marine jurisdiction that meet the minimum 30% target for sanctuary

protection from 3 to 5, increasing the area of Australian waters with bioregional protection 30% or above by over 60% (Figure 2).

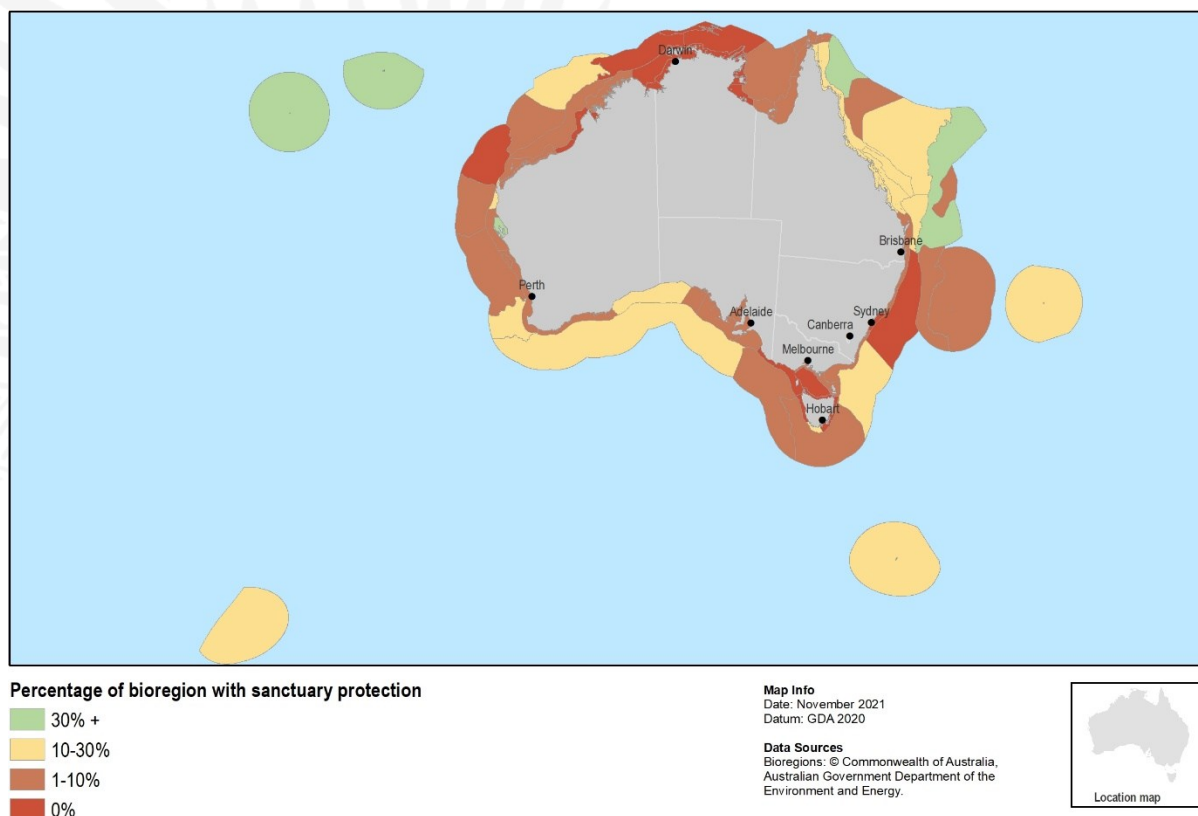


Figure 2. Marine bioregions level of sanctuary protection in Australian waters.

Fundamental questions still remain about the full extent of the conservation values of the broader Indian Ocean region, including the full extent and range of ecosystems and features represented and the levels of productivity and uniqueness in the waters of these island territories [38]. Scientific research of the IOT marine ecosystems is likely to help answer these.

3.3. Strengthening regional protection

THE PROPOSED IOT MARINE PARKS WILL SUBSTANTIALLY INCREASE PROTECTION IN THE HEAVILY EXPLOITED CENTRAL INDO-PACIFIC MARINE REALM.

The proposed marine parks are in the Java transitional province, part of the Central Indo-Pacific realm of the global marine ecosystems mapping [39]. This realm is one of the most ecologically diverse places on earth. Recognised as a major centre of marine biodiversity, the province is likely to harbor a large proportion of the world’s biodiversity and significant non-living resources [40]. The warm tropical waters of the Java transitional province allow for the most extensive coral reefs globally, with around 75% of all coral species identified in the region [41]. The region has been identified as an important marine area with opportunity for stronger, more representative, and more widespread protection [42].

The current level of protection in this realm is highly inadequate – limited to small areas in a few marine parks [43] (**Error! Reference source not found.**) – and the environmental pressures are substantial. Current protection in the Java transitional province is extremely low, with less than 1%

MPA coverage and sanctuary protection. The proposed IOT marine parks would significantly increase these levels, increasing the province protection to 47%. The contribution is also significant for the Central Indo-Pacific realm, which currently has 1% sanctuary protection. The proposed MPAs would more than double the amount of the realm protected in a sanctuary area.

Increasing the level of sanctuary protection in the Java transitional province is very important, due to the intensity of fishing, leading to overfishing [44] (Figure 4). For example, Indonesia is the third highest producer of wild-caught fisheries in the world [45], and one of the top 10 fish-dependant countries in the world, with the entire region in the top fishing effort category globally [45]. Therefore, the large proposed marine national park zones are an opportunity for Australia to increase protection in of the most biodiverse parts of the ocean facing considerable threats.

