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Establishment of the Coral Sea Marine Reserve: An In-Depth Analysis of the Social And Environmental Impacts of an Ecosystem-Based Management Approach to Conservation

Grace O'Connor
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Establishment of the Coral Sea Marine Reserve: An in-depth analysis of the social and environmental impacts of an ecosystem-based management approach to conservation

Grace O’Connor
Project Advisor: Mariasole Bianco
Protect Our Coral Sea Campaign / Cairns and Far North Environment Centre
Cairns, QLD, Australia

Academic Director: Tony Cummings
Colby College
Environmental Studies

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ABSTRACT

The proposed Coral Sea Marine Reserve covers approximately 989,842 square kilometers and is in an area that is internationally recognized for rich biodiversity, unique species and important heritage values. The reserve was established to protect and maintain biodiversity and to contribute to international (UNCED) and national obligations (EPBC, NRSMPA). This spatial protection is an ecosystem-based management approach calling for ecologically sustainable use of marine resources, as well as protection of many vulnerable and endangered species. The zoning of the Coral Sea Marine Reserve will drastically limit human use, most notably prohibiting fishing in the majority of the area. Extensive research has been done on the ecological and cultural values of the Coral Sea and therefore why it should be protected, yet it is also necessary to understand the environmental and social implications that the creation the marine reserve will have in order to determine if it is the best management option. In order to investigate these impacts, intensive interviews were conducted with ten individuals across five different stakeholder groups. It was found that, while the Reserve is not perfect, it does protect large portions of marine biodiversity and achieves its international and national obligations.
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1. INTRODUCTION

The proposed Coral Sea Marine Reserve covers approximately 989,842 square kilometers and is in an area that is internationally recognized for rich biodiversity, unique species and important heritage values. The area is considered one of the most distinctive and undisturbed tropical marine ecosystems in the world, described by Environment Minister Tony Burke as the “jewel in the crown” of the National Representative System of Marine Reserves. It contains 49 different habitats and provides refuge for a wide range of threatened, migratory, and commercially valuable species (Ceccarelli 2011). The reserve was established to protect and maintain biodiversity and to contribute to the National Representative System of Marine Reserves in Australia (Zethoven 2008). This spatial protection is an ecosystem-based management approach calling for ecologically sustainable use of marine resources, as well as protection of many vulnerable and endangered species. As knowledge of the Coral Sea’s physical and ecological features is patchy, it is therefore extremely difficult to define the physical forces, evolutionary pathways, and adaptive mechanisms that have shaped the region’s ecosystems, and therefore even harder to predict the responses of these systems to future disturbances and pressures (Ceccarelli 2011). The Coral Sea Marine Reserve would safeguard the area and increase ecosystem tolerance to various unavoidable disturbances. The declaration of the existing Coral Sea Conservation Zone is a temporary measure that recognized the outstanding biological values of the Coral Sea and represents one of the only attempts to globally protect an oceanic pelagic system on a large scale (Ceccarelli 2011).

While extensive research has been done on the cultural and ecological importance of the Coral Sea and therefore why it should be protected (Zethoven 2008, Ceccarelli 2011), it is necessary to understand the environmental and social implications that the creation of a marine reserve will have. The Coral Sea Marine Reserve will drastically limit human use,
most notably prohibiting fishing in the majority of the area. It has been determined that the best way to protect this area is through an ecosystem-based management approach employing the precautionary principle. Declining biodiversity reduces the capacity of ecosystems to withstand perturbations, and as systems are more degraded, large-scale protection will increase resilience to unavoidable stressors (SEWPaC 2012). With the creation of the National System of Marine Protected Areas in 1998, Australia has been working towards a representative system of reserves for more than a decade and made a global commitment to employ a system of marine reserves in Australia that would be representative, adequate, and comprehensive (Director of National Parks 2012). Australia is often seen as a leader in marine conservation, and this is something that is of national importance. While protecting biodiversity is ultimately the main goal of the marine reserve, it is also important to allow for sustainable use of the area as the more people who see the area, the more likely they are to care about it and want it protected. While stakeholders have had the opportunity to make submissions to the government regarding zoning, many are still extremely frustrated with the outcomes.

2. AIMS

Despite the fact that the Coral Sea Marine Reserve (CSMR) would undoubtedly protect important marine ecosystems and features, there is great debate about how effective it will actually be, and whether it is the best management option. While the main goal of the Reserve is to protect biodiversity, there is some question as to whether it will actually do this. Additionally, the World Heritage status of the Great Barrier Reef, one of Australia’s most prized reefs, is in question. UNESCO recently released a report suggesting that the Great Barrier Reef may be placed on the World Heritage “in danger” list if the Federal and Queensland Governments fail to improve water quality, ensure legislative protection, and limit port development adjacent to the reef (WWF 2013). The Lonely Planet, a highly
influential guidebook, has also recently removed the Great Barrier Reef as one of the top ten diving destinations in the world (Parsons 2013). In spite of this, Australia is striving to once again be recognized as a world leader in marine conservation. While it is important to protect Australian waters from threats to biodiversity, it is unclear if science is truly the driving process of this policy regime, or whether it is largely a politicized process that strives to put Australia back in front, at the advantage of not only the biodiversity, but also the Australian people. This study aims to examine and analyze the environmental and social impacts of the Coral Sea Marine Reserve and determine if the Reserve, and its current zoning, would be the best management solution and truly the best option for Australia.

3. METHODOLOGY

In order to evaluate the effectiveness of the Coral Sea Marine Reserve at achieving its conservation goals, a series of intensive interviews were conducted with stakeholders in the issue. The first step of this process was identifying which groups would be affected by the creation of the Reserve and which groups had an important role in the planning process. The next step was then determining who within those groups would be suitable to talk to. The list of people to interview was determined by reading the draft management plans of the CSMR and numerous popular articles written about the Reserve, which often identified parties most impacted. My advisor, Mariasole Bianco, was also extremely instrumental in helping me figure out whom to speak with.

I was largely limited by the availability of people I wished to speak with. A number of contacts that I made never responded, which was a limiting factor to my research. Intensive interviews were conducted with ten different people across five different stakeholder groups. I wanted my project to be based first and foremost on the science of the issue, and as a result spoke with four scientists who had done specific research on the Coral Sea and who had been instrumental in supplying information on which the Coral Sea Management Plan is based. I
also spoke with the Department of Sustainability, Environment, Water, Population and Communities, which is the government agency responsible for the establishment and implementation of marine reserves in Australia. I spoke with two dive tourism operators who operate in the Coral Sea, two people involved in fisheries management, and one conservation organization, which represents all conservation interests.

The majority of the interviews were conducted in person, in and around Cairns, Townsville, and Magnetic Island, as well as a few interviews conducted over the phone to those who were spatially isolated. The interviews lasted between thirty minutes and two hours. The interview transcripts asked many of the same questions along with specific questions tailored to each individual’s area of expertise. For a list of questions posed of all interviewees see Appendix II. All interviews complied with Local Review Board Ethics guidelines and permission to use information gained from the interviews was given.

The opinions of stakeholders were compared to what was stated in government documents and scientific journals. In order to adequately supplement the material that gained through intensive interviews, a range of government zoning publications, regulatory impact statements, proposal submissions, and government press releases were read and compared to what individuals mentioned.

