SUBMISSION NO. 6
Inquiry into the Role of Science for Fisheries and Aquaculture

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Summary

The effectiveness of Australia's science and analytical capability to sustainably manage Australia's fisheries and aquaculture is constrained by the lack of strategic assessment of, and government policies for, the future security of Australia's seafood supply, not by the lack of scientific capability. Australian governments have allowed distortion of the assessments of the well-being of the country's fisheries and exaggeration of the impacts of fishing to mislead public perception. A multi-million dollar campaign by numerous NGOs has fostered this misrepresentation. NGOs and even academics and some government agencies are benefiting.

Governments have taken electoral advantage in the distortion of the perception by appearing to be 'green' by imposing restrictions on fishing that are not supported by the available science of either conservation or food security. In fact, recent government actions are at the expense of the provision of cost-effective protection of marine environments and the fisheries they support. The failure to champion seafood security, to subject claims of threats from fishing to suitably rigorous scientific evaluation and to critically assess other threats and how best to conserve marine environments, is shameful.

The Terms of Reference for this Inquiry are addressed in turn:

- **the relationship between scientific knowledge of fish species, ecosystems, biodiversity and fish stock sustainability;**

  Much will be said about the complexities in this relationship but pragmatic evaluation confirms that there is adequate knowledge and scientific process already existing in Australia to enable the management of the sustainability of Australia's fish stocks. Contrary to the misconception being marketed by many NGOs, seafood 'certification' schemes and even numerous academics, Australia's fish stocks are virtually all well managed to ensure their sustainability. What negative impacts of wild-capture fisheries (normal commercial and recreational fishing) do occur are relatively minor and readily corrected if identified and addressed even moderately conscientiously by the responsible government fisheries management agency. The few problems that remain with excessive impacts of fishing are more the result of governments not managing specific problems that are known, rather than a lack of scientific knowledge. In fact Australia has many more fish stocks that are significantly underexploited (with growing negative social and economic consequences, discussed below) than it has stocks that are seriously overexploited.

Unfortunately though, Australian governments have allowed themselves to be completely misdirected in their interpretation of how Australia should respond to the "exceptional pressure (that) is being

placed on global fish stocks" (press release for this Inquiry, 29 March 2012). The 'exceptional pressures' that are being placed on Australian fish stocks are not from fishing and they are not being well managed.

Exceptional pressure from fishing is being placed on some fish stocks around the world, particularly where these stocks are shared between countries where agreement is elusive, such as in the Mediterranean, or where population pressures are extreme and alternative food sources are limited, such as in some developing countries, particularly in Asia. In most countries that have stable governments and national control of fishing, fish stocks are actually stable or improving (Hilborn and Kearney, 2012, Worm et al., 2009). Australia is an island and governments have absolute control of virtually all our fish stocks and fishing practices. Tunas are the notable exception; many tuna stocks are shared and while most of them in Australian waters remain way above the level that will produce maximum sustainable yields (they are greatly underexploited) southern bluefin tuna (SBT) has, because of the difficulty in getting binding international agreement, been reduced to less than 10% of the unfished biomass. Even SBT is reported to be recovering as a result of recent management efforts.

Australia realised in the 1990s that there were problems with numerous fisheries and even some fishing practices but these have almost all been addressed; destructive fishing practices are illegal and the great majority of stocks that had been overfished have recovered or are recovering. Where problems are identified for individual fisheries there is no excuse for the responsible government not correcting them with traditional fisheries management techniques, primarily effort and catch controls.

While fisheries researchers, managers and governments that have implemented the necessary management measures deserve commendation for recent achievements in fisheries outcomes another prominent reason for this success must be acknowledged; in any area where control is vested in a single government, fisheries management, including the conservation of biodiversity and protection of ecosystems from the effects of fishing, is fundamentally easy. Marine environments are extraordinarily resilient to controlled harvest; in spite of inadequate fisheries management in many countries there has never been a species of marine fish documented to have been fished to extinction anywhere in the world. Even when stocks have suffered from serious over-harvesting they have been proven to recover extremely quickly when fishing effort is reduced (Hilborn and Kearney, 2012). The essential ingredient is a commitment from governments not to allow destructive fishing practices or continued grossly excessive fishing effort. Destructive fishing practices are illegal in Australia and traditional fisheries management techniques, primarily based on controls on fishing effort and catch, when applied with conviction and even moderate skill, are remarkably effective and efficient for ensuring the sustainability of fish stocks and protecting biodiversity.

Australia's capture fisheries that are adequately managed, as they must be to meet the country's commitments to Ecologically Sustainable Development (ESD), are actually an incredibly sustainable source of animal protein, particularly when compared to other forms of food production (Hilborn and Kearney, 2012). In a country such as Australia that imports the bulk of its seafood it is environmentally and socially irresponsible not to optimally exploit fish stocks. Wise use and conservation of these resources will require the amount and type of fishing to be extremely close to

that which will produce the maximum sustainable yield; any less will mean that more pressure will be placed on less environmentally sustainable sources of food, including fish stocks in other parts of the world.

Australia has one dominant problem with its fisheries research and management; fisheries scientists, fisheries management agencies and the fishing industry have allowed public perception of fishing to become seriously besmirched. The responsible authorities do not counter the misinformation that continues to support the public perception that Australia's oceans are in peril from fishing and that as a result it is environmentally irresponsible to eat many species of fish. It is arguably dereliction of duty by Australia's fisheries management and research agencies to allow this incorrect perception to exist and to increasingly dominate attitudes of seafood consumers. It is simply bad business for the Australian seafood industries to allow this to continue.

Very few Australians are aware that Australia's fisheries are almost all completely sustainable and that well-managed fishing represents the most environmentally sustainable source of animal protein. Fishing is not one of the major threats to the sustainability of Australia's oceans. The failure of governments and the seafood industry to convince the public of this continues to allow government funds and marine management efforts to be misdirected. The anti-fishing campaign by numerous NGOs and academics has been so intense and well-funded that even many sectors of the fishing industry have accepted the rhetoric; their inability to counter assertions that are claimed to be scientific has taken its toll. The resulting public misconception remains the biggest single obstacle to the wise conservation and use of our oceans, including the sustainable development of the seafood industry in this country.

If some of Australia's fisheries are not sustainably managed to ESD standards, as they are all required to be by the many pieces of fisheries management and environmental legislation, then the relevant agencies, institutions and government ministers should be publicly held to account. Australian governments and industry continue to allow NGOs, including in the form of 'third party accreditation schemes' and 'seafood consumer guides', to completely dominate public perception of what Australian seafood is sustainable. In many cases this third party accreditation is actually encouraged by individual fisheries or companies to obtain a competitive advantage, even over other local fisheries, in the market place. Obtaining a competitive advantage is perfectly predictable behaviour in a capitalistic society such as Australia. Unfortunately, in Australia the broader impact of marketing only a few species as sustainable is to give the public the impression that only those few fisheries that have been able to afford third part certification are actually sustainable.

Third party accreditation is actually, rather perversely, giving the impression that the certification that Australian governments provide by accrediting Australian fisheries under the various state and Commonwealth fisheries and environmental management acts is not credible. In effect the claim that third-party accreditation of the sustainability of fisheries in Australia is necessary represents a public statement that Australia's fisheries research and management agencies and the environmental agencies that accredit fisheries through the Environmental Impact Assessment processes, the EPBC Act, or similar processes, are either not competent or they are not to be believed. Why do government agencies not comprehensively and effectively refute such claims, or even assertions? They are, after all, not true!