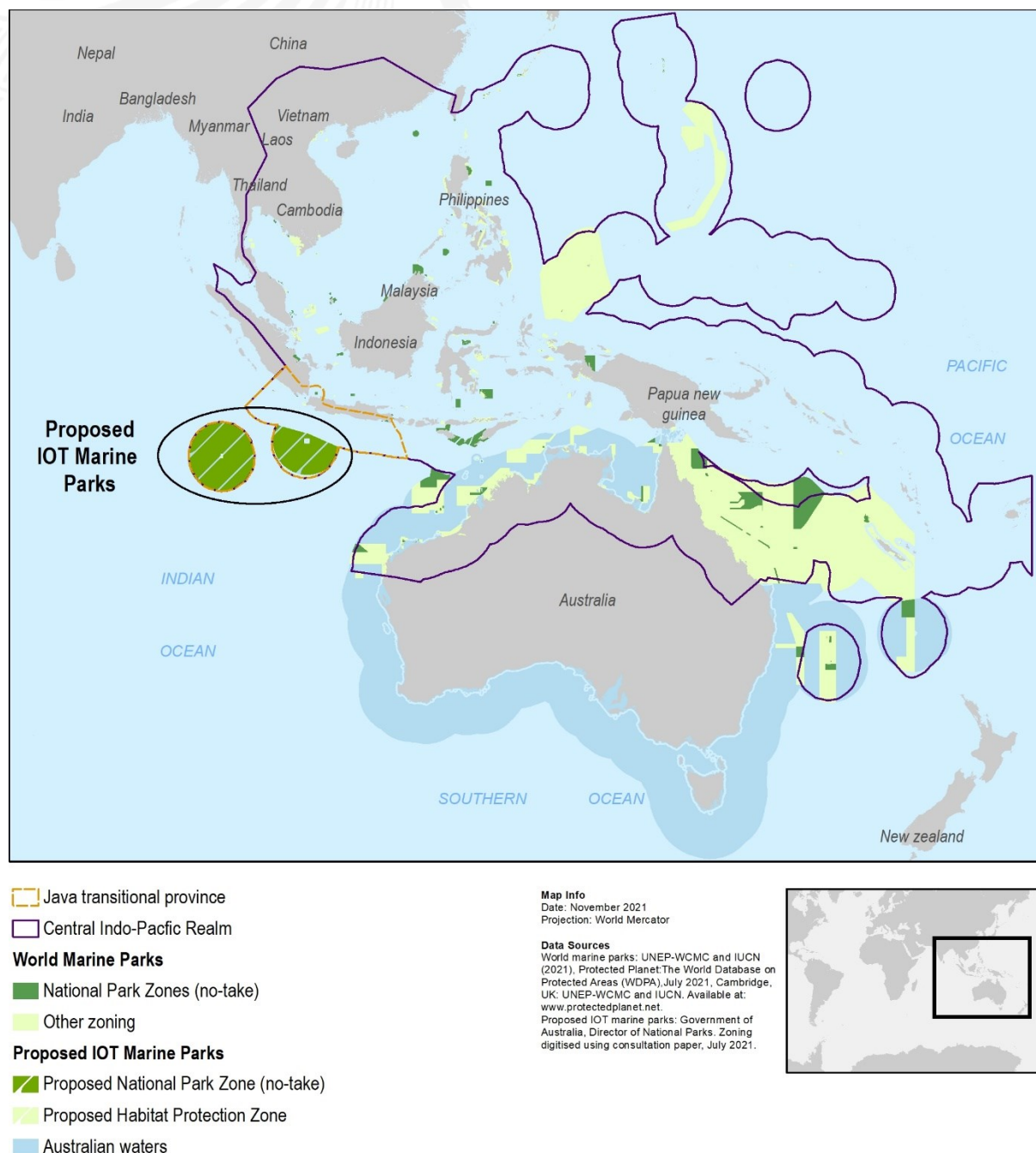


Figure 3. Marine Parks in the Central Indo-Pacific Realm and Java transitional province.

