

Chapter 3—Advice from the Expert Scientific Panel

Introduction

Many stakeholders in the consultations and through submissions identified new information or a need to reconsider previous assessments and information that had underpinned the zoning of the proclaimed estate. Where these issues fell within the terms of reference of the ESP, they were referred by the BAP for advice. These referrals are summarised in Table 3.1.

Table 3.1 Matters referred for ESP consideration and advice

BAP advice request to the ESP	CMR and/or network to which the request related	Relevant ESP report chapter
Evaluate the process used to determine fishing gear risk for CMRs	Estate wide	ESP 2.3.5
Review the FGRA rating for demersal auto-longline gear, specifically in relation to operations in the Coral Sea CMR and the Central Eastern CMR	Central Eastern CMR Coral Sea CMR	ESP 3.1.1
Review the FGRA rating for the NPF, specifically in relation to the Gulf of Carpentaria CMR	Gulf of Carpentaria CMR North CMR Network	ESP 3.1.2
Review the FGRA for the former Northern Territory (NT) Finfish Trawl Fishery (now amalgamated into the NT Demersal Fishery), specifically in relation to the Oceanic Shoals and Arafura CMRs	Oceanic Shoals CMR Arafura CMR	ESP 3.1.3
Review the FGRA rating for Western Australian trawl fisheries, specifically demersal scallop trawl in the Bremer and Geographe CMRs	Bremer CMR Geographe CMR	ESP 3.1.4
Recreational fishing in relation to CMRs	Estate wide	ESP 3.2
Assess how different CMR zone types contribute to achieving conservation objectives and the potential merits of split zoning over coral reefs in the Coral Sea	Estate wide	ESP 3.3
Assess the value of specific marine features, systems and processes, including: <ul style="list-style-type: none"> • connectivity • the pelagic system • the continental shelf and slope • canyons and seamounts 	Estate wide	ESP 3.4
What new information is there on the conservation values of the: <ul style="list-style-type: none"> • Coral Sea CMR • Geographe CMR • Bremer CMR • Perth Canyon CMR • Oceanic Shoals CMR 	Coral Sea CMR Geographe CMR Bremer CMR Perth Canyon CMR Oceanic Shoals CMR	ESP 3.5

The ESP findings on the referred matters are summarised below and should be read in the

context of the full ESP report.

3.1 FISHING GEAR RISK ASSESSMENTS

Overall

- The ESP concluded that findings of the FGRAs were well founded in the context of the information available at the time they were conducted. However, the ESP found that a significant amount of research has since been published that is relevant to the assessment of the risk to biodiversity and ecosystems from commercial fishing operations.

Demersal auto-longline in Central Eastern and Coral Sea Commonwealth marine reserves

- Recent management arrangements implemented by the Australian Fisheries Management Authority (AFMA), particularly those relating to spatial closures, together with use of tori lines and industry codes of practice designed to improve the survival of bycatch, have significantly mitigated the threat of demersal longline fishing to vulnerable chondrichthyans and seabirds in the Central Eastern CMR. In addition, current fishery closures limit demersal longline fishing on most of the seamounts in this reserve.
- Information on the impact of the auto-longline sector of the Coral Sea Fishery in relation to target species, bycatch species and habitat is poor, but closer monitoring of logbooks and placement of observers has been recommended.
- The impact of demersal longline fishing on deepwater habitats such as those found in the Central Eastern and Coral Sea CMRs remains uncertain, as to date no research has specifically assessed this risk.
- In some circumstances and under appropriate management arrangements, demersal longline may be a more sustainable method relative to trawl for deepwater fisheries off the continental slope and on seamounts. However, this will depend largely on the habitat characteristics of the area fished and the intensity of fishing.
- Spatial closures appear to offer the best protection where catch rates of non-target species are high.
- Until such time that these relationships can be properly understood, a precautionary approach to deepwater fishing should be maintained. For this reason, demersal longline fishing (including auto-longlines) should remain a method that is incompatible with the conservation values of the Central Eastern and Coral Sea CMRs, particularly those relating to seamounts.

Northern Prawn Fishery and Gulf of Carpentaria Commonwealth Marine Reserve

- Recent research and better identification of the conservation values suggest that the NPF operations (demersal trawling) may not impact as significantly on the benthic environment in the Gulf of Carpentaria CMR as previously thought, particularly as operations avoid ecologically important habitats such as sponge gardens and reefs, which are located in what is considered untrawlable ground and which are protected within fishery spatial closures.
- More recent evaluations of the risks to elasmobranchs suggest that none were at risk from trawling because of widespread distributions and/or low overlaps with the fishery.
- It is highly likely that a similar situation may apply to other areas of the North and North-west, such as the Wessels CMR and the Joseph Bonaparte Gulf CMR.