The gross exaggeration of the impacts of fishing in Australia has been used by NGOs, and a worrying number of academics, to distort public perception of the effects of fishing. Many of these same NGOs then 'accredit' selective fisheries, often employing the same academics, for considerable financial or other gains. The costs are high and they are normally met by individual fisheries and then passed on to consumers through product mark-up. However, the Western Australian Government has recently allocated $14.5millon for the third-party accreditation of that State's fisheries (Moore 2012). Western Australia has extremely good fisheries research and management; assessments in WA are based on some of the world's most reliable data and the people who do the Government assessments are internationally recognised. They would likely be more highly qualified and have more relevant experience than those that will do the 'third party' assessments.

The costs of re-assessing Western Australia's individual fisheries will be relatively low compared to those in many other areas of Australia. Furthermore, there are relatively few estuaries in Western Australia and as a result comparatively few separate fisheries compared to other states. The costs of certifying all of Western Australia's fisheries will be much less than comparable costs for each of the other states.

The initial costs of third party individual accreditation for each of Australia's many hundreds of fisheries will run to well over a hundred million dollars and possibly many times this. Accreditation is an ongoing process with some schemes requiring re-assessment, usually on a three year cycle. The financial rewards for the NGO campaign that has misled public perception of the sustainability of Australia's fisheries are obvious; many of the same NGOs and individuals are being paid in the accreditation process. Taxpayers and seafood consumers will pay for governments' collective failure to defend the credibility of their own agencies. The credibility of government agencies for protecting natural resources and public interests will be permanently tarnished. As will the credibility of individual fisheries scientists who work for any Australian government.

The whole process of 'independent accreditation' of fisheries in Australia will do little more than confirm current public perception that governments and their management agencies are not credible!

The percentage of Australia's fisheries for which there is a problem with sustainability is extremely small. Those that are not sustainable need to be identified and fixed. It is much more efficient and effective to highlight the problems with a small minority of fisheries and to fix them than it is to individually reassess the great majority and confirm government assessments that there was not a problem in the first place.

If there is to be cost-effective third party assessment it should be of the government process of assessment, not of the hundreds of individual fisheries in Australia. If government assessments are not to be believed then assess and fix the government assessment processes. It will be a great deal more cost-effective to obtain third party accreditation of the process of Australian government assessments to international standards (for example the FAO Sustainable Fishing standard) than it will be to re-accredit the hundreds of individual fisheries to the extremely variable standards provided by NGOs.

It is striking that there are already approximately 20 separate 'third party accreditation' schemes impacting seafood preferences in Australia, yet no essential qualifications or experience are required of those doing the many so called 'independent' assessments. There is no government standard of such assessments and no overarching legislation (such as the EPBC Act represents for all government fisheries assessments). If 'third party accreditation' of government fisheries assessments is necessary then so also is accreditation of assessments by the many so called 'independent' assessors. Not only have governments failed to defend their own assessments they have also failed to protect the public from opinions that are claimed to be from appropriately qualified 'independent' scientists, but are often actually from groups that have self-interest in misrepresenting the state of Australia's fisheries and then selling 'assessments'.

fishery management and biosecurity, including but not limited to:

(Introductory comment)

Australia's fisheries management is immensely more effective than our biosecurity management. Compelling evidence includes that not a single marine species has ever been recorded as having been fished to extinction in Australia, but by 2008 there were already 429 introduced species recorded in Australian marine waters (Hewitt and Campbell, 2010) and many more introduced pathogens. Many of these species and pathogens have already seriously impacted, or have the potential to impact, fish stocks and ecosystems. Because of hugely interconnected nature of marine environments most introductions will be impossible to eradicate.

The natural resilience of marine environments and the relative effectiveness of fisheries management when compared to Australia's terrestrial environments and land management are relevant to this Inquiry: not a single marine species has been recorded as extinct but 54 terrestrial species of vertebrates alone have already been eliminated and many more are seriously threatened (Dept. SEWPaC, 2009). The extreme (numerically infinite) contrast in the number of recorded extinctions between Australia's terrestrial and marine environments (54:0) provides testimony to the fundamental differences in the environments themselves, the biology of the component parts, the threats to them and the effectiveness of management efforts. Management measures that have been developed and accepted for terrestrial environments, such as area closures to most activities in the form of 'no-take' zones do not represent appropriate management in most marine environments.

Areas closed to fishing that is already well managed by traditional fisheries management will result in a net loss to fisheries production. The 'spillover' benefits claimed from areas that were devastated in other countries before some areas were closed to fishing are not relevant to Australia, in fact they are seriously misleading. In Australia the loss in fisheries production for at least relatively sedentary species from closing areas to all fishing will likely approximate the percentage of the area that is closed in 'no-take' zones; it may actually be more because the areas that have been closed are disproportionately the better fishing areas. (Detail on the perils of transposing terrestrial management principles, such as area closures, to marine areas can be provided to the Inquiry in the form of a scientific paper that is about to be submitted. A further paper (in final preparation) that describes why it is impossible to get a 'spillover' benefit in areas where fisheries are already well managed is also available).

o the calculation and monitoring of stock size, sustainable yield and bycatch, as well as related data collection

The available data and analytical capability are obviously less than ideal, particularly for some of the country's smaller and/or more complex fisheries, but the continuing improvement (more than 300% increase in the last six years) in the number of Commonwealth managed species assessed to be sustainably managed (not overfished) (Woodhams et al., 2011) provides compelling testimony to the utility of current information gathering processes and management performance. Extra, or more concentrated, efforts will undoubtedly be necessary in some fisheries or areas, but increasingly these extra fisheries are smaller ones in constrained areas. In the main these areas can be relatively easily identified from catch rate and composition data which indicate problems, or the lack of such data which confirms the absence of adequate information. Targeted surveys may be necessary in those fisheries/areas where significant secondary impacts may be suspected but are not yet documented.

Our fisheries resources and the ecosystems that support them are mostly being protected against the impacts of fishing, but not against the real risks to their long-term sustainability, such as pollution and introduced organisms. Much more information on, and subsequent assessment of, the impacts of these threats is urgently needed, as is management that effectively addresses them. Australia's data collection and management of the impacts on marine resources and environments is currently grossly distorted towards the effects of fishing and away from the real and irreversible threats.

o the effects of climate change, especially relating to species dispersion, stock levels and impacts on fishing communities

Climate change has been shaping marine environments and their contents for millions of years; it will continue to do so. Organisms will move if temperatures and oceanic conditions change. These movements will be far less constrained in the oceans than they will be on land where there are many physical barriers, man-made and natural. Anthropogenic impacts that change the rate of climate change are obviously undesirable, but the solution, or even appropriate response, does not lie in changing the fundamental approach to fisheries management. Problems need to be properly identified (not assumed) and then addressed at their source. What is necessary for fisheries management is to continue to respond to management needs specific for the ongoing regulation of each fishery. Recent research has shown that well managed fishing across the full range of habitat types and species is actually better for biodiversity conservation than is prevention of fishing in areas that are predetermined based on factors not related to how to address the threats to them. Most marine parks in Australia by design do not address threats to those areas or biodiversity more generally (see for example NSW 'Science Paper' as discussed in Kearney 2008 and SA ministerial correspondence (Caica, 2011)).

Climate change can be expected to impact fish stock dispersion and stock levels in many areas and these will impact individual fishing communities but not necessarily negatively, except for the impact associated with human aversion to change itself. The most easily predicted significant negative

impact on fisheries production will come in coastal or estuarine areas where barriers to ocean encroachment have been, or will be, built. In these areas the result of sea-level rises will be that fish nursery areas will be destroyed and replacement of these shallow nursery grounds by inundation of surrounding areas will not be possible.