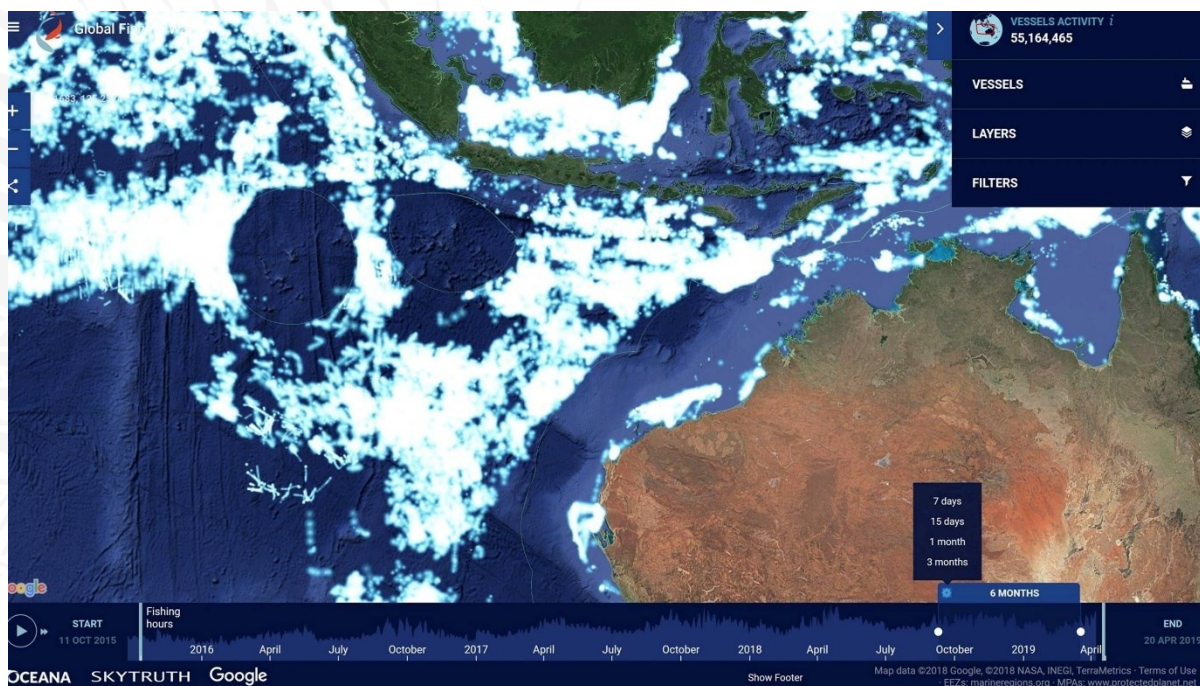


Figure 4. Vessel activity (based on satellite imagery and vessel tracking data for 6 months, October 2019 – April 2020) demonstrating fishing pressure in the Eastern Indian Ocean.

Source: <https://globalfishingwatch.org/map>

3.4. Protecting pelagic species and habitats

THE PROPOSED IOT MARINE PARKS WILL PROVIDE OPTIMAL PROTECTION FOR PELAGIC AND MIGRATORY SPECIES.

Large fully protected areas are the most effective type of MPA for conservation [46–48], particularly for pelagic and migratory species [49]. Currently, fewer protected areas exist in pelagic zones than any other ecosystem globally [24]. The proposed IOT MPAs are an opportunity for Australia to protect a part of the pelagic zone in Australia's marine estate.

The benefits of protecting pelagic ecosystems are immense, as they directly or indirectly support almost all marine life, connect ecosystems by transferring energy through food webs [50], account for nearly half of photosynthesis on earth [24], and play a major role in ameliorating the pace and extent of climate change [51]. Fully protected areas exceeding 100 km² can adequately protect the home range of most coral reef species and protect substantial parts of the home range of larger, and migratory species [50,52,53].

The proposed Christmas and Cocos (Keeling) Islands marine national parks zones will help protect many threatened species. The IUCN Red List has 115 marine neritic pelagic², 60 deep benthic, and 308 oceanic species listed for the waters surrounding Christmas and Cocos (Keeling) Islands, including whales, rays, sharks, dolphins, sunfish, seabirds, trevally, marlin, turtles and tuna [54]. Of these, 21 are listed as critically endangered or endangered, with 41 data deficient [54]. This includes southern bluefin tuna, listed as endangered by the IUCN in 2021 [54].

² The neritic zone is defined as the shallow marine environment extending from mean low water down to 200-metre depths, generally corresponding to the continental shelf.

The southern bluefin tuna is a key conservation feature for the IOT, and is proposed as a biologically important area [55] (Figure 5). Although the population is slowly recovering, it has reached just 20% of its original, pre-fishing level, and is still classified as overfished [56]. Australia's total EEZ covers around 40% of the estimated spawning area extending from the Kimberley coastal offshore to Christmas Island [57]. Currently, Argo-Rowley Terrace and Mermaid reef marine parks cover around 5% of the spawning habitat. The proposed marine national park zone covering Christmas Island will increase the marine national park protection of this to around 43%. This is a significant achievement for the protection of an endangered and overfished tuna species.

The proposed marine national park zones will bolster Australia's contribution to pelagic shark conservation and provide essential habitat protection within the region. The proposed marine parks will encompass large areas of highly suitable habitat for pelagic sharks [58], including a proposed biologically important area for whale shark foraging (Figure 5). The waters surrounding Christmas Island, particularly at the Wharton Basin subregion, may also be an important feeding area for whale sharks and other pelagic species [38].

Protecting shark habitat is critical for the continual survival of many shark species. Globally, important habitats for threatened pelagic sharks overlap considerably with industrial fishing activity. The proposed marine parks overlap a shark hotspot that is in the top 75th percentile for relative densities of sharks, highlighting the critical need for large marine national park protection in the region [59]. It is estimated that pelagic sharks and rays have declined by 71% since the 1970s. Over 75% of these species are now threatened with extinction, with over half either endangered or critically endangered [60].

About 19 pelagic shark species have been recorded in the IOT waters, including whale sharks. The marine parks could provide a vital marine national park area for pelagic sharks within the Indian Ocean and Coral Triangle region. In the region, sharks are heavily threatened by commercial overfishing, particularly targeted for their fins [61]. For example, based on current rates of fishing, the great hammerhead (*Sphyrna mokarran*) is likely to decline by 99.3% in the next 30 years in the Indian Ocean, due largely to overfishing. The regional data shows a current population decline of 6.6% annually, and will without doubt become critically endangered or extinct if current fishing rates continue [62].

Alongside the proposed biologically important areas for southern bluefin tuna and whale sharks, the proposed marine park includes a biologically important area for Abbott's booby foraging (Figure 5). Abbott's booby birds are migratory marine species, listed as Endangered under the EPBC Act, and critically endangered by the IUCN in 2001. Abbott's booby birds only known extant nesting colony is on Christmas Island, protecting this species and their foraging habitat is therefore critical to the survival of the bird [63].