2. CORAL SEA FEATURES

2.1 CONSERVATION VALUE

The Coral Sea is recognized for the international significance of its physical, ecological and heritage value (Zethoven 2008). It is ecologically distinct from the adjacent Great Barrier Reef, provides habitat to a number of protected species, and acts as a migration corridor and system of ‘stepping-stones’ from the western Pacific to the Great Barrier Reef (Ceccarelli 2011). Within the Coral Sea, there are two already protected no-take
Commonwealth Marine Reserves: the Lihou Reef National Nature Reserve, and the Coringa-Herald National Nature Reserve. The Coral Sea is one of the few places remaining on earth where biodiverse populations have not been severely depleted, especially seabirds, sharks, humpback, minke, and killer whales, dolphins, turtles, marlin, sailfish, tuna, and myriads of invertebrates, many which are yet to be discovered (Zethoven 2008). The waters, reefs and islands of the Coral Sea act as nurseries and breeding grounds for seabirds, turtles, humpback whales, sharks, and other top predators.

2.2 Physical Features

The Coral Sea basin lies on the eastern edge of the Australian continental shelf and the northern end of the Tasmanid Seamount Chain in the South (Brewer et al. 2007). This unique area is characterized by deep ocean trenches, a series of carbonate plateaux, canyons, ridges, knolls, pinnacles, saddles, and terraces. The most notable of the large plateaux are the Eastern Queensland, Marion, and Keen Plateaux, all of which include emergent reefs and cays. The waters of the Coral Sea are often defined by nutrient poor waters sustaining low pelagic productivity (Ceccarelli 2011). The majority of the Coral Sea is composed by pelagic environments in relatively deep water over the major plateaux. The reefs lie on the edge of the Coral Triangle of Southeast Asia, which is the global center of marine biodiversity, and currents pass through the Coral Sea to replenish reefs of Australia and the Triangle. The coral reefs and seamounts of the Coral Sea provide critical stepping-stones that connect species in the wider pacific with those of the Great Barrier Reef and southeastern Australia (Zethoven 2008). The East Australian Current originates in the Coral Sea and is responsible for delivering, distributing, and dispersing an abundance of pelagic and shelf-slope demersal organisms and their larvae towards the south (Zethoven 2008).
3. POLICY CONTEXT
3.1 INTERNATIONAL

The last decade of the 20th century marked a paradigm shift in environmental thinking. There was a greater scientific understanding of global environmental problems than there had been previously, and the beginning of broad knowledge of ecological systems (United Nations 1997). The United Nations Conference on Environment and Development (UNCED) in 1992 in Rio de Janeiro, nicknamed ‘Earth Summit’, was the beginning of this environmental understanding. As the name would suggest, central to the goals of UNCED was the concept of sustainable development. As defined in Our Common Future, sustainable development is “meeting the needs of present generations without compromising the ability of future generations to meet their own needs.” As economies worldwide were growing, this was an important concept: that the environment and development were inseparable. As chair of the World Commission on Environment, Gro Bruntland stated in 1987, “…the ‘environment’ is where we live; and ‘development’ is what we all do in attempting to improve our lot within that abode. The two are inseparable” (United Nations 1987). While this concept of ecologically sustainable development is not without flaws and puts the environment in a very economically defined lens, it does set an important precedent in ways of thinking about the environment.

Out of this conference came important agreements for protecting biodiversity. The Convention on Biodiversity (CBD) was signed in 1992 at the UNCED and ratified in 1993. It is a comprehensive, binding agreement, which covers the use and conservation of biodiversity. The CBD was agreed upon by the world community as part of a global commitment to sustainable development (UNEP 1993). The Convention represents a dramatic step forward in the conservation of biological diversity and is the first global, comprehensive agreement to address all aspects of biological diversity. It recognizes that
conserving biodiversity is a common concern of humankind and an integral part of the development process. Signatory countries to this agreement, of which Australia is one, are required to develop and implement strategies for sustainable use and protection of biodiversity (McGraw 2002). Additionally, this agreement provides a forum for continuing an international dialogue on biodiversity-related issues through annual conferences of the parties (COPs).

Previous to 1995, the CBD, although provided a framework for protection of biodiversity, contained no specific article on marine and coastal biodiversity, which for Australia, are two ecosystems of high economic and social importance. There was a growing global consensus on the importance of marine and coastal biodiversity and at the second COPs, a policy focused on this, the Jakarta Mandate, was ratified. One of the key elements of the Jakarta Mandate Work Programme is marine and coastal protected areas (MCPA). With recognition that many of the world’s fishery resources are already over-exploited and other marine living resources are subject to threats of over-exploitation, it was clear protection of the oceans on a worldwide scale was necessary. The CBD has repeatedly emphasized that ecosystem-based management tools should be the guiding approach to achieve conservation and sustainable use of marine and coastal living resources. The Jakarta Mandate realized that networks of marine and coastal protected areas are important tools for conservation, management, and sustainable use of marine and coastal biodiversity and resources (Secretariat of the CBD 2000). There was a recognition that marine and coastal protection was significantly lagging behind terrestrial protection. However, there was also the recognition that marine and coastal protected areas would only be successful if the areas were set up and managed as part of a broader program that manages all uses of the marine and coastal area including adjacent land (Secretariat of the CBD 2000). Therefore, it was determined that systems of national and regional representative marine and coastal protected
areas were to be established in order to encompass complete ecosystems and habitats to as large and extent as possible.

3.2 NATIONAL

In 1998, the Australian and New Zealand Environment and Conservation Council (ANZECC) developed a National System of Marine Protected Areas (NRSMPA) in the Commonwealth of Australia (ANZECC 1998). Although Australia had previously developed the Great Barrier Reef Marine Park and a ‘postage stamp collection’ of marine reserves elsewhere, NRSMPA was a framework to expand Australia’s existing reserves. ANZECC viewed the establishment of this national system as a “key responsibility and obligation,” and the Commonwealth and state and territory governments committed to the creation of a NRSMPA by 2012 (SEWPaC 2012). Australia formally affirmed this commitment at the UN World Summit on Sustainable Development in 2002. The reserves in the NRSMPA are to be based on the best available scientific information, conservation of Australia’s biodiversity, and wise use of marine resources (ANZECC 1998). ANZECC has adopted the IUCN definition of protected area in order to maintain global consistency. A protected area has been defined as: “An area of land and/or sea especially dedicated to the protection of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means” (ANZECC 1998). The primary goal of NRSMPA is to establish and manage a comprehensive, adequate and representative system of MPAs to contribute to the long-term ecological viability of marine and estuarine systems, to maintain ecological processes and systems, and to protect Australia’s biological diversity at all levels. Secondary to this is a formal management framework for a broad spectrum of human activities (SEWPaC 2012).

When assessing the Coral Sea Marine Reserve, it is important to keep these initial goals in mind. Although the views of different stakeholders are undoubtedly important,
ultimately, the conservation of biodiversity has been identified as the most important goal of the system of reserves. Also important is the fact that MPAs may incorporate areas ranging from highly protected areas to sustainable multiple use areas, accommodating a wide spectrum of human activities. While in some situations a total closure of an area is recommended, in many areas multiple use marine parks, if well monitored, have been found to be extremely effective at maintaining biodiversity, while still allowing human activities (McCook et al. 2010). An important policy tool, the precautionary principle, is also employed in order to protect areas that we do not know much about (Lauck et al. 1998). However, the absence of scientific certainty should not be a reason for postponing measures to establish MPAs to protect representative areas. Although much of the Coral Sea has not been studied in great detail, there is still great value in protecting what we do not yet know.