However, consideration must be given to ensuring that sufficient areas are protected from the impacts of trawl, especially where there is an absence of MNPZs.

Northern Territory Demersal Fishery and Oceanic Shoals and Arafura Commonwealth marine reserves

- Recent research, an improved understanding of the habitat, a better identification of the conservation values of the area and improvements in gear type and management suggest that Demersal and Developmental Fishery operations (semi-demersal trawling) may not impact as significantly on the benthic environment as previously thought.
- More recent evaluations of the risks to elasmobranchs suggest that none were at risk because of widespread distributions and/or low overlaps with the fishery. A national recovery plan is being developed to address threats to these species.
- It is highly likely that a similar situation may apply to other areas of the North and North-west CMRs. However, consideration must be given to ensuring that sufficient areas are protected from the impacts of trawl, especially where there is an absence of MNPZs.

Demersal scallop trawl

- The South-west FGRA for demersal/bottom trawling, which had been transferred from the South-east FGRA, was not applicable to demersal scallop trawling in Western Australia (WA).
- For this reason, the fishing risk was assessed against ecologically sustainable development reporting conducted by the WA Department of Fisheries. It concluded that demersal scallop trawl was incompatible with the conservation objectives of CMRs, based primarily on the lack of information on the impact of these fisheries on small shark species.
- More recent research on the impact of scallop trawling on soft substrates in WA in both the South West Trawl Managed Fishery and the South Coast Trawl Fishery, together with state Ecologically Sustainable Development Assessments, suggest that the habitat impacts are both localised and minor. Similarly, current ecologically sustainable development reporting suggests that impacts on bycatch and threatened, endangered and protected species is low.
- This suggests that scallop trawl fisheries operating on soft sediment substrates in the Bremer and Geographe CMRs should be considered as being 'Compatible' with respect to the conservation values of these areas.
- These findings may be applicable to all scallop trawl operations in WA; however, care should be exercised when transferring risk assessments between areas of similar geomorphology but inherently different biodiversity assemblages.

3.2 RECREATIONAL FISHING

Recreational fishing surveys

- Previous national recreational fishing surveys provided substantial information on recreational fishing catches, but this information is dated, although individual jurisdictions continue to conduct surveys. The ESP notes that the spatial scope of these surveys is not directly applicable to Commonwealth waters or specific to CMR zones.

Comparisons and interactions with commercial catches

- Recreational catches of fish can be significant components of total catches of fish, often of the same order of magnitude and sometimes exceeding commercial fishing on the same species. At the spatial level of CMR, and for specialised fishing, such as for pelagic fish, research and monitoring is needed to quantify recreational catch and effort. The ESP notes that recently-developed novel methods may show promise in this regard.

Effects of recreational fishing on biodiversity

- While recreational fishing can have significant impacts on target species of fish, these impacts and the possible indirect effects of recreational fishing on biodiversity are not well understood or quantified, especially in Commonwealth waters. Risks to biodiversity need to be better understood.

Relative risks of recreational fishing

- There is good evidence that line fishing does have impacts, if not always on numbers of fish then on biomass per unit area of targeted relatively sedentary species. It is important to note, though, that these studies have been primarily conducted on reef habitats and, with respect to effects of recreational fishing per se, are often confounded by the additional impact of commercial line fishing on the same areas that are open to fishing. There is a good case for investment in specific experiments on effects of solely recreational fishing on fished versus no-take areas, including on non-sedentary species.

Catch-and-release fishing

- The ESP notes that post-release survival for some pelagic species may be high. However, for others, especially reef-associated species which are subject to barotrauma, survival may be considerably reduced, especially when caught from deep water. The prospect of post-release mortality and the unknown impact of capture on the physiology of survivors makes this form of fishing incompatible with MNPZ protection. It is likely that post-release survival of most species can be further enhanced by encouraging experimentally-determined gear and handling techniques.
- The voluntary practice of catch-and-release and the willingness of the recreational sector to assist research is a good basis for future beneficial citizen science studies. The ESP believes that investment in the monitoring of the levels of catch and release by recreational fishers in key regions of the CMR estate, especially in remote areas, and further engagement of recreational fishers in regulated and supervised citizen science activities will be an important component of CMR management into the future.

Effects of recreational fishing on pelagic fish

- While recreational fishing for pelagic species at low levels of effort would be unlikely to impact on the populations of these species, especially for catch-and-release fishing, the limited studies on catch and effort suggest reserve managers should adopt a cautious approach to recreational fishing for pelagic species until better data is available and there is an improved understanding of impacts on populations, particularly of targeted species.

