

Harbouring Discontent: World Heritage, the Great Barrier Reef and the Gladstone Port Development



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Abstract

The Great Barrier Reef (GBR) is facing unprecedented pressures from a range of inputs—one of the most prominent being industrial coastal development. Of these developments, none has more current significance than the Gladstone Port Development (GPD) in Gladstone Harbour at the southern end of the GBR in Queensland, Australia. The Port expansion includes the extension of an existing coal terminal, reclamation and development of new land and three gas processing plants on Curtis Island, plus associated dredging works. These developments are causing controversy globally because they are occurring within the GBR World Heritage Area (WHA). Gladstone Harbour was included within the original World Heritage Listing (WHL) as it met the criteria attributed to the entire GBR – natural environmental assets of Outstanding Universal Value (OUV); including turtles, dugongs, mangroves, seagrasses and coral. These environmental attributes are under serious threat with the GPD, causing a clash between development and conservation in Gladstone Harbour. Moreover, the WH listing for the entire GBR is at risk because of the rapid development of the export industry along the GBR coast. These developments have been allowed because they are occurring in the small percent of the WHA that is not managed by the Federal GBR Marine Park Authority (GBRMPA); rather jurisdiction of these coastal waters falls to the Queensland government. The GBR has long been regarded as epitomising “best-practice” management standards for MPA because of management by the GBRMPA. However, the management ‘best-practice’ title is now under threat.

In this study discrepancies in boundaries and management practices between the GBRWHA and the GBR Marine Protected Area (MPA), come to the fore through the perspectives of high-user stakeholders - the fishers and conservationists/researchers of the region. The stakeholders provide localised insights into the OUV together with views about current management approaches. These perceptions were gathered throughout July 2012 using semi-structured interviews in Gladstone. Using these insights this study explores the way in which multiple interests collide – drawing out and questioning the role of state and federal government in regulating the space. Arguably, the management of the GPD should match the values embedded in the area’s WH designation, granted in 1981. The extent to which this has happened is explored in this study.

This study finds that the WHL of Gladstone Harbour remains significant for local user groups. While there are calls to redraw the GBRWHA it is critical to further understand how locals value the area and the WH listing *before* maps are re-drawn. The incorporation of stakeholder perceptions into environmental governance for marine habitats is essential to achieve better environmental and social outcomes. In this context, this study embraces a political ecology paradigm which provides a conceptual framework for an explanation of the GPD. Such an approach enables an explanation of the forces at work in the GPD - which allows environmental, political and economic factors to be intertwined into explanations and analysis. This overarching conceptual approach illustrates how multiple interests interact in a way which limits the efficacy of the existing environment governance framework.

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List of acronyms

AAT: Administrative Appeals Tribunal

APLNG: Australian Pacific Liquefied Natural Gas

Convention: The convention concerning...

CSG: Coal Seam Gas

EIA: Environmental Impact Assessment

EIS: Environmental Impact Statement

GBR: Great Barrier Reef

GBRIA: Great Barrier Reef Intergovernmental Agreement

GBRMP: Great Barrier Reef Marine Park

GBRMPA: Great Barrier Reef Marine Park Authority

GBRWHA: Great Barrier Reef World Heritage Area

GCC: Gladstone Conservation Council

GLNG: Gladstone Liquefied Natural Gas

GPC(L): Gladstone Ports Corporation (Limited)

GPD: Gladstone Port Development

IUCN: International Union for the Conservation of Nature

LMAC: Local Marine Advisory Council

LNG: Liquefied Natural Gas

MPA: Marine Protected Area

OG: Operational Guidelines

OUV: Outstanding Universal Value

QGC: Queensland Gas Company

WH: World Heritage

WHA: World Heritage Area

WHC: World Heritage Committee

WHL: World Heritage List/ Listing

WHS: World Heritage Site

WICET: Wiggins Island Coal Export Terminal

UNESCO: United Nations Economic, Social, Cultural Organisation

List of Legislation

INTERNATIONAL CONVENTIONS

- *Convention for the Protection of the World Cultural and Natural Heritage, 1972* (the World Heritage Convention) (WHC)
- *United Nations Convention on the Law of the Sea, 1982* (the Law of the Sea Convention or UNCLOS)
- *Convention on Biological Diversity, 1992* (the Biodiversity Convention)
- In addition, Great Barrier Reef was inscribed on the World Heritage List in 1981, pursuant to the World Heritage Convention. The Great Barrier Reef Marine Park was the first 'Particularly Sensitive Sea Area' designated by the International Maritime Organisation.

COMMONWEALTH

- *Petroleum (Submerged Lands) Act 1967* (Cth)
- *Continental Shelf (Living Natural Resources) Act 1968* (Cth)
- *Great Barrier Reef Marine Park Act 1975* (Cth)
- *Environmental Protection (Sea Dumping) Act 1981* (Cth)
- *Great Barrier Reef Marine Park Regulations 1983* (Cth)
- *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* (Cth)
- *Great Barrier Reef Marine Park (Environmental Management Charge-Excise) Act 1993* (Cth)
- *Great Barrier Reef Marine Park (Environmental Management Charge-General) Act 1999* (Cth)
- *Environmental Protection and Biodiversity Conservation Act 1999* (Cth)
- *Great Barrier Reef Marine Park (Aquaculture) Regulations 2000* (Cth)
- *Great Barrier Reef Marine Park Zoning Plan 2003* (Cth)

QUEENSLAND STATE

- *Nature Conservation Act 1992* (Qld)
- *Transport Operations (Marine Safety) Act 1994* (Qld)
- *Environmental Protection Act 1994* (Qld)
- *Fisheries Act 1994* (Qld)
- *Coastal Protection and Management Act 1995* (Qld)

Chapter 1:

Introduction to the Great Barrier Reef World Heritage Area

“The Great Barrier Reef is internationally recognised for its outstanding biodiversity. The World Heritage status of the Reef recognises its great diversity of species and habitats. Conserving the Reef’s biodiversity is not just desirable- it’s essential. By protecting biodiversity, we are protecting our future and our children’s future” (GBRMPA 2011a).

The Great Barrier Reef World Heritage Area (GBRWHA) is one of Australia’s most valued and recognisable natural assets, and defines the state of Queensland (Oxford economics 2009; Australian Government 2012b). Despite its iconic status, this natural jewel is at a crossroads. Australia’s position as an exporter of natural resources has placed unprecedented pressure on the Great Barrier Reef (GBR) which is already threatened by climate change, invasive species, agricultural runoff and coastal developments (GBRMPA 2009; Cousteau *in* Johnson and Marshall 2007). Eleven proposed port developments to aid coal and gas exports (Douvere and Badman 2012; Australian government 2012b) have roused concern that Australia will destroy the GBR in order to export commodities. The first and largest of these developments is the Gladstone port development (GPD).

The development has raised concern internationally because the works are occurring in a World Heritage Area (WHA). Of particular concern is the dredge spoil removed to deepen the navigation channel; which is being dumped 400 meters away from the Great Barrier Reef Marine Park (GBRMP), a commonwealth managed marine protected area (MPA) (ABC 4 corners 2011). The environmental concern is also evident locally, with high-users of the region suffering from a loss of space and the impacts of the environmental damage. From the outset, the setting of the GPD reflects the incongruities between protected area regimes that occur in the region. The developments are in direct conflict with the spirit and intent of the international environmental and heritage protection instrument Australia signed in 1972, the *Convention Concerning the Protection of the World Cultural and Natural Heritage* (the *Convention*). This international commitment to conserve and protect the reef

is operationalized through a complicated environmental governance framework within Australian legislation. It is this framework which comes under stress when development confronts conservation – as is the case with port developments in Gladstone Harbour.

In this introductory chapter, Section 1 explains the importance and significance of the GBR and the study site. It will further outline the environmental governance framework designed to manage the GBR. Following from this, section 2 outlines the cultural and economic significance of the region in local and international dimensions. The current developments in Gladstone are explained in section 3. Section 4 outlines the research design and significance of the study. Section 5 outlines the research in context with the wider literary context and section 6 provides the aims, research questions and objectives of the study. Section 7 frames the work within its limitations, while section 8 summarises the structure of the thesis in a chapter-by-chapter synopsis.

1.1 The Great Barrier Reef World Heritage Area (GBRWHA)

1.1.1 The importance of the GBR: size, scope and significance

The GBR is a World Heritage Listed (WHL) site of Outstanding Universal Value (OUV), listed in 1981 for its natural environmental heritage, which is incomparable to other sites in its diversity: “it seems clear that if only one coral reef site in the world were to be chosen for the World Heritage List, the Great Barrier Reef is the site to be chosen” (UNESCO 1981). It is the largest complex of coral reefs and associated species on earth. It extends over 2,000km along the north-eastern coast of Australia [Figure 1.1].

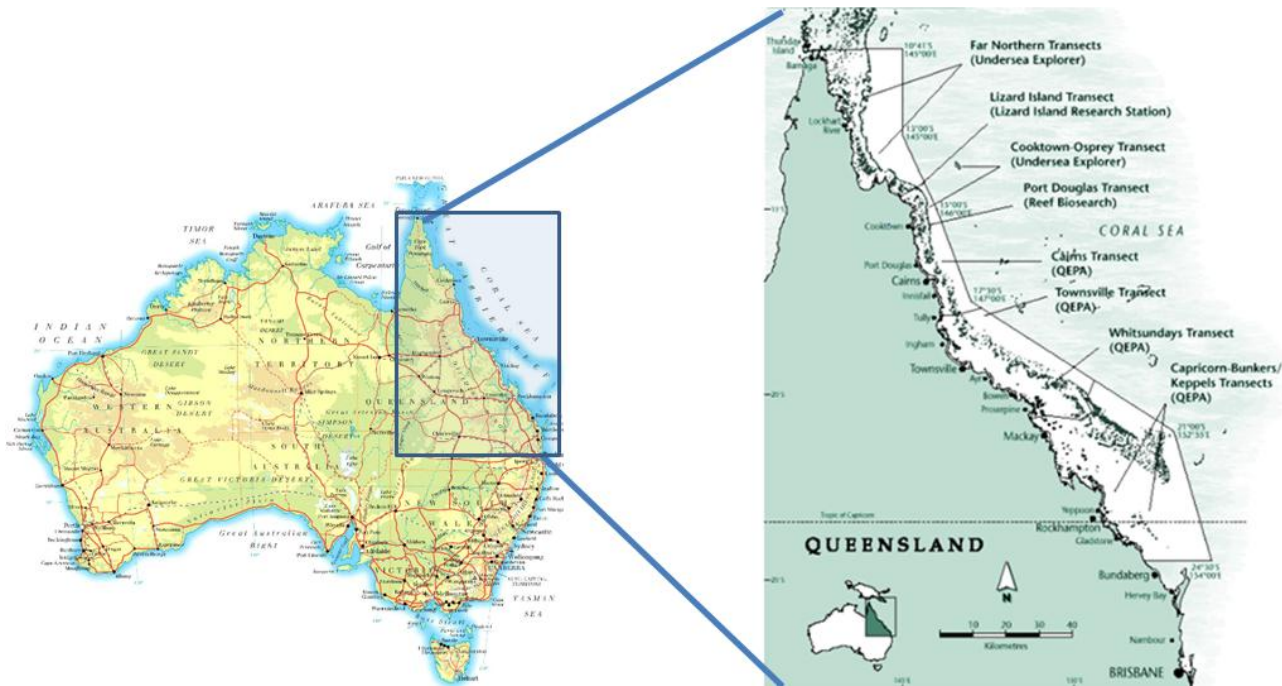


Figure 1.1: the GBRWHA, covering the majority of the Queensland coastal area and extending to the tip of Australia (adapted from Puhanic 2011 and GBRMPA 1999).

The GBR contains more than 3,200 coral reefs and represents one of the most biologically rich ecosystems known on earth (Bowen and Bowen 2002). It is home to the near extinct dugongs, as well as six species of endangered turtles [Table 1.1].

Table 1.1: Turtle species and status of protection (GBRMPA 2011e).

Species	Common name	IUCN status	EPBC act status	Queensland Nature conservation regulation 1994
<i>Caretta caretta</i>	Loggerhead	Endangered	Endangered	Endangered
<i>Chelonia mydas</i>	Green	Endangered	Vulnerable	Vulnerable
<i>Eretmochelys imbricata</i>	Hawksbill	Critically endangered	Vulnerable	Vulnerable
<i>Natator depressus</i>	Fatback	Data insufficient	Vulnerable	Vulnerable
<i>Lepidochelys olivacea</i>	Olive ridley	Endangered	Endangered	Endangered
<i>Dermochelys coriacea</i>	Leatherback	Critically endangered	Vulnerable	Endangered

The reef structures have long-supported human activities, especially coastal indigenous communities, and the reef continues to hold cultural and spiritual significance for the traditional land-owners (Bowen and Bowen 2002). Figure 1.2 shows the location of the indigenous groups of Gladstone.

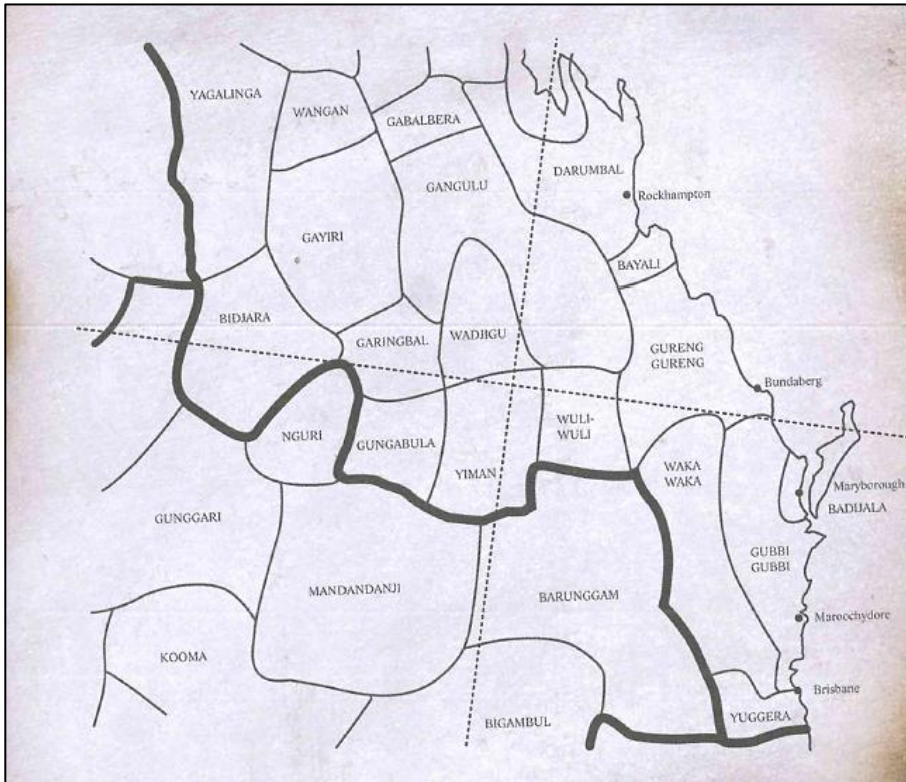


Figure 1.2: distribution of the Gladstone Indigenous land owners and language groups [not to scale] (GPCL 2009).

The GBR is the largest designated World Heritage Site (WHS) in the world (UNESCO 1992-2012a; Lawrence *et al.* 2002) [Figure 1.3]. It is Australia's most recognisable natural icon and provides an estimated six billion dollars (AUS) to the state and national economy (Access Economics Pty Ltd 2007; McCook *et al.* 2010). The GBR provides a source of livelihood to thousands of people, through fishing, research, tourism, and coastal employment. For many Australians the GBR is immeasurably valuable to our way of life and perceptions about Australia's natural beauty (GBRMPA 2012a). The importance of the region is ingrained within Australian culture and history.

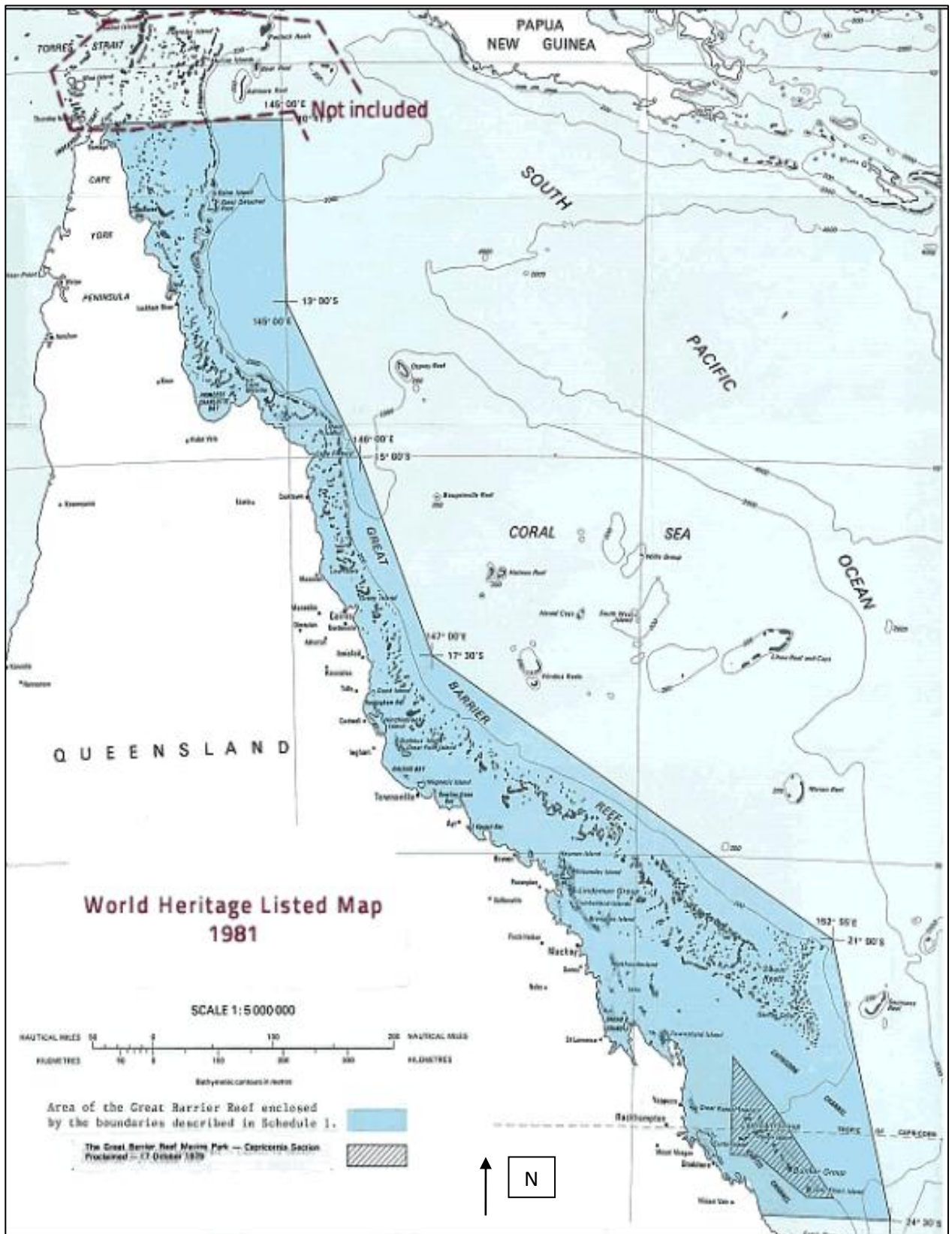


Figure 1.3 the GBRWHA map from the inscription on the WHL, 1981. UNESCO 1981.

1.1.2 Management of the Reef

Management of the GBR takes place at a variety of governance levels from the international framework of UNESCO's *World Heritage Convention*, through to national legislation in the form of the *Great Barrier Reef Marine Park Act 1975* (Cth) and state and local regulations and policies. Each is aimed at preserving, conserving and managing marine and coastal activities of the multiple interests of stakeholders. Importantly, in 1981 the GBRWHA boundaries were decided with the intention that the GBRMP would match the WH boundary (UNESCO 1981). Previously, the MPA had been declared but not defined in terms of its size and scope [Figure 3.1]. Deciding the 'what' and 'where' of the environmental protective regime for the reef was a complicated process (Kirwoken 1991). Although approximately 99% of the reef lies within the GBRMP, there is the remaining 1% within the WH boundaries that are not consistent with the commonwealth MPA boundaries. Critically, one such anomaly occurs in the Gladstone Harbour area¹; the region of focus for this thesis.

Australia has been extolled for its reef management, employing cutting edge science and best practice management, primarily through the overarching governing body, the GBRMP Authority (Brodie *et al.* 2001; Day *et al.* 2002; Day 2008; Ruckelshause *et al.* 2008). However, shortfalls in protection have become one of the key issues for the reef (Brodie and Waterhouse 2012). These shortcomings and failure to uphold high protection standards in the recent history of the reef relate to, *inter alia*: overfishing, crown-of-thorns starfish (COTS) outbreaks, adverse climate change impacts, increased nutrient runoff from farmland and **coastal development** (GBRMPA 2009; Cousteau *in* Johnson and Marshall 2007 [emphasis added]). These anthropocentric inputs are schematically represented in Image 1.5, showing the sources of stress on the reef.

¹ All islands within the GBR are WHL but not included in the MPA.

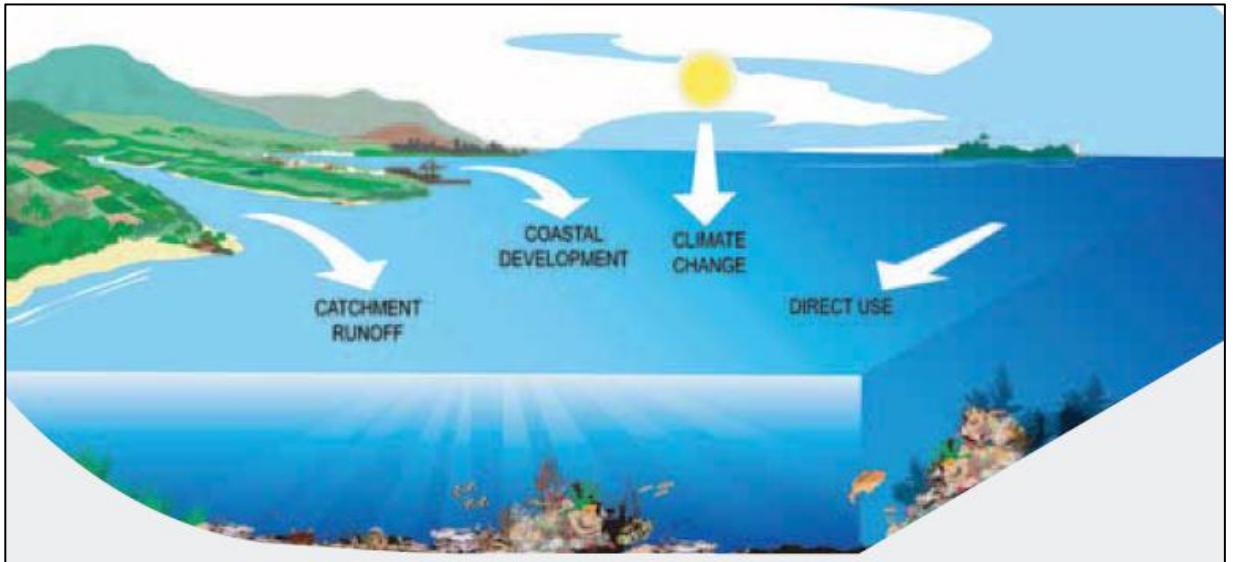


Figure 1.4: the major input impacts that are affecting the GBR (GBRMPA 2009)

1.2 Coastal Development

One of the most pertinent issues for the reef's health concerns the impacts of coastal development. Particularly the new port developments along the Queensland coast, with 45² developments proposed for the GBRWHA (Douvere and Badman 2012; Appendix C). These developments are considered necessary by government and industry to meet the growing demands for the export of natural resources, including coal and liquefied natural gas (LNG). Queensland is a coal rich region has witnessed enormous investment in coal exploration and extraction (The State of Queensland [DERM] 2012). The exponential growth and production in exploration requires increased port space. The regions of mining leases and activity are shown in in Figure 1.6. Accordingly, ports located along the Queensland coast are under pressure to expand. At present, there are eleven ports operating adjacent to the Great Barrier Reef, accounting for approximately \$17 billion of Australia's export trade (Australian Government- AMSA 2012).

² The 45 new developments are not all port developments, but are the proposals for developments of significance which could impinge on the WHL.

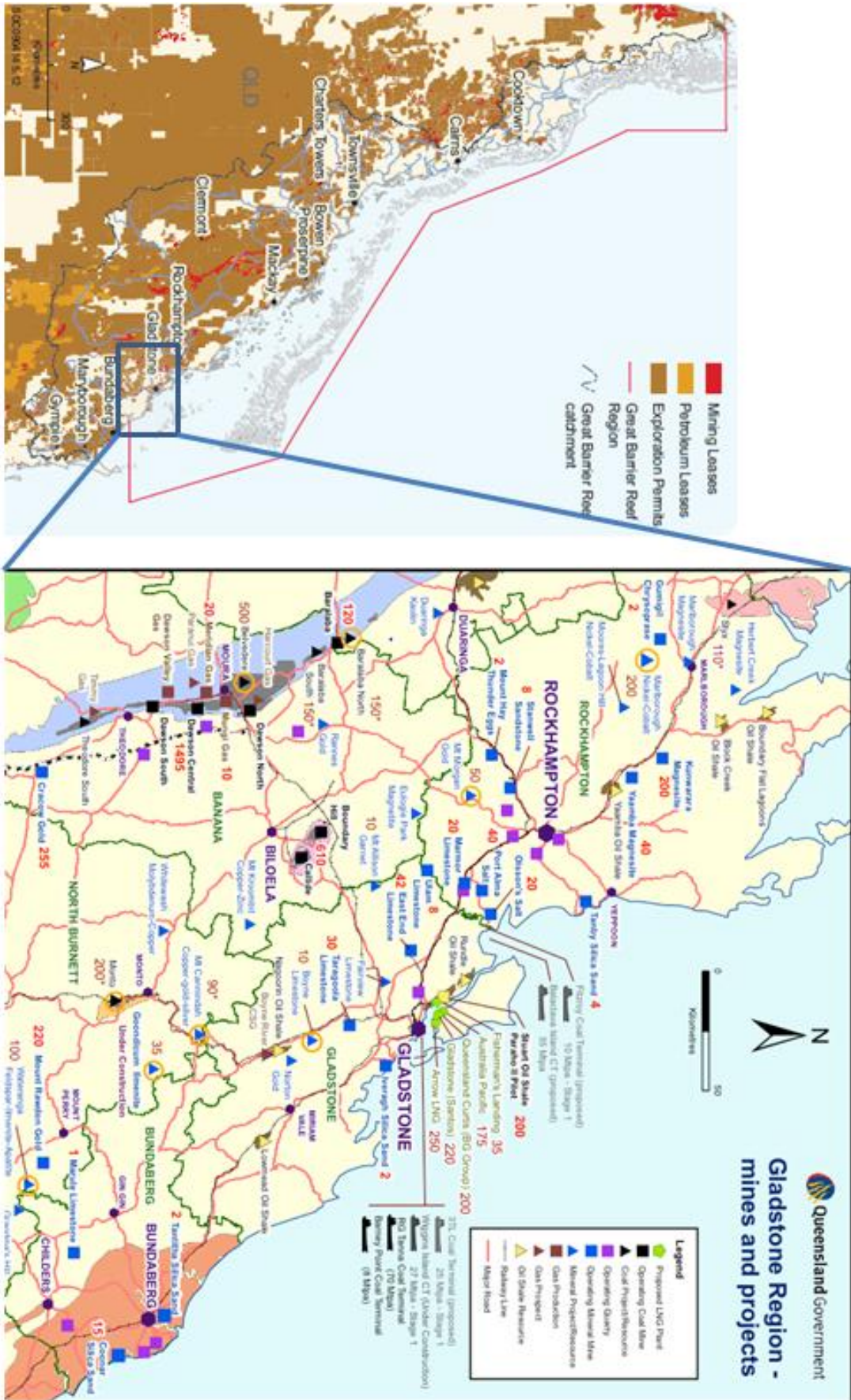


Figure 1.5: Queensland mining region, and the current mines and projects in the Gladstone region (Queensland government [department of Employment, Economic Development and Innovation] 2012).