Activities on land, including efforts to stop ocean inundation of low lying areas, will continue to have far more impact, directly and indirectly, on the sustainability of fisheries stocks and associated ecosystems than will well-managed fishing.

o pest and disease management and mitigation

As outlined above, introduced pests and diseases represent an immensely greater (numerically infinitely greater; 429:0, the ratio of introduced marine species compared to marine extinctions) threat to marine biodiversity and ecosystem services, than does fishing. The source of the bulk of introduced species is shipping (ballast water discharge and fouling on hulls) and the deliberate importation of live animals and plants for the aquarium industry. Continued expansion in global trade increases Australia's exposure. This is particularly magnified by the huge increase in shipping and the expansion in its origins associated with the current mining boom. The ever-increasing number of introduced organisms being detected (Hewitt and Campbell, 2010) demonstrates that mitigation measures are seriously deficient, and likely increasingly so.

o minimising risks to the natural environment and human health

The major risks to Australia's natural marine environment are pollution in its many forms, introduced and translocated organisms and inappropriate or inadequately managed coastal development. By impacting water-quality and pathogens in marine environments these are also potential threats to human health. These threats could be transmitted to seafood if contamination is not adequately controlled.

Fishing in Australia is not in itself threatening to human health, except to some individuals who fish. To these individuals, assuming they fish voluntarily, the risk is not morally unacceptable. Fishing does, however, provide considerable benefits to human life and health through the lifestyle and, increasingly acknowledged, health benefits of seafood. The NHMRC acknowledges the health advantages of eating seafood to the extent that it recommends that Australians eat 40% more seafood than they currently do (NHMRC, 2011). Accepting, as the NHMRC does, that seafood is necessary for human health, any loss of fisheries production, such as through inappropriate closure of areas to well-managed fishing, represents a threat to human health and general well-being.

o cooperation among Australian governments on the above;

The specific issues listed in the terms of reference for this inquiry are clearly not being adequately and cooperatively addressed by Australian governments. The bigger strategic issues, such as those related to where Australia's future supplies of seafood are to come from and why Australian governments are allowing distortion of public perception of the impacts of Australia's fisheries, are not being adequately addressed by any government.

While Australia has a very impressive record for controlling fisheries it has limited fisheries production; it imports more than 70% of the seafood it consumes. Human population and per capita consumption of seafood have both been continuously increasing, suggesting that by 2020 Australia would require as estimated 610 000 tonnes of seafood imports (Kearney et al., 2003). To meet the increase in individual consumption of 40% recommended by the NHMRC in 2012 without increasing its domestic fisheries production (a prospect for which there is no explicit policy from any government, let alone cooperative policies among Australian governments), Australia will need to import approximately 850 000 tonnes (more than five times the current national wild-fisheries production) of seafood per year by 2020. This objective is becoming increasingly-obviously impossible under current management strategies. Current Australian government actions in the marine realm are focused on further restriction of fishing, most prominently in so-called 'marine protected areas' which contrary to the claim by many NGOs, will very significantly decrease Australia's fisheries production and eliminate a great deal of future potential. This loss of potential is most obvious in the Coral Sea where current proposals to further restrict fishing will deprive Australia of a potential source of tuna equal to Australia's current total capture fisheries production.

In a 2009 estimation of adherence to the UN Code of Conduct for Responsible Fisheries, Australia ranked fourth out of the 53 countries surveyed, (Pitcher et al., 2009). Thus by continuing to import the bulk of its seafood from countries with inferior records for sustainable fisheries Australia is effectively exporting responsibility for the sustainable management of the world's fish stocks to countries with lesser ability or interest in doing so (Kearney and Farebrother, 2012). If we are to feed growing human populations in the most environmentally friendly manner the world cannot afford to not exploit fisheries sustainably at levels that approximate the maximum long-term surplus production (maximum sustainable yield, MSY). Well managed fishing has a far smaller environmental footprint than other forms of food production. More and more of the world's fisheries will need to be fully exploited but not over-fished.

research, development and applied science of aquaculture, including:

Australia currently has some world-leading research capability in aquaculture, particularly in the replacement of fish-meal and fish oil in fish foods and in closing the life cycle of new species. However, the production from aquaculture in Australia has stagnated, with only a few notable exceptions, particularly the culture of Atlantic salmon in Tasmania. The failure of aquaculture to develop further has not been due to the lack of quality biological or technical research; it is the result of market failure by the Australian aquaculture industry. For many reasons the costs associated with the aquaculture of most species of fin-fish in Australia result in product that cannot compete with imports, particularly from Asia. While factors such as comparative labour costs and more recently, exchange rates, are unquestionably major contributors the lack of policies which adequately encourage and support aquaculture in Australia is fundamental to the problem. In many states, for example NSW, local opposition to projects (the 'not in my back yard' syndrome) and exaggeration and inappropriate generalisation of the risks from aquaculture make it is extremely difficult to develop aquaculture in coastal areas. Examination of the relevant Commonwealth policies and legislation suggests that the Commonwealth does not even have the capability to approve aquaculture in Commonwealth waters, even if it wanted to.

Strategic assessment of where Australia's future seafood is to come from is an issue of national urgency. If aquaculture is to make a major contribution to Australia's future seafood supply, as indeed it must if Australia is to appropriately address its fundamental food and health security issues, then further definition of 'where' it is to come from must include identification of which areas in Australia are to be designated for aquaculture development. Of course the allocation of areas for aquaculture must be in the context of a total package of policies and legislation that address the broad issue of current market failure. These policies must include measures to actively encourage the development of aquaculture, as they must also encourage the development of new capture fisheries.

o transitioning from wild fisheries to aquaculture in individual species

It is not possible that there can be a transition for all species that are currently taken in wild fisheries to aquaculture. Nor would this be desirable even if possible. Many species are simply not suitable for aquaculture. Furthermore, wild fisheries, and the resulting consumption of seafood specialities in local areas, are heritage issues for many Australians. Aquaculture must not be seen as an alternative to local wild-fisheries for Australia's seafood future. Both forms of fisheries activities and subsequent seafood production have an essential role.

The pros and cons of both capture fisheries and aquaculture for each species and situation need to be evaluated in strategic assessments of how seafood security and the related social and heritage issues are to be assured. These assessments must include recognition that well-managed wild-fisheries represent the most environmentally sustainable source of food in Australia; harvesting only the surplus, sustainable production from the ocean with methods that do not irreversibly damage underlying ecosystems is environmentally benign; compared to other forms of food production it is extremely so. Unlike other forms of food production, such as agricultural cultivation, fishing does not commence by destroying native vegetation and culturing introduced or translocated species to the exclusion of native species. Fishing in Australia must, by law, not irreversibly damage the environment. No form of agricultural cultivation in Australia would be permitted if it was subjected to the same rigorous environmental controls that govern fishing. The various fisheries management acts all require that fishing must not irreversibly damage target or by-catch species or the habitats that support them. Marine wild-fisheries also produce the purest organic food; fishing uses virtually no herbicides, pesticides or antibiotics. Also of particular relevance to Australia, fishing uses extremely little fresh water.