Consume-on-site provisions

- Consume-on-site provisions for recreational fishing in some areas, especially remote reefs, have the potential to minimise impacts while allowing limited fishing to occur in such areas. Controlled experiments could be conducted on effects and

practicality of consume-on-site arrangements (if implemented) on pairs of more remote reefs within the CMR estate.

3.3 MARINE RESERVE ZONING AND THE UNDERPINNING SCIENCE

Marine National Park Zone (International Union for Conservation of Nature Protected Area Category II)

- The ESP recognises the significant body of scientific literature that demonstrates the effectiveness of MNPZs (no-take zones) in achieving conservation outcomes and for their role as scientific reference areas. The ESP notes the emerging consensus that, to attain and preserve natural condition, no-take, size, configuration, enforcement and length of time the area has been protected all need to be considered.
- The ESP considers that, because MNPZs are important scientific reference sites for monitoring change within and outside reserves, each reserve should include at least one MNPZ and that a significant sample of each primary conservation feature and each provincial bioregion be included in at least one MNPZ of an appropriate configuration and size to meet conservation objectives.
- The ESP also recognises the relative paucity of research on offshore MNPZs, including most of the Australian estate, and proposes future research to test the applicability of patterns emerging from shallow water no-take zones to their offshore equivalents.

Habitat Protection Zone (International Union for Conservation of Nature Protected Area Category IV)

- The ESP recognises the value of HPZs to protect habitat, biological diversity and associated ecosystem services and structure. Areas of high conservation value should be captured in HPZs across the CMR estate, where socio-economic factors prevent designation as a MNPZ. Allowed uses in HPZs must be compatible with the conservation of biodiversity and maintenance of the integrity of ecological processes.
- The ESP considers that there is a high conservation benefit from zoning areas as HPZs to protect benthic and demersal habitats by excluding damaging activities while allowing activities such as regulated fishing in the water column, including take of pelagic species that do not compromise conservation values and management objectives for these areas.
- The ESP notes the general paucity of studies on the value and effectiveness of Marine Protected Area zoning that protect specific habitats and that many studies that have been undertaken were not in Australia. This indicates a need for scientific study on the efficacy and benefits of HPZs and comparisons with MNPZs, MUZs and controls outside of CMRs. Investments in research and monitoring on this issue should be a priority in the future.

Multiple Use Zone (International Union for Conservation of Nature Protected Area Category VI)

- While the strongest biodiversity and conservation benefits are delivered by excluding extractive activities from marine reserves, less restrictive management regimes can also deliver biodiversity benefits. The inclusion of some extractive activities in MUZs can be compatible with biodiversity conservation as long as the intensity, extent and impact of the activities are known and well managed.
- MUZs should be used in conjunction with other regulatory controls, such as permits, quotas, bag limits and anchoring and fishing gear restrictions, for

managing social, economic and recreational activities where conservation objectives are not compromised by the inclusion of these activities.

Split zoning over coral reefs in the Coral Sea

- The ESP recognises the integrity of coral reefs, which are structurally and ecologically complex ecosystems with a high degree of dependency between habitat forming and associated species. Given this complexity, different management regimes across reef systems should not be applied across small reefs (less than 20 km across).
- Splitting reef systems into more than one zone type should only be considered on reef systems that are large enough to ensure that:
 - (i) each zone covers a sufficient area to deliver conservation outcomes
 - (ii) the allowable activities undertaken in one zone are not of a type, scale or intensity to impact on adjacent zones
 - (iii) one zone type is a MNPZ.
- Individual reefs often form part of larger reef systems which may offer a better opportunity to manage different areas for different objectives if biodiversity objectives are not compromised. The impacts of allowable activities in one zone need to be well managed and monitored to ensure that their impacts do not compromise the management objectives of other zones, particularly MNPZs.
- Split zones and paired sites offer an opportunity to study the effectiveness of different management approaches and can provide useful information to inform and improve future reserve management.

3.4 VALUES OF SPECIFIC MARINE FEATURES, SYSTEMS AND PROCESSES

Connectivity

- Connectivity is integral to the functioning of marine ecosystems. Recent studies illustrate the complexity and dynamics of dispersal processes and the need for further research. However, scientific understanding of connectivity in marine systems is steadily improving. The movements of species during one or more of their life stages are complex and not yet well described for the vast majority of species, especially in CMRs. Computer modelling of ocean currents and oceanographic processes is increasingly being used to improve understanding and facilitate better predictions of how marine species are connected, reproduce, disperse, forage and migrate.
- The identification of sink or source areas for recruitment can support reserve design and known patterns of connectivity should be included in conservation planning.
- Further research into connectivity will benefit future improvements of the CMR network. Future research will also need to address how connectivity might be affected by changing current strengths and other effects of global warming.