1.3 The study site: Gladstone and the current developments

Gladstone is a coastal region located in central Queensland, bordering the southern end of the GBRWHA. Gladstone has a long history as a port city. It was established in 1896 as a town based around a meatworks and later developed as a heavy industry town with the construction of an aluminium smelter in 1964 (GEIDB 2012). Since the mid-twentieth century, Gladstone has grown to become one of Australia's major ports. Currently, Gladstone is one of the top three coal exporters for Australia, and one of the five major ports in the world (GPCL 2011).

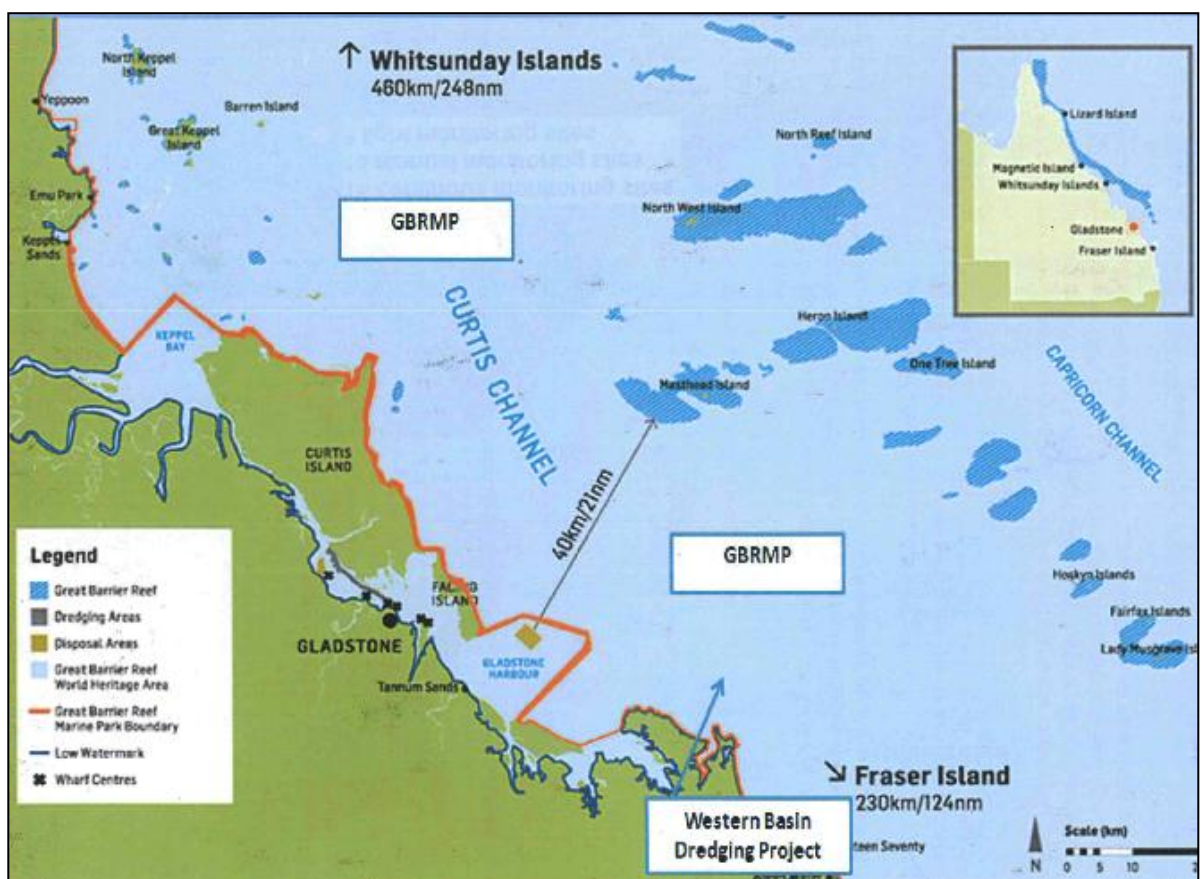


Figure 1.6: the Gladstone region and Curtis Island, including the boundaries of the GBRMP, and the areas of development, including the distance between the dredging dump location and the nearest coral cay [Masthead Island] (GPCL 2012).

Gladstone was chosen for this study based on its location within the GBRWHA, but out of the GBRMP. Gladstone represents a boundary anomaly in the region. In the case of the GBRMP, the Commonwealth has jurisdiction. In the case of the Queensland-owned islands and areas beyond the low water mark and port exclusion zones, the Queensland Government has jurisdiction. But the Commonwealth has international obligations under the *Convention*.

The space the Gladstone Harbour and Curtis Island inhabit is important, as boundaries determine which government has jurisdiction over various parts of the Area (Lucas *et al.* 1997).

Today, Gladstone is undergoing another surge in development with LNG (Haworth 2010). The existing port facilities are being expanded to allow for the largest gas exporting site in Australia. This includes three³ LNG processing plants on Curtis Island. In order to access the island facilities, 40 million cubic meters of sea floor to be removed (dredged) and relocated⁴. Part of the dredge spoils will create the Fisherman's landing reclamation area, the construction of an extra 150ha of land which has been flagged for future development (GPCL 2011). A further development of a second Wiggins Island Coal Terminal is under construction [Figure 1.7].

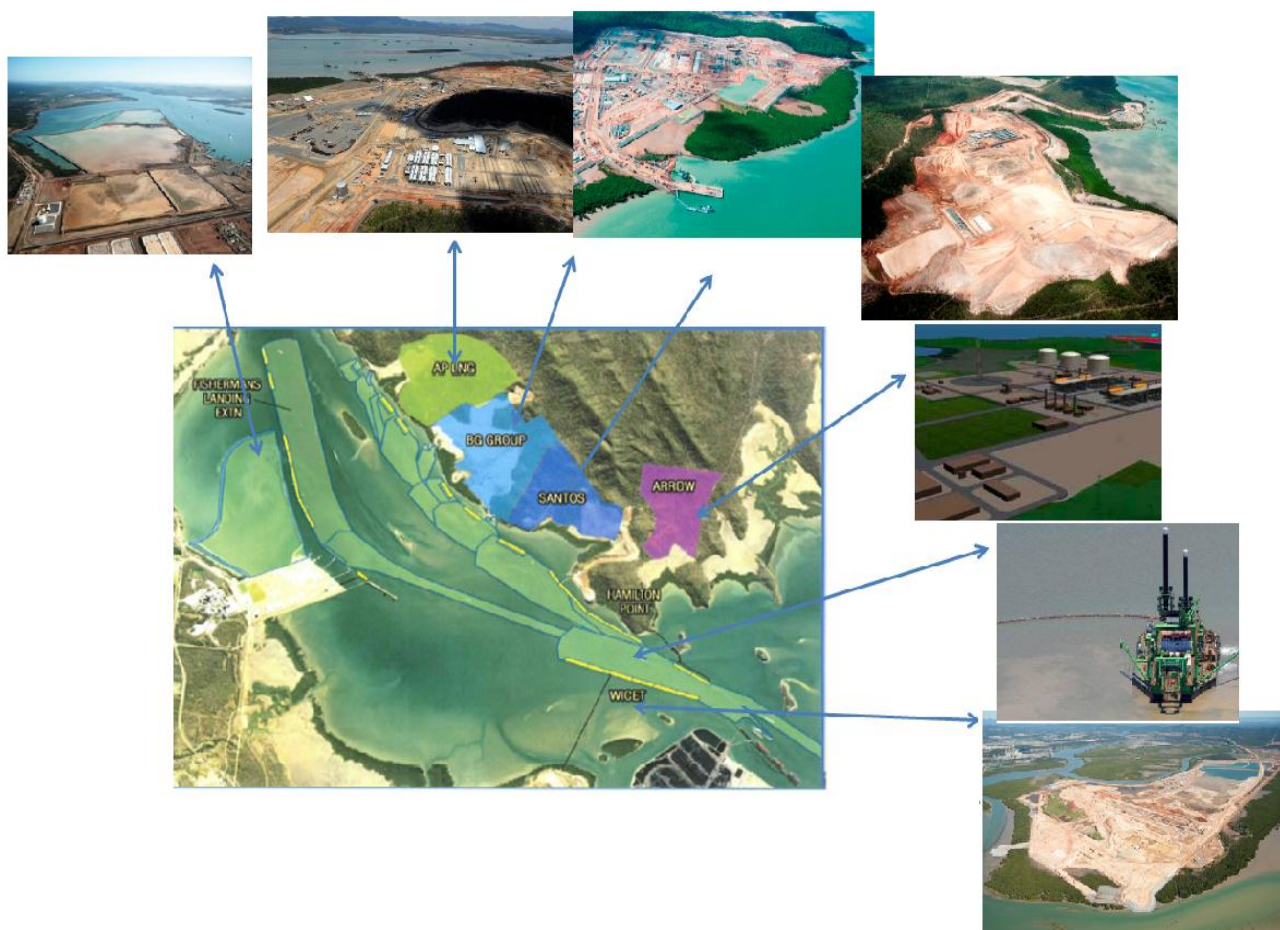


Figure 1.7: Image showing the locations and developments occurring in Gladstone as part of the expanding natural resources export driven economy in Queensland. The figure also includes Arrow energy, which has not finalised financial backing, but is set to start construction soon (adapted from: GLNG 2012; APLNG 2012; OGC 2012; GPCL 2011).

³ With a fourth plant (Arrow energy) waiting for final investment.

⁴ This is the quantity that has been given approval for the development, it may not all be dredged. The GPC say 26 million cubic meters will be removed (GPCL 2012).

Curtis Island is located 16km from Gladstone and is part of the WHA (Queensland Government [Department of National Parks, Recreation, Sport and Racing]). The island was once pastoral land, but today land use is regulated through a state Marine Park, a national park, a residential area and port development land [Figure 1.8]. The low water mark of Curtis Island is the boundary for the GBRMP (commonwealth managed waters). The island is ecologically important, home to a wide range of flora and fauna, and is recognised as an important breeding site for turtles [Table 1.1]. The surrounding waters have been declared dugong protected areas because of the high content of seagrass meadows, a globally declining ecosystem (GBRMPA 2012a).

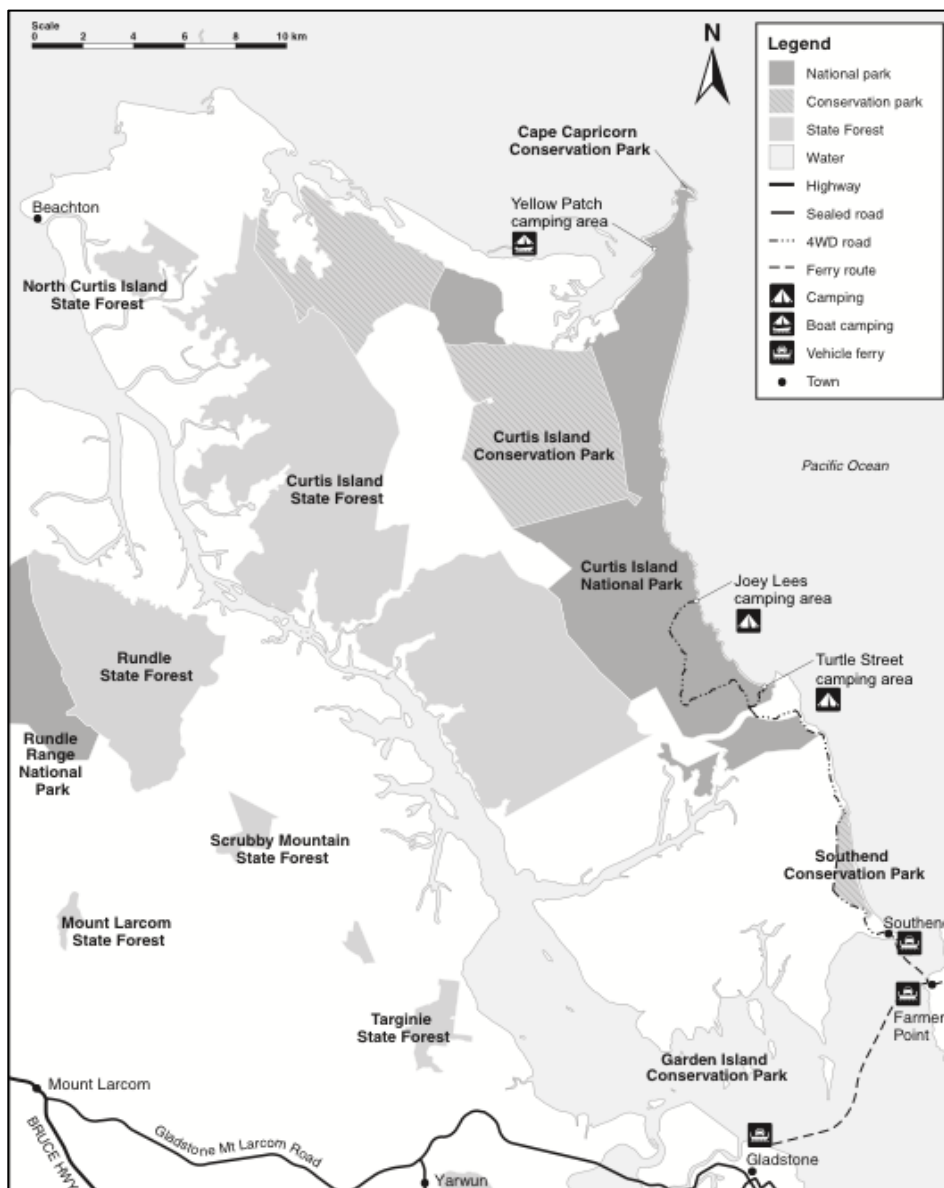


Figure 1.8: A map of Curtis Island, Queensland with protected area zones shown. (Queensland Government [Department of National Parks, Recreation, Sport and Racing]).

Gladstone is expected to accommodate up to 20,000 people in peak construction times of development (GEID 2012). This represents a remarkable rate of development. The clash between development and conservation is highly poignant in the Gladstone region.

The expansions are in direct conflict with Australia's obligations to the *World Heritage Convention* (the *Convention*)⁵ as the developments are occurring within the WH boundaries. This is causing controversy and threatening the natural heritage values. As a signatory to the *Convention*, Australia has a responsibility to protect the site in perpetuity as a global property (UNESCO 1992-2012b). Australia's commitment to the *Convention* is confirmed in national legislation, the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). The Port expansion developments in Gladstone call into question national, state and local commitments to environmental protection. Controversially, Australia failed to report the Port developments, thus ignoring this obligation under the *Convention* (Dovere and Badman 2012).

1.4 Research Design of this Thesis

1.4.1 Study Significance

Growing tourist numbers, development pressures and environmental concerns threaten the viability of WH properties globally. Long term maintenance of site integrity presents challenges for managers, who must balance competing demands of development and preservation (Gillespie 2012b). Not only are WHAs under threat, coral reefs, home to the largest range of biodiversity in the world, are declining faster than scientists can count them (Sylvan 2006) under pressure from global stressors of increasing ocean temperature and ocean acidification (Hoegh-Guldberg *et al.* 2007). Coral reefs are some of the most sensitive ecosystems in the world with IPCC trends predicting a decrease in 70% of the world's reefs within 40 years under the current warming trend (IPCC Report 2007). Without a comprehensive understanding of coral reef ecosystems and associated species, it is not possible to understand the full extent of the damage being caused by large-scale developments, such as the GPD. In the draft conservation strategy (GBRMP 2012b), of the species mentioned [Figure 1.7], much of the marine biodiversity is poorly known. What is known and recognised is the importance of marine ecosystems to global society- and protection of biodiversity of these regions is challenged beyond the boundaries of the

⁵ Officially, the *Convention Concerning the Protection of the World Cultural and Natural Heritage*, 1972.

GBRMP (GBRMP 2012b). Therefore it is important to look at the areas beyond these borders to assess and protect the GBR.

Taxonomic group	Species diversity and level of knowledge in the Great Barrier Reef
Macroalgae	At least 630 species; level of knowledge for a limited number of species good; overall level of knowledge poor
Seagrasses	15 species; level of knowledge fairly good
Mangroves	39 species; level of knowledge fairly good
Sponges	At least 2500 species for all Queensland waters; overall level of knowledge poor
Jellyfish	>100 species; overall level of knowledge poor
Bryozoans	~950 species; overall level of knowledge poor
Soft corals and sea pens	At least 150 species; overall level of knowledge poor
Sea anemones	~40 species; overall level of knowledge poor
Hard corals	>450 species; knowledge for many reef-building species good; level of knowledge for remainder poor
Molluscs	>3000 species; overall level of knowledge medium; good for commercially important species
Worms	At least 500 species; level of knowledge poor but better for polychaetes than other groups
Crustaceans	~1300 species; overall level of knowledge poor; good for some commercially important species
Marine insects	Number of species unknown, probably >20, level of knowledge very poor
Marine arachnids	Number of species unknown, probably >5, level of knowledge very poor
Plankton	Species diversity very high; overall level of knowledge poor
Echinoderms	~630 species; some species well studied, i.e. crown-of-thorns starfish, but majority poorly known
Ascidians/Tunicates	~720 species for all Australian waters; overall level of knowledge poor
Bony fishes	~1625 species; level of knowledge good for some coral reef and commercially important species; poor for remainder
Sharks and rays	~133 species; level of knowledge generally poor but improving
Crocodiles	One species estuarine crocodile; level of knowledge good
Marine turtles	Six species; level of knowledge generally good
Sea snakes	14 breeding species; level of knowledge good for several species; but remainder poor
Seabirds	22 nesting species; level of knowledge good for some species; poor for remainder
Marine mammals	>30 species of whales and dolphins and 1 species of dugong; overall knowledge for dugong and humpback whale good; for remainder poor to very poor

Figure 1.9 the taxonomic groups and knowledge levels of each in the GBR, based on the draft strategic assessment the GBRMP Authority conducted throughout 2012 (GBRMP 2012b).

This thesis explores the GPD as a case study, looking at the implications of the development and the spatial relevance of the protective regimes applied in the GBRWHA. WH obligations create a situation in which multiple interests collide (Gillespie 2012b). This thesis examines the tensions created by conservation and development seen by high-users of the region: fisheries and conservationists/researchers.

1.4.2 Boundaries of management

The main sources of incongruity with the boundaries demarcating protected areas lie in its management framework. Critically, *the region is protected under federal law as part of the GBRWHA, but is not managed by the GBRMP Authority, as it is part of the small percent of the WHA that is excluded from the GBRMP*. There has been ongoing conflict regarding rights and responsibilities for the area that have never been clearly resolved. The long history of industry in the area and the high use port status remains vitally important for Australia's economic growth, yet potentially at a significant cost to the GBR.

The GBRWH boundaries are simplistic in design – straight lines with little variation, yet they have been imposed on a complicated landscape [Figure 1.3]. This is a situation which can challenge the success of environmental and heritage protection regimes across the world (Gillespie 2012a). A protected space and its associated value should determine the actions occurring within it. The question asked in the case of Gladstone is why the development was allowed to occur in the manner in which it has, within an area that is subject to the highest symbolic level of protection in the world.

“Successful WH management requires that site integrity is maintained over the short and long term. The maintenance of site integrity presents constant challenges for managers, who are often called upon to balance the competing demands of conservation with development. Part of the tool kit for managers includes the spatial restrictions which are activated through planning mechanisms that restrict or promote particular activities. The spatial extent of these heritage inspired overlays is a conundrum for all WH property stakeholders and, accordingly, there is a need to better understand more about how and why boundaries and zones are created” (Gillespie 2012a, 2).

In Gladstone the issue stems far beyond the scope of ‘ownership’ and rights within the space. The privatisation of government resources and the political drive for increasing Australian coal exports to boost the economy has been the motivator for the development. The environmental impacts of development are contentious and, at times, uncertain, but arguably there is a sell-off of the longevity of the environmental assets of Gladstone's marine region, and the greater GBR region for short term profits associated with coal exports.

1.5 Contribution to literature

Coral reefs are threatened by a multitude of anthropocentric and natural impacts globally. At the 2012 Coral Reef Symposium⁶, conservation planning, coral reef management and the social and economic dimensions of coral reefs were the major themes, with more talks on these topics than any previous symposia (Hughes 2012). Being a contemporary topic, a critique of the ongoing GPD has not been addressed within academia⁷. The Gladstone region is the first off the rank for port developments in Queensland. This thesis assesses the efficacy of management arrangements *vis-à-vis* high-user groups. The review of the present development has potential to make a valuable contribution to future planning and implementation of best-practice management that has been a hallmark of GBR environmental governance.

Social science literature about the GBR pertaining to science and management is largely based upon tourism and tourist experiences and uses of the reef (Kenchington 1991; Fenton *et al.* 1998; Inglis *et al.* 1999; Shafer and Inglis 2000; Harriott 2002). This study offers a different perspective, placing emphasis on those with a continual interaction with the GBR. The emphasis here is more than about economic value alone, rather the priority is to assess reactions and perceptions of other daily users of Gladstone Harbour. This is an important and emerging paradigm, with an increase in awareness of the importance of community consultation in effective implementation of policy for protective areas (Elliott *et al.* 2001; McClanahan *et al.* 2006).

The protection of marine and coastal environments is ongoing (GBRMPA 2012b). Achieving balance in managing development and conservation objectives is critical for the longer term (Salafsky and Margoluis 1998; Garnett *et al.* 2007). This thesis contributes to the new body of work reflecting upon the operation of the *Convention* combined with marine science and management literature – framed from a social science perspective. At present, the issues surrounding the WHA of the GBR, separate to the MPAs have not been assessed in literature⁸.

⁶ Held in Cairns, Queensland in July 2012.

⁷ At date of publication of this thesis

⁸ There have been studies on the areas in the GBRWHA which are excluded from the GBRMP boundaries, but not framed within a WH context that are known at the date of publication.

1.6 Aims, research questions and objectives

The inconsistencies of the spatial regulation of Gladstone Harbour highlight issues about how developments are allowed to occur in a WHA. The importance of the site is emphasised because it is listed for all four natural criteria of the *Convention* [Table 1.2]. The relationship between WH values and daily management appear imprecise and undefined. Until the links become clearer, management difficulties will persist (Lawrence *et al.* 2002).

Table 1.2: UNESCO criteria for the listing of a natural site, this outlines the qualifications a site is required to possess to be considered for the WHL. (The Convention 1972).

UNESCO NATURAL HERITAGE CRITERIA:	
1	To contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance
2	To be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features
3	To be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals
4	To contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation

This study aims to document and assess how high-use stakeholders: fisheries and conservationists view current usage and management of the harbour. As part of this process the current environmental management approach – emphasised with spatial planning based on boundaries and zones - are also assessed. The research questions are

1. Does the current management approach reflect the WH values?
2. How are high-users of the space (Gladstone Harbour) engaged with the WH values – in particular the natural environmental assets of the region?

To understand high-user opinions the study used semi-structured interviews. These were conducted predominantly in Gladstone throughout July 2012. This was an important part of the study, as the perspectives and information gained *in-situ* allowed the grounding of the study within the real-use of the region. To gain a visual understanding of the marine environment and WH protection, maps were used to garner perceptions about boundaries.

Understanding the limitations and assumptions of maps and the mapping process is fundamental to enhancing our understanding of multi-use areas (Monmonier 1996). Scientific studies and a wide body of literature were used to triangulate the personal perspectives with the environmental implications of the development. These techniques intertwine the environment with human perceptions of importance, and link the physical science to the social science. While a political ecology framework has been applied to this study, the theory does not dominate the thesis, rather is implicit and embedded in the stakeholder perspectives and evident in the ongoing tensions between conservation and development, developed through the research.

1.7 Scope of research

This thesis has been designed to consider the perspectives of high-users of the GPD. Arguably, the implications in this study are global, as the tensions between conservation and development are not restricted to the GPD or GBR. While the scope of the study has geographical boundaries these are artificially drawn zones. The ecological, social, historical and economic importance of the GBR does not stop at the low-tide mark; nor is the impact of the GPD limited to the Gladstone Harbour region. The impacts stretch inland- to the coal fields where the gas extraction is occurring, and outward to the Greater GBR through shipping impacts. The shipping impacts are a large feature of the concerns over the development, as the increased shipping leads to increased risk of accidents. While this is crucial to the vulnerability assessment of the GBR this issue extends beyond the range of this thesis.

The temporal scope of this study is focused on contemporary history and the current port development from 2008-2012. However, the importance of history for the context is considered. The history of gazettement the WHA and MPA, as well as historical human use of the region provides an important framework for this study⁹.

⁹ The historical framing within this study largely excludes indigenous history and use of the region. This is because the scope of the development and industrialisation of the region occurred within European settlement of the region. The importance of the traditional owners of the land is not forgotten in this work, although only brief mentions have been made.

1.8 Structure of this work

Drawing on concepts of scale, this thesis flows from an international to national/state, to regional and local focus. The chapters are designed to provide a multi-level analysis of the GPD within its protected status context. Section one (chapters 2-4) outlines the background, both within time and literature of the topic. Section two (chapters 5-6) provides the rationale for the data and the results, while section three builds upon section 1 and 2 to provide a cohesive analysis of the information provided, extrapolating conclusions, perspectives and implications (chapters 7-8). The structure of this thesis reflects the importance of context, as a large amount of time is devoted to the literature and background, emphasised in section 1.

Chapter 2 presents the literary context and environmental heritage protection framework at an international scale, considering the concept of WH in the international and historical setting, and the specific role of Australia. The overarching theory for this study is interwoven throughout the thesis and is explained in chapter 2. *Chapter 3* outlines the GBR region, looking at the sites importance. Chapter 3 frames the relevant national legislation and the international framework under which the GBR is protected. *Chapter 4* investigates the Gladstone region, and outlines the current developments and the environmental implications.

Chapter 5 explains the methods used to conduct fieldwork in Gladstone and how the data collected *in-situ* was analysed. Chapter 5 also looks at the methodological theory of fieldwork, assessing the complexities of conducting qualitative fieldwork and the position of the researcher and participants in research. *Chapter 6* presents the results using visual tools to present the raw data to support the analysis of the results.

Chapter 7 presents the real-world implications of the results together with the theoretical understanding of the intertwined issues. In this chapter the meaning, management, understandings and regulations of a contested space are explored. The exploration of the natural environment's values dictated by the high users of the space is implicated within the data, and triangulated with the literature and politics and science where possible. Finally, *chapter 8* provides a conclusion to the study and provides recommendations for furthering this study.

Chapter 2:

Environmental Governance: World Heritage Listing and Marine Protected Area Management

“Heritage is our legacy from the past, what we live with today, and what we pass onto the future generations...the heritage of the Great Barrier Reef shapes and drives what the reef is like now, how it is managed and the types of reefs tomorrows generation will inherit” (GBRMPA 2011c)

World Heritage sites (WHS) are some of the most well-known and visited places around the world (Prideaux *et al.* 2012). WH status is a lucrative title attracting economic benefits and global protection. While WH listing an area provides benefits, the listing imposes additional duty-bearer responsibilities on the state to protect the region, which can prove difficult in many cases. The complexities of WH listing are especially evident in ocean and coastal environments, as marine ecosystems are complex, adaptive and linked through oceanography, topography and species movements (Levin and Lubcheno 2008). While many aspects of the GBRWHA management are considered best practice, Australia’s WH management record for other natural WHAs is not (Maswood 2000; Gillespie 2012). A large element of criticism for WH management, which is present in the GBR is related to the discrepancy between boundaries. The boundaries demarking the regulatory framework of the GBRMP and the GBRWHA have come to a crossroad in Gladstone. This is largely based on the conflicts between development and conservation. The current pressures on the GBR are immersed in the broader political climate about natural resource use versus conservation.

This chapter begins with an outline of the WH framework and the concept of OUV in section 2.1. Section 2.2 explains the WH management of MPA’s from the perspective of social and physical science. Section 2.3 outlines the Australian context of WH and outlines major issues that have arisen with designation. Finally, Section 2.4 frames the GPD within the broader context of theories emanating from political ecology.

2.1 World Heritage – an explanation

2.1.1 Protecting sites of global significance

Sites that possess OUV require ongoing protection and should be regarded as being part of the common heritage of all people (Spalding 2002). These places are recognised and protected through United Nations Educational, Scientific and Cultural Organisation's (UNESCO's) *Convention Concerning the Protection of the World Cultural and Natural Heritage (The Convention) 1972*. The *Convention* is the most visible international legal achievement of the modern conservation movement (Strasser 2002; Jokilehto 2006) and is recognised as one of the most successful documents of international environmental and heritage law (Gillespie 2012). With 189 signatories (UNESCO 1992-2012c), it is almost universal in its ratification, establishing a globally recognised ethical-legal foundation safeguarding WHAs (Musitelli 2002). Listing provides universal recognition; but responsibility for protection resides with the sovereign state in which the WHA is located (Vernhes 1990). The WHL is generally considered an excellent international effort to save the global commons (Frey and Steiner 2011). Recognition of sites on the WHL is considered to be a grand accolade, engendering a sense of pride (Spalding 2002).