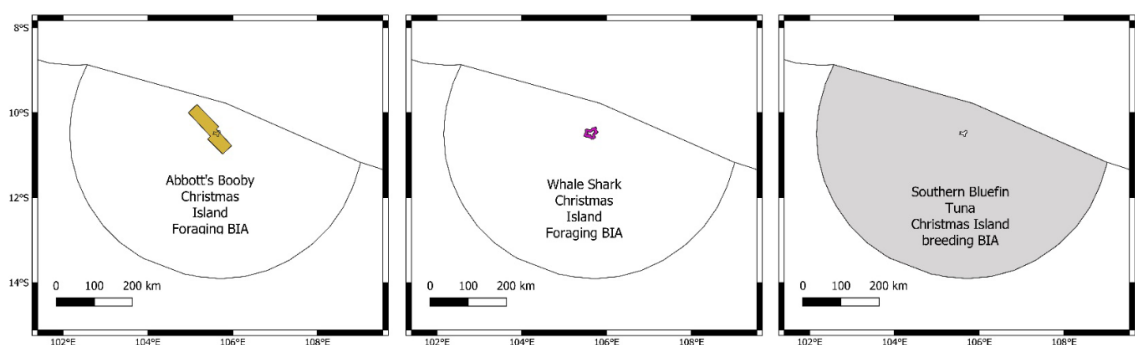


Figure 5. Proposed biologically important areas for Australia's Indian Ocean Territories (O'Hara, 2021 [55]).

Pelagic and migratory species protection is a complex issue, particularly for highly fished species and habitats. The high mobility and large home ranges combined with a lack of data means protected areas need to be large areas that aim to target specific life-stages, such as nurseries and/or spawning zones [64].

THE PROPOSED IOT MARINE PARKS WILL PROVIDE OPTIMAL PROTECTION FOR DEEP SEA HABITATS INCLUDING SEAMOUNTS

Seamounts are underwater rises that are at least 100 m above the seafloor, where the seafloor is deeper than 200 m. They are an important benthic feature influencing ocean currents, creating waves, increasing upwellings and forming important nutrient rich habitats [65–68].

Current levels of protection for seamounts globally are very low with less than 2% of seamounts afforded high levels of protection in sanctuary areas [69]. With only 47% of global seamounts in national EEZ areas, the opportunity to protect these habitats is low [70]. The protection the proposed marine parks will provide to seamounts is of national and global significance. Within Australia, 45% of mapped seamounts are in marine parks, but only 10% are in sanctuary areas.

The proposed marine national park zones in the IOTs will increase protection by 42% to a total of 52%; a significant achievement for a fragile and threatened ecosystem (**Error! Reference source not found.**). The proposed marine parks will include 77 of the 79 seamounts within the IOT bioregions in marine national park zones, with the other 2 forming the islands and included in habitat protection zones.

There are 5 distinct seamount groups proposed as key ecological features (**Error! Reference source not found.**). Key ecological features are elements of the marine environment important to a region's biodiversity or its ecosystem function and integrity [71]. Currently, 4 key ecological features cover seamounts in Australia, including the Lord Howe seamount chain, seamounts south and east of Tasmania, and the Tasmantid seamount chain. These will be the only seamounts listed as key ecological features in Australia's Indian Ocean.

Some of the seamounts in the proposed marine parks are massive – spanning over 70 km in diameter and rising 3-5 km above the sea floor, making them some of the tallest seamounts in Australian waters [55]. The seamounts found in the IOT are at 2 main depth ranges. There are seamounts at mid to lower depths (1000-3500 m). These deeper seamounts are important to cold-water coral and sponge communities on their summit rims and steep flanks, and infaunal communities on flat muddy seafloors. The shallow seamounts are classified as mid-oceanic shallow seamounts and islands are rare in the eastern Indian Ocean. These not only form the islands, but also provide habitat for coral communities [72], and safe lagoonal habitat for other shallow water species [55].

As an ecological feature, seamounts are biodiversity hotspots [73], attracting and supporting large species diversity and numbers of species from all depth ranges, particularly recognised for deep-sea biodiversity [74]. Seamounts are known biodiversity hotspots for pelagic species and important aggregating locations for highly migratory pelagic species, including sharks, billfishes, kingfish, and tuna [67]. Because of their ecological role for migratory species, seamounts are often referred to as 'stepping stones' in the ocean [75,76].

Because seamounts are known as biodiversity hotspots, providing habitat for key commercial species like tuna, they are the focus of many commercial fisheries. Seamounts are relatively fragile

habitats [68], and are highly vulnerable to disturbance by fish trawling or mining (generally targeting cobalt-rich ferromanganese crusts). Recent research into seamounts has shown that closing these areas to destructive fishing activities should be a priority to aid in their recovery and prevent further adverse impacts. While there is no bottom trawling currently licenced in the waters, a marine park will help to safeguard the habitat in perpetuity [74].