Aquaculture can produce a wide range of products with varying environmental and sustainability credentials. The culture of filter-feeders, such as oysters and mussels, produces product which has environmental impacts that are usually largely limited to visual or navigational issues in localised waterways. 'Food-converting' aquaculture, where fish or other marine animals are fed and cultivated is more similar to agriculture. However, it is extremely significant that the food conversion efficiency of relatively sedentary fish species is much greater than terrestrial animals; all but the

most mobile fish such as tuna, have two characteristics that bestow a fundamental energy conversion advantage, they do not have to stand up and they do not have to maintain constant body temperature (tunas do keep their inner-body warm and they are constantly mobile). Well managed aquaculture has a much smaller environmental footprint than does most forms of meat production on land.

o improving sustainability and lifecycle management practices and outcomes

These are issues that must be continuously advanced. Progress can be relatively easily projected from current research capabilities once the bigger strategic issues of how and where aquaculture is to be developed to a scale that can be competitive with available imports are addressed.

o pest and disease management and mitigation;

These are essential, ongoing research and management issues that must be addressed for all natural ecosystems and all forms of food production. National coordination is necessary, but cost-effective measures will vary with the circumstance and type of aquaculture.

governance arrangements relating to fisheries and aquaculture, including the implications for sustainability and industry development;

The current 'exceptional pressures' on Australian fish stocks and coastal biodiversity are not caused by fishing; they are coming from pollution, introduced organisms and inappropriate coastal development. The reduction in Australia's capture fisheries production that is continuing is not due to declines in catches as a result of overfishing. Rather it is a result of three compounding factors; unbalanced and excessive restriction of fishing; an almost complete failure to develop new, sustainable fisheries throughout the Australian EEZ; and a decline in coastal fisheries production due to pollution, disease and inappropriate coastal developments.

Misrepresentation and transposition of problems with destructive fishing practices and overfishing in other countries with inadequate fisheries management has led to unjustified and misguided demonization of all forms of fishing in Australia by numerous international and local NGOs and inadequately informed scientists, predominantly academics or employees of 'conservation' agencies. The result has been serious misdirection of public perception, frequently to the benefit of organisations or individuals.

Australian governments have failed to expose the fallacy in the assertion that well-managed fishing is a threat to fish stocks and biodiversity generally. In fact Australia governments have sought electoral reward in nurturing the mis-conception that further restricting fishing is sound conservation. This is most obviously expressed in the declaration of multiple marine parks in which the primary management action is restriction of fishing. Current scientific assessment confirms that further restriction of fishing in areas that are already subject to sound and sustainable fisheries management cannot deliver the spillover benefits that are primary to much of the advocacy for marine parks by the anti-fishing lobby. Basic fisheries science, and even common logic, confirms that if fishing is already deliberately constrained to take a sustainable yield that is less than or equal to

the maximum surplus production, by environmentally benign methods, then closing some of the area that produces that yield will result in a decrease in fisheries production. For relatively sedentary species, this decrease will approach the percentage of the fishing area that is closed, or more than this if disproportionately good fishing areas are closed (because they contain some special feature, that is usually beneficial to fish). Closing the best fishing areas to all types of fishing, regardless of the impact of each type, has actually been a feature of the marine parks process in Australia.

Nor will closing well-managed areas to fishing result in the frequently claimed benefit from increased production of eggs and larvae in the closed areas. Unless fisheries are so heavily overexploited that there is a decline in recruitment to the fishery (recruitment overfished) the production of more eggs and larvae will not result in a benefit to total fisheries production. Extremely few fisheries are recruitment over-fished in Australia and these few are already subject to recovery plans, as they must be under existing fisheries legislation. Marine parks do not represent the most appropriate management action for the few remaining over-fished stocks Australia does have.

Australia's failure to take an holistic and strategic approach to the fundamental question, "where is Australia's fish for future generations to come from" is allowing advocacy for further restriction on fishing to derail pursuit of Australia's accepted primary principle for natural resource use and conservation, Ecologically Sustainable Development. Australians' guilt over the country's failure to manage terrestrial ecosystems and biodiversity has catalysed actions for controls in the marine environment that are more restrictive than those on land. Unfortunately this goal, which in itself is laudable, has been derailed by the assumption that management measures which are seen to work on land are appropriate for marine environments and can be transposed there. The closure of areas to human developments such as housing, industry and agriculture, that has been so visibly effective for terrestrial environments, will not provide adequate and appropriate protection in the marine realm. Non-material boundaries in the ocean (lines on water) do not provide protection against the real threats, such as pollution and introduced organisms. Area management in the form of MPAs is an extremely blunt, inefficient and usually inappropriate tool for either fisheries management or biodiversity conservation in marine environments where more targeted management is possible.

- ***current initiatives and responses to the above matters by state, territory and Australian governments;***

The lack of effective government policies and agreed strategies for future supply of seafood coupled with inadequate evaluation of the threats to marine ecosystems and how best to manage them, is allowing continued restrictions on fishing for short-term electoral gain and/or income and notoriety for influential lobby groups or academics. Australia has failed to adequately consider the long-term impacts of not addressing the real threats to marine environments and the exposure of Australians to increasing shortages of an essential food commodity.

The current proposal by the Commonwealth Government to close the Coral Sea to most forms of fishing is a pertinent example of the failure to include adequate assessment of strategic issues in marine conservation policies that impact fishing. Details of the problems with this proposal are provided in Attachment 1. In summary the Government's Coral Sea Proposal constitutes accommodation of unjustified calls by NGOs and some academics for closure of an extremely large area, almost a

million (989,842) km^2, to at least some forms of fishing and mining (Dept. SEWPaC, 2011). It is claimed by these interests that the objective is biodiversity conservation and not fisheries management, yet closing the area to fishing (fisheries management) is the principle action to be taken and no biodiversity has been identified to be seriously and irreversibly threatened by fishing. Even if some biodiversity was to be identified to be threatened closing the whole area to some forms of fishing or even significant parts of the area to all types of fishing will not represent cost-effective management or sound conservation. Fishing is not the major threat to biodiversity in the area. Nor does closing the area to mining constitute adequate protection against mining; as the Gulf of Mexico oil spill demonstrated pollution from mining is not constrained in marine environments by wishful boundaries.

The extreme concentration of the Coral Sea Proposal on description of what is in areas and the assumption that these areas should be closed to extraction, primarily fishing, is fundamental, but it is seriously flawed. It renders the proposal to be little more than a description of a process to close as much as possible of Australia's Coral Sea to as many types of fishing as possible. The Goals and Principles adopted in the Proposal are self-serving for the inclusion of more and larger areas in fishing closures at the expense of goals that relate to effective and efficient conservation (Attachment 1). The resulting area will then be proclaimed to be 'protected' without assessment of the provision of protection. Mitigation of actual threats to biodiversity has been actively avoided, and 'precaution' in addressing them has been circumvented by redefining the Precautionary Principle specifically for the NRSMPA (Kearney et al., 2012).

The Goals and Principles of the Government's Coral Sea Proposal are inconsistent with evidence-based determination of what protection is necessary, how that protection should be provided and assessment of the effectiveness of the actions that are taken. They are inconsistent with, or even contrary to, Australia's overarching goal for natural resource conservation and use, ESD.

The Proposal neglects consideration of the major strategic issues relating to the Coral Sea, its conservation and its use. The extremely narrow concentration on what is to be included in areas is at the expense of determination of the real role the area should play in Australia's future, what protection is needed and how it is to be delivered in accordance with ESD. Strategic issues that have been overlooked include: accurate assessment of threats to the biodiversity and heritage values of the region and alternative measures for the management of each; the role the Coral Sea should play in Australia's seafood security, particularly for future generations; Australia's relationship with its Pacific neighbours and its role in international fisheries management; fair and equitable resource allocation in the interests of all Australians; and evaluation of alternatives for managing the assessed impacts of each specific form of fishing (Attachment 1).

 any other related matter.