For a site to be accepted by the WH Committee (WHC), the state party in which the site is found must nominate the site, and the nominating dossier must articulate the ways in which the site meets the WH criteria (Boer 1992). The nomination is then assessed by expert bodies before the WHC reaches a decision on the listing (Turtinen 2000) [Figure 2.1]. The text of the *Convention* and the accompanying *Operational Guidelines (OG)*, requires states to endeavour to develop general policies to promote the heritage value of the site, including the incorporation of planning and management regimes, undertaking research and counteracting threats and enshrining these efforts within legal, administrative and financial frameworks (Spalding 2002). Due to the exigencies of international law, neither of these documents (*Convention* or the *OG*) have any real effect until they are implemented by the nominating country through their own national and/or local regulations (Gillespie 2012a).

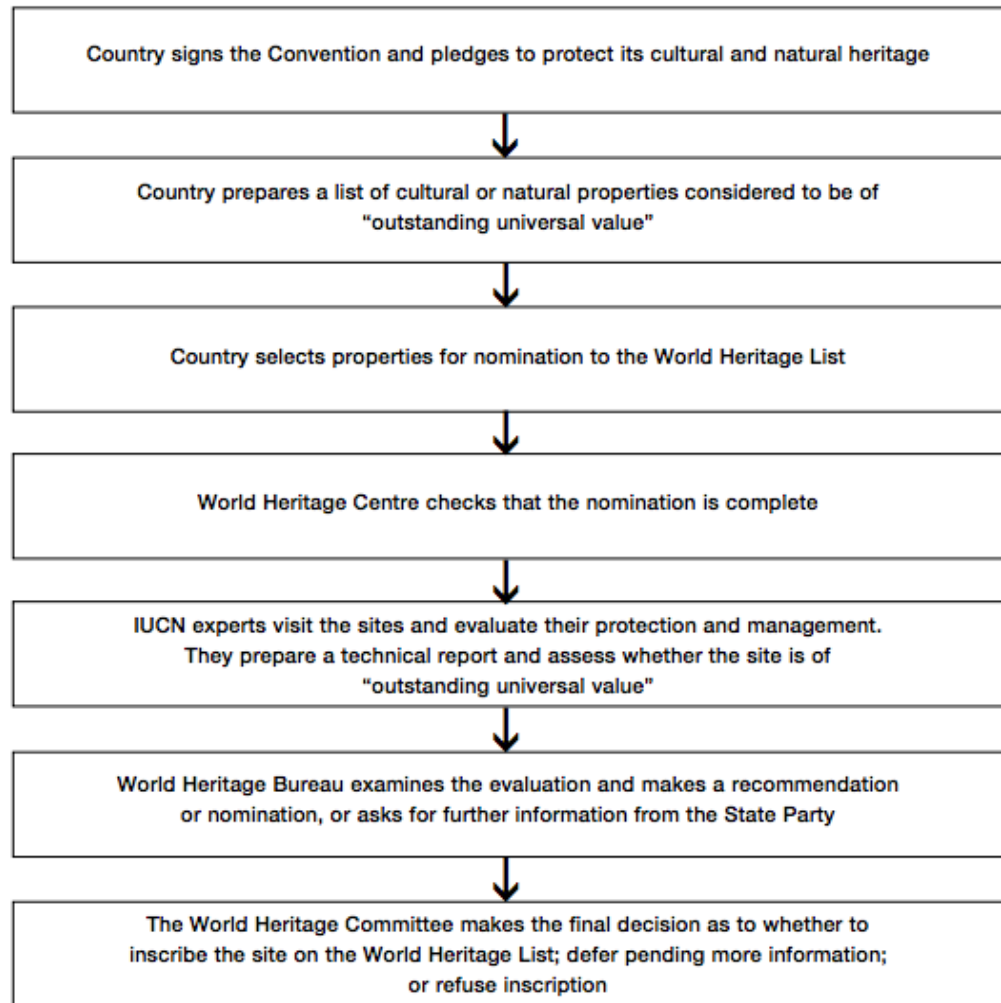


Figure 2.1: the process by which a site is WHL, showing the role of the sovereign state and the WHC. (Spalding 2002)

2.1.2 Defining Outstanding Universal Value (OUV)

For a site to meet the WH criteria it must be recognised as having OUV (Spalding 2002). The meaning of OUV provided by the *OG* is set out in Table 2.1. While the notion of OUV is somewhat vague and in need of further exploration (Jokilehto 2006), it is clear that WH listed properties need to be exceptional, remarkable places worthy of conservation and protection for all.

Table 2.1: The WH OG definition for Outstanding Universal Value, added to the OG in 2009, prior to this, there was no formalised definition for OUV (UNESCO 1972).

Outstanding Universal Value

Outstanding Universal Value means cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity. As such, the permanent protection of this heritage is of the highest importance to the international community as a whole. The Committee defines the criteria for the inscription of properties on the World Heritage List.

States Parties are invited to submit nominations of properties of cultural and/or natural value considered to be of "Outstanding Universal Value" for inscription on the World Heritage List.

At the time of inscription of a property on the World Heritage List, the Committee adopts a Statement of Outstanding Universal Value (see paragraph 154) which will be the key reference for the future effective protection and management of the property.

The *Convention* is not intended to ensure the protection of all properties of great interest, importance or value, but only for a select list of the most outstanding of these from an international viewpoint. It is not to be assumed that a property of national and/or regional importance will automatically be inscribed on the World Heritage List.

Nominations presented to the Committee shall demonstrate the full commitment of the State Party to preserve the heritage.

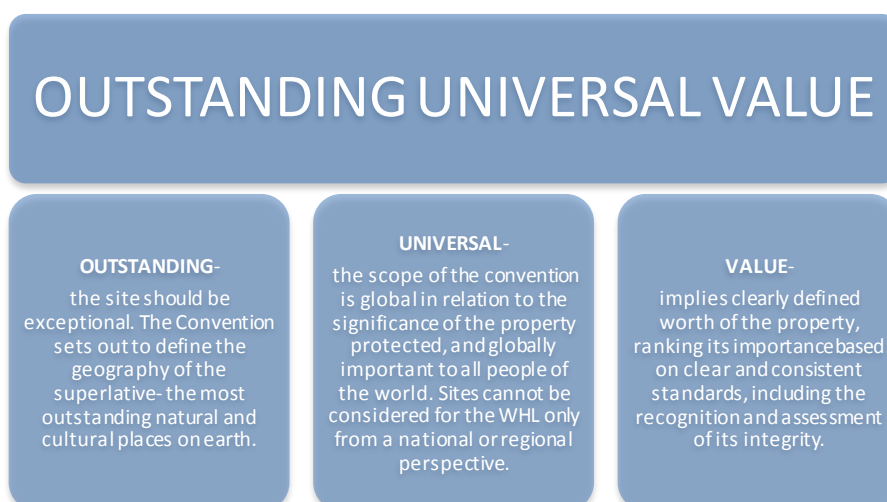


Figure 2.2: The meanings of OUV, broken down on a word-by-word basis (modified from Obura et al. 2012).

Understanding the meaning of OUV [Table 2.1; Figure 2.2] is essential to understand the extent to which the GBR is perceived to be managed to maintain these characteristics¹⁰. As OUV is an arguably nebulous concept, there are potential challenges for the translation of WH values and OUV to site-specific on-the-ground policies for site managers. This also translates into the continuation of OUV once a site is listed. A significant weakness of the WH system is both the lack of enforcement mechanisms within the international agreement, and the attendant *OG* which provides little help in enforce compliance, rather these are a set of guidelines and recommendations of management for a WHA (Gillespie 2010). One of the strongest enforcement tools the World Heritage Committee (WHC) has to enhance national protection of sites is the threat of listing a site as *in-danger*, or even *de-listing* a site. These procedures are relatively powerful tools and in many cases have led to dramatic efforts to prevent damage to sites (Spalding 2002). There have been only two sites removed from the list to date¹¹. Critically, the *in-danger* listing is seen as a ‘black list’ for Australia, with the government viewing it as a failure of management (Beem 2009, Appendix D), although this is not the intention of the *in-danger* listing (Vernhes 1990). The *in-danger* listing could be the case if management does not change for the GBR (Douvere and Badman 2012).

2.1.3 Monitoring and missions in a WH context

As an aid to ensure regular site monitoring, the *Convention* has established reporting procedures as a checking power. This is conducted through periodic reports received from state parties on the conservation and management successes, and the requirement to report any activity that has the potential to harm the OUV of a WHA. Closely linked to this is reactive monitoring, which occurs if a site is thought to be threatened and the state party is inactive (Turtien 2000).

2.2 Managing a Marine Environment

The designations of MPAs are one of the most powerful tools available to prevent over-exploitation of marine resources and degradation to ocean habitats (Agardy *et al.* 2011; Trenouth *et al.* 2012). The International Union for the Conservation of Nature (IUCN)

¹⁰ Appendix 1.

¹¹ The two sites include the Arabian Oryx sanctuary, in Oman [Natural site]. This site was removed because the state decreased the size of the protected area by 90% (UNESCO 2007); and Dresden, Germany [Cultural site]. This was because the state decided to build a bridge through the site (UNESCO 2009).

defines MPAs as “any area of intertidal or sub-tidal terrain, together with the overlying water and associated flora, fauna, historical, and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment” (IUCN 1998). The number of MPAs has increased from 118 in 1970 to 63 000 in 2011; arguably indicating that implementation is highly successful (Thorpe *et al.* 2011).

2.2.1 Entire ecosystem protection: human/nature included

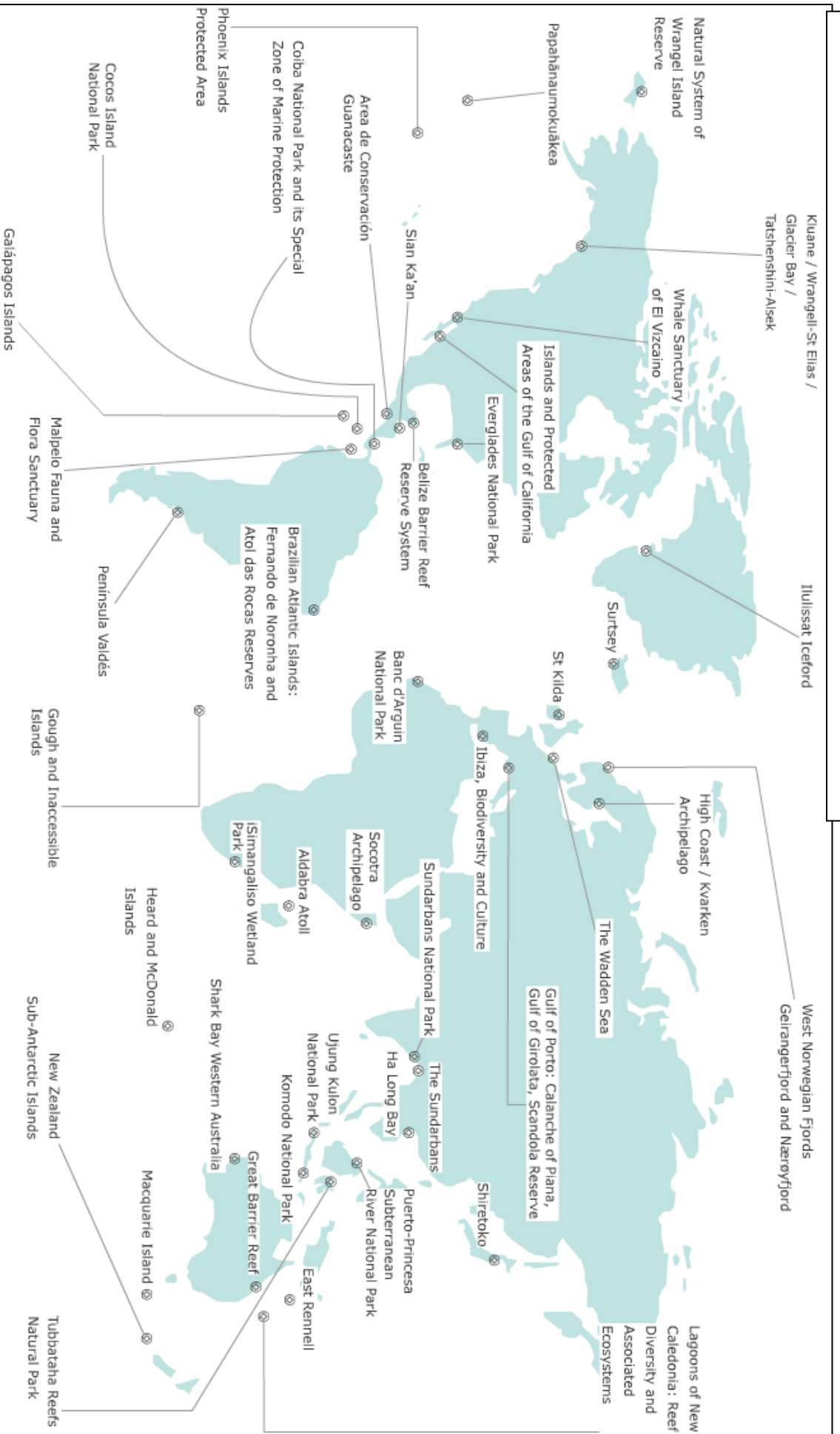
If marine resources are to be used sustainably, there needs to be reconciliation between economic and social demands, alongside a commitment to protect the environment (Gilliland and Laffoley 2008). The systematic planning that goes into a comprehensive MPA involves an entire ecosystem overview, and differs from terrestrial systems in ways that have implications for the biogeography and conservation planning of a protected zone (Steele 1985; Carr *et al.* 1998). This is because of the connectivity of a marine ecosystem, meaning marine ecosystems are three dimensional with no clear biogeographic boundaries (Lourie and Vincent 2004). Arguably, both marine biogeography and marine conservation are behind terrestrial conservation practice because marine regions have traditionally been seen as open-access resources (Cocklin *et al.* 1998; Groves and Hunter 2003). Nonetheless, an increasing awareness of threats in recent years has increased protective regimes, oftentimes utilising ideals stemming from a precautionary and ecosystem based approach to ocean management (Cocklin *et al.* 1998; Jones 2001; Pikitch *et al.* 2004).

As there is increased awareness of anthropocentric impacts on marine environments (Gilman 2002) MPAs are modelled on management policies that include the entire ecosystem to ensure a healthy, productive, resilient ecosystem that can provide the services humans require (Christie *et al.* 2009). Economics have also come to the forefront of marine conservation with a realisation there must be balance between economic uses and values, preservation of natural features, and the intrinsic value of a site (Gilman 2002). This has come to fruition in a WH context through the uptake of adaptive co-management - involving prediction, monitoring, reviewing, adjustments, and stakeholder engagement (Makino *et al.* 2009). In 2005, the WHC launched a Marine Program to establish effective conservation of existing and flagged marine areas, ensuring protection of the 46 marine WHA in 35

countries [Figure 2.3]. Considering the world is 70% marine it is significant that marine areas remain largely underrepresented on the WHL - comprising of only 5% of the WHL¹².

¹² The WH Marine Program enables the formulation of global, regional and local strategies which serve as a communal resource for MPAs, including areas outside of the WHA (UNESCO 1999-2012d). This is a new development in terms of WHA management, which is traditionally country-by-country approach, as UNESCO recognises marine ecosystems transcend national boundaries (Rao *in* Obura *et al.* 2012).

Figure 2.3: the location of the 46 MPAs that are WHL, under the guidance of the UNESCO WH marine program. (UNESCO 1992-2012d)



MPAs are commonly proposed as an important management intervention, especially for coral reef systems (Christie and White 2007). MPAs are employed to address issues of overfishing, habitat degradation, and foster alternative livelihoods (Christie and White 2007). The design and creation of MPAs often has impacts beyond the borders of the MPA, as land-use patterns have shown considerable detrimental effects on coral reefs, necessitating integrated management of coastal areas (Cho 2005). Engaging with high users of the area is integral for the success of the MPA (Ballantyne *et al.* 2009; Ferse *et al.* 2010; Trenouth *et al.* 2012) to reduce resentment and encourage self-enforcement (Oracion *et al.* 2005; Thile *et al.* 2005). It is clear that public acceptance and support for a MPA is essential for compliance with the specified rules and regulations (Adler 1996; Dahl 1997; White *et al.* 2002; Himes 2007). Developing marine policy and managing marine resources requires multi-scale ecological information married with social science and policy (Hughes *et al.* 2007). This includes integration of global issues, such as climate change, with local management, such as traditional fishing practices into an integrated policy plan, effective for both the users of the space and the environment within the space.

2.3 World Heritage and Australia - The Regulatory Framework

Becoming one of the first state parties to be a signatory to the *Convention* in 1974 (UNESCO 1992-2012b; Alpin *in* Jones and Shaw 2007), Australia has entrenched the heritage values outlined in the *Convention* into Australian law, with the *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999* (Cth). This is a legislative tool protecting matters of national environmental significance, specifically WHAs (Padgett and Kirworken 2001). The Australian management objectives of a WHL site are outlined in table 2.2.

Table 2.2: The Commonwealth Governments management objectives for a WHA (Australian Government [DESWPC] 2011).

Management objectives

The primary management objectives for World Heritage properties are part of Australia's general obligations under the World Heritage Convention:

To protect, conserve and present the World Heritage values of the property

To integrate the protection of the area into a comprehensive planning program

To give the property a function in the life of the Australian community

To strengthen appreciation and respect of the property's World Heritage values, particularly through educational and information programs

To keep the community broadly informed about the condition of the World Heritage values of the property

To take appropriate scientific, technical, legal, administrative and financial measures necessary for achieving the foregoing objectives.

In achieving these primary objectives due regard is given to:

Ensuring the provision of essential services to communities within and adjacent to a property

Allowing provision for use of the property which does not have a significant impact on the World Heritage values and their integrity

Recognising the role of current management agencies in the protection of a property's values

The involvement of the local community in the planning and management of a property.

The discourse around protected area management and how best to maintain the OUV of WHA/MPAs reflects continual, unresolved issues in an Australian and global context (Bentrupperaumer *et al.* 2006). This leads to misunderstandings and disagreements over the nature and status of environmental values, potentially threatening effective management (Bentrupperaumer *et al.* 2006). In Australia, contestation over valuing and protecting environmental assets has a long history. The Australian federal system of government creates some of these tensions as state governments retain *prima facie*, constitutional power over environmental regulation. This does not mean that the commonwealth government is excluded from making laws about environmental regulation. By operation of section 51 (29) of the Australian *Constitution* the federal government can make laws relating to external affairs in treaty or convention obligations, such as those imposed by virtue of Australia being a signatory to the *Convention* (Gillespie 2012c). The most famous instance of the Commonwealth applying constitutional laws to environmental protection and heritage is the 1983 Tasmanian Dam's Case.

In *Commonwealth v Tasmania* (1983, 158 CLR 1) (the Tasmanian Dams Case), the Commonwealth succeeded in stopping a hydro-electric dam proposed for the Franklin River in Tasmania's south-west wilderness. The proposal was stymied by the newly elected Hawke (federal Labor) government's passage of the *World Heritage Properties Conservation Act 1983* (Cth), which, in conjunction with the *National Parks and Wildlife Conservation Act 1975* (Cth) enabled the federal government to prohibit clearing, excavation and other activities within the declared Tasmanian Wilderness WHA¹³. This case and a series of others have meant that the federal government now has extensive powers over environmental and heritage concerns (Boer and Wiffen 2006).

The Tasmanian Dams Case is not an isolated incidence in Australia regarding the management of WH properties. Questions regarding the adequacy of WH management in this country also arose in the controversy surrounding uranium mining in Kakadu in 1998, where management of key environmental assets continually sparks debate (Gillespie 2012a). From the controversy surrounding uranium mining in Kakadu in 1998, to ongoing debate about offshore mining in Shark Bay, Western Australia, the management of key environmental assets continues to spark debate. The threat of an *in-danger* designation was most likely in the case of Kakadu. The WHS was threatened to be placed on the *in-danger* list because of the proposed uranium mine (Maswood 2000). To the consternation of some, Kakadu was not actually listed as *in-danger*; rather, the scientific suggestions were set aside, raising questions regarding the future implications for the heritage regime (Maswood 2000; Aplin 2004). The Kakadu case shows the vital importance of boundaries and boundary-making for WH properties, as, crucially, the mining was located in an enclave surrounded by the WHA, but not legally part of it.

2.4 The theoretical framework - the value of a political ecology approach

Applying a political ecology critique to the GPD provides a fundamental and systematic approach to the rationale behind the development, within the local, national and global spatial realms the development is occurring in. While basing this study within theory appropriates it

¹³ WH listed in 1982.

to the multi-dimensional context, it is not the basis for the study, rather is intertwined throughout. The phrase political ecology conjoins the concerns of an ecology and political economy discourse. These discourses combine and explain environmental problems, human needs and the wider political system (Forsyth 2003). Ecology deals with the structure and function of levels of organisation beyond the individual or species, illustrating the connectedness of humans and other species (Odum 1964 *in* Forsyth 2003)¹⁴. Political and environmental ethics must address the ‘big picture’ because so many ecological and social problems have a systemic or structural basis (Gleeson and Low 1998).

Political ecology emerged in the 1980s as a theoretical paradigm seeking to explain and recognise the relations between the environment, development, capitalism and connectivity/globalism (Robbins 2004). This theory is a critique of the capitalist blueprint, and is used as a tool to analyse of relations between different scales and problems. The essence of Marxist theory is the capitalist system allows for the wealthy minority to control resources and the discourse argues that they have turned the poor majority into a resource commodity, expropriating surplus value from the workers - the producers of value (Peet *et al.* 2011). Under market conditions, the individual capitalist has to produce commodities at prices regulated by competition. This forces production to occur at the lowest cost regardless of external consequences like environmental degradation. Marxist theory conceptualises capitalist development as socially unjust - with unequal distribution of wealth and is geographically and spatially uneven - as it occurs in some places disproportionately more than others (Peet *et al.* 2011). Peet observed:

“Political ecology has repeatedly shown...that environmental degradation is not an unfortunate accident under advanced capitalism, it is instead a part of the logic of that economic system. Environmental degradation is a consistent symptom of various logics and trajectories of accumulation and the deadly operations of markets” (Peet *et al.* 2011, 26).

Protected areas occupy a large domain of political ecology, as spatially defined conservation units are often limiting access to a common resource (Zimmerer and Bassett 2003). The overarching themes of political ecology applicable to this study include access to and control

¹⁴ There are multiple and varying definitions for political economy, ecology and political economy. This paper does not seek to clarify the definition of the terms, rather use the broad definition provided.

over resources; integration of scales of analysis; ambiguities in property rights and the disenfranchisement of legitimate local users and uses (McCarthy 2002).

Political ecology is applicable to the GPD, offering insight into the rationale behind the development. The application of the political ecology paradigm encompasses the different geographical scales and hierarchies of the socioeconomic stakeholders in the region (Blaikie and Brookfield 1987). These scales are socially constructed, historically contingent and politically contested (Lefebvre 1991). The environmental changes are not distributed evenly throughout society, rather political, social and economic forces account for the unequal weighting of the changes and the impacts. These changes are reflective of the existing social and economic inequalities within society (Robbins 2004).

On one reading the GPD could be construed as a sell-off of the GBR as a natural resource/asset of value for the expansion of a semi-private industry enabling short term profit to a small pool of parties, including private, multinational corporations. Arguably, the GPD could be viewed as being part of a wider privatisation agenda. Privatisation is a political activity, and brings benefits to some groups and disadvantage to others (Wettenhall 1998). This privatisation of public goods is seen with the partial transfer of the Gladstone port operations in 2008, under the provision of the *Government Owned Corporations Act 1993 (COG act)* (Qld). This act enabled the GPC to undertake commercial activities on behalf of the state government. Such privatisation is seen to be problematic as it potentially ignores the structural framework, based on principles of accountability and transparency, for public institutions. Using a political ecology approach, it becomes possible to develop a fuller understanding of the social, political, economic and environmental dimensions associated with environmental governance.

2.5 Conclusion

WH is a centrepiece of global environmental and natural heritage protection. The international framework, translated to national and localised rules, enables a governing structure for the GBR. While these protective measures are in place, the GBR has generally been labelled as an exemplary site in MPA management. While GBR management is still seen as exemplifying best-practice, there are serious issues with the protective mechanisms,

in particular, the GPD site. While an *in-danger* threat acts as a mechanism to ensure compliance with the overarching protective regime, ultimately Australia is responsible to uphold the OUV of the WHL site. The decision making process about suitable or appropriate environmental regulation tends to become subject to localised conditions. To fully understand the interplay of such localised conditions this thesis applies the concepts of political ecology to unravel the complexity of environmental heritage protection for Gladstone Harbour. In doing so, this study contributes to the growing literature about best-practice MPA management

Chapter 3:

Environmental Regulation: managing the Great Barrier Reef

“Biologists now often talk of the Reef as only the main system of an overall system of reefs throughout the whole indo-pacific region, and suspect there may be interconnection of all these reefs through the planktonic movement across the ocean... The interlocking and independent physical factors which have so long kept the reef alive and growing, such as water temperatures, freshwater replenishment from streams and estuaries, the tidal movements which bring deep ocean water in and out of the calmer and narrower waters within the barrier, and the winds and weather systems, are probably all indispensable to the maintenance and dynamics of its living species” (Wright 1977).

The GBR is one of the most valued natural sites on earth and home to a huge diversity of flora and fauna. The reef has a long history of being managed in order to protect the site. The formalisation of the GBR as a MPA occurred in 1975, and was followed by the 1981 WH inscription of the majority of the reef [Figure 1.3]. The GBR has undergone various changes in protective regimes under the management of the GBR Marine Park Authority (GBRMPA) since 1975, and is currently managed through zoning plans, allowing different activities and uses in different areas (GBRMPA 2011d; Brodie and Waterhouse 2012). Despite ongoing commended management in the region (Skeat *et al.* 2000) the GBR is facing threats from climate change and anthropocentric impacts (GBRMPA 2009). Of great concern is the impact of developments along the coast of Queensland as a result of the mining boom in Australia, specifically the Gladstone port development (GPD) (Greenpeace 2012). The GPD has attracted significant international attention and condemnation through various institutions, including a huge media coverage [Appendix G]. Critically UNESCO have recently questioned the integrity of WH protection (Hoegh-Guldberg 2012).

In this chapter, Section 3.1 outlines the biology, oceanography and geography of the reef, describing the natural qualities of the zone. Section 3.2 details the history of human use of the reef, and the management changes from white settlement until 1974, looking at the changes in the understanding of the value of the reef, reflected in legislation. Section 3.3 outlines the commonwealth legislation, creating the GBRMP we now have today, this section also outlines the role and establishment of the protection agency of the region: GBRMPA, and looks at the new zoning plan. Section 3.5 covers the multiple layers and legislation of the region including intergovernmental relations, and the chapter is concluded in section 3.5.

The history of the formation of the GBRMP is important in framing the issues surrounding current challenges in protecting a MPA with multiple uses. Understanding the physical and social frames the contemporary challenges of management explored in greater detail in chapter 4.

3.1 Biology, Geography and Oceanography of the GBR

The GBR is not a continuous barrier, but rather is made up of around 2900 reefs (Craik 1992) amalgamated into 70 bioregions which are both reef and nonreefal environments (GBRMPA 2011a) [Figure 3.1].