Building upon the NRSMPA, Australia enacted the Environmental Protection and Biodiversity Conservation Act (EPBC) in 1999, which provides for the proclamation and management of Commonwealth Reserves. Under the EPBC Act, the Governor-General of Australia may declare an area of seas as Commonwealth reserve, defined as an ‘an area from the seaward boundary of State and Northern Territory coastal waters to the outer limit of the EEZ 200 nautical miles from the territorial sea baseline’” (Office of Parliamentary Counsel 2012). The Coral Sea Marine Reserve extends from the edge of the Great Barrier Reef Marine Park (GRBMP) to the outermost edge of the Australian EEZ (SEWPaC 2013). In order to ensure consistency in defining and managing protected areas, the Australian government has adopted the IUCN internationally recognized set of protected area management categories. As these categories are internationally recognized, they have legal effect.

This system of reserves has national (EPBC), multinational (NRSMPA), and global commitments. Finally, in 2012 the Australian Government established 40 new
Commonwealth marine reserves around Australia building on the existing marine reserves that have gradually been established since the first Commonwealth marine reserve was declared in 1982. The new Commonwealth marine reserves add more than 2.3 million square kilometers to Australia’s marine reserve estate, resulting in a total area of 3.1 million square kilometers of ocean being managed primarily for biodiversity and conservation (SEWPaC 2013). When put in this perspective, Australia is truly making an extraordinary commitment to marine conservation. For a map of the current proposed zoning for the network of Commonwealth marine reserves see Appendix I, Figure 1.

As developed by the EPBC, there are a number of administration principles that must be followed for all Commonwealth Marine Reserves. Firstly, community participation is a very important part of the process. In line with the EPBC, the development of the Coral Sea Marine Reserve was not without public consultation. In fact, the development of Australia’s system of marine reserves has been the government’s most extensive public engagement process (SEWPaC 2012). More than 680,000 submissions were received on the reserves and management plans (Tony Burke 2013). The development and proclamation of the Commonwealth marine reserve system has involved extensive consultation over the past four years including over 150 days of statutory consultation. The final Commonwealth marine reserves network proposal was developed through an extensive planning and public consultation process. In 2008 a joint letter was sent to the Environment Minister from Environmental NGOs urging for the whole area of the Coral Sea to be declared a ‘very large no-take oceanic park’ (Zethoven 2008). In 2009, the area was declared a Conservation Zone, an interim protection measure as established by the Australian Government under national environment law while the area undergoes a thorough assessment process to determine the need for any permanent protection measures (DEWHA 2009). The declaration of this conservation zone saw no on the water changes, but was simply a formal recognition that the
area is environmentally significant and should see future protection. Once the area was declared a conservation zone, bioregional profiles were developed and released to the public. Between May 2009 and March 2010 areas of the reserve needing further assessment were identified and released to the public by the Department of SEPWaC about activities in these areas as well as targeted consultation with marine industries and other interests to ensure that options for the location of reserves were developed with a sound understanding of their socio-economic implications (SEWPaC 2013). In November 2011 a Draft Plan of the reserve was released and the first public consultation period of 90 days was held. A remarkable 487,435 submissions were made with 99.8% calling for greater protection. Over 300 scientists from around the world submitted a proposal calling for greater protection (Director of National Parks 2012). However, it is important to note that of these 487,000 submissions that were made, the large majority of them originated internationally (Commonwealth of Australia 2012). While this number is impressive nonetheless, it is important to note that there is a lot of influence coming from overseas. On June 14, 2012 the Minister for SEWPaC announced a final Commonwealth marine reserves network proposal and from July to September 2012 a 60-day public consultation period occurred and November of 2012 the final zoning for the reserve was declared, but not established. Following this, from November to December 2012, a 30-day public consultation period on the Draft Management Plan occurred, and from January 2013 to February, the final 30-day public consultation period occurred (SEWPaC 2013). Currently Parliament must review the Plan for fifteen sitting days, eight of which have been completed thus far. The opposition can move for a disallowance motion. It is important to note that the marine reserve is not final yet, and no on the water changes will occur until it is. It is expected that the Reserve will be finalized in July 2013 and implemented in July 2014. For a map of the current proposed zoning see Appendix I, Figure 2.
3.3 Stakeholders

Simply put, a stakeholder is a person with an interest or concern in something. In a policy context, stakeholders are the people who make decisions and people who are affected by those decisions (United Nations Environment Programme 2013) However, these groups are not always the same people and competing visions, values, and interests often lead to conflict. In terms of the Coral Sea, there are five main stakeholder groups that have been identified. Those interests include government, conservation, science, fishing, and dive tourism.

3.31 Government

The Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) is responsible for “implementing the Australian Government’s policies to protect our environment and heritage, and to promote a sustainable way of life” (SEWPaC 2013) SEWPac is largely responsible for dealing with marine and coastal issues and more specifically, tasked with developing and establishing the Commonwealth marine reserves.

3.32 Conservation

Coral Sea conservation interests are represented by Protect Our Coral Sea, which is a joint campaign supported by regional, national, and international non-governmental organizations including the Pew Environment Group, Cairns and Far North Environment Centre, Greenpeace, and the World Wide Fund for Nature. For a full list of organizations, see Appendix II. The goal of this campaign is stated as “the establishment of a large, world-class, highly protected marine park in the Coral Sea that will provide a safe haven for marine life and recognise its historic significance” (Protect Our Coral Sea 2013).
3.33 Science

Scientists have played a large role in the planning and decision-making process of the Coral Sea Marine Reserve. A sample of scientists involved in this process were interviewed including: Dr. Robin Beaman, whose work largely focuses on the mapping of the sea floor and has worked in the Coral Sea determining the geological processes, discovering submarine canyons, sediment flows, and cold water coral communities. Dr. Daniela Ceccarelli has worked as a marine consultant and has completed multiple reviews ecological of the Coral Sea for both SEWPac and conservation organizations. Richard Fitzpatrick’s work in the Coral Sea focuses on the home range and metabolic rate of sharks. He also works as a filmmaker working for BBC, National Geographic, and the Discovery Channel. Dr. Stephen Sutton focuses on commercial and recreational fishing and how these groups are impacted by zoning changes.

3.34 Fishing

Both commercial and recreational fishermen are stakeholders in the Coral Sea, as both groups will be impacted by the zoning changes. There are two main commercial fisheries in the Coral Sea: The Coral Sea Fishery and the Eastern Tuna and Billfish Fishery. These interests were represented by Dean Logan, CEO of the Australian Marine Alliance, an organization which attempts to build unity and policy consistency across all representative fishing sectors including recreational, commercial, boating, and lighting. Lyle Squire, of Cairns Marine, Australia’s largest and leading supplier of marine life for display, supplying Australian retail outlets, regional wholesalers, and public aquaria, and part of the Coral Sea Fishery, was also extremely helpful. Cairns Marine has taken steps to establish the world’s highest standards and to demonstrate these as a benchmark for marine aquarium fish
collectors wholesalers worldwide. While recreational fishermen are quite against the creation of the CSMR, the reality is that very little recreational fishing actually occurs in the Coral Sea as it is upwards of 200 km from Cairns to the nearest fishing ground in the Coral Sea (SEWPaC 2012).