Strategic evaluation of Australia's marine conservation and seafood security must include thorough investigation of the role the tropical north of the country should play in both capture fisheries and

aquaculture. The wild-fisheries of our northern waters, particularly those in offshore areas such as the Coral Sea and parts of the north-west shelf, remain seriously under-exploited. Northern coastal areas and many inshore locations offer great potential for tropical aquaculture of the type that has been developed to great effect in south-east Asia.

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ATTACHMENT 1

Notes on the "Detailed Analysis of the Proposed Coral Sea Marine Reserve" 19 -2-12

Robert Kearney, Emeritus Professor of Fisheries University of Canberra.

The substance of the Proposal begins with the 'Policy Context', the introduction to which considers the background to the NRSMPA and the principles on which it is based. This introduction states, "*As a signatory to the Convention on Biological Diversity, Australia shares an international commitment to establish a representative system of marine protected areas within its maritime jurisdiction".* It also stresses, *"The NRSMPA guidelines describe principles to be followed in developing the NRSMPA. They include the CAR principles—those of Comprehensiveness, Adequacy and Representativeness."* Throughout this Proposal the commitment to meeting a specific interpretation of the CAR principles, essentially having as much of every possible type of area included in reserves, completely displaces evidence-based assessment that these reserves provide 'biodiversity conservation'. This is despite the statement that, "Biodiversity conservation is the primary objective for all parts of the NRSMPA" (page 28 of this Proposal). It should also be noted that the CAR principles were developed as an approach to the conservations of the relatively static, old-growth components of terrestrial forests and their relevance to highly interconnected and volatile marine environments remains questionable.

The 'Policy Context' of the Proposal continues with four primary Goals for the NRSMPA of which this Proposal is part. It is rather extraordinary, but telling, that each and every one of these Goals is limited to a description of some aspect of what types of areas are to be included in marine reserves. Not one of the Goals relates to the actual provision of protection or to the achievement of sound outcomes for the conservation of biodiversity which is, as stated above, "the primary objective for all parts of the NRSMPA". The concentration of all Goals on what is in zones at the exclusion of objectives that describe what protection of biodiversity is required and risk assessment of how that is best provided also ignores the requirements of the Convention on Biological Diversity and the EPBC Act to base management on addressing specific threats. This Proposal addresses nothing more regulation of extraction from areas that are then called reserves. This declaration is apparently based on the fundamentally flawed assumption that total no-take equates to total protection.

The requirement to base the provision of protection on addressing identified threats is not only the logical way in which protection should be pursued it is actually expressed in Zoning Principle 3 of this Proposal. This Principle states, *"Zoning will be based on the consideration of the threat that specific activities pose to the conservation objectives of each marine reserve".* The failure to do this, or even to reflect it in the Goals for the Proposal, is critical. It is discussed further below under 'Zoning Principles'.

Two 'location principles' follow the Goals. Again neither deals with how location, or action that might be taken in each location, actually addresses biodiversity conservation. The first

deals with how location of reserves relates to existing spatial management; the second relates to the number and size of reserves and not their location or their assessed relationship to biodiversity conservation, except to make the unsubstantiated assertion that a small number of large reserves is better than a large number of small ones, i.e. bigger is better. The fact that this conclusion is reached in the absence of cost-benefit analyses that include consideration of the strategic socio-economic issues that relate to regulation, discussed below, is further evidence of how the concentration on description of what is in areas has distracted the whole Proposal from correct assessment of the cost-effective provision of protection.

Fourteen 'selection principles' are then described for use when options exist to meet the abovementioned Goals. Thirteen of these relate almost exclusively to the characteristics of what is in the reserves and how the boundaries are determined. Only one of the fourteen relates to the capacity of the reserve to mitigate threats to conservation values and no evidence is given of how the reserve will actually comply with this principle. Again it is telling how remarkably little consideration is given in the 'selection principles' to mitigating threats and providing protection. This consideration is diminished even further as the 'selection principals', of which only one refers to the mitigation of threats, are specifically stated to be optional.

Zoning Principles

The four Goals are followed by four zoning principles that are to be applied in developing the regional system of marine reserves:

1. Zoning will be based on the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)/the World Conservation Union (IUCN) categories of protection.

The IUCN Categories, on which the EPBC Act Categories are based, are not strictly "categories of protection" as stated and proposed in this Proposal. They are categories of areas and associated actions that may be necessary for greatly different purposes, as discussed under principle 2 below. This is not a matter of semantics, for declaring that different IUCN categories are being used is not an adequate substitute for first determining what level of protection is necessary and possible for each area and how that level of protection is to be provided. If zoning of areas is to be truly based on 'categories of protection', as it should be, then it should be based on assessment of exactly what level of protection against what is necessary in each area, how this is to be provided and how the effectiveness of that protection is to be measured, assessed and adapted as necessary. Furthermore, in accordance with the third zoning principle below, these steps should be followed to address the threat that each specific activity poses. This has clearly not been done.

2. The regional marine reserve network will aim to include some highly protected areas (IUCN Categories I and II) in each provincial bioregion.

The pre-determined intent of having certain IUCN Categories in each designated area of the Reserve is confirmation of prior commitment to creating a regime of regulation whether or not the resulting restriction of activities is necessary or appropriate. It is not consistent with evidence-based, cost-effective delivery of conservation of biodiversity. Nor is it consistent with the IUCN consideration that *'the only principle that should apply in assigning*

categories is the appropriateness of a protected area's assigned management purpose within the system relative to the ecological needs of, and threats to, the species or ecosystems in the context of the entire landscape or seascape where that biodiversity occurs' (Dudley, 2008 p.44).

Australia has no commitment to have any amount of any of the Australian/IUCN Categories included in the NRSMPA (Minister Burke's letter to Dr Gary Morgan of 25/1/2011 confirms that the Government accepts this). The inclusion in this Proposal of a Principle, the aim of which is to have certain categories represented in all bioregions, before the need for each type of category had been assessed for each bioregion, demonstrates a predetermined intention to have such categories, regardless of need. This constitutes inappropriate management process.

The IUCN stresses that its Categories are not hierarchical, that is no category is better than any other; Categories I and II are not better than Category VI. The purposes of each of the Categories are different and the need for each type should be determined by evidence-based assessment, not assumption as has been done in this case. Australia can meet fully all international and national commitments to marine reserves without having a single area designated as Category I or II. Furthermore, as Australia has the proven ability to manage its fisheries extremely well and there are no significant or irreversible threats from fishing in the Coral Sea the whole of the area could be proclaimed as protected against the effects of fishing (an MPA under the definition used in this Proposal) without a single additional fishing closure.

This concept of starting out with the intention of having representation of a stated highly regulated Category in each provincial bioregion, as a fundamental principle of this whole Proposal and not as a response to identified need, strongly suggests that the zoning process is based on a predisposition for regulation, not on proper assessment of Australia's actual requirements for appropriate, effective and efficient biodiversity conservation.

Areas that are identified to require the special conditions that relate to Categories I and II should be identified prior to the development of any commitment to any particular zoning. It is noteworthy that the IUCN suggests that areas zoned as Categories I and II relate to very specific areas that would normally be small and not the very large areas that are proposed in this Proposal.

3. Zoning will be based on the consideration of the threat that specific activities pose to the conservation objectives of each marine reserve.

This principle is fundamental to pursuing Australia's international commitments under the Convention on Biological Diversity (CBD), the stated original justification for the NRSMPA, and to national commitments under the EPBC Act and the InterGovernmental Agreement on the Environment. Unfortunately what the rest of this Proposal describes is not aligned with this principle.