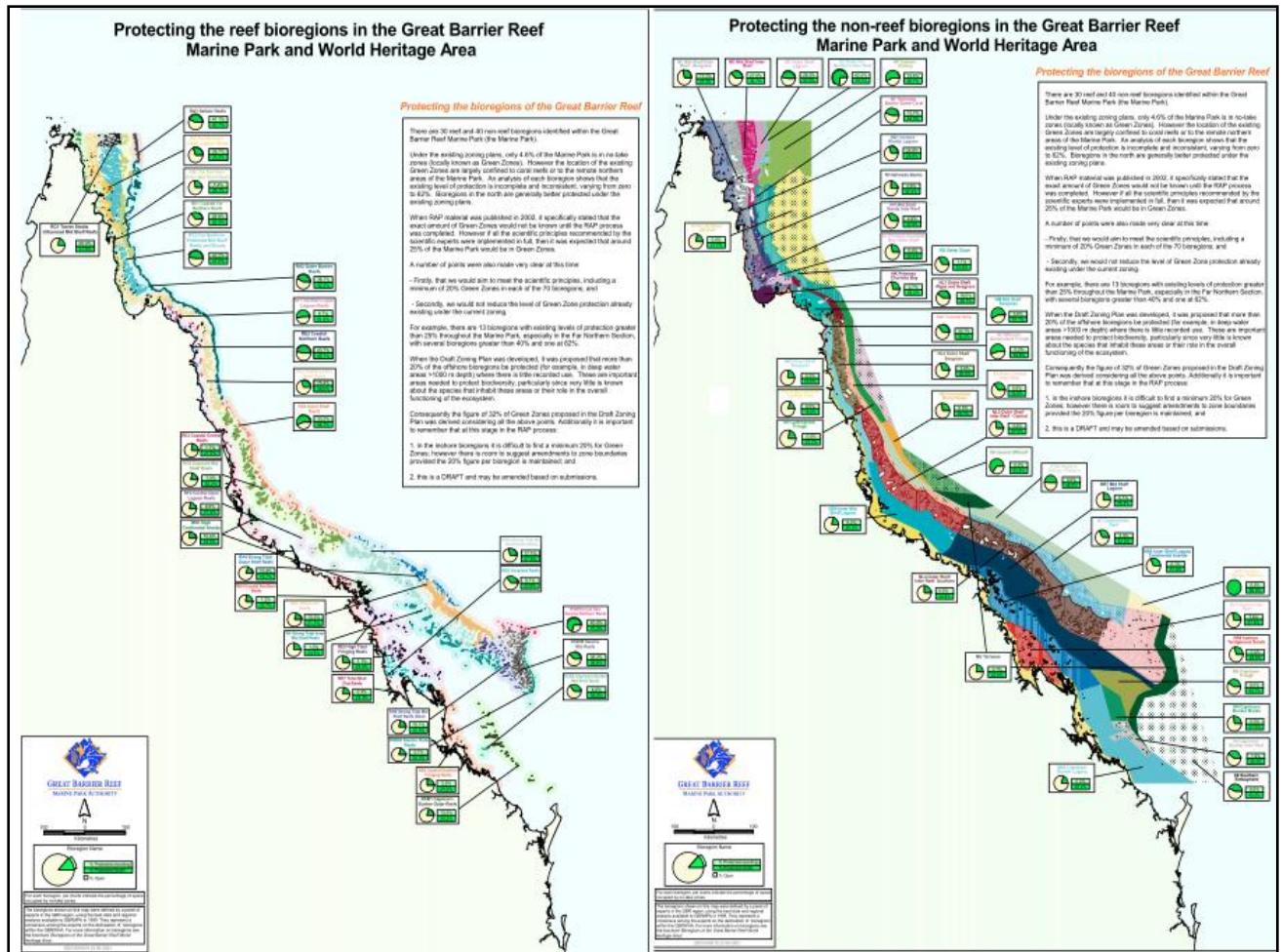


Figure 3.1: Reef and nonreefal bioregions of the GBRWHA, the mapping of these bioregions was done as part of the 2003 zoning plan, undertaken by the GBRM Authority (GBRMPA 2011d).

The GBR is a diverse marine environment, a product of the oceanographic influences in distributional patterns of plankton, nutrient concentrations, feeding and survivorship, reproduction timing and location and movement of species (Kingsford and Wolanski *in* Hutchings *et al.* 2008). The Eastern Australian Current is the main contributor to the biogeography's and diversity of the GBR [Figure 3.2].

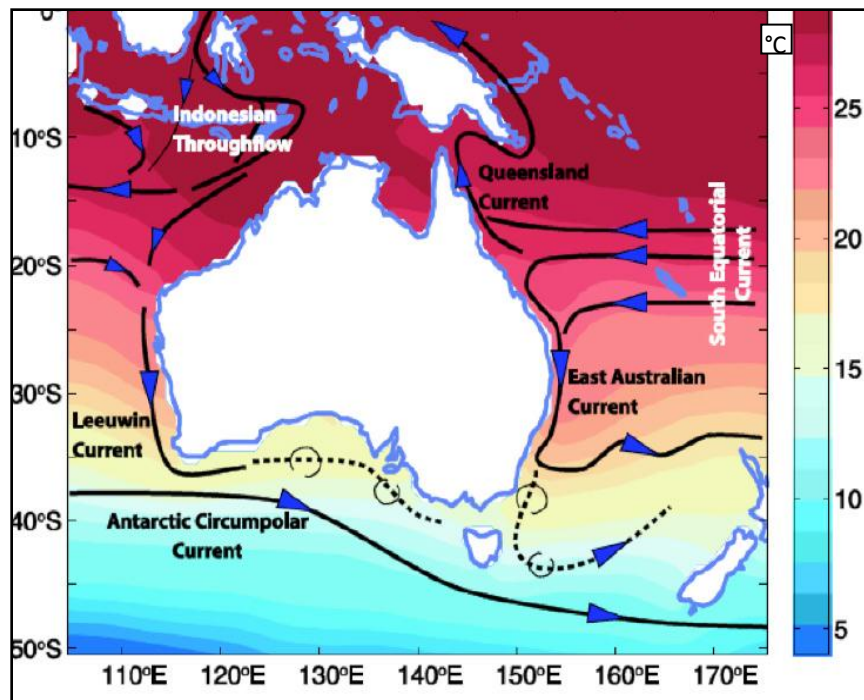


Figure 3.2: Oceanography of Australia, showing the currents which flow into the GBR region, attributing to the diversity of the region, with water temperature – as coral reefs need a minimum temperature of 18 degrees Celsius, being a tropical ecosystem (Degrees Celsius). (Lough et al. 2012).

The region is among the richest in the world in faunal diversity providing a habitat for many species. This reflects the scientific importance and maturity of the ecosystem, which has evolved and developed over 10,000 years. While the reef is an ancient structure, it is not stagnant; with the modern reef only 5000 years old due to processes of sea level rise and temperature causing the reef to perish and reform over time (Baker 2001 in Wolanski 2001). There are a multitude of inputs and outputs occurring within the reef, creating the unique ecosystem seen today [Figure 3.3]. The GBR includes 300 reef islands including cays, 87 of them permanently vegetated, and about 600 continental or high islands, often with fringing reefs (Craik 1992).

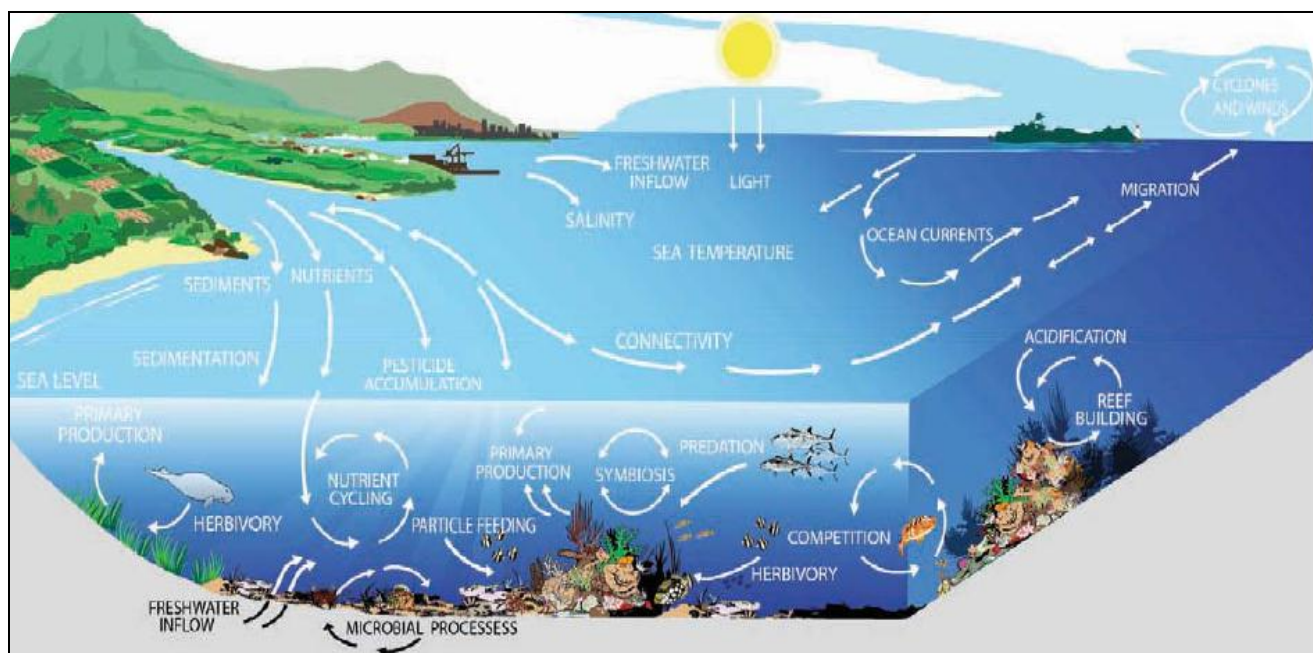


Figure 3.3: the major physical, chemical and ecological process in the GBR, showing the inputs and oceanographic processes contributing to the healthy functioning of the GBR (GBRMPA 2009).

3.2 History Pre-Legislation

3.2.1 GBR discovery and exploration

There are multiple tiers of protection and legislation aimed at managing and conserving the GBR. Historically, the GBR supported coastal Indigenous Australian communities for approximately 60 000 years (GBRMPA 2011b), fishing and living off the land and sea (Daley *et al.* 2008). Captain Cook was the first European to document the existence of the reef when he sailed along the east coast in 1770 (Fairbridge and Teichert 1948). This was soon followed by the rapid establishment of European colonies in the region leading to intensive natural resource exploitation¹⁵ (Fitzgerald 1982; Hopley 1989; Bowen and Bowen 2002). European settlement brought the establishment of agriculture, which continues to impact the reef with nutrient runoff affecting inshore reefs (Haynes *et al.* 2000; Fabricus *et al.* 2005; Lewis *et al.* 2009; Packett *et al.* 2009; Uthicke *et al.* 2012). In contrast scientific exploration of the GBR was sporadic and confined to short visits during the early part of the twentieth century (Lawrence *et al.* 2002). Out of the long-standing concerns about reef

¹⁵ this was largely resource extraction, development of tourism and commercial fishing (Daley *et al.* 2008)

exploitation, the Royal Geographical Society of Australasia formed ‘The Great Barrier Reef Committee of Investigation’ in 1922 to formulate an understanding of the functioning’s of the GBR (Hill 1984; Lawrence *et al.* 2002).

3.2.2 Early study and use of the GBR

Throughout the 1930’s tourism expanded, but research of the reef did not progress at the same rate. Natural resource exploration continued as the size and scope of the reef permitted Australians to feel complacent and to believe that nothing could cause significant damage to the reef (Connell 1971). During this period it became apparent the reef and its structures could not be studied in isolation from one another, and an understanding of the GBR as a connected ecosystem came into practice. While this idea was widely accepted by science, industry continued to use extractive techniques with reef exploration “the [GBR] was seen as a vast resource waiting to be exploited” (Lucas *et al.* 1997, 383). Oil drilling in the GBR began in 1959 and grew with an application in 1967 to mine Ellison Island for limestone. The discovery of hydro-carbonates in the 1960s led to the *Petroleum (Submerged Lands) Act 1967* (Cth), which regulated exploration and pipeline construction (Kirwoekn 1991). These issues drew attention to the lack of adequate management of the GBR, and highlighted the need for Australia to protect to its offshore resources. In 1968 the *Continental Shelf (Living Natural Resources) Act* (Cth) was passed, giving the Commonwealth Government responsibility for sedentary living resources to the outer barrier of the reef (Lucas *et al.* 1997).

Thus the history of the modern reef post colonisation has been characterised by conflict between different uses and understandings of the reef. The developments currently occurring in Gladstone denote a new phase of this history, generating tension between those seeing the reef as a commodity and those that do not.

3.2.3 The idea of a marine park: Protection and use

The idea of the GBR becoming a single, large marine national park was proposed by the Australian National Travel Association in 1966 (Lawrence *et al.* 2002), and was widely

supported by environmental organisations and researchers. At this stage the Queensland state government had already assigned many individual islands as terrestrial national parks (Lawrence *et al.* 2002). The GBR committee¹⁶ contributed greatly to the zoning and governance processes, which expanded the biological and geomorphologic knowledge of the reef (Hill 1984). During the 1970's, research efforts in the GBR underwent a major shift from expedition-type enterprises to institutionally based projects and programmes (Crossland *in* GBRMPA 1996), with attention focused on threats to the GBR, particularly from invasive species (such as crown of thorns starfish), petroleum and mineral extraction and the risk of an oil spill (Wachenfield *et al.* 1998). The federal government began the initial stages of GBR conservation, establishing the *Royal Commission into Exploration and Drilling for Petroleum*, and imposed a moratorium pending its report.

3.3 National intervention

3.3.1 The Royal Commission Report

The Royal Commission report released in November 1974 acknowledged that the risk of blowouts was real and “some measure of chronic spills would occur ranging from small to substantial” (Bowen and Bowen 2002, 349). The report recommended prohibition against oil drilling on any cay, island, national park or marine park (when declared). The report recommended the declaration of a marine park to cover most of the reef province and a special statutory authority be established for ecological protection, research and development. On 24 July 1974, a Commonwealth government¹⁷ authorised the drafting of legislation based on the concept of a body corporate – the GBRMP Authority, and the *Great Barrier Reef Marine Parks Act (1975) (Cth) (GBRMP Act)* passed into law on 20 June 1975 with support from all political parties (Craik 1992).

¹⁶ This Committee was formed in 1922[section 3.2.1].

¹⁷ cabinet decision 2383

3.3.2 The *GBRMP Act 1975* (Cth)

The *GBRMP Act* established the long-term protection and conservation of the GBR region, through legislative measures that, amongst other things, established the protected area boundaries. The Act also sanctioned the Governor General to proclaim areas within the GBR to be part of the GBRMP (Great Barrier Reef Marine Park) (*GBRMP Act 1975* ss 30 and 31) [Figure 3.3]. The Act's main objective was to provide for the long term protection and conservation of the environment, biodiversity and heritage of the GBR region, allowing for ecologically sustainable use of the region for public enjoyment, education, research and various activities use, involving engagement of interested persons, governments, communities, indigenous persons, business and industry in the management of the park (s.2a).

3.3.3 The GBRMP Authority

Part of the legislation included the establishment of a statutory authority responsible to the current parliament for ecological protection, research and development within the GBR region (Wachenfield *et al.* 1998), thereby creating the GBRMPA – the Great Barrier Reef Marine Park Authority (s6). The GBRMPA was given multiple roles within the marine park, including making recommendations to the Minister in relation to the care and development of the Marine Park and areas of inclusion, developing zoning plans, ensuring co-management on a state and federal level, conducting research and providing education and information (ss.7 and 8). The authority is made up of two federal and one Queensland nominee, and works with the GBR consultative committee, which is an advisory committee of representatives of major user groups (Craik 1992). The current makeup of the GBRMP Authority is outlines in Table 3.1

Table 3.1: Chairman and members of the GBRMPA Board, appointed under ss10(2) GBRMP Act 1975 (GBRMPA 2011f).

Name	Position	Time in position
Russell Reichelt	Chairman and chief executive of the GBRMPA	2007-present
Melissa George	Indigenous advisory committee chair	2002-2006; 2006 (chair)-present
Daniel Gschwind	Member of Authority	2009-present
Toney Mooney	Member of Authority	2011-present
TBA	Queensland Government Representative	N/A

The role of the Act and Authority has been subject to litigation. Rothwall and Jessup (2009) document two significant 2007 Administrative Appeals Tribunal (AAT) decisions regarding the operational extent of the Act and Authority. In this case, one question before the Tribunal was whether the Red Baron flying business operating out of Horseshoe Bay on Magnetic Island needed permission to operate from the GBRMP Authority. In this case the AAT held that Horseshoe Bay was not part of the GBRWHA and so neither the *GBRMP* Act nor the GBRMP Authority had jurisdiction over the flying business. In effect the “AAT had excised Horseshoe Bay from the Park” (Rothwall and Jessup 2009, 73). This case highlighted the issue that the discrepancy between borders of the GBRMP and the GBRWHA has been, and continues to be, a point of contention in various locations within the GBR. The nature and scope of the Park and WHA boundaries are of central importance to this thesis and will be shown to be critical to understanding the current debates surrounding the conservation and use of the GBR.

3.3.4 Federal management: planning for the future

Following the introduction of federal legislation incorporating the GBR as a Commonwealth MPA in 1975, the GBRMPA began zoning the reef. The first task was the development of the documents required for proclamation of the Capricornia section in the southern part of the GBR. This is the geographical region 25m+ seaward from Gladstone, including the Heron-Wistari complex and One Tree Island (OTI) shown in figure 3.4.

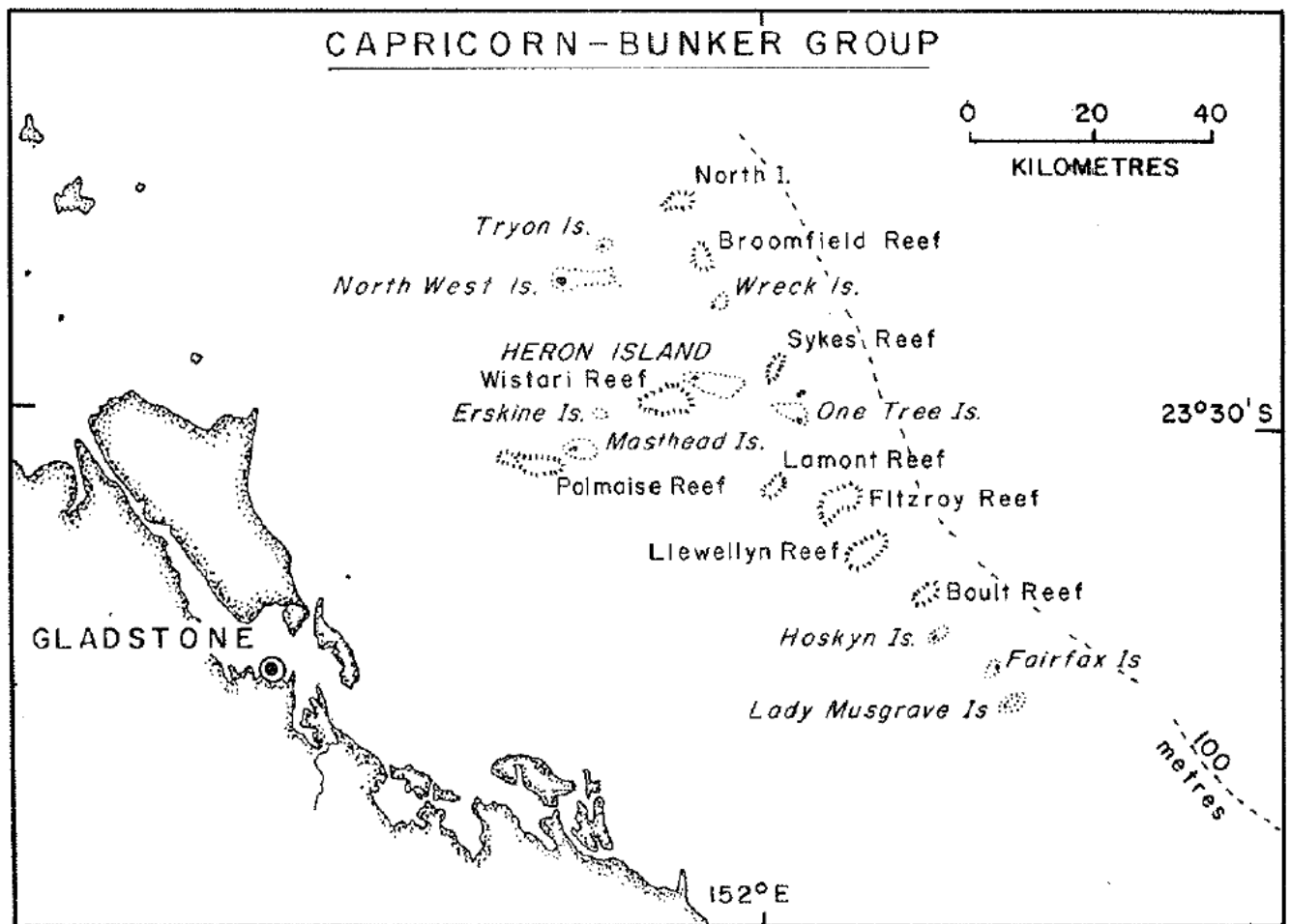


Figure 3.4: Capricorn-Bunker Group offshore from Gladstone in the GBR (Flood 1977).

When establishing the Commonwealth MPA, emphasis was placed on future direction and management, focused primarily on ongoing research to ensure the GBRMPA were using up-to-date research applied to marine conservation (Chadwick and Green 2000). This led to the creation of the 25-year strategic plan, a document providing future vision for the GBRWHA. The plan identified eight key issues for management of the WH area with specific strategies, goals and principles to address these issues [Table 3.2] (Ruckelshause *et al.* 2008).

Table 3.2: Key issues addressed for GBRWHA management, outlined in the 25-year strategic plan by the GBMP Authority (GBRMPA 2009).

Eight key issues for management of the GBRWHA:
1. Conservation and Resource management
2. Education
3. Communication
4. Consultation and commitment
5. Research and monitoring
6. Integrated planning
7. Recognition of Aboriginal and Torres strait islander interests
8. Management processes and legislation

3.3.5 2003 Zoning Plan

Over the period 1975 to 2001, sections of the GBR progressively became part of the federal protected areas zone, and in 2004 were finally consolidated into a sectionalised map under the *Great Barrier Reef Marine Park Zoning Plan 2003*. Zoning plans dictate what activities may occur in various spaces, and the conditions in which those activities may proceed. These plans are a spatial tool providing protection to specific areas while allowing a range of defined reasonable uses, including certain extractive activities, to continue in some zones (Day 2002). Marine park zoning has become a cornerstone of management for the GBR, with increased understanding of ocean connectivity and ecological events like mass spawning. The multiple use approach recognizes that the GBR is an integrated system, not a series of isolated areas, and is considered a more ecologically sound approach to management (Pressy and McNeill *in* Day 2002).

The new zoning plan led to the no-take area of the GBR increasing from 5% to 30% and allowing for overall greater levels of protection while still permitting a range of uses and activities to occur, with an overriding conservation objective of ecological sustainability (Hutchings *et al.* 2008). The zoning management in the GBR area is seen as one of the most comprehensive management plans for a natural site in the world. The use of multiple zones, including buffer zones has become central to WH management, tracing back to 1977 (Gillespie 2011).

Establishing boundaries through mapping – drawing lines on paper or a computer is often highly subjective and arbitrary. The creation of new boundaries may not take account for, or accommodate earlier practices and norms (Gillespie 2012a): ‘Boundary making through the process of drawing a line on a map is only actualised through social acknowledgement of this demarcation. Conventions, norms and social practices make boundaries real and it is in the recognition of the (bounded) line that legitimacy is conferred’ (Gillespie 2012a, 5). While the 2003 zoning plan was successful in community engagement with creating new zones and maps, the WHA boundaries were not heavily integrated into this process. This is because WH boundaries are decided by the sovereign state and agreed upon by the WHC, they do not have to adhere to pre-existing boundaries (Bentrupperaumer *et al.* 2006). WHA boundaries cannot be changed without notification to the WHC, meaning the zoning maps which are created and continually updated are only changing the internal mapping, rather than the WHA itself [figure 3.5].

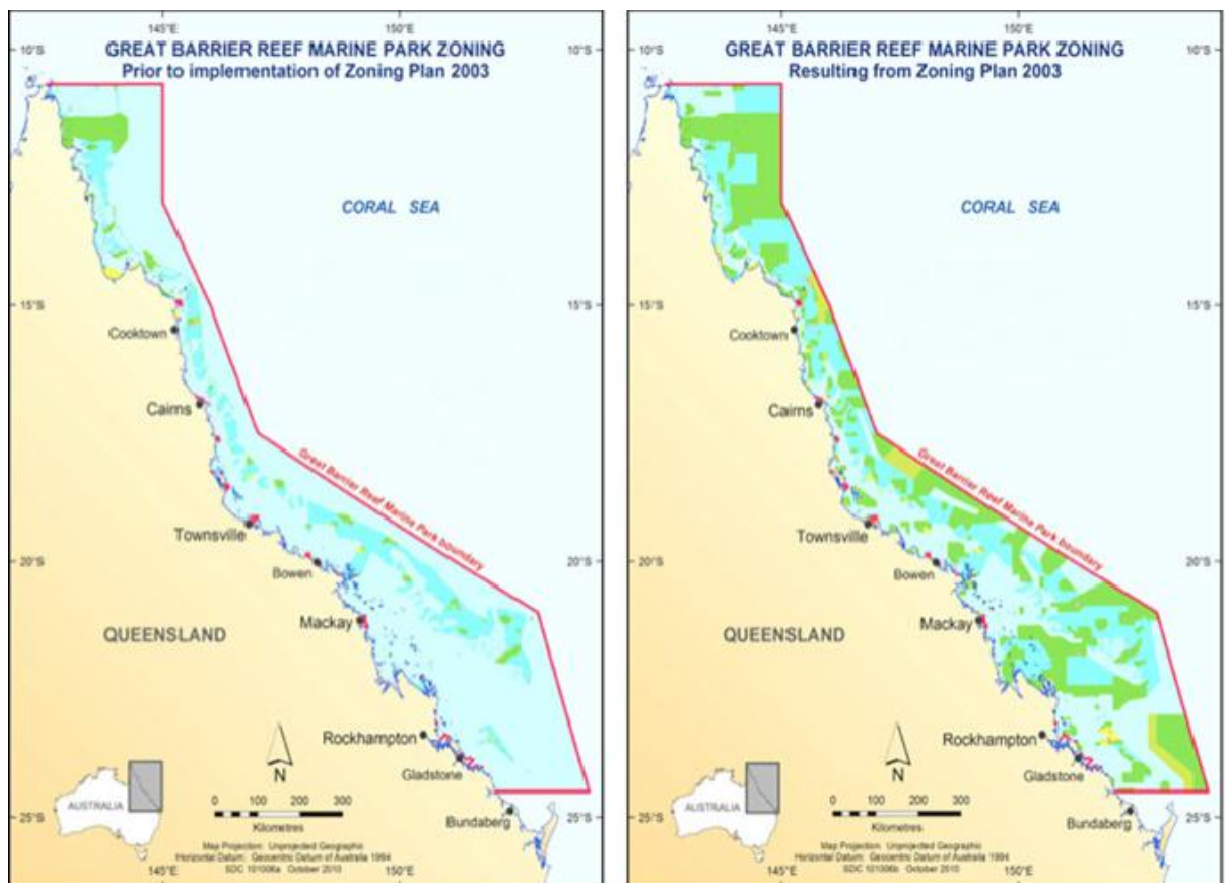
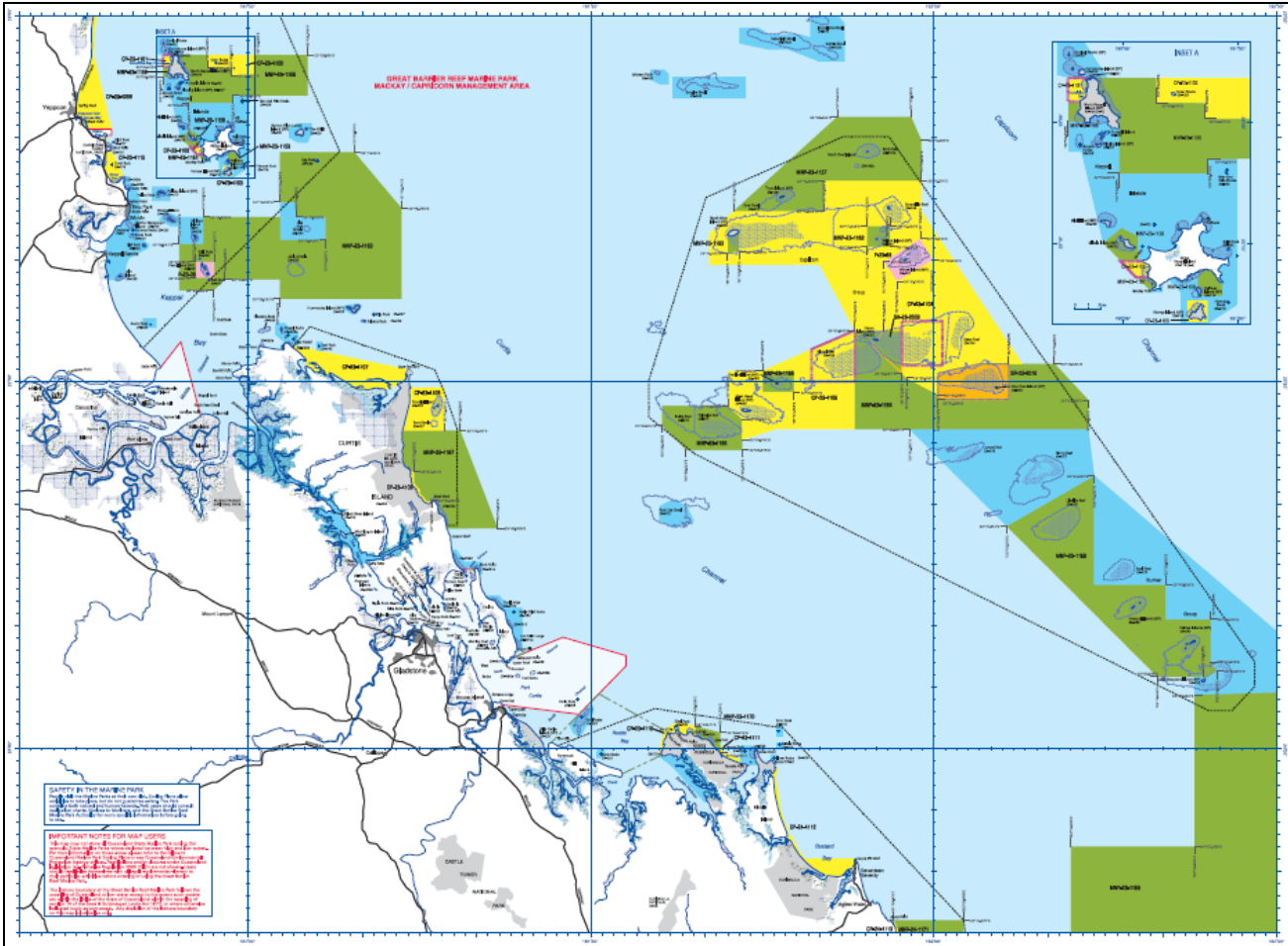


Figure 3.5: the pre and post 2003 zoning plan maps, showing the increase in areas which have been mapped allowing for multiple uses of the region based on the biogeographic data collected (GBRMPA 2011d).