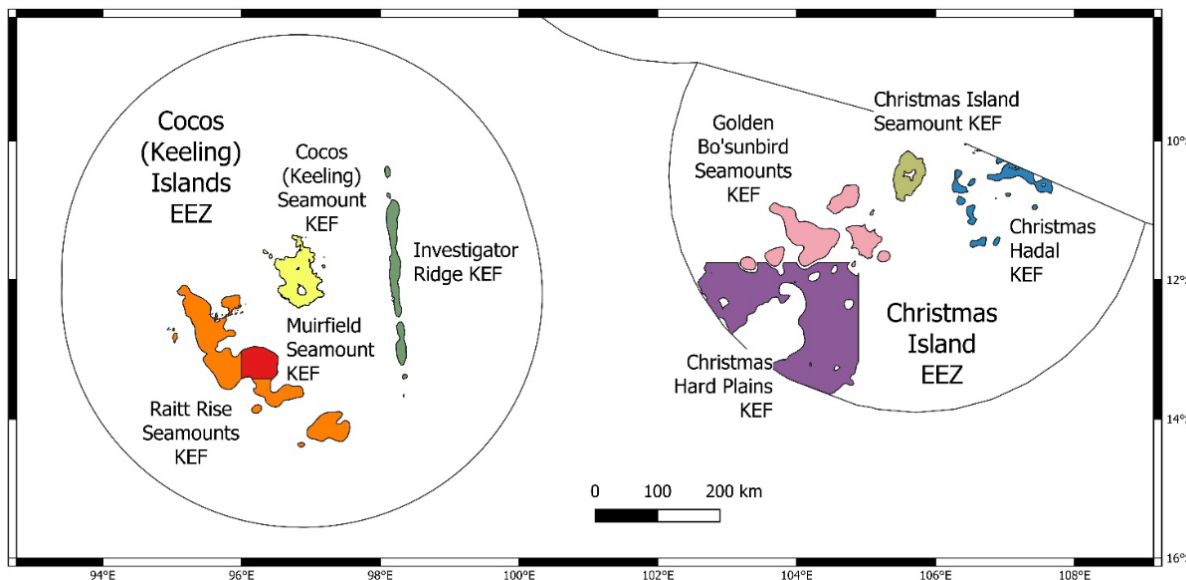


Figure 6. Proposed key ecological features in Australia's Indian Ocean Territories (O'Hara 2021 [55]).

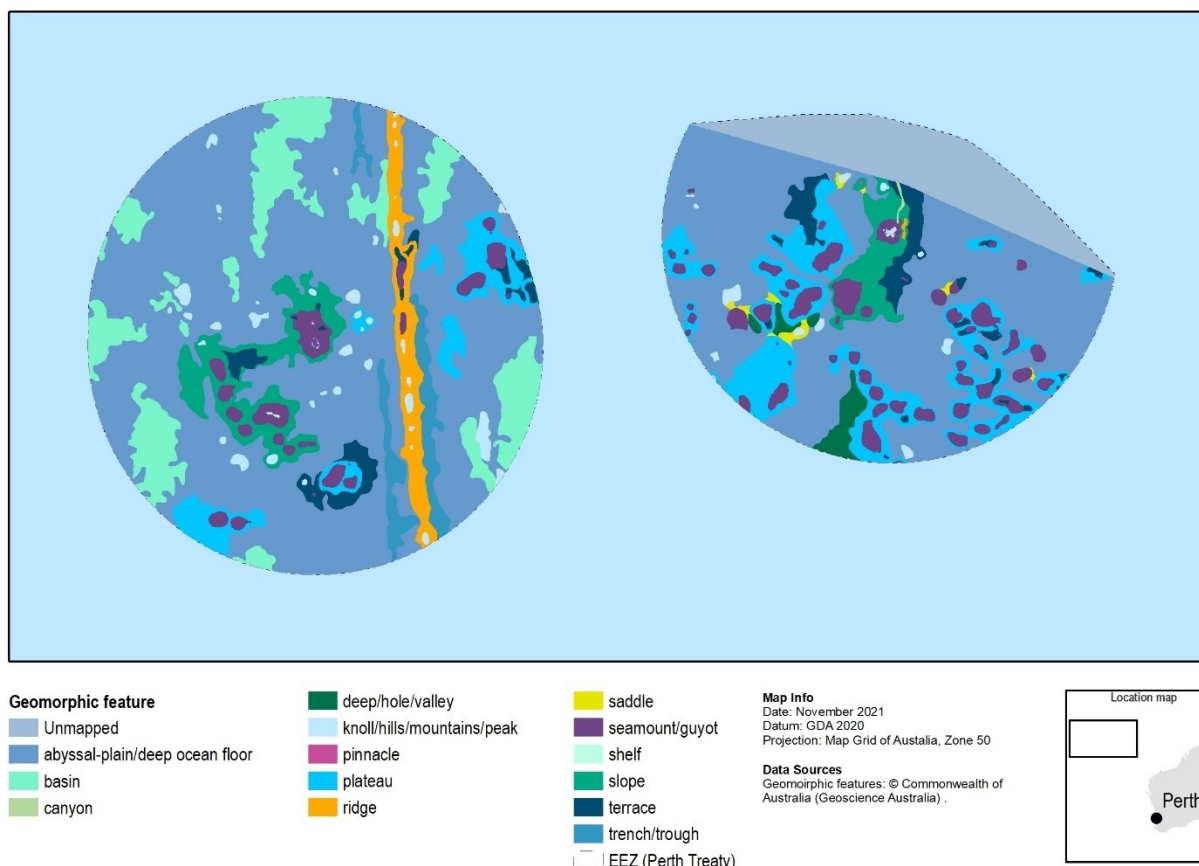


Figure 7. Geomorphic features (including seamounts) in Australia's Indian Ocean Territories

3.5. Protecting the last of the world's wilderness areas

The proposed marine parks in Australian IOT are a key opportunity for the Commonwealth Government to increase wilderness protection in the marine estate, protecting some of Australia's most remote and undisturbed marine areas.

Marine wildernesses offer vital refuge where natural ecological and evolutionary processes can continue with minimal human disturbance. Ecosystems under fewer stressors have greater stability and resilience which may help contribute to climate change adaptation and mitigation and ensure continuation of ecosystem services including fisheries [34].