The four Goals for this Proposal, discussed above, are clearly to achieve zoning that is based on what is in areas and, more commonly, on areas that are surrogates for biodiversity and not on '*consideration of the threat that specific activities pose to the conservation objectives'*. In

so doing the Goals of the Proposal are not consistent with this critical Zoning Principle of this same Proposal.

Because this Proposal has not been preceded by the necessary and appropriate risk assessment the suite of threats to the conservation of the Coral Sea region have not been adequately identified. Structured risk assessment would be a pre-requisite for adherence to this principle and for meeting the requirements of the CBD and the EPBC Act. There is also no evidence of prioritisation of management in accordance with the magnitude of each threat, as stipulated in the InterGovernmental Agreement on the Environment.

4. Zoning of marine reserves will seek to ensure that the conservation objectives of the area are protected, taking into account a precautionary approach to threats as well as the relative costs and benefits (economic, social and environmental) of different zoning arrangements.

Again the need to protect the conservation objectives of the area is stated, but how this Proposal and the zoning it proposes are related to the provision of that protection is not described.

The Principle of "taking into account a precautionary approach to threats" has been seriously distorted in the whole process of the NRSMPA, including this Proposal. The definition of the Precautionary Principle agreed the states and Commonwealth in Australia's InterGovernmental Agreement on the Environment states, "***Where there are threats of serious or irreversible environmental damage*** (emphasis added), *lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation*". This definition is very closely aligned with internationally accepted definitions of the Principle, including in its fundamental purpose to address threats. However, the definition of the Principle that was developed specifically for the NRSMPA is not. This NRSMPA specific definition states *"[t]he absence of scientific certainty should not be a reason for postponing measures to establish MPAs ..."* By replacing the primary purpose of addressing threats of serious or irreversible environmental damage with a requirement to meet uncertainty with more MPAs this variant definition developed specifically for the NRSMPA seriously distorts the intent of both the nationally and internationally agreed definitions of the Precautionary Principle. It demands an output in the form of MPAs at the expense of facilitating the outcome of precautionary protection of biodiversity against assessed threats (Kearney et al 2012). It exposes the self-serving nature of the NRSMPA process as currently being pursued; more reserves regardless of assessed need, at the expense of efficient, effective and properly precautionary conservation practice.

The impact of the underlying philosophy that results in deliberate removal of the need to invoke precaution when there are *"threats of serious or irreversible environmental damage"* in the NRSMPA specific definition of the Precautionary Principle is not restricted to the distorted use of the Principle. The preoccupation of the whole proposal with identification of all inclusive areas that are then closed to fishing is the more obviously inconsistent with a logical approach to conservation because fishing has not been identified as a serious or irreversible threat of environmental damage in the Coral Sea. In fact it is not an irreversible threat anywhere in Australia (Kearney et al 2012).

The distorted philosophy underlying the Proposal is further reflected in the expanded interpretation of the primary need for biodiversity conservation (page 28). Here, after identifying the need for precaution the Proposal states *"Therefore, although the mitigation of threats to biodiversity is not the basis on which the marine reserve networks in Commonwealth waters are identified, threat mitigation within proposed reserves is a consideration in decisions about proposed reserve zoning and about which activities can be permitted within zones"*. The deliberate removal of the requirement to base the declaration of reserves on identified needs is telling in itself. It surely brings into question the logic of claiming protection of biodiversity when the provision of 'protection' is not based on addressing the problem. But even though the primary purpose of the reserve network is not addressing threats, according to the overall objective of this Proposal, threat mitigation should guide zoning. It clearly does not.

This Coral Sea Proposal confirms the distortion of the Precautionary Principle, and avoidance of first identifying and then addressing specific threats, to support and justify the call for more and bigger MPAs, even though they are in effect little more than fishing closures. It actually takes regulation for the sake of regulation one step further by prescribing that highly restrictive Categories are to be included in each sub-region, regardless of assessed requirement. There may be significance in the choice of Categories I and II as discussed above as both of these specifically restrict extraction without necessary identification of specific threats from extraction! The exaggerated claims of benefits from the creation of these closures has in turn distracted efforts from adequately assessing the full range of "threats of serious or irreversible environmental damage" and the provision of appropriate and, when necessary, precautionary management of each of them.

"the relative costs and benefits (economic, social and environmental) of different zoning arrangements" as required in accordance with this Principle have, as discussed below, clearly not been appropriately or adequately taken into account.

Minimising socioeconomic impacts.

A separate evaluation of the socioeconomic impacts of the Proposal is being carried out by ABARES (page 51 of the Proposal). The results of this evaluation are not yet available. However, the issues to be considered and the principles for their consideration are outlined in the Proposal. Unfortunately, numerous major strategic issues have not been included in the Proposal and the way in which several others are being evaluated is inadequate or inappropriate.

As demonstrated throughout this submission, the Goals and Principles of the Proposal have not been aligned with the overall objective of the delivery of conservation of biodiversity. There is disproportionate concentration in the Proposal on inclusion of types of areas, to the exclusion, apparently complete, of consideration of alternative means of providing appropriate biodiversity conservation. No risk assessments or analyses of the costs and benefits of alternative management strategies are apparent.

The adopted strategy of closing areas to extractive use is not based on adequate consideration of what biodiversity is actually threatened by what type of extraction. Nor does it accommodate the provision of protection against the very real and growing non-extractive threats, such as pollution and introduced organisms.

Even more worrying is the narrowness of what analyses are included and the failure to even mention several of the strategic issues that will impact Australia's future. Furthermore, the restrictions that are proposed are not justified by appropriate analyses of relevant principles and data. This is most immediately apparent in the proposals to regulate fishing extremely heavily.

The extreme restrictions by area and gear type that are to be imposed on commercial fishing will effectively eliminate the efficient harvest of most forms of seafood from the entire Australian Coral Sea. No justification for this in terms of biodiversity conservation is given. Economic consideration is limited to the fact that the area is currently very lightly fished and therefore it will not cost much to compensate existing fishers. Unfortunately, the key issue of how to compensate Australian seafood consumers, particularly future generations of them, is completely neglected.

The more strategic issues that should be included in the assessment of socio-economic impacts include:

Australia's food security

Shortly after being elected in 2007 the Labor Government convened a Summit to identify the strategic issues that must be addressed by 2020. Food security was one of the identified priorities. Australia has no greater food security issue than that which relates to the future sustainable supply of seafood.

Australia currently imports in excess of 70% of the seafood consumed in this country. Human population and per capita consumption of seafood both continue to increase suggesting that by 2020 Australia's requirements for imported seafood would rise to an estimated 610 000 tonnes (Kearney et al 2003). The most recent, 2011, nutrition survey by the National Health and Medical Research Council (NHMRC) projects that Australians should eat 40% more seafood than they currently do (NHMRC 2011). To meet this projection without significantly increasing its domestic fisheries production (a prospect for which there is no explicit Government policy and little likelihood under current management strategies, discussed below) Australia will need to import approximately 850 000 tonnes of seafood per year by 2020.

Fifty two per cent by value, and more by weight of whole fish, of Australia's current imports of seafood come from three countries, Thailand (26%), China (14%) and Vietnam (12%) (ABARES 2011) that have much less impressive records for sustainable fisheries management than does Australia: In a 2009 estimation of adherence to UN Code of Conduct for Responsible Fisheries, Australia ranked fourth out of the 53 countries surveyed, Thailand 42nd, China 22nd and Vietnam 45th (Pitcher et al 2009). Thus by continuing to import the bulk of its seafood Australia is not only exposing its food security, but is also effectively exporting

responsibility for the sustainable management of the world's fish stocks to countries with a far inferior record for good fisheries management and sustainability of seafood.