3.35 Dive Tourism

There are three main dive tourism companies, which operate in the Coral Sea. These include Spirit of Freedom, Eye to Eye Marine Encounters, and Mike Ball Dive Expeditions. These three operators are members of the Cod Hole and Ribbon Reef Operators Association (CHARROA).

4. Main Issues

The following are the main issues of concern that surfaced during intensive interviews and have been compared with government documents and scientific research regarding each issue.

4.1 Goals of the Reserve

Of those interviewed, there seemed to be a major disconnect between the stated goals of the Reserve and what stakeholders actually felt the Reserve would accomplish or was trying to accomplish.

4.11 Stated

As stated by the Peter Cochrane, the Director of National Parks in Australia, there are two main objectives for the Marine Reserve, which are intended to provide clear direction for management (Director of National Parks 2012). These include to:

1. provide for the protection and conservation of biodiversity and other natural and cultural values of the Coal Sea Commonwealth Marine Reserve; and
2. provide for the ecologically sustainable use of the natural resources within the Commonwealth Marine Reserve where it is consistent with objective 1.

It is important to note that the first priority of the Reserve is for the “protection and conservation of biodiversity,” and can be interpreted to mean that economic costs are not the first priority in protecting biodiversity; however, the second objective can be interpreted to mean that this conservation of biodiversity should be done so in a way that minimizes adverse social costs.

4.12 Conservation

The conservation opinion of the objectives of the Reserve is focused primarily on science. As Mariasole Bianco noted, the conservation goals for the Reserve are to “protect one of the most intact tropical marine environments on Earth, provide protection for pelagic species which are overfished worldwide, and to decrease anthropogenic impacts which will increase the ability of the reef to cope with global climate change and ocean acidification.” These goals seem to be well aligned with those of stated by the government. Additionally, Mariasole noted that the reserve in the Coral Sea was important because it would:

“provide a globally significant legacy for future generations to come and create a point of reference for future work, in terms of what is a pristine tropical marine environment. This is a major step forward for creating balance in our oceans and ensuring healthy oceans for the future. We need to take steps today to secure a healthy ocean for tomorrow.”

However, as Mariasole pointed out, “Rome wasn’t built in a day. The zoning plan is not perfect, but it is a world-first and it is a solid foundation on which to build. It [the zoning] doesn’t fully protect all the major biodiversity hotspots at the moment, but it is a good step towards meeting all of these goals in the future.”
4.13 Science

According to Daniela Ceccarelli, one of the major scientific consultants on the Coral Sea, the main goal of the Reserve is to “Comply with the plan to create a big network of zones all around Australia and to protect areas that are large and representative, especially areas in open oceans because that is the underrepresented ecosystem in marine protected areas.” However, despite the fact that these goals are stated, it is largely unclear if they are achievable. Dr. Ceccarelli notes that the “The goal is very lofty.” And unfortunately, whether these goals have fully been fulfilled in the planning process is unclear. Ceccarelli went onto say, “unfortunately I think the way its been done is that they have looked at all the areas that have least commercial interest to people and they have made them green [highest level of protection]…Goals were good but execution I think has tried to tiptoe too much around commercial interests.” This feeling is in a way, confirmed by environmental minister Tony Burke who, in a press release stated, “The marine reserves have been designed to minimise impact on the recreational and commercial fishing sector wherever possible, while also ensuring the reserves network is representative of the diversity of marine ecosystems and habitats in Australia’s oceans.”

This statement makes it clear that there is a disconnect of the true goals of the reserve. As Bob Pressey, coral reef scientist at James Cook University states in his controversial article Australia’s new marine protected areas: why they won’t work, “We’ve become dangerously focused on protected areas, but rarely consider what they’re supposed to achieve” (Pressey 2013).

Dr. Rob Beaman focused on Australia’s international obligation; he noted that, “Australia can be an example to the world. We can protect our marine areas and be a good global citizen. This is important because if we can’t protect our marine environments, then
how can we expect developing countries to?” This raises an important point. Australia has a responsibility, as committed to at a global scale during the UNCED, and a national scale with the NRSMPA and EPCB. While Australia cares about this goal and so to do a number of scientists and conservationists, Dr. Beaman was careful to add, “Local fishermen don’t care about being a good global citizen per se, but in the end we are sharing waters.” Dr. Beaman stressed Australia’s goal of being a global leader, and fulfilling its international and national goals. He mentioned that he had recently attended a conference with representatives from Australia’s adjacent EEZs to the Coral Sea, and he noted that talking with Australia’s neighbors was very important.

“There are so many migratory species and current flows that originate in the waters that it is important to develop similar management strategies. While mining is not allowed in the Coral Sea Marine Reserve, there are other countries that do engage in these practices, which has the potential to negatively impact Australia’s waters. Everything is connected, and ecosystem-based management is the best practice.”

As Richard Fitzpatrick put it, “very little science has actually been conducted and that is putting it mildly.” He continued, “There is no science in the zoning. It is done to placate green groups, and keep tourism as happy as possible. Political decisions have outweighed science.” Richard was very skeptical of the whole process and quite disappointed.

4.14 Fishing

Lyle Squire of Cairns Marine, was also very skeptical of the goals of the reserve and felt as though misinformation is driving how many people, particularly the general public, view the Reserve. To Lyle, the goals of the Reserve are to “satisfy a perception of NGOs and a misinformed general public. To give reassurance to the general community that Australia is genuinely interested in conservation. The reality is all these things could have been satisfied in a completely different manner.” Dean Logan also felt as though the Reserve had misinformed goals. “The stated goals are to lock up large scales of the marine environment so
they can be set aside for future generations. This will not be achieved by stopping fishing.”

These two fisheries viewpoints make it clear that the goals are not nearly as transparent as
they may seem.

4.15 Dive Tourism

The perceived goals of the Reserve by dive tourism operators closely paralleled with
conservationist goals. As Jo Harris of Spirit of Freedom stated the goals are, “Protecting and
maintaining marine biodiversity while allowing for sustainable use of natural resources.”
According to John Rumney of Eye to Eye Marine Encounters, the goals are to “set aside a
substantial area of the Coral Sea to have a better managed and higher protected area. That’s
what marine reserves are. There is a greater chance of the area staying healthy and with the
way we are managing all other oceans, it [the Reserve] is a lighthouse of hope for
biodiversity.”

4.2 Ecosystem Based Management and the Precautionary Principle

4.21 Stated

Ecosystem-based management has been a driving force of the Coral Sea Marine
Reserve and is a very important tool for protecting entire ecosystems rather than just single
species. Large, pelagic marine reserves are fairly uncommon, and the Coral Sea would join
the Chagos marine reserve in the Indian Ocean as one of the only reserves protecting pelagic
species (Ceccarelli 2011). The Chagos Archipelago is the largest unfished, uninhabited, and
remote coral reef wilderness in the Indian Ocean (Graham and McClanahan 2013). Like the
Coral Sea, the Chagos Archipelago is an area of great marine biodiversity and is a stepping-
stone, linking reefs east and west in the Indian Ocean (Koldewey et al. 2010). Wilderness
areas will not always be immune to longer-term threats such as ocean warming and
acidification, but they might help to mitigate some of the impacts by protecting certain
oceanographic and habitat features that provide some species with refuge (Graham and
The creation of networks of marine reserves is viewed as an essential component of marine management as it focuses on the protection of the ecosystem rather than managing specific threats or species in isolation (Koldewey et al. 2010). Additionally, large areas are required for the preservation of large, mobile predators whose trophic interactions strongly influence community structure (Gerber et al. 2011).