Protecting wilderness areas is a critical component of conservation. While current direct human stressors within Australia's IOT marine estate are comparatively low, global patterns of population increases and increase in demands for resources, no 'unused' area of the ocean can be presumed to remain undisturbed into the future [77]. Proactive, precautionary protection of wilderness areas against exploitation will likely provide long-term benefits to biodiversity, ecosystem intactness and resilience both inside and outside of the protected zones [78–84]. This is particularly important for habitats such as deep-sea or oligotrophic ecosystems which are part of the marine park habitat profile that likely take decades to millennia to recover from disturbance [34,85].

Considering more terrestrial wilderness areas have been lost over the past 2 decades than protected [86], implementing large, remote MPAs such as the proposed IOT marine parks provides Australia with a limited opportunity to protect the waters before overexploitation causes long-term, potentially irreversible damage to the region [34]. The proposed marine parks will offer protection to a wilderness area in an otherwise over-exploited seascape.

3.6. Fostering resilience to climate change

THE PROPOSED LARGE IOT MARINE NATIONAL PARKS WILL HELP BUILD RESILIENCE IN THE FACE OF CLIMATE CHANGE.

The impacts of human-driven greenhouse gas emissions are accelerating [87] and disproportionately impacting many marine habitats [88] [89]. Impacts of climate change and ocean acidification in this area are high, with some of the greatest increases in human impacts in the global oceans between 2008-2013 [90]. While marine sanctuaries cannot provide immunity to the impacts of climate change, sanctuary areas are more resilient and recover faster from (some) impacts than unprotected areas [32,84]. This is because marine sanctuaries sustain ecosystem processes that are important for recovery from the impacts of climate change [91]. Marine sanctuaries have been shown to help reduce the sensitivity of coral to warming [92], improve recovery post-disturbance, and promote increased biomass of key species [93]. Benefits from sanctuary protection against climate change impacts for pelagic ecosystems is more speculative than in coastal areas, but the same notion of reducing multiple stressors will make ecosystems more resilient and therefore better able to withstand climate change impacts [94].

There is no spatial management tool that can ensure full protection against the global environmental crisis of climate change, but well-designed, large, marine parks with large sanctuary areas such as the proposed IOT marine parks have the ability to act as climate refuges, if well managed [23].

RECOMMENDATIONS

- We strongly recommend that the Australian Government proceed with establishing the proposed marine park's current design in collaboration with the local Christmas and Cocos (Keeling) Island communities. The current designs demonstrate world's best practice in marine protection and will help Australia's marine reserve network: build resilience in the face of climate change; protect pelagic and migratory species; and protect underrepresented habitats in the Indian Ocean.
- We encourage ongoing scientific research involving (or coordinated with) the local communities, including the development of a bioregional assessment of the natural values of the region to inform future management.

4. SOCIO-ECONOMIC BENEFITS OF THE PROPOSED LARGE SANCTUARIES

4.1. Supporting sustainable global fisheries

THE PROPOSED LARGE IOT MARINE NATIONAL PARKS WILL HELP SUSTAIN PRODUCTIVE COMMERCIAL, RECREATIONAL AND SUBSISTENCE/COMMUNITY FISHERIES.

Sanctuary protection of IOT waters from fishing will help sustain fisheries in other areas by acting as replenishment zones. They can benefit recreational, commercial, and subsistence/community fishers by protecting sites important for critical life stages (such as nursery sites), critical functions (such as feeding and spawning sites) and dispersal (dispersion centres for larvae and new recruits), things that usually go beyond the mandate of fishery management plans [95]. Marine national park protection can also provide refuge for vulnerable species, and prevent critical habitats from damage [25], which in turn feed the surrounding waters with more, and bigger fish. A review of studies of 124 marine reserves found that fish biomass is on average 6.7 times greater in marine national park zones than in unprotected areas, and 3.4 times greater than in partially protected marine parks [48]. Similarly, a study of reserves on Australia's south coast region found that sanctuaries were of great benefit to biodiversity, whereas partial protection provided few to no biodiversity benefits over unprotected areas [96]. Bigger fish produce disproportionately more eggs than smaller fish. As a result, 1 hectare of marine national park area produces the offspring equivalent to 3–225 hectares of unprotected ocean [97].

Studies from the two largest MPAs have shown the longlining fishing fleets catch-per-unit-effort (CPUE) are higher since the implementation of the MPAs, and that there was little, if any, negative impacts on the fishing industry – waters which were actively fished prior to the marine park expansion [98]. This is aligned with other studies which have found marine sanctuary areas do not diminish the CPUE of fisheries [99–102].

Fishery benefits, including CPUE, will likely be realised by the local communities from spillover of fish stock into coastal waters. Spill over is the movement of marine species from the sanctuary zone to fishing areas, benefitting the local fisheries with increased biomass of target species [103].

THE PROPOSED LARGE IOT MARINE NATIONAL PARKS WILL HELP CONSERVE SOUTHERN BLUEFIN TUNA & YELLOWFIN TUNA.

The waters surrounding Christmas Island form part of the only known spawning ground of the southern bluefin tuna, a species that is globally overfished, and listed as critically endangered [54]. The large proposed marine national park may therefore prove pivotal to the species' persistence by preventing exploitation of important spawning aggregations [59,104]. Even for a highly migratory fish such as tuna, as much as half of the tuna population in a large protected area may not leave it, thereby providing enhanced protection for a significant proportion of the population [105].