ACTIVITIES GUIDE (see relevant Zoning Plans and Regulations for details)	ZONES						
	General Use Zone	Habitat Protection Zone	Conservation Park Zone	Buffer Zone	Scientific Research Zone	Marine National Park Zone	Preservation Zone
Aquaculture	Permit	Permit	Permit ¹	X	X	X	X
Bait netting	✓	✓	✓	X	X	X	X
Boating, diving, photography	✓	✓	✓	✓	✓ ²	✓	X
Crabbing (trapping)	✓	✓	✓ ³	X	X	X	X
Harvest fishing for aquarium fish, coral and beachworm	Permit	Permit	Permit ¹	X	X	X	X
Harvest fishing for sea cucumber, trochus, tropical rock lobster	Permit	Permit	X	X	X	X	X
Limited collecting	✓ ⁴	✓ ⁴	✓ ⁴	X	X	X	X
Limited spearfishing (snorkel only)	✓	✓	✓ ¹	X	X	X	X
Line fishing	✓ ⁵	✓ ⁵	✓ ⁶	X	X	X	X
Netting (other than bait netting)	✓	✓	X	X	X	X	X
Research (other than limited impact research)	Permit	Permit	Permit	Permit	Permit	Permit	Permit
Shipping (other than in a designated shipping area)	✓	Permit	Permit	Permit	Permit	Permit	X
Tourism programme	Permit	Permit	Permit	Permit	Permit	Permit	X
Traditional use of marine resources	✓ ⁷	✓ ⁷	✓ ⁷	✓ ⁷	✓ ⁷	✓ ⁷	X
Trawling	✓	X	X	X	X	X	X
Trolling	✓ ⁵	✓ ⁵	✓ ⁵	✓ ^{5,8}	X	X	X

Figure 3.6: The Gladstone Region zoning plan and the key for the different zones (GBRMPA 2011d)

3.4 The current management procedures and initiatives beyond the GBRMPA

3.4.1 Intergovernmental management of the GBR

The *Submerged Lands Act (1967)* (Qld) was one of the earliest intergovernmental agreements specifically designed for the GBR. The management of the region was amalgamated in 1969 when the MPA lobbying began, making the management of the GBR a Queensland and Commonwealth concern (Kriwoekn 1991). The jurisdictional tensions continued throughout the 1970s with re-zoning maritime boundaries and commonwealth waters (Kriwoekn 1991). As a result, Queensland is responsible for the area landward of the low-water mark, and internal waterways, bays, estuaries and inlets and almost all GBR islands. The federal government has jurisdiction over commonwealth-owned islands, all the waters, reefs and shoals below the low-water mark (Kriwoekn 1991). The struggle to establish the MPA with an intergovernmental agreement was largely a function of the political climate of Queensland “because opposition to Canberra constitutes a major component of the dominant political culture [in Queensland]” (Scott 1986, 67).

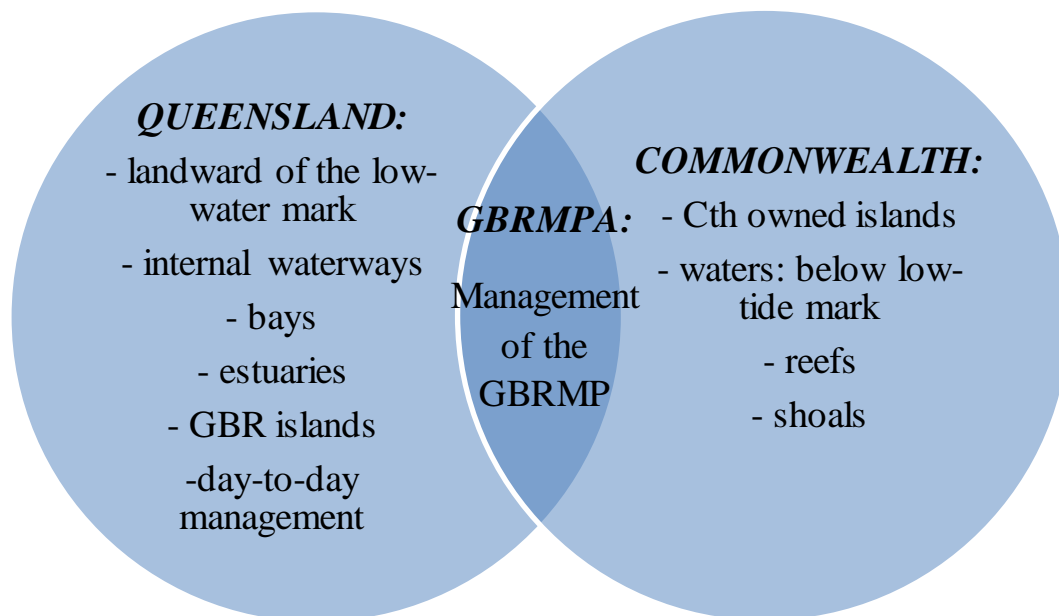


Figure 3.7: The intergovernmental interaction of the federal and state governments in Queensland, Australia.

Closely related to the intergovernmental issues was incompatible zoning - specifically at Gladstone. The region between Curtis Island and the coast had been declared a

‘Conservation and Mineral Resource Zone’ in anticipation for future shale oil mining and processing (Kriwoekn 1991). This was problematic as the region is state controlled, but the *GBRMP Act 1975* (Cth) specifies complete restrictions of extraction, except for research (section xxxviii), and is adjacent to this area.

3.4.2 The Emerald agreement (1979)

While the enactment of federal legislation helped solidify protection by providing an appropriate legal regime, attempts to solve remaining tensions took place through the formation of the Emerald Agreement [Table 3.3]. The Emerald Agreement was designed to allow for adaptive co-management over the region, with co-ordination of management between the Commonwealth and State government bodies (Kriwoekn 1991).

Table 3.3 the emerald agreement provisions (Adapted from Kriwoekn 1991).

EMERALD AGREEMENT PROVISIONS:

- The Great Barrier Reef Marine Park Act, 1975 and the boundaries of the GBR region (within which parts of the marine park may be declared) are not changed;
- A ministerial council comprising two Queensland and two commonwealth ministers be established to address major issues;
- The Capricornia section be declared as the first part of the marine park;
- Queensland will have responsibility for carrying out day-to-day management of the marine park, subject to the authority;
- Queensland legislation will be amended to correspond to the Great Barrier Reef Marine Park Act, 1975;
- Arrangements with Queensland regarding the territorial sea (ie within the three-mile limit) will be on the same basis as arrangements with other states; and
- The ministerial council should endorse and monitor scientific research in the region

3.4.3 The GBR Intergovernmental Agreement

While the Emerald Agreement marked a key breakthrough for environmental governance of the reef, it was replaced with the current Great Barrier Reef

Intergovernmental Agreement (GBRIA) of 2009. The GBRIA agreement outlines the arrangements, objectives, functions and accountabilities of the State and Commonwealth in managing the GBRWHA, outlined in the legislation and government agencies responsible for the zone. The management is complex and involves multiple government agencies involvement, shown in Figure 3.8.

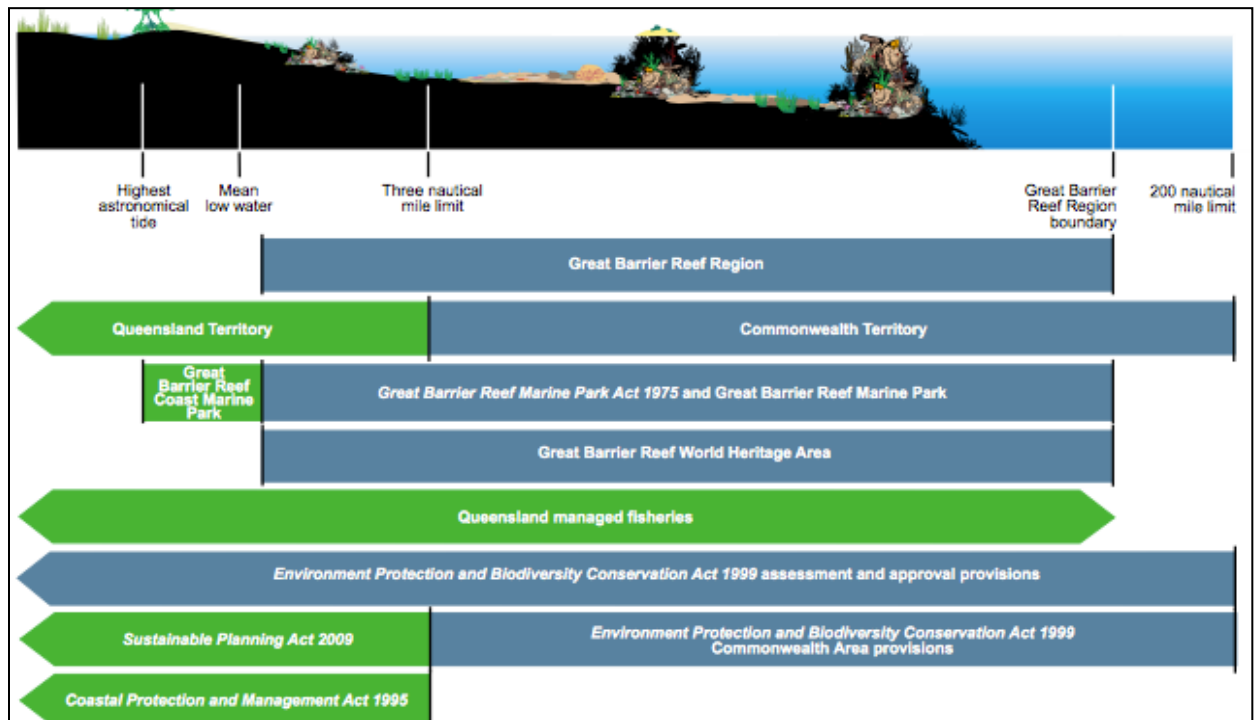


Figure 3.8: Jurisdictional boundaries for the GBRWHA, demonstrating the multiple layers of governance for the different regions in the GBR (GBRMPA 2012b).

Intergovernmental relations are designed to provide a practical approach to marine protection - based on the ecological connectedness of marine ecosystems. As an example of ecosystem linkage which crosses multiple regulatory jurisdictions, turtle activity exemplifies the complexity of management and jurisdiction [Figure 3.9]:

“[turtles]...which hatch from nests on land under Queensland jurisdiction, move to the sea across inertial areas under state jurisdiction, cross the low water mark to enter commonwealth jurisdiction, and then on to feed for years in international waters. Eventually they return to the Great Barrier Reef to mate under Commonwealth jurisdiction and for females to lay eggs on Queensland territory” (Kenchington 1990, 129).

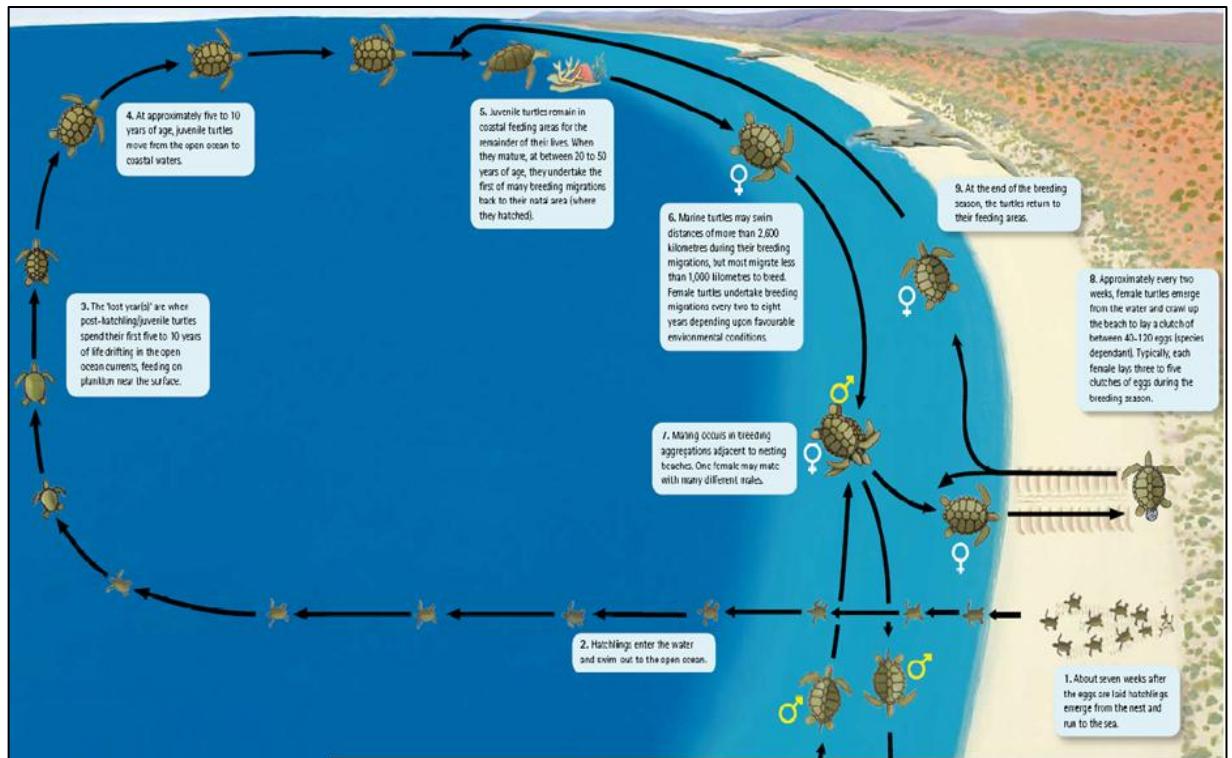


Figure 3.9: the lifecycle of a turtle in the GBRMP, this exemplifies the issues with management, as shown in the quote above (Government of Western Australia [Department of Environment and Conservation] 2009).

This highlights the trans-jurisdictional nature of the marine environment, and the need for multiple tiers of management and cooperation between all.

3.4.4 State regulation for the GBRWHA

The Queensland government's management of the GBRWHA is intertwined with the Commonwealth, with day-to-day management conducted by the state. The legislative structure of the Queensland government adds protection, both in the GBRMP and the areas in the GBRWHA that are state managed. The GBR coast marine park runs the full length of the GBRMP north of Bundaberg to Cape York, providing protection for Queensland tidal waters and lands, [Figure 3.10] (Queensland Government [DERM] 2011). The state park is complementary to the 2003-zoning system of the GBRMP. The state marine parks are managed under the *Marine Parks Act 2004* (Qld). This aAct was created to manage and maintain the site in line with the *GBRMP Act 1975* (Cth) (Queensland Government [DERM] 2011). This is entered into practice, as the GBRMPA jointly manage both parks (Queensland Government [DERM] 2011).



Figure 3.10: The GBRWHA and GBRMP boundaries (GBRMPA 2004).

The discrepancies between the boundaries of WH, federal and state are small, with Figure 3.10 showing the 1% of the marine GBRWHA that is not included in the WHA. Nonetheless, boundary incongruities demonstrate the need for the clear intergovernmental relations management approaches to the area – a perspective which is assessed throughout this study.

3.5 Conclusion

The GBR is subject to complex jurisdictional boundaries: in some places the Commonwealth government has exclusive jurisdiction while in other cases the government of Queensland does. However all areas have joint management in some capacity under WH listing and Australian legislation. The complexity of the boundaries and management is a product of the historical evolution of the GBRWHA/MP and the federal- state constitutional tensions regarding jurisdiction over environmental matters. It is also a result of the science underpinning our understanding of the connectivity of marine ecosystems- now seen as a total system requiring multiple bioregions to be protected rather than just the coral reef structures. In the recent past governments have sought to work cooperatively to manage the reef, evidenced firstly through the Emerald Agreement then the more recent GBRIA – cooperative federalism at work. This chapter has traced the physical processes intertwined within the political climate surrounding the GBRWHA, from pre-protection to the present because we cannot understand the gaps and anomalies surrounding the GPD without understanding the broader environmental management regulatory arrangements and the history of these agreements.

Chapter 4:

The Gladstone Port Development

“The Gladstone region is home to a thriving 21st Century industrial base served by one of Australia’s busiest ports, the Port of Gladstone. A major industrial cluster, where economic competitiveness is balanced with steadily improving environmental performance, Gladstone’s development potential is underpinned by the 22,000 hectare Gladstone State Development Area, which offers a range of development ready sites, established infrastructure and growing possibilities for economic development to drive the regions sustainable growth. And with recent continuing investment in the LNG industry, which is expected to play an increasingly important role in global energy markets over coming years, the Gladstone regions strong industrial growth looks set to continue” (GADPL 2011).

The need to understand the local conditions in Gladstone - its history as a regional town, the industry base, contemporary developments, and the natural environment is vital for the contextualisation of the industrial development, management, and environmental regulation in the region. The current listing as a state park (both marine and terrestrial on Curtis Island [Figure 1.8]) and inclusion in the WHA bequests an importance to the region, but is this suitable, considering the strong influence of industry?

This chapter provides a historical basis for the Gladstone region in Section 4.1. Section 4.2 explains the current developments in terms of size, scope and management. Section 4.3 covers the environmental implication of these developments, and in doing so extrapolates the environmental qualities that the region possesses which give reason to the environmental protection the region has, alongside reiterating the ideas of connectivity conservation discussed in chapter 2.2.1.

4.1 History of Gladstone

4.1.1 Early history

Located 540km north of Brisbane, Gladstone is one of the most substantial and commercially successful ports in Australia, with some of the most sophisticated facilities in the country (GAPDL 2011). Industry began in Gladstone with the Meatworks in 1896. The success of the Port was reinforced with coal trade post World War Two¹⁸. This era saw the region emerge as an industrial powerhouse in Queensland [Figure 4.1]. It was because of this status that Gladstone secured the bauxite refinery, the power station, and aluminium smelter (Kerr 1988), and substantially increasing the population of the region between 1962 and 1982 as people migrated for work (Fitzgerald *et al.* 2009).

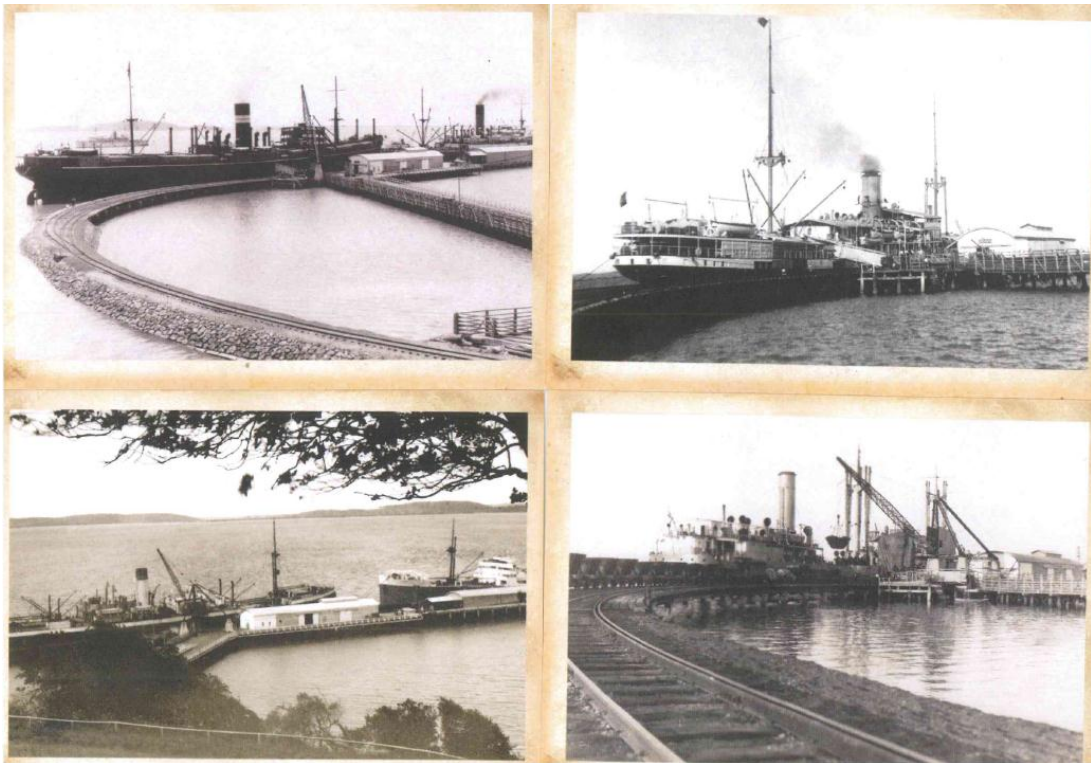


Figure 4.1: images of the Gladstone port and coal facilities, 1925 (adapted from: GPCL 2009).

¹⁸ At this period, the Gladstone port had the capacity, and was in a suitable location to handle coal, while other locations were not able to maintain this.

4.1.2 Industry today

These early industries are still in operation today. The alumina refinery is the largest in the world, and the power station, operated by NRG, provides a substantial percent of Queensland's power:

“In terms of industrial development, Gladstone is a boom town in a boom area. Projects worth thousands of millions of dollars...continue the process of Gladstone industrial transformation that begins with the establishment of the alumina plant in the 1960s. Measured on that basis, Gladstone's growth is massive” (Ettershank and Morgan 1980, 5).

The industry of the region has grown since the 1960's, including the establishment of the RG Tanna coal terminal, Cement Australia, Orica chemicals, oil and shipping container hub, and the Liquefied Natural Gas (LNG) facilities¹⁹ [Figure 4.2]. These industries give Gladstone the industrial title it holds today.

¹⁹ LNG is natural gas, which has been cooled by liquefaction to its liquid state. This reduces the volume of the gas by 600 times, enabling it to be economically transported globally by ships. The gas is mostly methane, with small concentrations of ethane, propane and butane. It is liquefied from coal, with is both the reservoir rock and the source rock for the gas. As coal is formed, large quantities of methane rich gas are generated and stored within the coal matrix. The Liquefied Natural Gas (LNG) plant facility operations are planned to commence in early 2014. The gas transmission pipelines will cross-port Curtis between friend point and laird point. The expected design for the crossing is for the gas transmission pipeline to be laid in a trench below the seabed and be backfilled with rock for protection. This will be dug out and the material will be added to the dredge at laird point. The LNG facility will be located at the Hamilton point west site adjacent from china bay on Curtis Island. This was decided upon based on the shipping access, geotechnical suitability, environmental suitability and proximity to infrastructure. The construction of Curtis Island also includes accommodation for workers as the facility will run 24 hours a day 7 days a week. Prior to this there was only a small residential area on the Southern side of the island.

Table 4.1 The Industrial history of the Gladstone region, including major dredging projects in the harbour (adapted from: GIEDB 2012; GPCL 2012).

1853	The township of Gladstone begins
1896	Gladstone meatworks established
1897	Rail link (Gladstone- Brisbane) completed
1914	Gladstone Harbour board formed
1934	Meatworks expansion
1960	Population is 7,200. Port trade is 202,000 tonnes
1960-1966	Dredging: 'a significant volume' Auckland point, Barney point, harbour channel
1967	QAL produces 1 st alumina
1968	Dredging: entrance channel 10.4m
1970	Population is 14,000
1971	Queensland's largest power station begins construction in Gladstone
1976	Power station commences generation, Gladstone declared a city
1980	Population is 23,000; port trade is 17 million tonnes
1980-1982	Dredging: Clinton and Fisherman's landing, 20 million m ³
1981	Queensland cement (now Cement Australia) commences linker production
1982	Boyne smelters commences aluminium production
1986-87	Dredging: inner harbour channels 5.5 million cubic meters
1987	Marina opens as a small craft facility
1990	Orica and Ticor commence chemical operation
1993	Gladstone State Development Area established west of Gladstone
1996	Port trade is 38 million tonnes. Population is 44,127
1997	Boyne smelter expansion (from 260,000 tonnes to 530,000 tonnes p/a)
1997	Dredging: Fisherman's landing 1 million m ³ ; plus outer channel 1 million m ³
1998	Dredging: inner channel swing basin. 2 million m ³
1999	Stuart Oil Shale project commences. Port trade is 43 million tonnes
1999	GEID established
1999	Dredging: inner channel. 2 million m ³
2000	Port trade 50 million tonnes. Population is 50,000
2001-2003	Dredging: RG Tanna and Fisherman's landing. 2 million m ³
2002	Lake Awoonga capacity raised
2003	GSDA extends 21,000ha. Port trade 60 million tonnes+
2005	Rio tinto Yarwan alumina refinery opens
2007	RG Tanna coal terminal expansion. Port trade is 76.4 million tonnes+
2008	GSDA expanded 28,000ha. Gladstone Regional council formed
2008-2009	Dredging: Fisherman's landing 0.66 million m ³
2009	Port trade 79 million tonnes+
2010	Dredging: Gladstone marina. 350,000 m ³
2010-2014	Curtis island ~26 million m ³

4.2 The GPD - Port Expansion and Development Projects

In this industrial setting the GPD and expansion contains multiple projects occurring concurrently - all are associated with the coal-powered and liquefied natural gas export (extractive) industry Australia has developed, and continues to develop (Kapterian *et al.* 2008). The developments stretch across central Queensland, from the coalfields 500km inland from Gladstone (Kapterian *et al.* 2008). The coal is transported to Gladstone, either through the pipelines being laid across land and under the marine bedrock or on the railway. The coal is processed in terminals on Gladstone Harbour, there are currently 2 coal terminals (one of which is being expanded), and three being constructed. This includes the Wiggins Island Coal Export Terminal (WICET) expansion, and three LNG processing plants, located on Curtis Island. The proponents for these are Australia Pacific LNG (APLNG), Queensland Gas Company (QGC) and Gladstone LNG (GLNG).

Table 4.2: the three proponents developing on Curtis Island and the shareholders of each (adapted from APLNG 2012; GLNG 2012; QGC 2012).

Australia pacific LNG	Gladstone LNG	Queensland Gas Company
Origin (37.5%)	Santos (30%)	BG Group.
ConocoPhillips (37.5%)	Petronas (27.5%)	
Sinopec (25%)	Total (27.5%) Kogas (15%)	

4.2.1 Western Basin Dredging

To enable LNG marine vessels to access Curtis Island and accommodate the increased shipping traffic, the existing harbour shipping channel is being extended - both horizontally and vertically. Currently, the harbour exclusively services the RG Tanna terminal. The expansion requires 26 million cubic meters of seafloor to be removed although approval has been granted for the maximum removal of 46 cubic meters (GPCL 2012).

The Gladstone Ports Corporation Limited (GPCL) is undertaking the dredging of the Western basin, located in the Port of Gladstone. Part of the dredge material will be used in the Fishermans Landing expansion and further material will be disposed of in the water off Facing Island at the East Banks Sea disposal site. This site is located outside of the

GBRMP. The material is transported on barges to these sites. There are currently three dredges operating in the harbour. As of October 2012, 9,200,000 cubic meters of dredge material had been removed. Of this 2,400,000 has been dumped in outside Facing Island [number 2 in Figure 4.2].