The precautionary principle is a very important policy tool in order to protect biodiversity that may be threatened in the future. With the unknown impending negative effects of climate change on the marine environment, particularly coral reefs, it is important to afford these systems as much protection as possible. The precautionary principle is an important aspect of the proclamations that were made as part Earth Summit. As Principle 15 states:

“In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are serious threats or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation” (UNEP1992).

In this case, climate change has repeatedly been identified as a “serious threat” causing potentially “irreversible damage” (SEWPaC 2012). Although there is undoubtedly a lack of knowledge regarding the fragility of biodiversity in the Coral Sea, this is not reason to avoid protection. Additionally the coral reefs of the Coral Sea are particularly prone to cyclones, which make these systems very vulnerable (Cecarelli 2011). Also important to note is that employing the precautionary principle increases ecosystem resilience. Declining biodiversity reduces the capacity of ecosystems to withstand perturbations without losing any of their functional properties (SEWPaC 2012). In a sense, representative marine reserve networks provide an insurance policy for our biodiversity assets by building and supporting the health and resilience of ecosystems. Not only is this important for simply protecting biodiversity, it
is also important to dive tourism operators, an important stakeholder with vested interests in the outcome of the reserve.

4.22 Conservation

Mariasole Bianco, of Protect Our Coral Sea Campaign, noted that,

“the idea is protecting one of the most pristine pelagic, tropical marine environments on Earth before is too late. Pelagic marine reserves are one of the missing elements in global ocean conservation, especially if we consider that in the last 50 years overfishing has reduced global populations of large ocean fish – sharks, tuna, marlin – by 90%. The Coral Sea is considered a biodiversity hotspot for these large oceanic fish that play a huge role in maintaining the health of the marine ecosystems. Protecting such a great ecological asset and biodiversity hotspot for pelagic species is a global responsibility that Australia is trying to fulfill.”

4.23 Science

When asked about the importance of the precautionary principle in regards to the Coral Sea, Dr. Ceccarelli noted, “It’s absolutely an important conservation tool, especially nowadays. Recent analysis of global, human footprint on marine systems suggests that the Coral Sea is one of the last few seas in the tropics that is still relatively pristine.” Claims made by fishermen still wanting to commercially fish in the area have suggested that there is no need to protect the area if it is already in good shape and to this Dr. Ceccarelli replied, “should we only protect all the areas where fish are gone and where it has kind of been trashed already? What’s the point?” Dr. Ceccarelli was among those to note that marine protected areas are not the solution to the larger global climate change, threatening to destroy the oceans. “I guess marine protected areas are really our best tool, unfortunately, because there are a lot of things that MPAs can’t do. They can’t stop climate change and they can’t stop pollution. They can only stop fishing really, and extraction. But that is our best tool at the moment. To leave nature alone as much as possible and see if it can find a way to cope.” Dr. Beaman noted that it is important to protect parts of the Coral Sea because there is so
little knowledge of what actually exists there. He noted, “We don’t know special ecosystems that exist, but if we take a broader approach we sometimes realize that by having representative zoning, we have protected a special thing you didn’t even know existed. We discover more things in the future and we are future proofing. There is a lot of finer detail to discover.”

4.24 Fishing

However, from some perspectives, in the case of the Coral Sea, the precautionary principle has been distorted. Dean Logan, CEO of Australian Marine Alliance, which aims to build unity and consistency across all representative fishing sectors, feels as though the Coral Sea Marine Reserve is a “complete distortion” of the precautionary principle. He implores that fisheries in Australia are managed sustainably. “At the end of the day, what does the science say? Science says were are doing a good job.” He went on to note, “we need to be precautionary in our approach, but need to rely on science to dictate policy.” Dean Logan feels as though the way that we increase ecosystem resilience is by fishing it sustainably rather than locking it up. As he mentioned, “Effectively managing a resource makes it more resilient. We (fishermen) make it more resilient.” According to him, locking up a resource “would not increase ecosystem resilience; it makes it lazier, we have to allow the environment to adapt.”

Lyle Squire helps to develop a Stewardship Action Plan for the commercial aquarium industry. This plan sets legal standards and establishes a code of practice to ensure for ecosystem resiliency. Lyle is one of the first to admit that establishing reef resilience is beyond necessary. In this plan, the industry itself takes initiative without having to wait for the government, which is often far too slow. If the industry realizes that there is bleaching in an area then they will often place a full or partial moratorium to allow the reef to recover. For example in areas where there is a lot of bleaching, Cairns Marine does not collect any blue
tangs, which are the most domestically important fish species. This is because blue tangs feed on algae, which is important for allowing the coral to recover following disturbances such as bleaching (personal comment Lyle Squire). However, Lyle feels that this sort of ecological risk assessment for fisheries is much more effective at increasing reef resiliency than a blanket green zone prohibiting all fishing. This alternative approach to managing for ecosystem resilience makes it clear that maybe a large scale spatial closure may not be the only way to achieve this conservation goal.

4.25 Dive Tourism

As John Rumney, explained, “what we don’t know is with climate change and acidification, what that will do to food stock and fish. There would be an increase in resilience of whole habitat by setting aside 30%. There are many endemic species to Coral Sea that we don’t know exist.” This existence value is something that is undoubtedly important, even if we are not able to reap the benefits.

4.3 OSPREY REEF

4.31 Stated

Osprey Reef has been one of the most highly contended areas in the whole of the Coral Sea. It can be seen as a snapshot of the process as a whole. The interest in Osprey Reef has been primarily by conservation organizations and dive tourism operators. Osprey Reef is world renowned for its resident populations of grey, white tip, and silvertip reef sharks. The high residency and limited spatial use of Osprey Reef suggests that reef sharks would be highly vulnerable to targeted fishing pressure and that MPAs incorporating no-take of sharks would be effective in protecting reef shark populations at Osprey Shark Reef (Barnett et al. 2012). For a map of the use of Osprey Reef by resident shark populations, see Appendix I, Figure 4. Sharks are intrinsically vulnerable to overfishing and populations are likely to benefit significantly from spatial closures (Koldewey et al. 2010). Sharks on Osprey Reef
have been recorded to travel 3-5km from the reef, however the current zoning only protects sharks from fishing to 50 meters off the reef (SEWPaC 2013). For a map of the current proposed zoning of Osprey Reef, see Appendix I, Figure 3.

Starting in 2006, there was a Memorandum of Understanding (MOU) that existed in order to “facilitate an industry cooperative approach between wild and harvest fishers and charter boat operators to ensure that there is no conflict between both user groups over access” (Coral Sea Fishers Association Inc. 2006). This expired when plans for the Coral Sea were first announced. This memorandum was at the instigation of commercial fishers and was signed with dive charter operators. Fishers voluntarily surrendered rights on reefs important to tourism, out of respect for dive operators who depend on a visually spectacular experience on reefs closest to Cairns (Coral Sea Fishers Association 2006).