The region is also a key fishing location for yellowfin tuna. The Western Australian catch limit shows the fishing mortality as subject to overfishing in Australian waters. The Indian Ocean Tuna commission Report shows the fishery is overfished and subject to overfishing, with catches increasing 11.7% since 2016, despite implementing a rebuilding plan [106]. Yellowfin tuna are fished

by multiple nations in the Indian ocean, with 427,240 MT of yellowfin tuna caught in the Indian Ocean in 2019, with 70,000 MT of this by the EU alone [106]. These levels of fishing have reduced spawning biomass stock to 30% of the unfished levels [106]. The proposed marine parks will play a critical role in the protection and replenishment of the yellowfin tuna stock, acting as a refuge in an exploited ocean.

RECOMMENDATION

- We strongly recommend that the Australian Government proceed with establishing the proposed marine parks in collaboration with the local Christmas and Cocos (Keeling) Islands communities, enhancing protection for the only known spawning ground of the southern bluefin tuna and helping to rebuild other fishery stocks while providing benefits to the local community fisheries.

4.2. Achieving cost-effective conservation

THE PROPOSED LARGE IOT MARINE NATIONAL PARKS WILL BE HIGHLY COST EFFECTIVE.

Large marine national park zones are not only much more effective for conservation than smaller sanctuaries and partially protected areas, but they are less costly to manage. Economies of scale mean that large sanctuaries also cost far less per unit area to manage than smaller ones [107–111]. The proposed design of the IOT marine parks will be much easier and less expensive to enforce than a mixed-zone marine park. Enforcement is often the most expensive aspect of management, particularly in remote areas like Christmas and Cocos (Keeling) Islands [107,108], but also crucial for marine park success [112]. In large marine national park zones, there is no reason for fishing vessels to be present, making the proposed zoning lead to greater compliance. This is because the majority of illegal fishing in sanctuary zones occurs along the zone boundary, with one clear boundary in line with Australia's EEZ, the boundaries are very clear.

Enforcement will likely be easier and more cost effective because of the large sanctuary zone, allowing for greater reliance on technology (e.g., drone, radar, and satellite observation) [113]. The marine parks can have increased reliance on pre-existing monitoring mechanisms like global fishing watch (<http://globalfishingwatch.org>), to monitor in near real time satellite movements of fishing ships.

4.3. Achieving a positive benefit: cost ratio

THE PROPOSED IOT MARINE PARKS WILL NOT NEGATIVELY IMPACT AUSTRALIAN INDUSTRIES.

The proposed marine parks will have no current impact on Australian commercial fisheries. There are three fisheries that currently have IOT offshore waters: The Western Tuna and Billfish Fishery (using longlines), the Southern Bluefin Tuna Fishery and the Western Skipjack Fishery (both using purse seine nets).

None of these fisheries have been active in IOT offshore waters since 2013, and there was very little fishing prior to this, with no recorded commercial fishing from 2007-2013 [1]. The area is too far from the Australian mainland and accessible ports, Australian fishing vessels are too small, and labour and fuel costs are too high for a viable commercial fishing industry here. Considering there

are no commercial fish processing facilities on the islands, the limitations of air transport from the islands, and Commonwealth legislation prohibiting large freezer-factory vessels, paired with global declines in catches [114]. Australian commercial fishing in the area is unviable and unsustainable.

There is no existing gas or oil production or mining in IOT waters, meaning the proposed zoning plan has no projected negative economic impacts for either industry. The proposed marine park will provide ongoing protection of the seabed and waters from these destructive practices.

THE PROPOSED IOT MARINE PARKS MAY BENEFIT THE SOUTHERN BLUEFIN TUNA FISHERY.

The marine parks proposal is arguably Australia's best opportunity for a large marine park with large sanctuary areas that causes little to no negative impact on fisheries while providing significant conservation benefits. Considering the area has not been fished commercially for 8 years, there is little risk of displacement or economic impacts for Australia's fisheries in an area that is warranting world class protection.

Protecting a large part of the only known spawning area for the southern bluefin tuna species (Figure 8) in the proposed Christmas Island marine national park will ensure these waters are maintained into the future as a refuge for the critically endangered species, thus contributing to its recovery. By protecting spawning tuna, reducing the risks of illegal fishing (if well managed), forestalling future fishing pressure, and improving the connectivity of Australia's marine parks network, the proposed marine national park can contribute to the sustainability of Australia's tuna fishing industry.