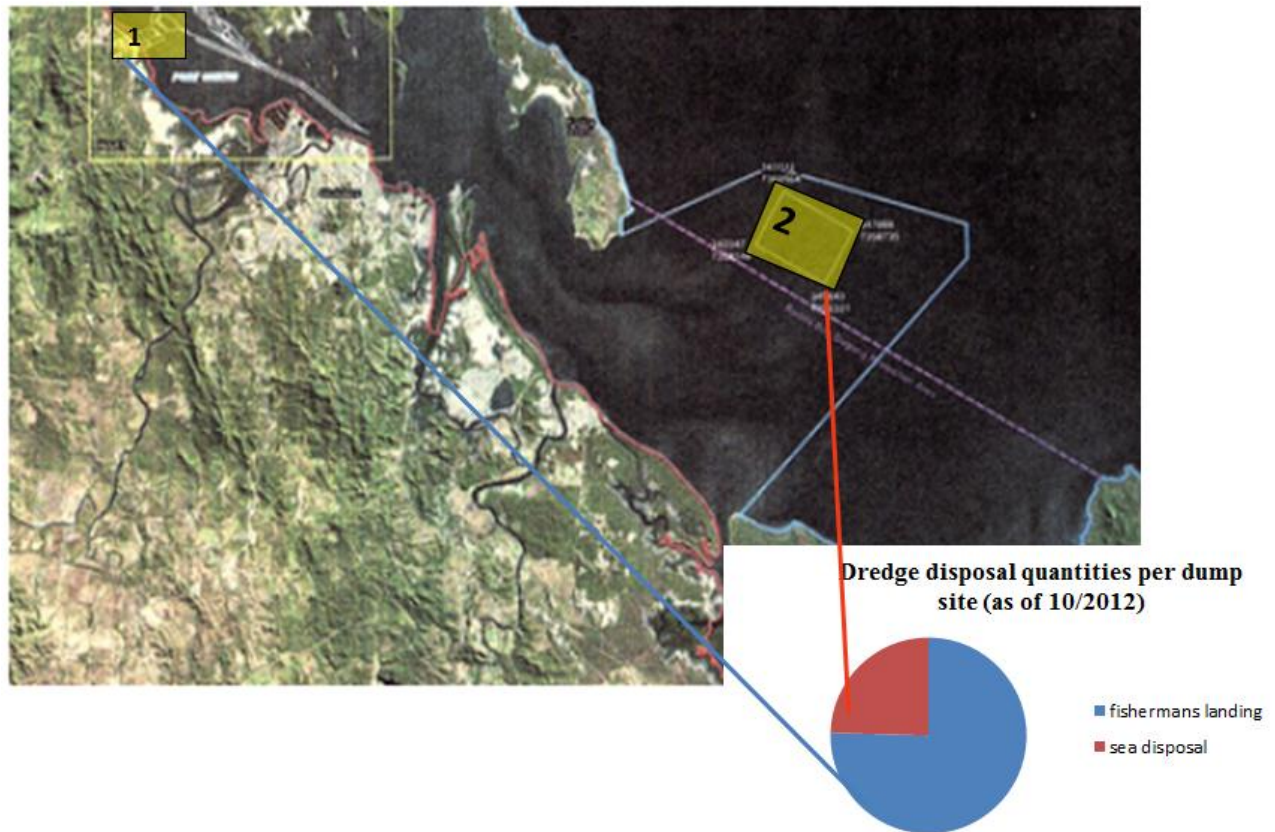


Figure 4.2 the dredging disposal areas marked by the yellow boxes. 1=fisherman's landing; 2=ocean dumping area. (Adapted from Aeuron 2010 in Hunt 201; GPCL 2012).

4.2.2 Fishermans Landing Northern Expansion Project

GPCL will reclaim 271ha of land to expand the existing port area. The land is being constructed from a proportion of the dredge material from the western basin dredging. The land would enable an additional six wharfs adjacent to the existing wharf, which currently accommodates multi-users including cement Australia, Orica, Rio Tinto and other industry (GPCL 2012). The area was also used by recreational and commercial fishers and supported seagrass communities (GPCL 2012). Fishermans Landing wharf will primarily service future developments, as the wharf is located within the Gladstone State Development Area (GSDA). The installation of a new boat ramp and tree planting will be carried out as part of the project to rehabilitate the area.

4.2.3 WICET expansion

This expansion of the WICET terminal is to increase the size of the current coal terminal (mid-construction) located on the mainland at Golding Point, behind the mangrove dominated Wiggins Island. The development includes a rail receipt dump station, increasing the quantity of coal received. The expansion will increase the capacity of the stockyard, and increase the number of wharf facilities for export.

4.2.4 Curtis Island LNG developments

There are currently three LNG facilities being constructed on Curtis Island, with a fourth submission under assessment²⁰. QCG, of the BG group expects to begin exports in 2013. The plant will be receiving the LNG through pipelines stretching 540km inland to the Surat Basin. Initially the plant will have a capacity of 8.5 million tonnes per annum (Mtpa), with the potential to increase to 10Mtpa. GLNG is a Santos Ltd/Petrona project, expected to begin shipping in 2014. The gas is sourced from the Bowen and Surat basin, with 420km of pipelines. Initially the project will have the capacity of 3.9Mtpa with the potential to increase to 10 Mtpa, this translates to an initial construction of two trains, with a capacity of five²¹. APLNG, a joint venture between Origin and ConocoPhillips, expects to begin shipping LNG by 2015. The initial capacity is 4.5Mtpa- four trains with the potential to increase to 18Mtpa. The pipeline stretches 400km to the LNG fields. These developments process the LNG into a liquefied state for shipping. The developments are all taking place on the western side of Curtis Island, facing Gladstone. The pipeline is to cross Port Curtis between Friend Point (on the mainland) and Laird Point (on Curtis Island), and will be trenched below the seabed then backfilled with sand and rock in order to avoid the risk of boat anchors damaging the pipe.

²⁰ The assessment process for these developments is an Environmental impacts assessment (EIA), carried out by the proponent. These assessments must be approved by the state government, and, in the case of Gladstone the commonwealth, as the development in question is in a WHA and has biodiversity impacts covered under the EPBC act (1994) (Hunt 2012). An EIA describes the current environment, the project's environmental impacts, and ways of avoiding, mitigating or offsetting these impacts- including direct, indirect, and cumulative impacts resulting from the construction, commissioning operation and decommissioning of a project. There is also the inclusion of a social impact assessment. This is done through several steps including: application (including initial advice statement), 'significant project' declaration, and referral to the Australia, government, terms of reference, the actual EIS statement within the EIA process, and evaluation of this (Queensland Government [deedi] 2012).

²¹ A train is a production unit.

Table 4.3: LNG processing plants production capacity and projected capacity on Curtis Island.

LNG processing plant	Initial capacity	Potential future capacity
QCG	8.5 Mtpa	10 Mtpa (5 trains)
GLNG	3.9 Mtpa (2 trains)	10 Mtpa (5 trains)
APLNG	4.5 Mtpa (4 trains)	18 Mtpa

As the developments have separate proponents, each compiled a separate Environmental Impact Assessment (EIA). The approval for each of these was granted between 2008 (WIECT) and 2011 (the BG group). Developments began soon after, although dredging for WIECT commenced in 2008 (for the initial terminal). While approval was granted based on the information provided in the proponents EIS submissions, there have been over 300 conditions placed on the developments from the federal and state governments²², who both granted approval.

4.3 Environmental implications of the developments

4.3.1 Dredging

Dredging of the sea floor will cause increased suspended sediment and turbidity. This will directly affect seagrass and macro-invertebrate communities, beyond direct effects of habitat destruction and through the dredging process. Dredging activities can have major impact on coastal ecosystems, decreasing the amount of light available for photosynthesis, covering seagrass beds, coral reefs or fish spawning sites with a layer of sediment, or leading to suspension of pollutants which accumulate on the seafloor (Kuster *et al.* 2007 in Petus and Delvin 2012). The removal of large quantities of sediment can damage nearby coral reefs. Impacts depend on exposure during operations (Salvat 1987). The removal of habitat reduces the productivity of the harbour and its ability to support fish populations (Hunt 2011). The dredge spoil is reportedly toxic, and the suspended sediment from this is also an issue. The toxins are reported to be from the industrial history in the region (Landos 2012).

The spread of mobilised sediment in the GBR is a serious issue associated with dredging. As most dredging occurs in sheltered bays, the fine sediment remains suspended for long periods can be dispersed by tidal currents, thereby affecting more distant sites - the dredge

²² See appendix B examples of the approval and conditions for the LNG and dredging.

sediment plumes in Gladstone have been mapped 32km from the Harbour (Petus and Delvin 2012). This indicates that the impacts of the development are not only on a local scale, but have a region wide impact. While the plumes travelled the length of the coast, there is also the possibility of this spreading outwards to the pristine Heron-Wisteria complex, 50km east of the mainland [Figure 3.4].

4.3.2 Seagrass, mangroves and coral

The Gladstone region is primarily a seagrass bioregion, established in the 2004-zoning plan (GBRMPA 2011d). Seagrasses are a unique group of flowering plants that have adapted to live fully submerged in seawater, and provide numerous ecological roles within the marine environment (Orth *et al.* 2006). Seagrasses and mangroves are keystone ecosystems that provide unique habitat for high densities of marine species with respect to diversity and abundance (Blaber 1980; Robertson & Duke 1987; Morton 1990). One of their most important ecological roles is their function as a nursery ground for marine species (Nagelkerken *et al.* 2000). Seagrass beds also provide important connections between reef habitats and bioregions, interrupt freshwater discharge, are sinks for terrestrial pollution, and can generate an environment with clear, nutrient poor waters, which promotes coral reef growth offshore (Moberg and Folke 1999). Seagrasses, particularly in the GBR, act as a buffer between catchment inputs and reef communities (Waycott *et al.* 2005).

It is obvious that seagrass beds are important ecosystem providers, especially when surrounding coral reef ecosystems. However the rate of degradation of coral reefs and seagrass meadows is globally increasing as a result of direct human pressures (Schaffelke *et al.* 2005). An established seagrass ecosystem exists within the GBRMPA zone that also encompasses Gladstone Harbour. The seagrass habitat is in a very vulnerable position due to coastal development, port activities, and urban and industrial runoff (Coles *et al.* 2007). A baseline survey mapped 13,578 ha of seagrass habitat within the Port Curtis and Rodds Bay area (Rasheed *et al.* 2003 *in* Hunt 2011), with estimates of 15% likely to be affected by direct anthropogenic (specifically industrial) impacts (Hunt 2011). Seagrass levels are not only affected by physical removal, but the disturbance of sediment by the dredging processes will cause a reduction of light availability, blocking the photosynthetic process required for seagrass, as well as increasing pollutants such as heavy metals and petrochemicals, which seagrass absorb and can be heavily affected by (Schaffelke *et al.* 2005).

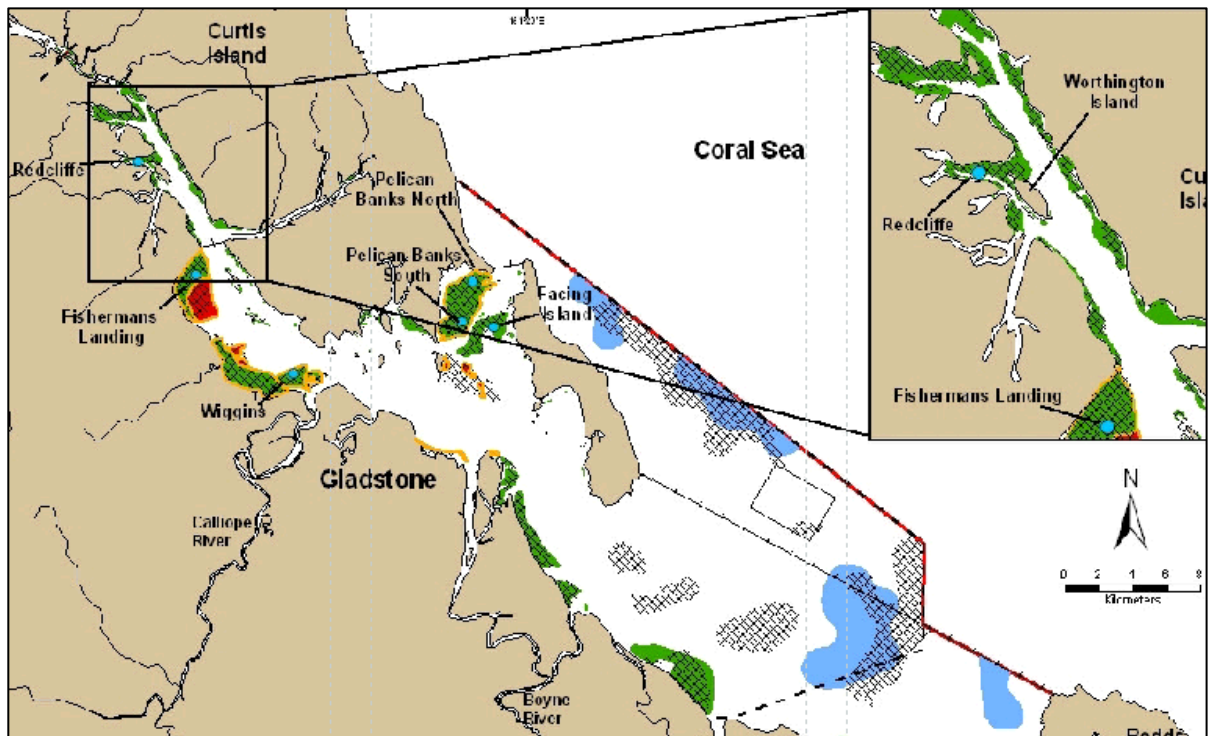


Figure 4.3: Seagrass areas mapping in Gladstone Harbour, and the multiple zones (black dotted line for port exclusion zone, red line for GBRMP) (seagrass health 2011)

Seagrass in the GBR region is also important as a major feeding ground for sea turtles [Table 1.1] and dugongs both of which are protected marine species and have strong links to indigenous Australian culture in the region [Figure 1.2]. For these reasons, the seagrass meadows in the Gladstone region are a protected dugong sanctuary (Coles *et al.* 2007). With increased shipping and industry in the area, dugongs and sea turtles will be heavily affected by the loss of feeding habitat (Hodgson and Marsh 2006). There is also a threat of poisoning and bioaccumulation of heavy metals from contaminated seagrass (Landos 2012). Both dugongs and sea turtles are already on the endangered species list because of direct anthropocentric consequences (Hodgson and Marsh 2007), and the protection of these species is a vital part of the WHL of the GBR and for the maintenance of the OUV of the reef (Marsh *et al.* 1999; Dryden *et al.* 2008).

Mangroves are intertidal marine plants, and support the shoreline by reducing erosion, and also benefit the marine ecosystem through nutrient uptake and turnover, carbon sink and sequestration, sediment trapping, and habitat formation and protection (Tomlison 1986). Mangroves are extremely important ecosystem providers for a suite of organisms, and are especially important in providing a safe habitat for juvenile crustaceans, molluscs and fish

during development into adulthood (Nagelkerken *et al.*2000). This is well represented in the lifecycle of the Red Emperor, which is an iconic fish in coral reef ecosystems (Hutchings *et al.* 2008).

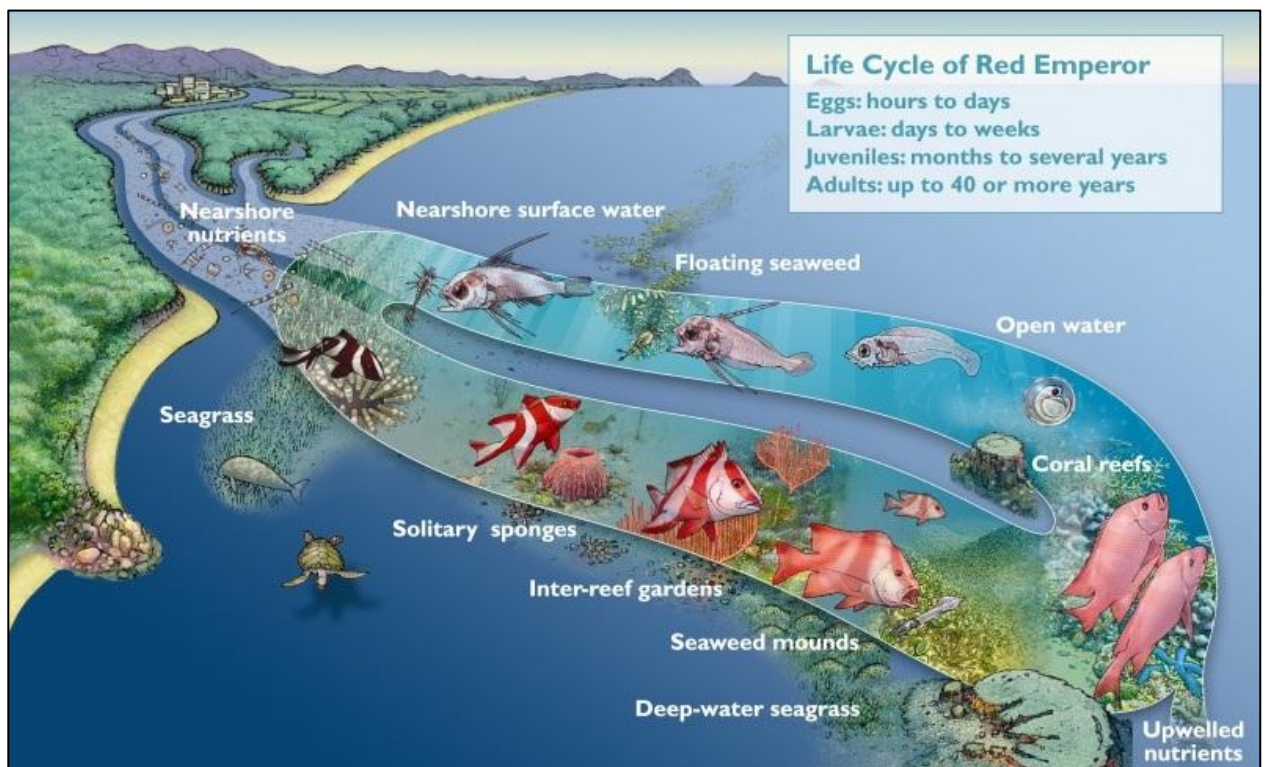


Figure 4.4: the Red Emperors lifecycle journey (Ryan [artist] in Hutchings et al. 2008)

Between 1941 and 1999, 1,470 ha of mangroves were cleared in the Gladstone region (Duke *et al.* 2003). Destruction of mangrove forests is mostly due to reclamation for coastal development around estuaries. This has resulted in river bank destabilisation, deterioration of natural water flow, and loss of key coastal marine habitat (Schaffelke *et al.* 2005). The removal and destruction of mangrove ecosystems also has dire implications on the lifecycle of many reef species, including those important in the fishing sector.

4.3.3 Marine life

The East Banks Dredge dump site has seen an increase in disease in fish since early-2011; reports of dead fish and diseased fish and crabs are also reported from the Narrows (Petus and Delvin 2012). While there is no conclusive evidence for the cause of the increased disease, the majority of fishermen and researchers in the region attribute this directly to increased dredging activity (Hunt 2011; Landos 2012). The rebuttal of this by GPC attests

the disease to the 2010 flooding in Queensland, and the breach of nearby Awarnga Dam. Reports indicate there is a significant, ongoing rise in disease in fish, crustacean and shellfish populations- including in samples collected in 2012, when there was no fresh water inundation from flooding (Landos 2012).

There has also been an increase in the number of dugong and turtle mortalities in the region [Figure 4.5], although there has been an increase in mortalities in other regions.

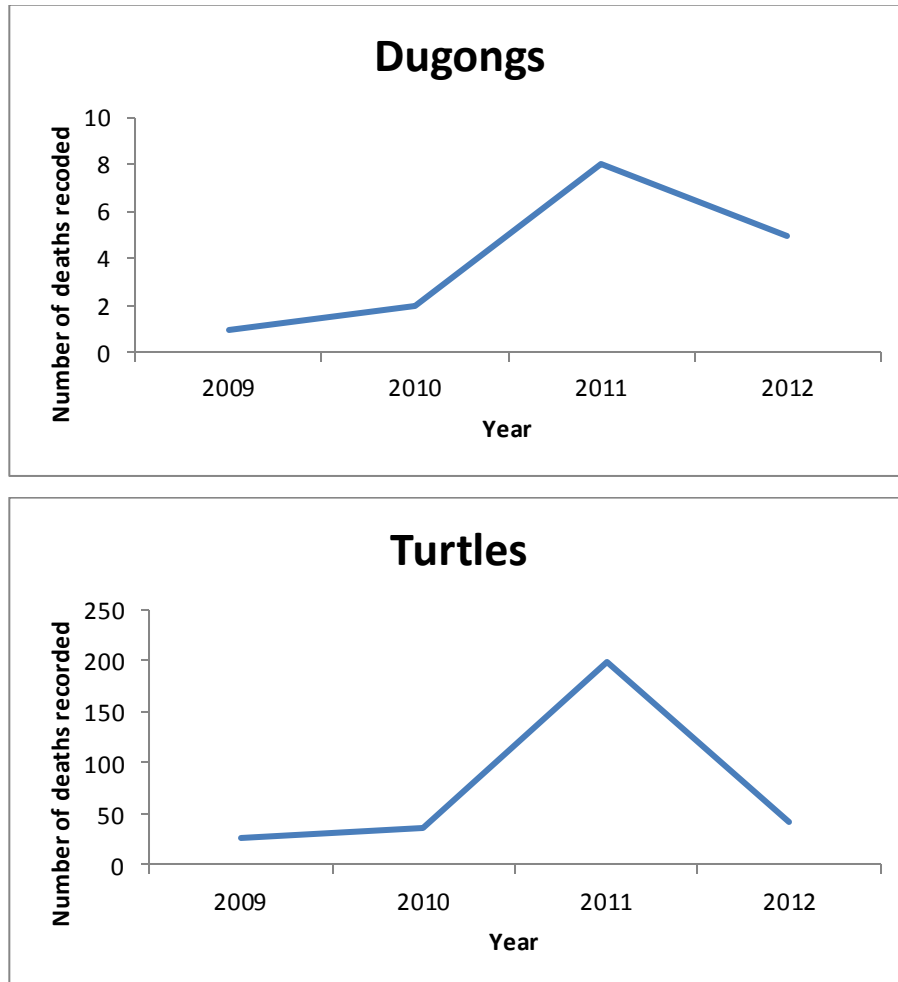


Figure 4.5: the number of dugong and turtle deaths in Gladstone 2009-2012. (Data from Queensland Government [DERM 2012])

Mega fauna are also a factor to be considered when assessing the potential damage the GPD could have. A recent study on humpback whales in the GBRMP shows the Capricornia bunker as important in the wintering area for the whales, and is one of the most likely locations for a humpback whale to occur, as the region is part of the migration route for the highly protected mammal. There are also predictions the Gladstone region will become an

important calving ground. Humpback whales will be most impacted by the increase in shipping based on these factors (Smith *et al.* 2012).

4.4.4 Terrestrial life

Marine species are not the only animals threatened by the development around Gladstone, with concern for the critically endangered Yellow Chat, which is endemic to the Fitzroy Basin area (Houston *et al.* 2004b). The Yellow Chat has been found on Curtis Island, but in recent years the numbers have diminished rapidly (Houston *et al.* 2004a, 2004b, 2006). Industrial development and unrestricted access to the bird's natural habitat are identified as some of the major threats to this species (Houston and Melzer 2008).

4.3.5 Transport impacts

Boat traffic causes disturbance through noise and boat strikes, and persistent interruptions will undoubtedly have impacts on the behaviour of dugongs and sea turtles, including their feeding and mating patterns. This will affect the reproductive success of these species, and could lead to their displacement from the area, or even local extinction. Dugongs are already restricted to coastal waters around seagrass meadows, particularly wide shallow protected bays, and are therefore particularly vulnerable to boat strikes (Marsh *et al.* 1999; Hodgson and Marsh 2007). Turtles are also affected by boat strikes, with a significant level of mortality seen along the east coast of Queensland each year (Hazel and Gyuris 2006). MPAs have been recognised as an effective tool for protection for sea turtles, and the threats of coastal development, habitat loss and boat strikes are well documented threats to their survival (Dryden *et al.* 2008). Curtis Island is a significant turtle nesting site within the region, and increased development, boat traffic and habitat destruction will impact these local populations (Dryden *et al.* 2008).

4.4 Conclusion

The historical context of Gladstone paints an image for its future as the industrial character of the town and harbour has, in part, eased the pathway for the current development to occur. The current developments are also important in contextualising the wider environmental impacts of increased coastal infrastructure development. If local patches of habitat collapse, a system-wide threshold may be surpassed that drives a larger scale regime shift (Hughes *et al.* 2007). Thresholds are dynamic and difficult to predict, because tipping points change in response to both local and larger-scale processes (Hughes *et al.* 2007). While the potential environmental impacts are a cause of concern, the spatial element of locality and concentration, all occurring within an internationally protected zone and adjacent to a National Park raise further concern. While there is little doubt that physical processes of the GBR are changing, in part as a result of anthropocentric influences (Douvere and Badman 2012), coastal and port developments have impacts on the values associated with the OUV. This is particularly so with respect to the cumulative additional pressures on significant marine habitats and protected species which are of high concern to the WHA (Douvere and Badman 2012).

Chapter 5:

Researching the Port Development: Methods and Methodology

“Reefs of the world are at risk and knowledge based management is critical” (Hutchings et al. 2008).

As an area of study, the GPD poses several methodological challenges. There is difficulty in assessing the implications of the GPD for stakeholders and the environment, because it is an ongoing process with continual changes. Furthermore, the contemporary and contentious nature of the GPD provokes varied and often passionate and polarised responses. This can be hard to navigate, but provides a rare opportunity to gain insights, often sending me ‘down the rabbit hole’ in terms of the intricacies and parallel topics allowing for rich and raw insights into the entire process and ideals of the development, placed within the broader context of a rapidly changing global society.

This chapter explains the methods and methodological framework used to conduct fieldwork on the GPD, conducted, in July 2012. Section 1 explains and justifies the methods deployed in the field and the format of fieldwork. Section 2 explains the data analysis process, and Section 3 looks into issues relating to this research in terms of positionality and subjectivity of both researcher and participant and the implications this may have had on the study.

5.1 Methods deployed in the field

5.1.1 Field framework

Fieldwork is arguably the essence of geography; a fundamental aspect of the discipline’s ethos (Jenkins 1997). During July 2012, 34 stakeholder interviews were conducted, primarily in Gladstone. Interview participants were selected based on their involvement, engagement, knowledge or interaction with the GPD, alongside their willingness to participate [Appendix E]. The demographics of participants are outlined in chapter 6, including stakeholder groups [Figure 6.2], gender balance [Figure 6.3; 6.4] and time spent in

Gladstone [Figure 6.5]. The stakeholders targeted were from three broad categories including:

1. Fishers - commercial fisherman and associated industry workers/ business owners²³
2. Scientists, researchers and environmentalists/conservationists
3. Industry and government officials

The interviews were semi-structured, with flexible questions to allow for natural flow, creating a fluid conversation rather than a formal interview structure (Valentine 2003; Bernard 2005; Hay 2005; Secor 2010 [Appendix F]). The rationale behind using interviews has been described by Valentine:

“An interview is not to be representative ... but to understand how individual people experience and make sense of their own lives” (Valentine 2003, 111).

The majority of interviews were conducted *in-situ* on a one-on-one basis. Interviews ran from 30 minutes to 2 hours. An audio recorder was used as the primary tool to save data; this was the best way to compile the information (Willms *et al.* 1990) and permitted a more natural uninterrupted conversation. A detailed record was kept using maps, photos and brochures, ensuring maximum information retention for a comprehensive analysis post fieldwork (Bernard 2005; Hay 2005). A field diary was also kept, as a useful tool to document the impressions, emotions and intangible elements of fieldwork (McGuinness and Simm 2005), and the self (Kobayashi 2003).

When face-to-face interviews were not feasible, phone interviews were used, as there is no significant difference in the quality of data received (Rogers 1976). Telephone interviews were used as the scope of this issue is not limited to the spatial area in which the development is taking place, but rather the issues present in Gladstone are entangled in a broader national and global framework. WH is not simply a site of national importance, but a site protected for all persons of the world (Spalding 2002).