Australia's capture fisheries around the most populated southern half of the country are approaching full exploitation. Current management strategies are predominantly focused on further restriction of commercial fishing, mainly through allocation of areas to other resource users, such as recreational fishers and diving enthusiasts, or in MPAs. More distressing is the continuing and progressive decline in our coastal fisheries due to episodic and insidious effects of pollution and introduced organisms. Many of our rivers, estuaries and inshore areas, the life-blood of coastal fisheries, are under extreme stress from urbanisation and agricultural runoff. Our future seafood security lies in addressing the non-fishing threats to sustainability in coastal areas while developing fisheries in the less polluted and lightly exploited northern parts of our Exclusive Economic Zone (EEZ), particularly the off-shore areas such as the Coral Sea.

The almost 1 million km^2 area of the Coral Sea included in this Proposal abuts the EEZs of several south Pacific nations, including Papua New Guinea. In 2010 the tuna catch from the 2.4 million km^2 of Papua New Guinea's EEZ exceeded 700 000 tonnes (more than five times Australia's total capture of edible fish, all species combined) and in 2011 it was estimated to approximate 1 000 000 tonnes (Dr John Hampton, Secretariat for the Pacific Community, personal communication, January, 2012). Australia imports more canned tuna than any other seafood product. The bulk of this tuna is processed in Thailand but captured in the waters of Australia's Pacific neighbours such as Papua New Guinea. While the Australian component of the Coral Sea is only 40% as large as the Papua New Guinean EEZ and it is not considered to be as productive for tuna as its northern counterpart it would only have to be one third as productive per unit area to represent a potential source of tuna alone that would be equal to Australia's total capture fisheries production of all species combined. Even at 10% of the productivity it could still represent Australia's largest fishery; a fishery sufficient to potentially replace Australia's total dependence on canned tuna imports. It is noteworthy to evaluation of the potential of the Coral Sea to meet Australia's needs for tuna that the most recent modelling of possible response of Pacific tuna to climate change suggests a relative southward movement of the tuna stocks currently exploited in Papua New Guinea's EEZ.

A change to current fisheries management policies would be necessary to accommodate increased tuna fishing in the Coral Sea. Australia does not currently exploit the dominant tuna species in the region, skipjack tuna, at all; we do not have a single fishery for this hugely prolific and underexploited species; the sustainable yield from the central and western Pacific of this one species has been estimated to exceed three million tonnes per annum. Australia is a world leader in sustainable fisheries management and any biodiversity concerns associated with exploitation of currently under-utilized resources could clearly be managed under existing fisheries management legislation. Even if more stringent management was necessary Australia has a proven record of responding to identified fisheries management needs, including addressing incidental impacts of fishing.

The tuna fishery of the greater western and central Pacific to Australia's north is now the world's largest fishery, producing in excess of two million tonnes of tuna per year (almost ten times Australia's total fisheries production, including aquaculture). Australia has to date not developed its tropical tuna fishery in its own EEZ to anywhere near its potential, nor is it a

player in the enormous fishery in the waters of the Pacific Island States to the north and east. If we are to expand into this area and be competitive with the fishing nations that already operate there, as will be necessary if we are to even maintain parity in seafood production per capita of population, it is imperative that Australians have the competitive advantage of preferential access to as much as possible of our 200 mile EEZ. Without this advantage we will not be able to compete with other fishing nations, for example Japan, China and the USA, who exploit the tuna resources of the region and have the advantage of privileged access to their own 200 mile zones. We will also not be a significant influence on the international management of these immensely important species that also inhabit Australia's EEZ. Additional to the enormous benefits to Australia's seafood consumers by increasing our tuna fishing in the Coral Sea, the conservation benefit of Australia's involvement in international tuna fisheries must also be noted. This benefit has been clearly demonstrated with southern bluefin tuna where without Australian pressure as a major player in the fishery for restraint on catches overfishing would have undoubtedly continued.

It is imperative for Australia's future seafood security that we increase sustainable exploitation of our own EEZ. The most obvious way of addressing this relies on developing the ability to use the tuna resources of the Coral Sea as a base from which to expand our tuna fisheries into the world's biggest fishery in the broader western and central Pacific. Australia needs a great deal more fish; it must come from somewhere! The most sustainable source is clearly Pacific tuna fisheries that are managed to Australia's exacting standards.

Consideration of the socio-economic implication of developing a major tuna fishery based on the Coral Sea should include the possible re-establishment of a tuna processing and canning industry in Australia, presumably in northern Australia. The likelihood that such a facility in northern Australia would attract landings of tuna caught throughout the western and central Pacific by vessels of other nations should be included in socio-economic assessments.

Australia's foreign policy and our relationship with Pacific Island neighbours

Perhaps the most strategic of all the socio-economic reasons for maintaining sustainable fisheries in the Coral Sea is the foreign policy perspective. If Australia were to close off the Coral Sea to tuna fishing we would no longer be an active participant in the fishery for the common resource that is not only the world's biggest fishery but is of unparalled importance to the developing countries of the region. Without a significant tuna fishery in the Coral Sea we would not even be a potentially equal participant. In the eyes of most Pacific Island countries we would not share the common interests of the coastal states of the region in so far as the management of the western and central Pacific tuna resources are concerned. We would in effect become a distant-water fishing nation (DWFN), and not a coastal state (our primary contiguous zone would be closed to tuna fishing).

The strategic ramifications of this distinction are much greater than mere fisheries management. In view of the unequalled importance of tuna fisheries to economic stability, international cooperation and regional harmony in a part of the world that is vital to Australia, and where our leadership is anticipated, this would be an extremely undesirable outcome. It would seriously undermine our regional role and our standing as an equal in the eyes of Pacific island nations.

Fisheries adjustment policy (Compensation?)

The Proposal uses the conclusion that because there is little fishing in the area there will be minimal cost of compensating fishers who may be displaced, as a justification for closing the Coral Sea to fishing. Indeed there are currently few fishers in total and some of them prefer to be 'bought out', provided the price is right. Some therefore support the Proposal. Unfortunately it has become practice in Australia when fishing areas are closed to compensate the catching sector for losses to a few individual fishers. Payments are usually 'one off' and have little lasting negative political consequence. But no consideration is given to compensating the real losers, Australia's seafood consumers who constitute more than 90% of the Australian population, or the broader seafood industry. For both groups the impact is permanent diminution of seafood supply; something Australia can ill afford.

In the case of the Coral Sea the real loss to seafood consumers is the long-term removal of the benefits that will come from developing the fisheries in this area to produce optimum sustainable yields as a major step to addressing the enormous and growing problem of seafood security. The issue of compensation must not be seen as the cost of short-term compensation to a small number of individual fishers. The real issue of compensation relates to the health and lifestyle of seafood consumers (>90% of the population). What is the Government to do for them, subsidise imports? Again the real issue is Australia's food and health security for present and future generations.

Alternatives for managing impacts of fishing on biodiversity conservation

No form of fishing as currently managed in the Coral Sea has been demonstrated to be a threat to biodiversity; the primary purpose of this Proposal is biodiversity conservation! The recent record of successful fisheries management in Australia confirms that even when a threat from some form of fishing is identified the threat is not irreversible (Kearney et al 2012). However, the plethora of fisheries closures in the Proposal confirms that all forms of fishing have been assumed to be significant threats, some obviously more than others. The absence of description of specific problems makes it impossible to assess the cost-effectiveness of the 'solution'. If some form(s) of fishing is a problem then alternative management strategies for addressing that problem should be identified and evaluated. Closing the areas to fishing before doing so is illogical.