Pelagic ecosystems

- Our knowledge of pelagic ecosystems is in its infancy relative to benthic and coastal realms, especially in relation to offshore regions. Clearly there are many geographic gaps. Added to this is the uncertainty associated with broader environmental shifts associated with climate change.
- Despite this, much is known about the oceanographic processes in pelagic ecosystems around Australia and it is clear that they play an important role in

connectivity (migration and dispersal of marine species) and trophic dynamics, not just in the water column but in terms of benthic–pelagic coupling across the marine environment.

- For these reasons, pelagic ecosystems need to be adequately represented and protected through the network of Commonwealth marine reserves.
- However, the ESP recognised that pelagic ecosystems are dynamic and there are challenges for the design and location of pelagic reserves. To be effective in contributing to the conservation of pelagic and associated species and the ecological processes on which they depend, CMR design and management must recognise this dynamism and the importance of complementary measures taken in the management of surrounding waters.

Continental shelf and slope

- Species assemblages vary with latitude, depth and substrate type. Across the range of organisms studied so far, some species appear to be widely distributed, while others appear to have very limited distributions. While knowledge and understanding of patterns of biodiversity distribution have improved and will continue to improve with further sampling of less studied parts of Australia's ocean environment, the evidence so far supports the general approach adopted in the design and planning of the CMRs, which is to include representative samples of all depth ranges in regional networks that include a wide range of seafloor features and substrates.

Canyons and seamounts

- Submarine canyons and seamounts are major geomorphic features that hold significant implications for distribution, abundance, dispersal and persistence of a wide variety of marine organisms. While some areas have been well studied, there remain big gaps in the knowledge and understanding of oceanographic dynamics, drivers of productivity and the role played by canyons and seamounts in the structuring and functioning of marine ecosystems and as potential refugia in a climate-driven, changing environment.
- Given the role and significance of seamounts and canyons in the functioning of deep sea, continental shelf and pelagic ecosystems and growing concern about the impacts of human activities, it would be prudent to protect representative samples of both and to support further studies that improve understanding and effective conservation of these features and the management of sustainable uses.

3.5 SCIENCE ON SPECIFIC COMMONWEALTH MARINE RESERVES AND UPDATED CONSERVATION VALUES

Coral Sea Commonwealth Marine Reserve

- The coral reefs in the Coral Sea CMR have been shown to be distinctive at the species and functional group level in southern, central and northern parts of the reserve. The Coral Sea is shown to be a significant biodiversity hotspot for reef-associated sharks and is an important area for pelagic resources such as tuna and marlin. All six species of turtle are found in the Coral Sea and it is also a significant area for breeding seabirds. The Coral Sea CMR is also significant in that it is one of few remaining areas globally that has not been significantly impacted by human activities.
- The diversity of the Coral Sea reefs warrants a higher level of protection, especially in the southern region. Because they are relatively un-impacted by human activity,

the reefs, pelagic and demersal biodiversity of the Coral Sea form an important baseline reference area and an adequate representation should be contained in highly protected, no-take reserves.

Geographe Commonwealth Marine Reserve

- New information about Geographe CMR confirms that it contains important habitat and reveals that its seagrass beds extend further and deeper than previously thought. Protection of these extensive and potentially important seagrass beds extents should be maintained or improved.

Bremer Commonwealth Marine Reserve

- The Bremer Canyon is a biodiversity hotspot, especially in terms of aggregations of megafauna, and is worthy of protection that enhances eco-tourism in the area.
- Further research that measures larval transport from the area may be warranted.

Perth Canyon Commonwealth Marine Reserve

- New information supports the understanding that the Perth Canyon is an area of biological significance, driven by localised upwelling around canyon heads that drives productivity and the associated feeding aggregations of an array of species, from whales and seabirds to pelagic predators such as tuna and marlin.

Oceanic Shoals Commonwealth Marine Reserve

- The carbonate banks and terraces of both the Sahul Shelf and Van Diemen Rise are associated with high biodiversity and feeding aggregations. A higher level of protection could be provided for a representative sample of these KEFs.
- The survey sites established by the Marine Biodiversity Hub (MBH) study of the Oceanic Shoals CMR warrant protection as scientific reference sites that provide valuable baseline information for the reserve.