4.32 Conservation

The Conservation interest in Osprey Reef can be described as the following:

“Osprey Reef is the one of the most iconic reefs in the Coral Sea and one of the most spectacular dive sites in the world. It contributes approximately $6 million dollars each year in direct revenue to the dive tourism industry in North Queensland. It is also one of the best-studied reefs in the Coal Sea. It attracts numerous pelagic fish species, has very high densities of sharks and boasts high coral cover, with what has been defined by scientists as ‘soft coral heaven’ below 30m. Recent studies of Osprey and Shark Reefs have already revealed species new to science from both deep and shallow habitats, ‘living fossils’ like coralline sponges in the shallow caves and glass sponges from the deep slopes” (Mariasole Bianco).

Conservation organizations have been campaigning to increase the level of protection around Osprey, Shark, and Vema Reefs. As Mariasole Bianco explained, “We believe that to ensure that the important reef-associated pelagic species and reef slopes are fully protected, the marine national park zone should be extended further west by 10 kms.”
4.33 Science

Dr. Rob Beaman noted that shallow coral reefs such as Osprey were among the most important areas in the Coral Sea to protect in order to maintain biodiversity, but “they often get hammered by cyclones and are therefore very fragile.” Shark scientist and documentary filmmaker Richard Fitzpatrick, who has done research focusing specifically on the resident shark populations of Osprey Reef, was adamant about the fact that the zoning of Osprey Reef is in the completely wrong spot. “The marine park takes into account movements of megafauna, but the zones are on the wrong side. They should be on the northwest, but are instead on the east.”

4.34 Fishing

Lyle Squire of Cairns Marine, noted that the MOU that existed on Osprey Reef was the “World’s first agreement of this sort.” He explained that the fishing organizations voluntarily gave up their rights so that dive tourism and fishing could co-exist and it quickly became apparent that this sort of agreement could be extremely successful. The spokesperson for the Coral Sea Fishery, Rob Lowden, stated in a press release, “The MOU is a landmark agreement and one that demonstrates the mature and proactive approach of commercial fishers in the Coral Sea. Commercial fishing is the only user group subject to management in the Coral Sea” (Coral Sea Fisheries Association 2006). Lyle went on to explain that the reality is that there is already protection for sharks on Osprey Reef. Lyle feels as though dive tourism operators and scientists alike do not fully understand the minimal fishing impacts on Osprey Reef, and a lack of understanding increases misinformation.

4.35 Dive Tourism

Mike Ball, owner of a dive tourism operator making trips to the Coral Sea speaks for all dive tourism operators in his desire for more reef protection included in the Coral Sea as
an insurance policy. “The coral bleaching that happened on Flinders almost sent me bankrupt could happen on Osprey.” (Lloyd, 2012). Osprey Reef, is undoubtedly the most important reef for dive tourism in the Coral Sea. John Rumney of Eye to Eye Marine Encounters, a tourism operator that combines adventure diving tourism with marine biology research, noted that the resident population of sharks on Osprey Reef, the main draw to the Coral Sea, are worth between several hundred thousand and one million dollars each. As he mentioned, “If there are no sharks, there is no point in going to the Coral Sea.” John Rumney argued that, “There was an arbitrary line at Osprey Reef. That line needs to be extended to like six kilometers so that shark assets are protected.” The reason that the zoning of Osprey has been such a hot topic is because not only is it used by dive tourism operators who are keen on seeing that shark populations are well protected, but also is used by Marlin fishermen who rarely fish on Osprey Reef, but are very against the zoning. John Rumney described a “cowboy attitude for marine life” and proclaimed that the “egos of marlin fishermen are unbelievable.” He described a time when a dive boat pulled up to Osprey Reef and witnessed a dead shark with floating beer bottle surrounding it. He claimed that the marlin fishermen are just killing the sharks for no reason (personal comment John Rumney). “If one shark leaves its okay, but if all sharks are fished out it would kill the industry. To date Osprey Reef is one of the most iconic shark research dives in Australia and the world.”

4.6 IS THE ZONING IN THE RIGHT AREAS?

4.61 Stated

Generally speaking, all stakeholders are in support of greater protection in the Coral Sea. The major concerns however, arose over the zoning of these areas. All stakeholder groups, including conservation organizations, found that the zoning in the Coral Sea is not what they would like it to be. However, it is important to note that when dealing with a contentious issue such as this one, all groups will never be completely happy with the
outcome. The Commonwealth Government has done their best to manage all of these concerns in as unbiased a manner as possible, using science, yet many stakeholders felt as though the zoning was extremely politicized, and while initially rooted science, the final product is not. The current zoning in the Coral Sea is divided into six different IUCN categories allowing for a range of activities. The largest portion of the Reserve is Marine National Park Zone (IUCN II) often referred to as a ‘green zone,’ which prohibits all fishing. The other zones areas have IUCN IV zonation and allow a varying range of commercial and recreational fishing activities. These include Conservation Park Zone, Habitat Protection Zone, Multiple Use Zone, and General Use Zone. Important to note is that no mining, gillnetting, or demersal long lining will be allowed anywhere in the Coral Sea (SEWPaC 2013). For a full list of activities allowed in each zone see Appendix I, Table 1.

4.62 Conservation

Effectively, conservation organizations want as much of the Coral Sea to be declared a green zone as possible. This idea started in September 2008, when a number of groups launched a call for the Coral Sea to be declared a ‘very large no-take oceanic park in Australia’s Coral Sea between the Great Barrier Reef Marine Park and the end of Australia’s Exclusive Economic Zone.’ The letter states that the Coral Sea is an international marine icon and contains diverse habitats such as abyssal plains, deep-sea canyons, underwater mountains, shallow reefs, remote islands and sandy cays. Additionally noted was the spectacular wildlife that finds refuge in the Coral Sea including sharks, marlin, tuna, swordfish, threatened turtles, whales, and sea birds, and a huge range of corals and reef fish. Furthermore, the letter states that “A great outcome for the Coral Sea will lift the bar for marine conservation around the nation,” in turn declaring the creation of the Coral Sea marine reserve an issue of national importance (Zethoven 2008). Mariasole Bianco was quick to point out that the zoning is much better now than it had previously been in the draft plan.
“When the draft plan for the CSMR was released only two reefs out of 25 where included in the marine national park zone. Since then we have negotiated a significant increase of protection in most of the areas that we campaigned for. The outstanding ecological contribution of more than 500,000 km² of green zone, the exclusion of long line fishing from three-quarters of the reserve and the complete ban of oil and gas exploration and mid-water trawling from the reserve, must be acknowledged. There are still significant biodiversity hotspots that are left without protection and we would obviously like to see those included in the green zone. However, in the world of real politics, achieving effective conservation is always politically difficult.”