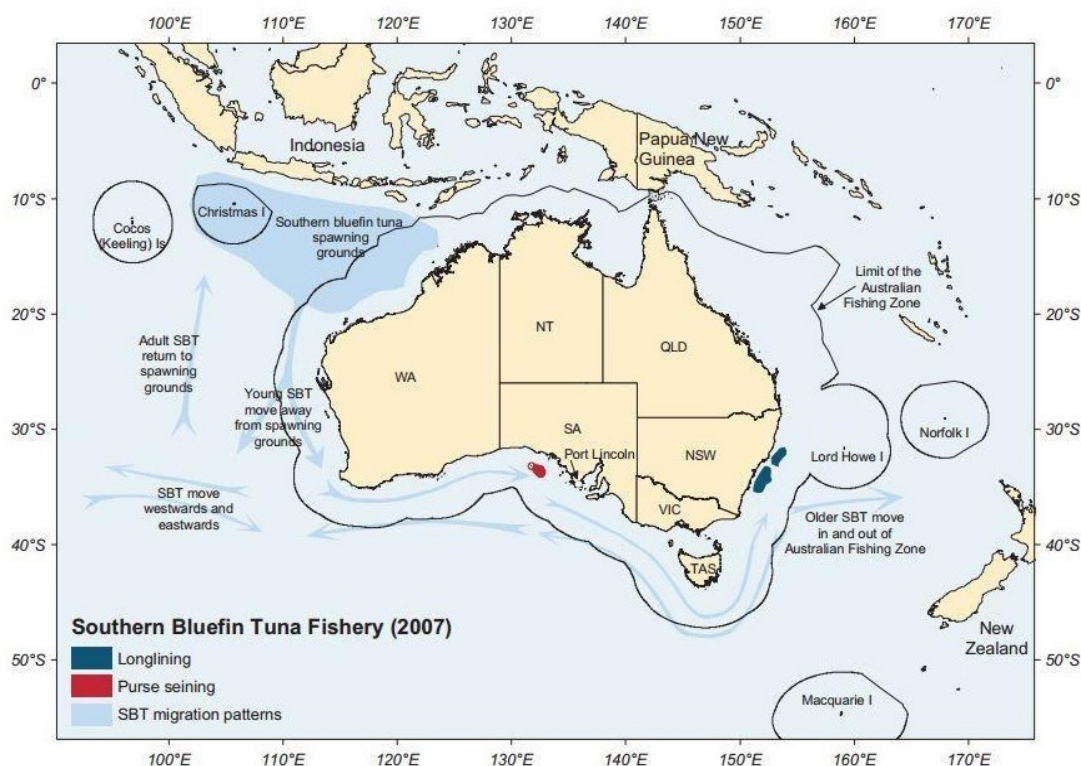
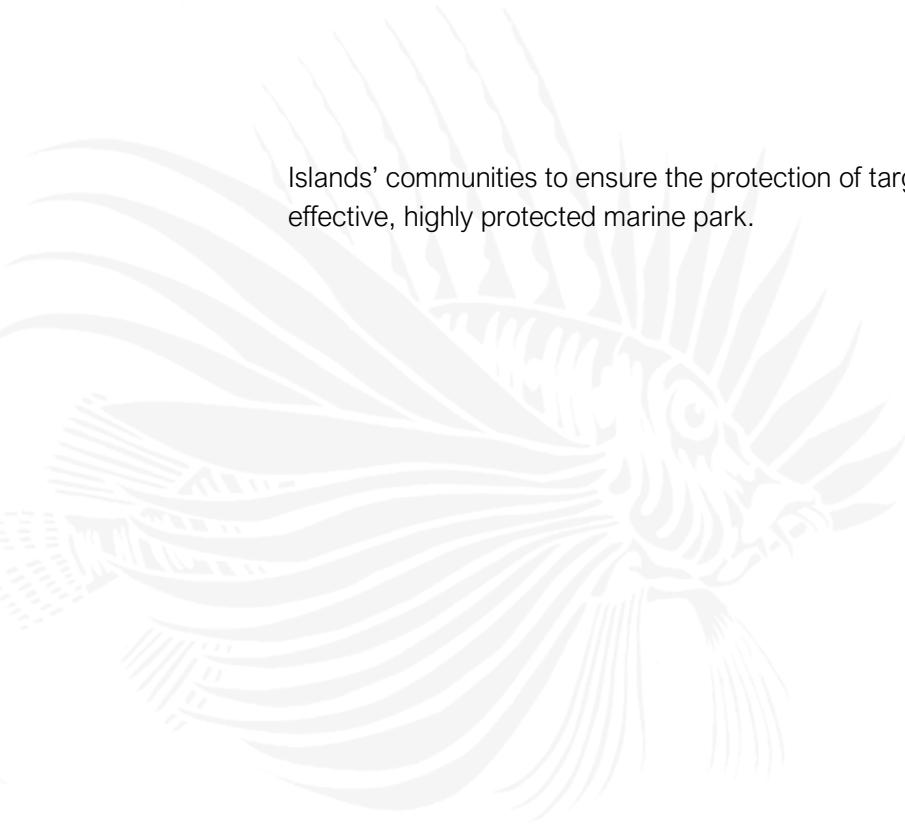


Figure 8. Southern Bluefin spawning grounds and main fishing areas in 2007. Source: AFMA

RECOMMENDATIONS

- We strongly recommend that the Australian Government proceed with establishing the proposed marine parks in collaboration with the local Christmas and Cocos (Keeling)

Islands' communities to ensure the protection of target fishery species, while creating a cost-effective, highly protected marine park.



5. CONCLUDING REMARKS

The Proclamation Proposal for the establishment of marine parks in Australia's Indian Ocean Territories (IOT) – the Christmas Island and Cocos (Keeling) Islands, co-designed with the residents of Christmas and Cocos (Keeling) Islands and in consultation with other stakeholders is a display of best practice marine park design, and a significant contribution to global marine conservation and the conservation of Australia's marine estate. The proposed marine parks will help safeguard one of the most unique and threatened marine regions in Australia. The marine parks will be some of Australia's premier marine parks for their large marine national park coverage protecting key pelagic habitats and species, and critically endangered species, and are of global conservation importance.

The proposed habitat protection zones in the near-shore waters will support access to important local fishing areas, allowing for continued community and small-scale fishing in the area, safeguarding the residents' culture and community fishing practices. The marine parks will likely have no negative impact on the existing commercial fishing operations for Australia and instead safeguard a key spawning ground for critically endangered southern bluefin tuna, but provide important spill-over into the coastal waters, further benefiting the local communities on the Islands.

The Centre for Conservation Geography commends the Commonwealth Government on the marine park design process and the proposed design, with large marine national park zoning. We hope this submission includes compelling evidence in support of the designs and our recommendations can be considered in the next phases of the marine park planning and implementation process.

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