²³ The number of Fisher stakeholders in the region has dropped considerably since the commencement of the GPD, meaning access to this stakeholder group was limited – hence the incorporation of those directly associated with the industry.

5.1.2 Mapping the region

When practical, participants were asked to map out their knowledge of the marine boundaries - specifically the GBRWHA and the GBRMP using a simple, unmarked map [Figure 5.1]. These were compiled in ArcMap 10 to create a visual map of perceptions, regulations and actualities, based on participant's knowledge (see chapter 6). This technique is similar to the mapping exercise used by Ledee *et al.* (2012) who mapped commercial fishers understandings the MPA and fishing areas in Gladstone.

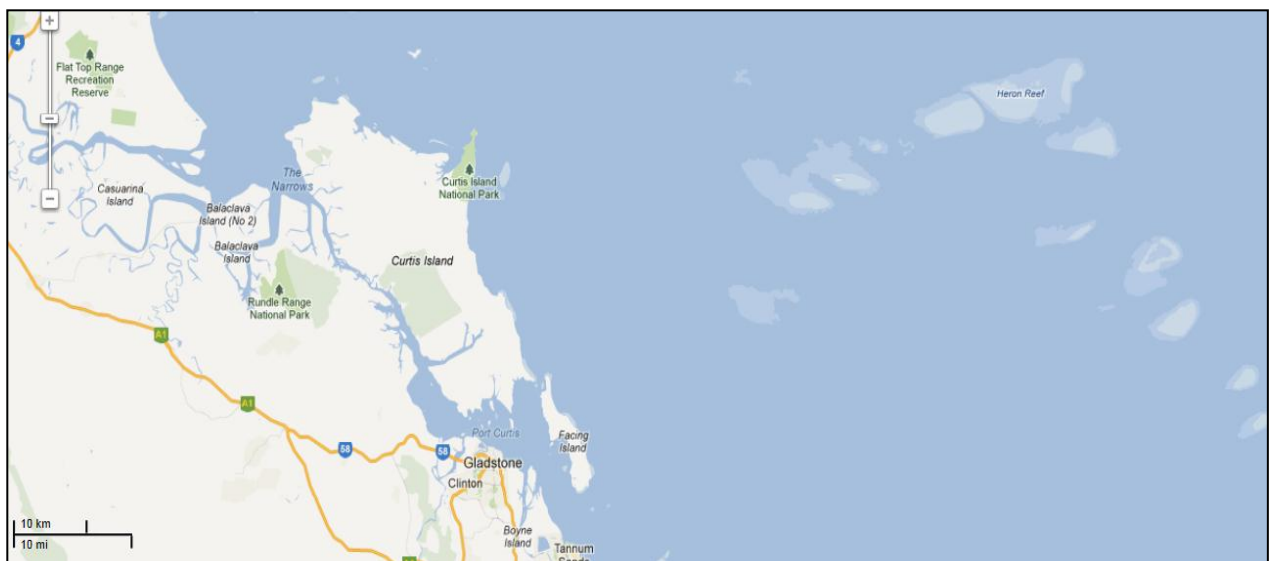


Figure 5.1: An example of the map used for stakeholder interviews to gauge perceptions and understanding of the zoning in the Gladstone region (www.maps.google.com)

5.1.3 Recruitment

To recruit participants, individuals who had involvement in the GPD in some capacity were asked to take part in research prior to my entering the field through emails and phone calls²⁴. The participants were made aware of the use of their perspectives to ensure that they understood the implications of participation so they could decide in a conscious, deliberate way if they wanted to take part (Mack *et al.* 2005). This was to ensure the respect of participant's position; an important guideline in ethical research (Ryan *et al.* 1979).

²⁴ These participants were sourced through media quotes and media exposure primarily.

Purposive sampling was used because it is important to recruit individuals with appropriate knowledge and expertise relating to the GPD processes (Beanland *et al.*1999; Patton 2002). Purposive sampling targeted participants for the study in order to examine meaning, process and interpretation (Rice and Ezzy 1999), thereby having a sample selected based on knowledge. The motivation of using purposive sampling was to describe and understand the implication of the GPD, rather than identifying the distribution of the impacts of the development based on demographics (Rice and Ezzy 1999).

As a subset snowball-sampling approach was used, where respondents who knew of others who may provide further insights into the study passed on their information (Bradshaw and Stratford *in* Hay 2005). Snowball sampling relies on key informants identifying other potential participants who may be able to assist with the study - a locating tool for sourcing information-rich key informants (Patton 1990). As the name suggests, the sampling gets larger as the number of potential participants who fit the research criteria are identified and included in the study (Patton 2002).

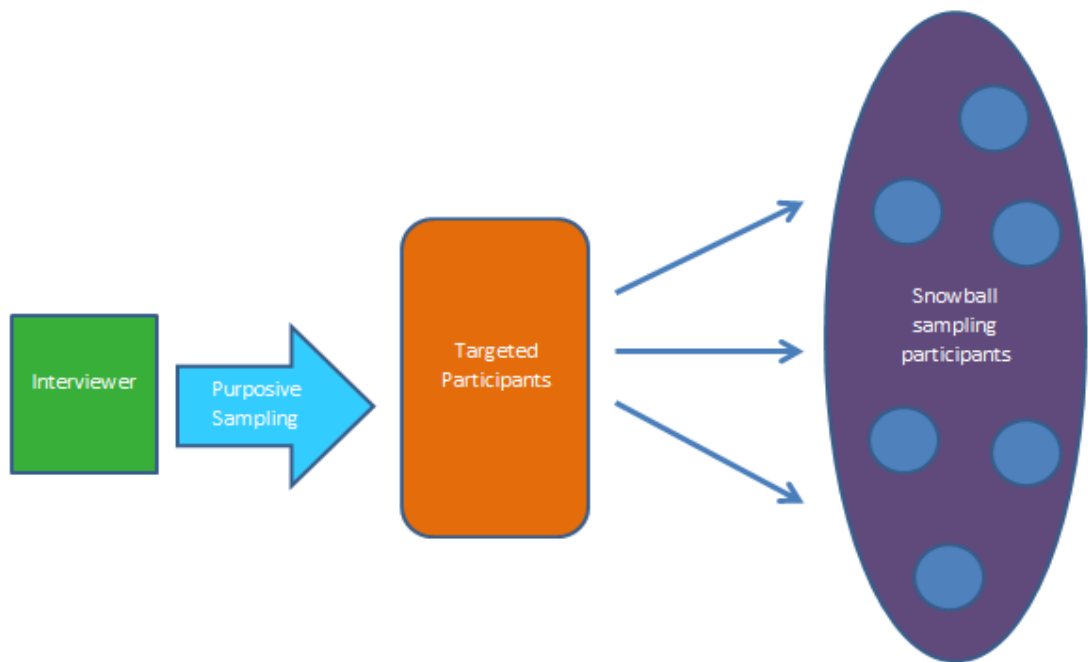


Figure 5.1: the recruitment technique used for fieldwork, showing the diversity of participants recruited when using snowball sampling.

5.1.4 Participant observation

As in much fieldwork, participant observation often falls into place without planning. This was the case within this fieldwork. Two meetings with the local conservation group, and two GPC organised tours were attended. The information from these activities was used to reinforce and reshape ideas and concepts. However, as this was not a primary objective of my research, the information obtained from these has not been heavily relied upon; rather it provides background to ensure completeness of the data (Becker and Geer 1957). In both instances, my role as a researcher, not a ‘member’ was outlined prior to the meetings. On the tours, I was a participant in the same capacity as others patrons.

5.1.5 Triangulation of data

Complementary to the primary data gathered, a wide body of literature was used to frame the study in context and to limit the influence of opinion and emotion. The data, which is information that was not collected during fieldwork, included a wide body of academic and historical literature, government, UNESCO and industry reports and newspaper articles.

“Secondary data provides three overlapping types of context – geographical, historical and socio-economic. They allow you to compare your case study material with others, with the wider region and the rest of the country none of which you will have time to study yourself” (Clark 2005, 59).

Marrying primary and secondary data allowed for a sequential approach using both qualitative and quantitative methods, grounded in literature (Creswell 2008). Linking secondary data sources with interview results ensured a wider, less biased view (Patton 2002). The complementary literature triangulated the fieldwork material with cross-referenced material, shown in Figure 5.2 (Valentine 2003).

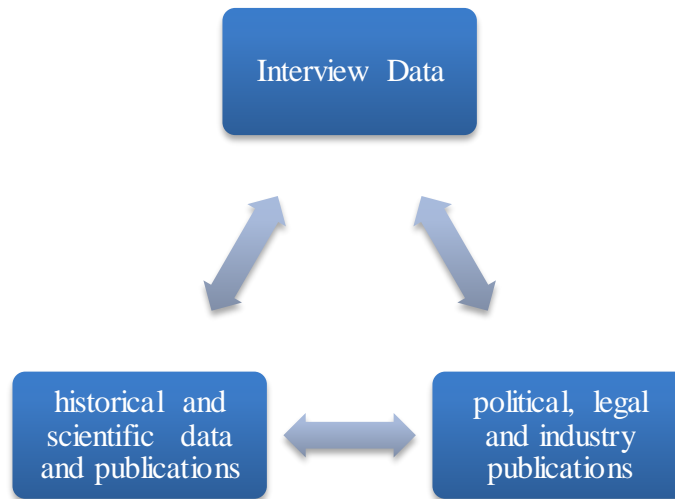


Figure 5.2: the triangulation of data sources primarily used within this study.

5.2 Data analysis

Analysis of qualitative data is a continuous process, and cannot be distinguished completely from the collection and reduction phase (Folkstad 2008 [Figure 5.3]). Transcripts of each interview were completed soon after each interview from the recordings and written notes. From this, the key themes were compiled into topics and revised using longhand. While this is a beneficial tool, transcribing is time consuming (Ryen 2002 *in* Folkstad 2008). However, without a written version of the interview, data analysis would be next to impossible. Typing of transcripts allowed revisitation of the data (Hay 2005).

The transcripts were assessed through key questions, both those initially asked, and those formulated after the fieldwork process because of strong responses observed. These were compiled in Microsoft Excel to create the results shown in Chapter 6.

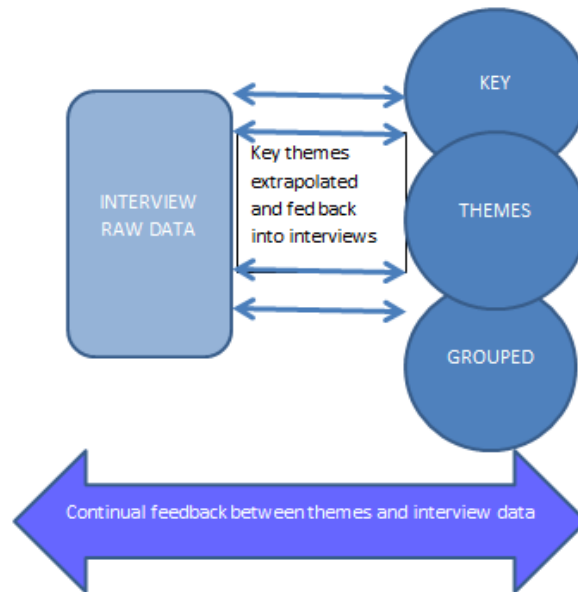


Figure 5.3: continual process of data collection and analysis.

5.3 Positionality and reflexivity in fieldwork

5.3.1 Reflection of fieldwork

The study of the GPD was dominated by qualitative approaches to research, relying on methods such as participant observation, interviews and archival research (Sheppard 2000; Delyser 2008). Methodologies are the “general investigation of the aims, concepts and principles of reasoning” in human geography (Sloman 1988, 525 in Cholke *et al.* 2004). In other words, methodology is the ‘why’ behind the ‘how’, a justification for using specific tools within research and why certain elements of these tools are used and emphasised rather than others.

5.3.2 Positioned subjects

The idea that knowledge is contextualised and circumstantial came to the fore with the academic rise of the feminist, post-Marxist and poststructuralist scholars of the 1980s and 1990s who engaged new theoretical approaches (Rosaldo 1989; McDowell 1992; England 1994; Rose 1997; Delyser 2008). The emergence of a new paradigm within human geography brought about the placement of ideas into time and place specific contexts, removing assumptions of universality or assumed truth. The idea that identity and ontology - who we are and how we became as such is the basis of positionality. These are both fixed

and socially ascribed (Rose 1997). No one is a neutral, scientific observer within the field of human geography, “...untouched by emotional and political exponents of places where we do research” (Skelton 2001, 89 *in* Smith 2000), rather the researcher themselves is a positioned subject, not an objective viewer, involved in the process and outcomes of research because of their positionality (Rosaldo 1989) [Figure 5.4].

A researcher cannot be all-seeing and all-knowing, thus interpretation of data needs to examine the positionality of the researcher as having an active role within the research (Sidaway 2000). Within my research, my position as a female with a background in politics and marine and environmental studies brought preconceived assumptions and strong views to this research. This positionality has amalgamated in my topic choice and stakeholder focus within an environmental justice and political ecology framework (Gregory *et al.* 2009). While there are techniques/methods I have deployed, such as conducting multiple interviews with various stakeholders including industry professionals and pro-development advocates for the port expansion, there is inevitably be some bias in my work. In an attempt to minimise this I formulated a list of interview questions, which aimed to be neutral in tone, with the intention of allowing for the participant to respond with their own opinion - rather than me posing a value-laden, leading question. As a trait of good scholarship and to ensure rigour in my work (Baxter and Eyles 1997), I pre-tested my interview questions on others to ensure this prior to fieldwork.

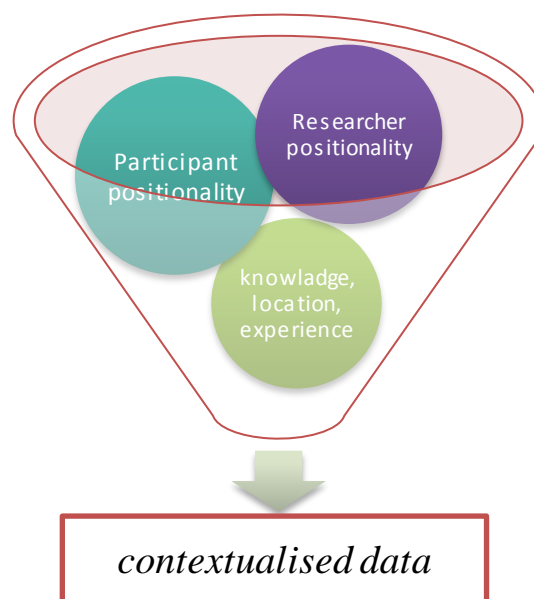


Figure 5.4: The roles of the participant, researcher and outside elements in the production of data in fieldwork.

5.3.3 Power in research

One of the major issues with regards to positionality is the issue of writing ‘for’ or ‘about’ rather than ‘with’ the participants (Sultana 2007). This issue has been taken up in scholarship with concerns about marginalization, essentialisms, and differences in representation. The idea of research having the ‘ability’ to change the participant’s lives is idealistic. It is important to be transparent about the nature, scope and realities of this work, and being honest about what the work can and cannot achieve (Kesby *et al.* in Flowerdew and Martin (eds) 2005). A transparent approach was taken with all interviews for this study.

5.3.4 Cultural nuances

Notions of power differentials bring into consideration issues of sameness and difference within research. These ideas can also be seen as *insiderness* or *outsiderness*. Having an insider or outsider perspective can compromise the quality and level of subjectivity within research. An insider can put both interpersonal relations and professionalism at stake; “*insiderness* or *outsiderness* are not fixed or static positions, rather they are ever shifting and permeable social locations that are differentially experienced and expressed by community members” (Naples 1996, 140). As my fieldwork is based within my country of origin, I have insider status, based on citizenship, language and elements of shared culture and history (Adriansen and Madsen 2009). While this granted me easier access to the field, there were still factors inhibiting me from being a full ‘*insider*’. Given that Australia is a large geographical space, there are some cultural nuances that will give me an outsider status, especially the perceived and real divides between an urban metropolis (Sydney) and smaller port city (Gladstone).

Ethical considerations play a vital role in research (Cholke *et al.* 2004; Rose 1997). Realising ethical considerations places the participant within a position of equal power at times, especially if the research incorporates the participant in ‘proof reading’ the work, by sending a transcript to the participants— which was done for this study. A major part of the ethics in presenting research is to allow the participant to remain anonymous, and ensure confidentiality of the raw data (Longhurst 2003). Unless the participant consents, names were not used to identify individuals.

5.4 Conclusion

Fieldwork does not take place in a vacuum, free from the social and cultural filters brought to the study by the researcher (Howitt and Stephens 2005). Ignoring our own place within research and methodologies is ignoring the sub-context in which research takes place. Research should aspire to be transparent, responsible and ethical (Rose 1997). There are no truths or universalities within qualitative research, and positionality and methodology help us to recognise the frame within which research takes place. For my research, my positionality, ethics and the methods deployed were taken into consideration to ensure they did not become a shortcoming in my research practice or analysis. Preconceived ideas about the social and environmental impacts of the GPD, and the media's influence, did in some way affect my research. However, it also gave me a good background for entering the field so I could base my methods in context. While there is a bias within my work, realising the positionality of myself as a researcher, and the stakeholders as participants was important to ensure a fair, honest and ethical approach was used during research. Reflection helps to identify both the shortcomings and strengths in the research process which may influence what is presented. It is impossible to have value-free research, but I aimed to present the findings as transparently as possible.

Chapter 6

Results: Great Barrier Grief

“Managing the Great Barrier Reef relies on good knowledge and information” (GBRMPA 2011g).

This chapter presents the data assimilated on the perceptions of high users to the development, conservation and boundaries/management in the GBRWHA at Gladstone Harbour. The views, values and attitudes of these groups are critically important to enhancing our understanding of the ways in which environmental regulation and management work, especially within the unique WH and marine setting. The data encompasses multiple scales of use and governance in Gladstone. This chapter presents key information gained from fieldwork: interviews, maps and participant observations. The results outline the knowledge, practice and understandings of the region in terms of the OUV for which the region is listed. Stakeholder understandings of the boundaries of the WHA and GBRMP are also presented²⁵.

The demographics of the participants are presented in Section 6.1. Section 6.2 outlines the perceptions and issues that stakeholders outlined regarding the port development. Boundary making, mapping and understandings are shown in section 6.3. Section 6.4 shows the results gathered regarding management of the space. The results are presented in a way to connect the ‘how’ and ‘why’ of the issue of the WH area in terms of OUV, management and boundaries. These links are made through an assessment of the uses, users and management of the space, which are interconnected [Figure 6.1].

²⁵ Throughout the figures, the stakeholder names have been simplified, so cross-over groups (industry and government) are used inter-changeably, but represent the same group of respondents.

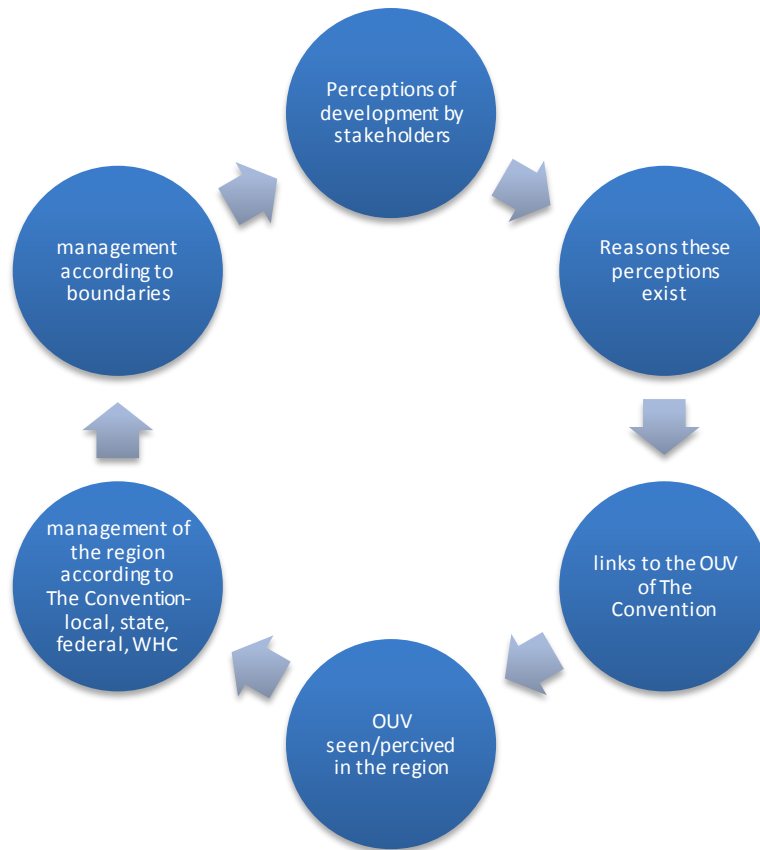


Figure 6.1: the presentation of results linking the local issues to the state, federal, national and international spatial boundaries.

The results show the connectedness of the local users to the international natural heritage protection regime of the *Convention*, providing the basis for multi-layered linkages between local, state, federal and international boundaries, perceptions and realities [figure 6.1].

6.1 The Participants

Of the 33 respondents, there were similar numbers between stakeholder groups, with nine fishers, seven conservationists, seven academics, and nine representatives from the government and industry. There were two other participants, a journalist and a representative from the Australian Maritime Shipping Authority [Figure 6.2].

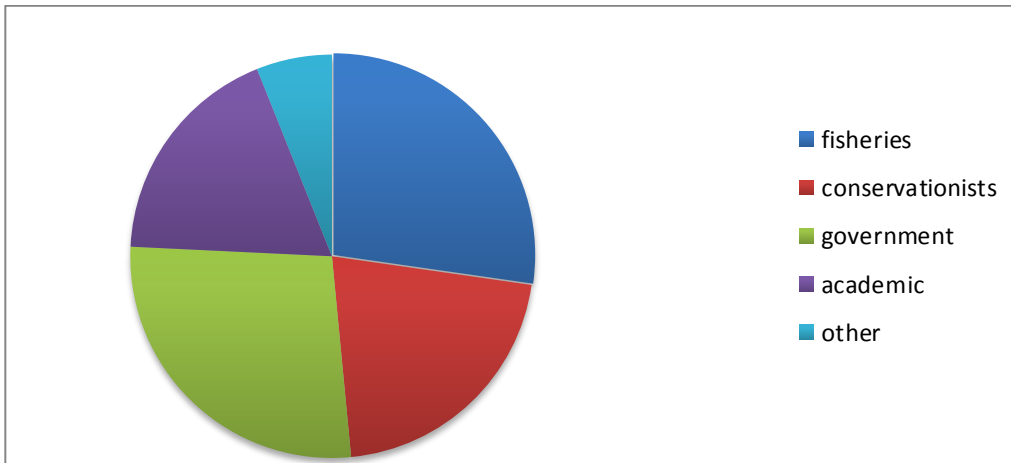


Figure 6.2: breakdown of participant's stakeholder positions, showing the mostly even distribution of participants in the interview process.

The majority of respondents were male [Figure 6.3], although analysis in each stakeholder group [Figure 6.4] shows that females were more prevalent in government and conservationists stakeholder groups.

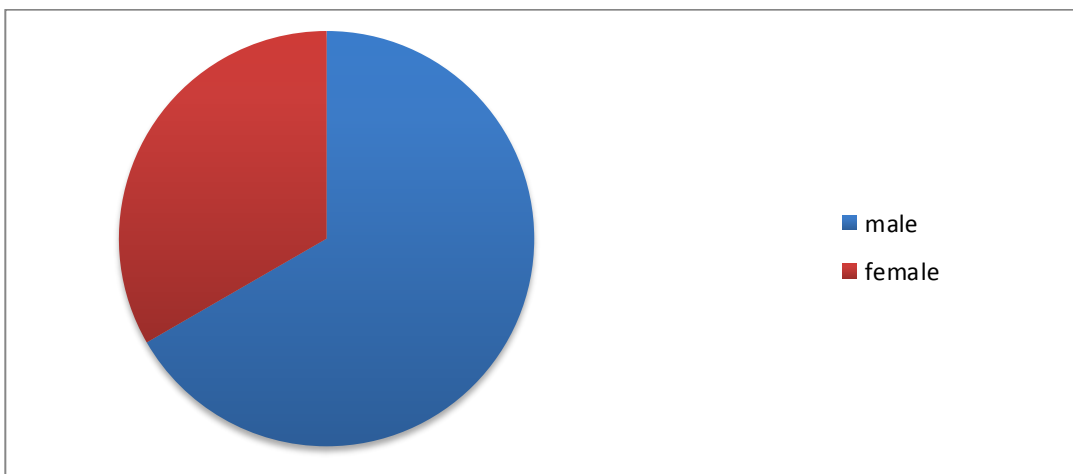


Figure 6.3: ratio of male to female participants, with a majority of male participants evident in the overall percentage of stakeholders.

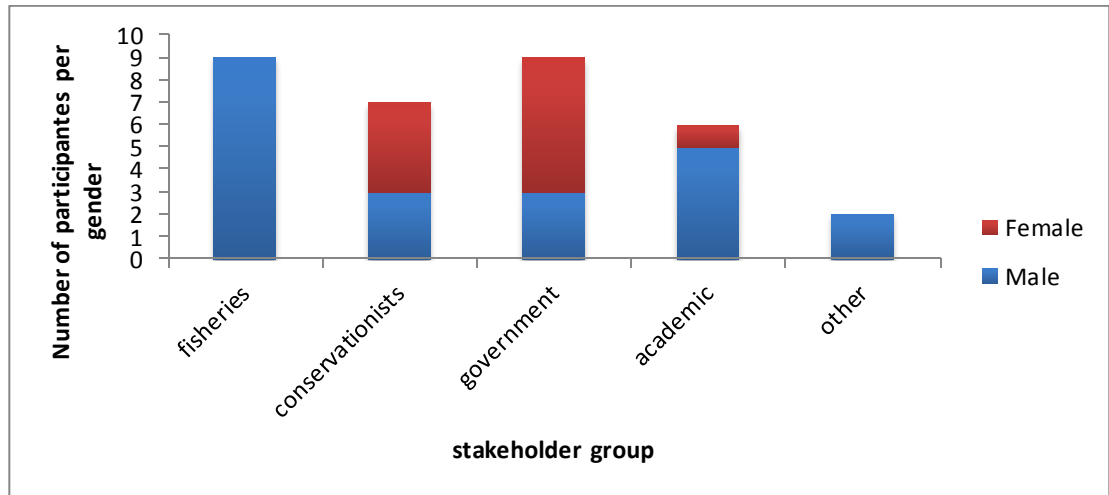


Figure 6.4: ratio of male to female participants within specific stakeholder groups, the majority of female participants are in the government stakeholder group.

Over 50% of participants had lived in Gladstone for 10+ years, so the fieldwork included a high level of local knowledge based on time spent in the region. Two participants stressed that this was crucial to the discussion of the development. The remaining 50% were participants not from Gladstone and who have not spent substantial time in the region. Of this, the majority [7] are academics. All fishers interviewed had lived in the region for 10+ years.

“We don't need people from the middle of NSW coming and telling us how to look after our harbour. And we don't need people coming down from Yeppoon telling us how to look after our harbour; we need local people driving it” (G.Sellers 2012, pers.comm).

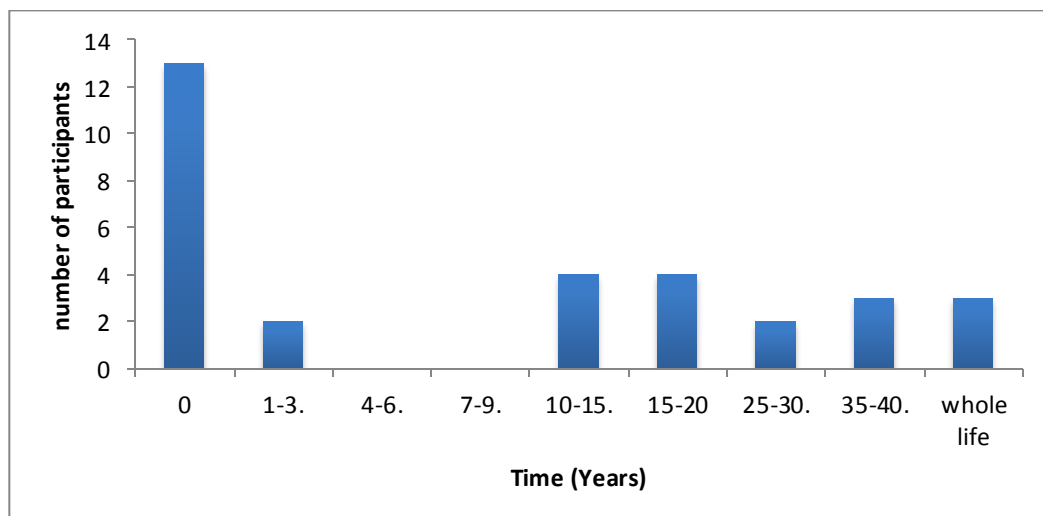


Figure 6.5: The amount of time participants have spent in the Gladstone region in years.