4.63 Science

Dr. Ceccarelli noted, regarding the current zoning, that, “It’s hard to say because especially in the Coral Sea, the big green zone is the area we know least about. It could be that that big green area is highly diverse and highly productive and wonderful and it could be great to have that protected but we actually don’t know.” She went on to note that in regards to the green zone (IUCN II),

“The result is a little disappointing. The fact that it is so big probably detracts from the fact that it is probably in the wrong place. I don’t want to can it too much because you have got to start somewhere and of course it is not pragmatic to expect the government to ignore the pragmatic interests, but at the same time it would have been more useful in achieving their goals and representing biodiversity and different habitats that are out there to even maybe run some more research programs to actually discover what is out there before they declared any sort of zoning.” (Personal comment, Daniela Ceccarelli)

Additionally, Dr. Ceccarelli noted that she wished that there was some sort of protection for the black marlin spawning ground. Many stakeholders felt as though a multiple use marine park would be best. Although the Coral Sea does have multiple zones allowing for a range of activities, the majority of it is given a National Park zonation, meaning that no extractive activities are allowed. Many stakeholders agreed that most of the best, most sustainable fishing practices occur in the Coral Sea. Richard Fitzpatrick sited the aquarium trade in the Coral Sea as “one of the best practices worldwide” and noted that it “should continue to be
promoted worldwide.” Fitzpatrick, among others, agreed that the best way to “police” the area is “by engaging other users in the process, particularity fishing and dive boats.”

4.64 Fishing

Dean Logan felt as though the zoning principle itself is flawed.

“Zoning is purely based on area, and on what is deemed as sensitive, pristine. It does increase protection, of course it does, but it is illogical to talk about whether zoning achieving particular objectives when zoning principle itself is flawed. They [the government] are not saying what the goals are, just saying that want to lock up the area.”

Mr. Logan feels as though the government has not been transparent in the zoning process and it is inherently flawed because of this.

4.7 Fisheries Management

Undoubtedly, one of the biggest concerns in implementing any marine reserve is how fisheries will be affected. The bioregional planning of marine reserves around Australian waters and specifically in the Coral Sea undoubtedly raises concerns about fishing.

4.71 Stated

In terms of commercial fishing, there are two main fisheries in the Coral Sea. The Eastern Tuna and Billfish Fishery and the Coral Sea Fishery. Both fisheries are managed by the Australian Fisheries Management Authority (AFMA), which is responsible for the efficient and sustainable management of Commonwealth fish resources on behalf of the Australian community (AFMA 2013). Australian fisheries boast to be some of the most sustainable in the world, with 71 of the 92 fish stocks considered to be fished sustainably, and with not one species being fished to the point of extinction (personal comment Dean Logan). However, there are no major opportunities to expand Australia’s fisheries. In 2010, 42% of Australia’s fish stocks were assessed as either overfished or unknown (ABARES 2010).
Additionally, Australian waters are comparatively less productive than waters found elsewhere, which makes them more vulnerable to overfishing.

The Coral Sea Fishery (CSF) extends from the eastern edge of the Great Barrier Reef Marine Park to the edge of the Australian Exclusive Economic Zone, from Sandy Cape to Cape York. A wide range of finfish species are taken in the CSF, as well as sharks, lobsters, trochus, sea cucumber and live rock (AMFA 2013). They are a total of 16 fishing permits using various different collection methods for five main sectors: line and trap, trawl and trap, sea cucumber, aquarium, lobster and trochus. In the 2007-2008 season (most recent available data), the fishery landed approximately 132 tonnes of fish, crustaceans, molluscs, and echinoderms and was valued at (excluding the aquarium sector) $0.58 million. The sustainability of this fishery is uncertain as most stocks have no been assessed and are classified as uncertain for overfishing. Despite unknown sustainability, the fishery has adopted “voluntary codes and policies to ensure responsible use of the fishery and its resources” (AMFA 2013). These include limited entries, limited number of permits, gear and operator limits, spatial and temporal management regimes as well as output controls (size limits, proportional and total catch limits) (AFMA 2013).

The Eastern Tuna and Billfin Fishery (ETBF) uses a much larger region, extending past the Coral Sea. It extends from Cape York to the South Australian/Victorian border. The ETBF operates 44 vessels and targets Yellowfin, Bigeye, and Albacore tuna, Striped marlin, and Broadbill swordfish, primarily by pelagic longline (AMFA 2013). For the 2012-13 fishing season, the Total Allowable Commercial Catch (TACC) was allocated at 7,522 tonnes and in 2009 was estimated to be worth approximately $38.9 million. Apart from Bigeye, which is “overfished and subject to overfishing,” and Striped marlin, whose stock status is uncertain, the stocks of the other species targeted have been determined to be “not overfished.
and not subject to overfishing.” While this fishery is much more commercially valuable than the CSF, it is not solely operated in the Coral Sea (AMFA 2013).

In order to address the loss of revenue from closures in the Coral Sea and in Australia as a whole, Tony Burke announced a Fisheries Adjustment Assistance Package (FAAP) worth around $100 million (Australian Government 2012). According to Minister Burke, "Analysis done by the Australian Bureau of Agricultural and Resource Economics and Sciences showed that overall the new marine reserves will displace around one per cent of catch from Australia's diverse wild-catch fisheries." Additionally he mentioned that, "Where fishing effort or catch needs to be reduced to account for the reduced access imposed by the new reserves, the government will work with the relevant fisheries managers and the industry to remove the necessary entitlements through buybacks," (Tony Burke 2012). For a more detailed explanation of the FAAP, see Appendix II. The Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) analyzed catch history data held by fisheries management agencies for all commercial fisheries that would be potentially displaced from the proposed marine reserves and concluded that the impacts of the draft and final marine reserves network proposals on economic activity and overall fisheries production were small to moderate with around one percent of annual average catch likely to be displaced (ABARES 2013).

4.72 Conservation

Conservation views are quick to point out that:

“the network will displace less than one percent of the total gross value produced by Australian fisheries, and according to the Centre for Policy Development (Hoisington and Eadie 2012), will provide $2 billion a year in unaccounted ecosystem services. The businesses impacted will be generously compensated since the Federal Government has pledged $100 million to assist fishing businesses affected by the marine reserves network.”

Conservation views hold strong to the fact that:
“the Coral Sea Fishery is a very low-value fishery with 16 permits but only four active boats in recent years. Two of the permits are used to collect aquarium specimens, which are taken live for their decorative value; another permit is used to collect sea cucumber for export to Southeast Asia. It is clear that this will not result in increased importation of foreign seafood” (Mariasole Bianco)

Although fishermen claim that illegal fishing will increase without them being out there to police, conservation groups feel that:

“the argument that the CSMR will contribute to increased illegal fishing neglects the reality of management. The Coral Sea is not an area of major concern for illegal fishing and, if illegal fishing increases, the appropriate mechanisms for detecting and prosecuting these vessels will be in place thanks to the Marine Reserve. This means that surveillance would be higher than at present, and consist of dedicated aircraft surveillance, as well as vessel compliance monitoring” (Mariasole Bianco).