Australia has very good governance of fishing at both state and Commonwealth levels and measures that address specific problems have proven remarkably successful. The fisheries in the Coral Sea come under Commonwealth jurisdiction. The most recent report on the status of Commonwealth managed fisheries confirms that in the seven most recent years for which data are available, 2004–2010 inclusive, the percentage of fisheries that were assessed and were found to be sustainably managed has more than doubled (27.0–58.3%). During the same period the percentage of total assessed stocks found to be overfished fell by more than a third (18.9–11.5%) (Woodhams et al 2011). There is currently extremely little fishing in the Coral Sea and no significant or irreversible problems with the management of that fishing have been identified. Even if fishing was to be considerably expanded, as it should be, Australia's fisheries management is impressive and improving and the people of Australia can be

extremely confident that the fisheries of the Coral Sea can be very sustainably managed with traditional fisheries management techniques. Australia's problems with fisheries management date back to pre-1995. Since then most problems that had occurred have been corrected. We do not now allow fisheries to develop that will over-exploit species or create unmanageable incidental problems. The Coral Sea is no different. In fact a well-managed Australian fishing presence in the whole area is the most likely cost-effective measure to deter the illegal, unreported and unregulated (IUU) fishing that can be anticipated if the area is not sustainably fished by Australia.

Nowhere in Australia has the blanket closure of areas to all forms of fishing been demonstrated to represent an appropriate fisheries management measure. Nor have blanket closures of all forms been found to represent a cost-effective measure for addressing an undesirable secondary effect, such as a threat to habitats or biodiversity, in areas where good fisheries management already occurs. If specific restrictions on some forms of fishing are necessary in some areas this can be accommodated under existing fisheries legislation and enforced far more cost-effectively than blanket closures. Additional to the loss of current and potential fisheries production from a well-managed Coral Sea indiscriminate closures do not represent an economically efficient means of regulating impacts that fishing may be assessed to have.

Nor do 'no-take' fishing closures actually provide the total protection that is frequently claimed. It must also not be assumed they will make a cost-effective contribution to the provision of protection or resilience against natural disturbances. Specifically relating to the Coral Sea Dr Ben Diggles has advised as follows: "*Empirical evidence shows the situation in the Coral Sea is similar to that of the Great Barrier Reef Marine Park, where natural disturbance history of reefs exerts a stronger influence on habitat quality (and therefore biodiversity) than does protection status (Myers and Ambrose 2009). This is demonstrated by the fact that Coringa Herald and Lihou Reefs (two existing IUCN Ia MPAs in the Coral Sea region that have been closed to all fishing for 30 years) have experienced massive losses of live coral cover from coral bleaching and storm events (Oxley et al. 2003, 2004). The "protected" reefs have been slow to recover, while other reefs open to fishing have been reported to have recovered more quickly from similar perturbations (Chin et al. 2008), providing empirical evidence that 30 years of "no take" zoning of these reefs has not demonstrably improved the ability of the "protected" reefs to recover from environmental perturbations (i.e. "resilience" of the reefs has not been improved)*" (Ben Diggles personal communication 17/2/12).

Resource allocation

In its suggested zoning of the various types of fishing the Proposal is not consistent with accepted principles of fisheries management. The regulation (restriction of area) of fishing is not based on first determining the problem with each type of fishing. Nor are the alternatives for managing any problem that might be identified, considered. Even in the underlying regulation of fishing, which has not been justified, there is inconsistency in the policy behind the approach. This policy inconsistency is apparent, for example, in the following statement, "In the proposed Coral Sea Commonwealth Marine Reserve, it is proposed that catch and release fishing activities and the take of fish for consumption during the duration of the trip will be allowed". What this demonstrates is that 'fishing' *per se* is not a problem; catch and

release fishing is permitted. Therefore, if the principle is to allow any form of fishing provided the catch is released, then all forms of fishing are allowed to catch fish provided the catch is released.

The absurdity of the policy is further exposed by the proposal to allow "the take of fish for consumption during the duration of the trip", apparently regardless of how these fish are taken. Thus, not only is fishing not a generic problem but nor is the take of fish. If fishing is allowable and so is the take of fish then why are all forms of commercial fishing not permitted? No reasons are given. If the reason for this preferential allocation to recreational fishers is based on the amount of fish that is taken then regulation of this amount of fish is exactly what fisheries quota management is for; Australia's fisheries management legislation is specifically designed for this purpose.

What is being proposed is that it is permissible for a relative small number of recreational fishers to take fish for themselves but it is not permissible for commercial fishers to take fish for consumption by the >90% of the Australian public who might consume it. This is resource allocation to a privileged few, not conservation of biodiversity or anything else. Even as an allocation mechanism it is based on highly questionable logic and policies. It also ignores the more strategic impact on the broader community of Australia's recreational fishers. It may benefit the extremely small number of anglers who fish the Coral Sea but it will progressively disadvantage anglers throughout the rest of eastern Australia who fish for the same species, presumably tuna and billfish, that are the anticipated targets in the Coral Sea. Closure of the Coral Sea to commercial fishing for tuna will merely concentrate the effort on these highly migratory species in the areas that remain open to commercial fishing, Unless of course, the total catch of the lightly exploited tropical tunas is further reduced by quota reductions, which will further reduce supply to consumers. Concentration of effort will exacerbate competition between commercial and recreational fishers and possibly result in 'localised depletion' to at least some extent in all other areas. While it is unlikely this will negatively impact the sustainability of the species or of the commercial fisheries that harvest them, unless the total quotas for these species are reduced concentration of commercial effort in the relatively inshore areas off Queensland and New South Wales is inevitable. This will impact a great many more anglers than the few who might believe they will benefit from the Coral Sea being closed to commercial fishing. It will, of course, be a double 'whammy' for all those recreational fishers who also purchase fish for family consumption.

Conclusions

The extreme concentration of the Coral Sea Proposal on description of what is in areas and the assumption that these areas should be closed to extraction, primarily fishing, is fundamental and unfortunately flawed. It renders the proposal to be little more than a description of a process to close as much as possible of Australia's Coral Sea to as many type of fishing as possible. The Goals and Principles adopted are self-serving for the inclusion of more and larger areas in fishing closures. These areas are then proclaimed to be 'protected' without assessment of the provision of protection. Mitigation of actual threats to biodiversity

has been actively avoided and 'precaution' in addressing them has been circumvented by redefining the Precautionary Principle specifically for the NRSMPA.

The Goals and Principles are inconsistent with evidence-based determination of what protection is necessary, how that protection should be provided and assessment of the effectiveness of the actions that are taken. They are not correctly aligned with Australia's overarching goal for natural resource conservation and use, ESD.

The Proposal neglects consideration of the major strategic issues relating to the Coral Sea, its conservation and its use. The extremely narrow concentration on what is to be included in areas is at the expense of determination of the real role the area should play in Australia's future, what protection is needed and how it is to be delivered in accordance with ESD. Strategic issues that have been overlooked include: accurate assessment of threats to the biodiversity and heritage values of the region and alternative measures for the management of each; the role the Coral Sea should play in Australia's seafood security, particularly for future generations; Australia's relationship with its Pacific neighbours and its role in international fisheries management; fair and equitable resource allocation in the interests of all Australians; evaluation of alternatives for managing the assessed impacts of each specific form of fishing.

The Proposal should not proceed until the strategic issues relating to the role of the Coral Sea in Australia's future are fully evaluated and the cost-effectiveness of alternatives for addressing them is transparently assessed.

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