4.73 Fishing

On paper, the FAAP seems to adequately compensate fisheries affected by the closures, however according to Dean Logan, the policy is “Crap. Complete nonsense.” He noted that he felt it was ridiculous that just $100 million was allocated for the entire marine bioregional planning process. He noted, “the compensation for the Great Barrier Reef was $250 million and this area is ten times larger, and only $100 million.” Further, “we should not be losing one cottage based fishery…We have every right to catch fish and exploit fisheries sustainably.” With the Reserve, Lyle Squire’s “world’s best practice” aquarium fishery would seize to exist. As he explained it, in order for a fishery to receive compensation from the FAAP, the fishery must be worth a total of $270,000, divided by the number of permits within the fishery. The Coral Sea Fishery currently has 16 permits, though with the changes to zoning, Lyle thinks this number will drop down to three, as uncertainty is so high (Lyle Squire personal comment). While currently the permits are valued at $16,360, these permits will have to increase dramatically to upwards of $90,000 each to make the whole Coral Sea Fishery viable (Lyle Squire Submission to Tony Burke 2011). This price of permits
is so costly that Lyle’s business would not be able to operate. Cairns Marine was restructured following the Great Barrier Reef rezoning and forced into the Coral Sea, and now the ability to fish in the Coral Sea is in seriously jeopardy (personal comment Lyle Squire). This sort of cost is not something that is accounted for by ABARES, but will have major effects on businesses.

5. CONCLUSIONS

Undoubtedly, the Reserve will not be perfect. In a world driven by contrasting political interests, this would be nearly impossible to achieve. While the reserve does not protect every area of biodiversity concern, largely due to commercial interests, which are important to account for to a degree, ultimately, the Reserve accomplishes the goal of setting aside a huge section of the ocean for protection. For this, Australia should be applauded. While the reserve is not perfect in its current state, it is a world-first and a solid foundation on which to build. By the time the Reserve would be planned perfectly, it might be too late. It is important to be precautionary in our approach to protection, and if this means setting aside areas we know little about, then so be it. It is unfortunate that commercial fishing will disappear in more than half of the Coral Sea. Although fisheries in the Coral Sea are following the global trend of declines, they are some of the most sustainable in the world. In this regard, it is disappointing that some of these fisheries will be eliminated and, as some argue, Australia will have to increase international seafood exports. However, according to ABARES analysis, the volume of wild catch that would be displaced by the creation of the whole network of marine reserves is only around 0.8 percent of the wild-catch industry’s national income, which is roughly the same percentage of annual variations in wild-catch (ABARES 2013). Additionally, an analysis of seafood in Cairns restaurants showed that the CSMR will have little impact on seafood offerings because seafood is already sourced from fisheries outside the Reserve (ABARES 2010). Nonetheless, the Reserve will be one of the
first in the world, only is Chagos ahead, to protect pelagic species. Pelagic protection is often spatially very difficult to achieve, and while it is true that migratory species do not understand international borders, by protecting spawning aggregations, much of the migration will be protected. The impacts that the Chagos reserve have already had on biodiversity are outstanding. Fish biomass is six times greater, and the composition substantially different, from even the oldest no take areas in eight other Indian Ocean countries’ waters. See Appendix I, Figure 5 for a graph showing these results. Ultimately, this ecosystem-based management approach to marine conservation is expected to be extremely beneficial for protecting marine biodiversity in one of the last remaining pristine tropical systems in the world. And this is an important aspect to consider. It is unclear what the future will bring in terms of climate change and ocean acidification, and the future of coral reefs is no doubt grim. However, at least now, to have a large section of the ocean, in the Coral Sea and a greater national network of marine reserves in Australia, is a goal that no other country has yet to achieve, and is likely to increase the reef’s ability to cope with global impacts. In this regard Australia is undoubtedly leading the way to a greater conservation of the marine environment and fulfilling its international and national obligations concerning the conservation of the marine environment dating back nearly two decades.
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Agenda 21.


Figure 1. Map of Australia's proposed network of Commonwealth marine reserves. Source: Commonwealth of Australia, 2012.
Figure 2. Map of proposed zoning of Coral Sea Marine Reserve. Source: Commonwealth of Australia, 2013.
Figure 3. Map of proposed zoning of Osprey, Shark and Vema Reefs. Source: Commonwealth of Australia, 2013.
Figure 4. Bubble plot showing the percentage of hours that each species of shark was detected at each receiver on Osprey Reef. White circles- whitetip reef sharks; grey circles- grey reef sharks; black circles- silvertip sharks. Source Barnett et al., 2012.
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Demersal trawl</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Gillnet (set mesh nets, demersal and pelagic)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Demersal longline (including auto-longline and trotline)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>AQUACULTURE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>COMMERCIAL TOURISM</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-fishing related tourism (including scuba/snorkel tours and nature watching)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Fishing related tourism (including charter fishing and fishing/spear diving tours)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td><strong>MINING</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(including exploration, development and other activities)</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>RESEARCH</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RECREATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scuba diving and snorkelling</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Recreational fishing (including spear-fishing)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>x</td>
</tr>
<tr>
<td>Boating</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

a. All activities require approval to be undertaken in marine reserves; approvals are provided in the management plan or through class approvals or individual permits.

b. Ballast water exchange is managed under national arrangements. Restrictions may apply in some areas.

c. Commercial fishing methods not listed in the table may require assessment.

d. Limited to one line/rod per person on board the vessel with one hook per line on board the vessel for line fishing and three lines per person when trolling.

Table 1. Overview of the zoning scheme for the Coral Sea Commonwealth Marine Reserve. Source: Commonwealth of Australia, 2013.
Figure 5. Total reef fish biomass (in kilograms per hectare [kg/ha]) as a function of trophic level (TL), management, and depth in nine countries across the central and western Indian Ocean. Source: Graham and McClanahan, 2013.
APPENDIX II

Protect Our Coral Sea includes the following conservation organizations:


The major elements of the Fisheries Adjustment Package include:

- Transitional Business Assistance – payments to fishing businesses based on their recent fishing history in those parts of the new marine reserves where they are impacted once the management plans are operational.
- Sectoral measures – competitive grants to improve the long term sustainability of fisheries displaced by the marine reserves.
- Removal of commercial fishing effort – the purchase of individual fishers' entitlements or quota units in fisheries where the scale of the fishery has been reduced by the reserves to help ensure that they remain sustainable.

General Interview Questions: These questions were asked to all individuals who were interviewed. More specific questions were also added based on the stakeholder.

I am an American student studying with the School for International Training and for the last month of the semester we complete an independent study project, which culminates in a 25-40 page research paper. For my research I am looking at the establishment of the Coral Sea Marine Reserve and analyzing the social and environmental impacts of this ecosystem-based management approach. First of all, do I have your consent to include the information obtained from our discussion in my paper? Additionally, would you like to be recognized explicitly for providing me with the information, or do you wish to remain anonymous? This information is only for the purpose of my research and will not be published, etc.

Can you tell me about your work and how it relates to the creation of the Coral Sea Marine Reserve?

What are the most important areas to protect in the Coral Sea in order to maintain biodiversity?

Do you think that the creation of the Coral Sea Marine Reserve is the most effective management tool to protect biodiversity in that area or are there other policies that you think would be more successful?

Do you think additional measures should be taken to protect this biodiversity? (other policies to prevent pollution, ocean acidification, etc.)
In your opinion what are the goals of the Coral Sea Marine reserve?

Do you feel as though the current zoning adequately accomplishes those goals?

Are there any areas in the current draft plan that you think should be zoned differently to allow for more or less protection?

Do you feel as though the zoning for the Coral Sea Marine Reserve is rooted in scientific fact, or do you feel as though it is at all politicized?