6.2 Perceptions of development

Most respondents discussed the positive and negative implications of the GPD. It was evident in interviews that the weighting of benefits and negative impacts correlated to stakeholder groups. The lowest rating of the GDP came from fisheries and conservationists. Only one fisher saw the development as having minimal impact. All other respondents commented on the significant negative changes it has had on their livelihoods. Figure 6.6 shows the perceptions of the development based on respondent's answers. Nearly half of respondents [15] saw no positive impacts from the development. These perceptions were based on the description of the development each participant gave, rather than a numerical value placed on it by each participant.

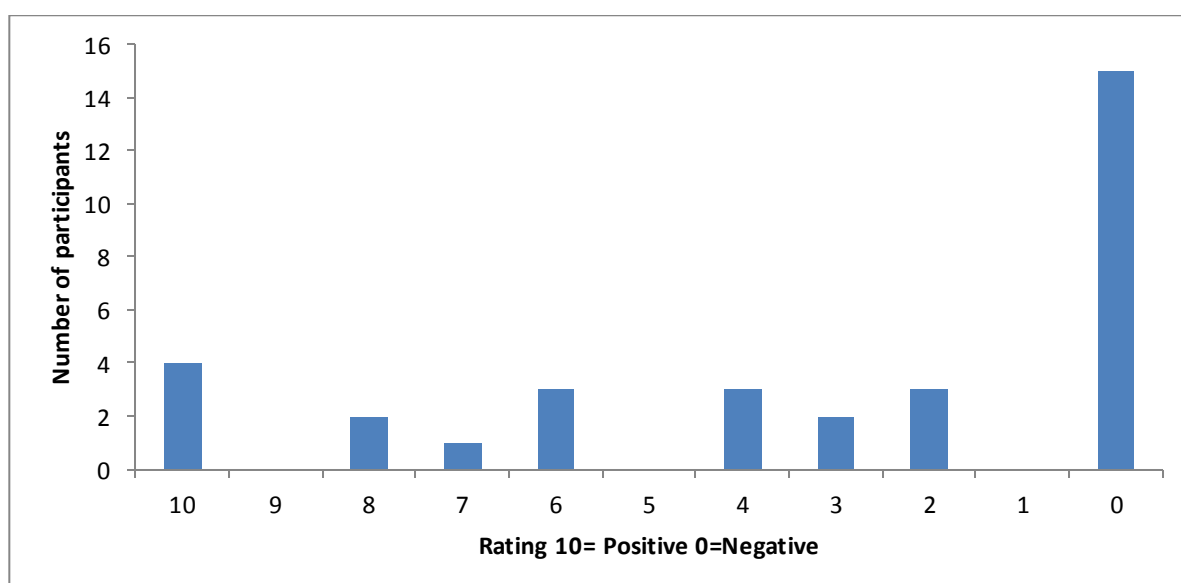


Figure 6.6: perceptions of development. On the “x” axis “10” represents an entirely positive perception while “0” represents no positive perception of the development²⁶

The negative response towards the development was linked to a number of issues, ranging from personal impacts to international conservation concerns, showing the multi-scale dimension of stakeholder responses.

As the GBR is listed for its natural heritage value [Table 1.2] it is useful to question how high-users value the natural environment. Accordingly, the respondent's knowledge of the OUV which they felt were present in Gladstone Harbour was graphed [Figure 6.7]. All respondents who saw values listed multiple attributes. One respondent mentioned no OUV

²⁶ Other than those associated with profits for the GPC and Queensland government.

in the region. The average OUV listed per participant was 6. The highest average between stakeholders was the fishers at 7, while industry stakeholders had an average of 3.3.

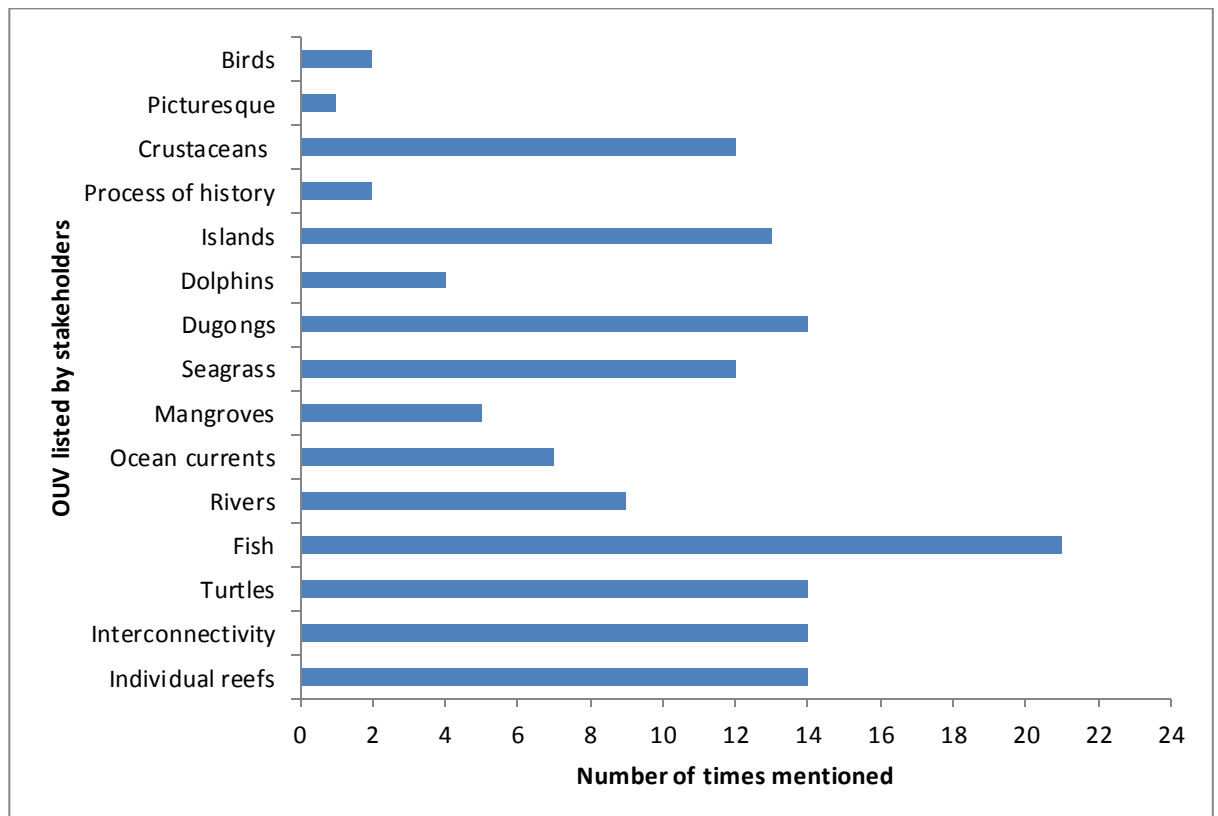


Figure 6.7: The OUV listed in interviews. The natural attribute description (Y axis) is adopted from the OUV criteria for the GBR [Appendix A].

As an example of the responses, one participant observed:

“Oh yeah, there’s a wonderful dugong habitat there. This is a magnificent harbour, in a number of ways, picturesque, it’s just got a whole range of attributes that are valuable not just to this community, but to the world as a whole, and it’s just off the reef. And reefs within the harbour, which doesn’t seem to get any consideration, significant reefs. There are some magnificent things in this harbour.” ([anon] 2012, pers.comm)

Participants with a good understanding of the natural attributes of the area [Figure 6.7] recognised the strong industrial history of Gladstone. Ten participants mentioned the industrial history in some form. The historical roots of development in the region were well-articulated by this respondent:

“But of the previous developments, a lot preceded the declaration of World Heritage Area, but one industry which came in after is the shale oil plant and that’s a mess and is shut because of environmental reasons to do with pollution and other reasons. That wouldn’t have been looked at properly under the WH stuff because it would be at the same time as listing. There hasn’t been much since listing, most are on land and regulated under the Queensland Environmental Protection Act, not matters for World Heritage people to look at, but these new developments are affecting the World Heritage Area because they are on Curtis Island and the huge dredging is also inside the World Heritage Area” (J.Brodie 2012, pers.comm)

While the natural heritage attributes of the GBRWHA were evident to many respondents, the concept of local conservation was less so. Most respondents who mentioned local conservation felt the conservation ethos of the region was minimal. Efforts were largely associated as being grassroots local organisations [Figure 6.8]. A strong conservation ethic emerged within the fishing community. All interviewees from this group expressed concern for the ongoing management of the marine area. The conservation groups had commitment to environmental protection, with the GCC forming as a direct result of the current developments.

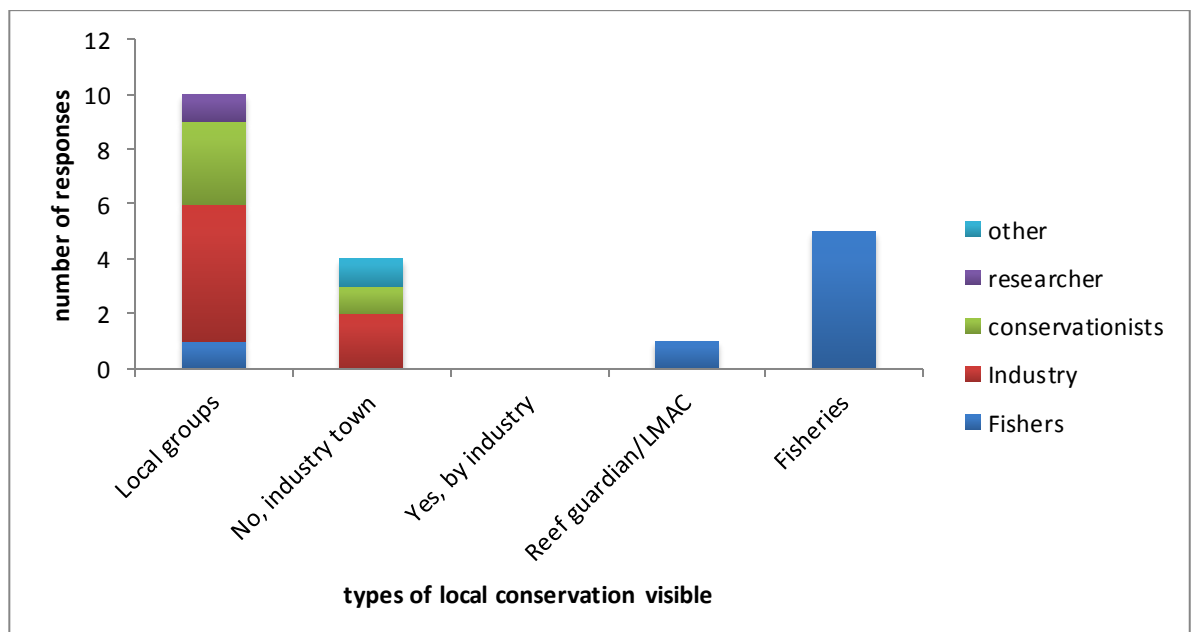


Figure 6.8: Stakeholder perceptions of local conservation

The conservation ethos and commitment to sustainably manage the natural resources resonated with many fishers. The following quotes exemplify of this sentiment, and opposition:

“Over the years we’ve looked after the area, to come to an area you can still be so close to town and catch as much product as you want, we used to look after it, and they just come along and do this. We’ve looked after it all these years and I just thought we may as well have just taken every bloody thing we could have done, because this is what they’re doing, they’ve really just destroyed it all” (N.Samules 2012, pers.comm).

“I agree with a lot of the critique, but I come at it from a different area, I come from it that the fish have a right to exist, and they come it as we have a right to fish, so they need the fish to harvest them, and I simply give the fish a right to exist. So we have different objectives of what it’s about. You look at the scale of the claim from the fisheries guys which is 20million dollars which is less than all of the offsets which is being offered by the dredging program, so they are really putting a high price on the damage which is being done on their fishing business” (J.Aarens 2012, pers.comm).

“Most people think fisherman aren’t conservationists but we don’t destroy because we want to be there every year, working. You don’t destroy what you’re making your living off. I’ve been working here for 20 years, and if you work if properly, you’ve got a living every year, you don’t destroy it” (A.Holland 2012, pers.comm).

“I think now the perception of commercial fishing is getting better, hence why I joined GBRMPA with the reef guardian program, that was one of the spin off benefits from actually protecting and looking after the resource, was a better perception for the public of the fisherman and what they’re about... Out at the Swain’s reef, it’s the most beautiful place I’ve ever seen, and the different light brings out different coral, and these are the memories ill always cherish.... I’ve got a duty of care, because I’m working in the marine environment and we’re doing everything we can possible to leave it as it should be left, when we move. And for when I finish fishing to leave it as it should be let for future generations. I said the reason I’m a reef guardian is because I’ve got duty of care, because I care about the reef, I genuinely care...Mate, if us fisherman worked together, and we take those guys to court, if we don’t get any money but to stop them dumping that crap, I’m sure here, we’ve won. Not because of money, but because we stopped them dumping all that crap they stirred out there. That’s the major concern” (G.Andrews 2012, pers.comm).

Respondents showed a high level of understanding of Gladstone as part of the GBR in terms of ecological connectivity [Figure 6.9]. Of the respondents who discussed Gladstone’s inclusion in the GBR, 11 mentioned connectivity in the GBR as *including* Gladstone. However, 6 participants believed Gladstone was not part of the GBR. During interviews

perceptions of ecological connectivity were not explicitly sought, thus many respondents did not express a perspective on this.

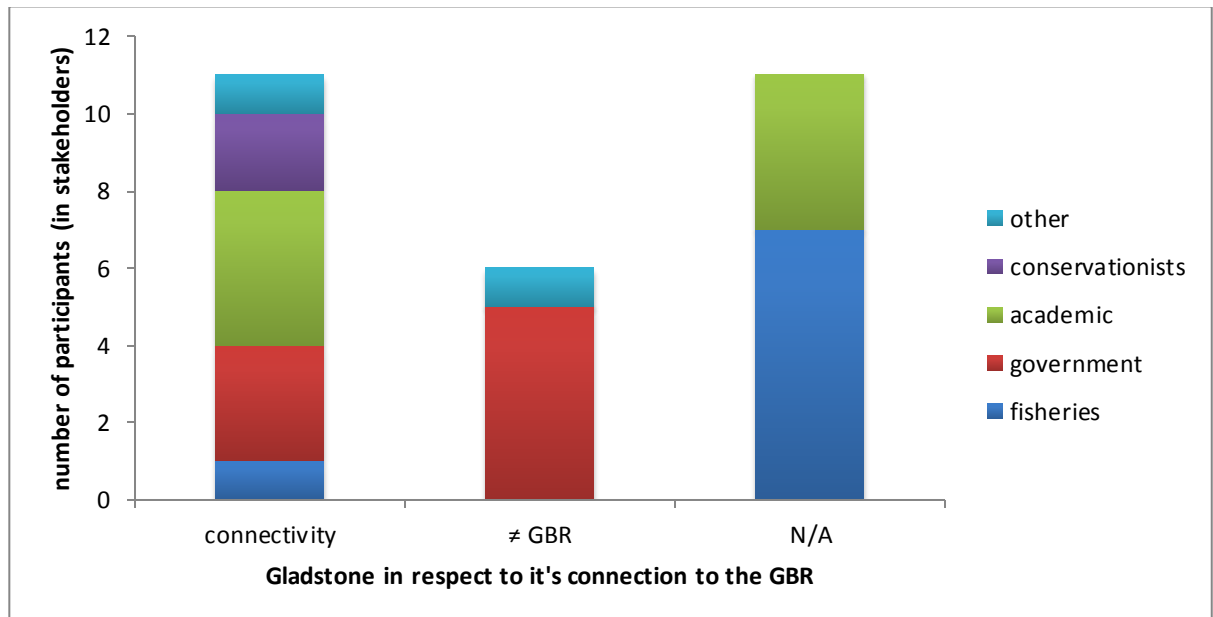


Figure 6.9: Stakeholders perceptions of Gladstone's connectivity or separation from the GBR.

The two respondents below, a fisher and an academic, explain their understandings of connectivity and its importance in environmental protection:

“No matter what you say it all works together, the system breeding inshore and moving off shore and all that. Gladstone is an industry town and they've worked together and everything's been ok, there have been events that have been a bit shaky, but overall we've co-existed with industry. Now with this development and the port, for them to say it's not impacting, is terrible. Mate, if us fisherman worked together, and we take those guys to court, if we don't get any money but to stop them dumping that crap, I'm sure here, we've won” (G.Andrews 2012, pers.comm)

“So the thing with fisheries is they are very interconnected, so Gladstone is like one of the fingers on a hand in the aquatic ecosystem. The fish which come out of Gladstone swim up and down the coast. there have been tagged fish from the Awoonga Dam that have been caught as far north as Townsville and as far south as Burnett Heads, so by damaging Gladstone's productivity we are depleting nearly 1000km of coastline from fish coming from one very unique and important nursery area. So what you need to understand is that you cannot just eradicate one critical estuary and cut it off for the sake of mining industry interests and hope that the rest of the coast will be fine- because that's just not how coastal ecosystems work. You need all your estuaries to be functioning; you need all of you

waterways to be healthy. If we are to have an active mining industry we need to incorporate that mining industry in such a way that it will not degrade these estuaries and does not cause substantial harm to the productivity of our waterways .Our inshore areas health plays a critical role in the health of the reef. We are already seeing impacts from Gladstone activities on the inner reef. The areas adjacent to facing island now have large areas of sick and dying coral. The Seagrass in the harbour has not recovered like areas post January 2011 floods, and it appears this is due to dredging impacts of resuspending sediments. With the loss of seagrass, the loss of estuarine productivity automatically follows. Not only have critical nursery areas for prawn, crabs and fish been lost, but key habitat and grazing resources for turtles and dugongs have been severely impacted. Not only have massive quantities of metals been resuspended, but the conditions which have followed the harbour development works have led to toxic algal blooms in the harbour affecting the people and possibly also the turtles and other aquatic species. The project has placed massive stress through the ecosystem, as evidenced by increased parasitic infection intensities compared to a reference site” (M.Landos 2012. pers.comm)

When asked to identify the issues surrounding the GPD a number of key issues were identified. From responses, the state of the marine health [8] and social issues [7] were regarded as problematic [Figure 6.9]. Combined with concerns about marine health, dredging and water quality [20], these were the central issues of concern from the interviewees.

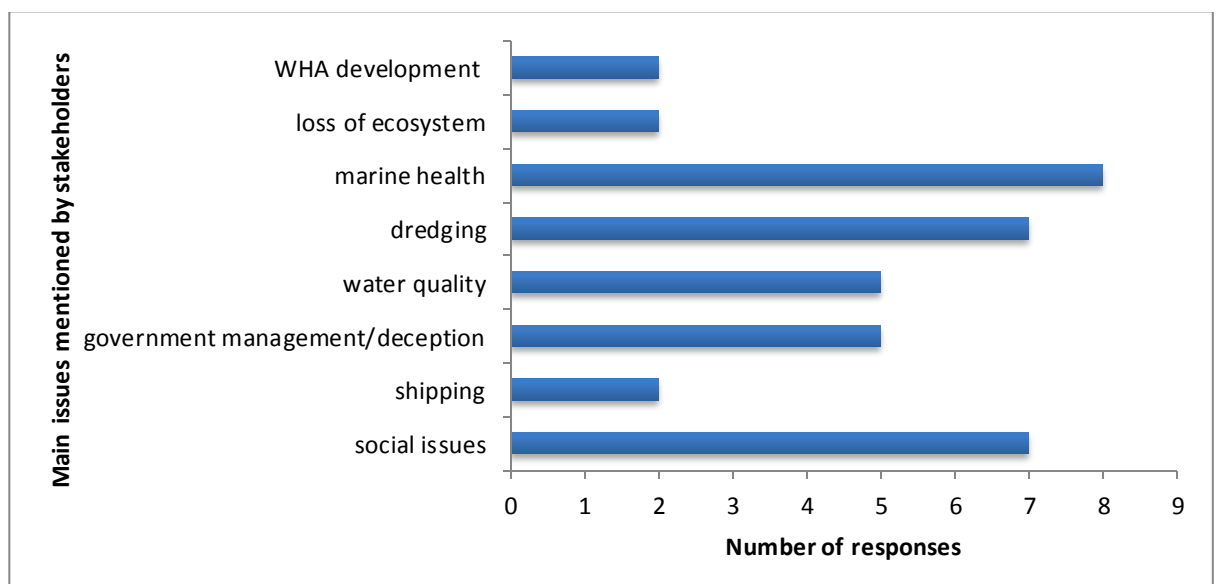


Figure 6.10: Main issues participants flagged as the biggest or main issue. Some respondents did not have a particular issue, others had multiple.

The health of the marine ecosystem in Gladstone and the GBR was a major concern for high-use stakeholders and remains a significant source of contention²⁷. Respondents feedback on the marine health issues is shown in Figure 6.11. Fourteen respondents linked the declining marine health to dredging, while others attributed the decline in aquatic health to flooding and dredging. Figure 6.11 also shows respondents who felt they could not answer the question based on a lack of scientific evidence, saying there is no way to attribute the health issues to a cause without baseline information. One participant, who firmly believes that dredging is causing the illness and disease said:

“The first impact was on live fish- the coral trout market. What happens is the live fish are kept in tanks on the boat and pumped through, that and the deaths of the marine mammals that we had things that weren’t quite right. Since then that’s escalated. The saga last year of all the barra getting sick in July/ August after the dredging began. And it was actually the industry that asked the minster to decide if the fish was fit for consumption or not. If you going onto the Gladstone Fishing Research Fund you’ll see all the photos of the diseased fish [a website established for the legal case of the fisherman in Gladstone]. Even up to a month ago you still get diseased fish” (T.Wittingham 2012, pers.comm)

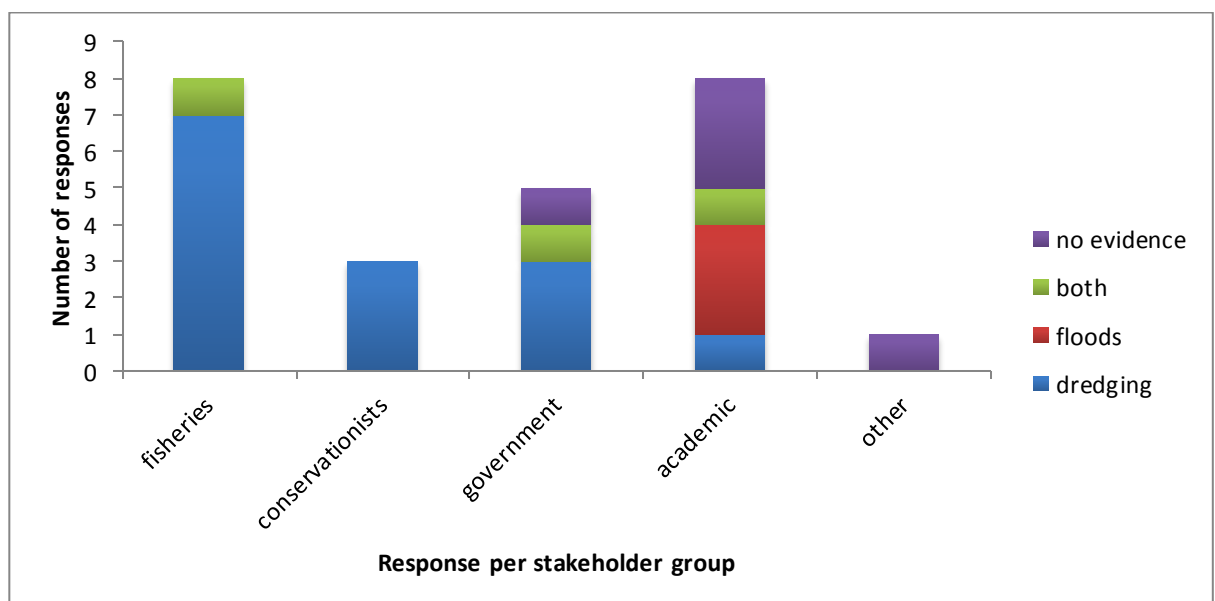


Figure 6.11: What’s to blame for decline in marine health?

When asked to articulate the impact of dredging on the environment, respondents provided a variety of responses. Fish health was the primary concern related to dredging, with benthic

²⁷ See the media and legal case surrounding the GPD, VIA Shine Lawyers (shine lawyers 2011).

species also highly important [Figure 6.12]. This is likely to be because benthic species includes crabs and prawns, both commercial catches in the Gladstone region. The other issues stakeholders listed referred to adverse impacts on the natural environment of the region.

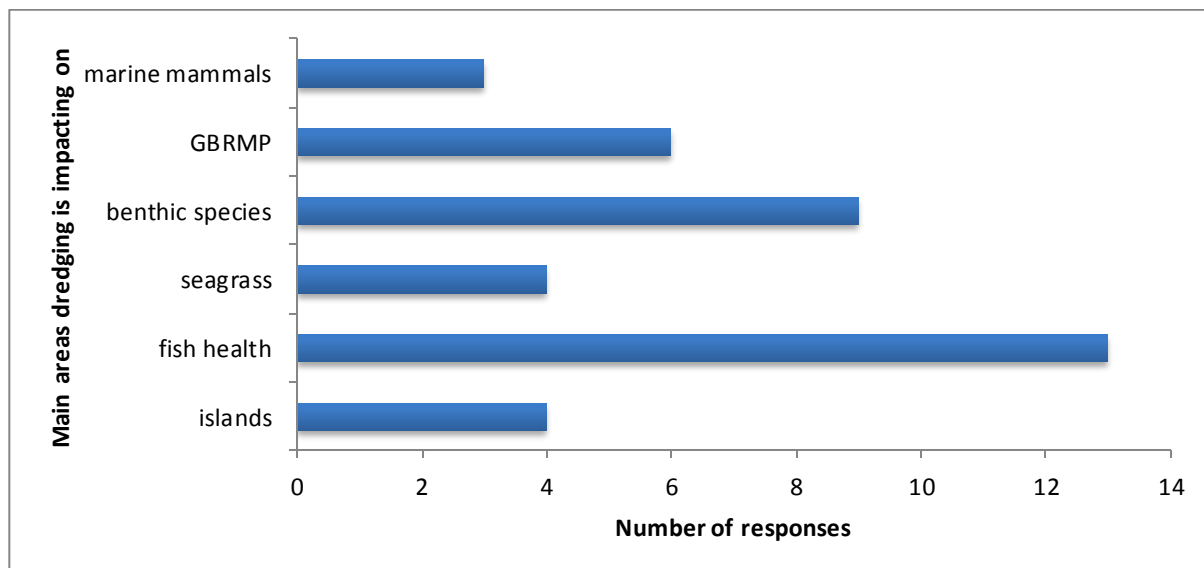


Figure 6.12: The main concerns participants felt dredging had caused

6.3 Boundaries

In order to better understand localised responses to the WH environmental management regime, it was necessary to establish how high-users of Gladstone Harbour perceived the spatial extent of the regulatory framework. Interviewees were asked to identify the boundary of the WHA. The overall perception of the jurisdictional boundaries from the participants shows that many people were unaware of the WH area boundary, although knew there was heritage listing/protection in some capacity. Six respondents said that the Gladstone coastal and marine area is not part of the GBR. While the majority of respondents understood the area is protected. Specifics of WHL were not well understood, especially with fishers.

“I think the boundaries are political lines on maps. I see what I call a lot of inter-jurisdictional dysfunction I would like to see more cooperation between departments; we’ve had for instance the Department of Fisheries giving permits to disturb mangroves, which is another term for getting rid of and destroying them. While the DERM have not issued a permit. So the GPC already have a permit to cause damage, but the permits haven’t gone through other departments, so that’s inter-jurisdictional dysfunction. I

think that if the World Heritage Park and the marine park and anything that we do to the environment should have the same set of rules and not driven to its artificial, determination, but we do it because its right for the environment, because its right to do. And we should force the people to work together” (J.Aarnes 2012, pers.comm).

Figure 6.13a represents the stakeholder’s visual perceptions of the WHA and GBRMP. The representation shows that conservationists have the most comprehensive understanding of the WHA and GBRMP. Of the respondents who mapped the boundaries, 5 fishers, 4 conservationists and one member from industry provided responses. Figure 6.13b shows the boundaries actual location to visually show discrepancies between the perceptions and realities.

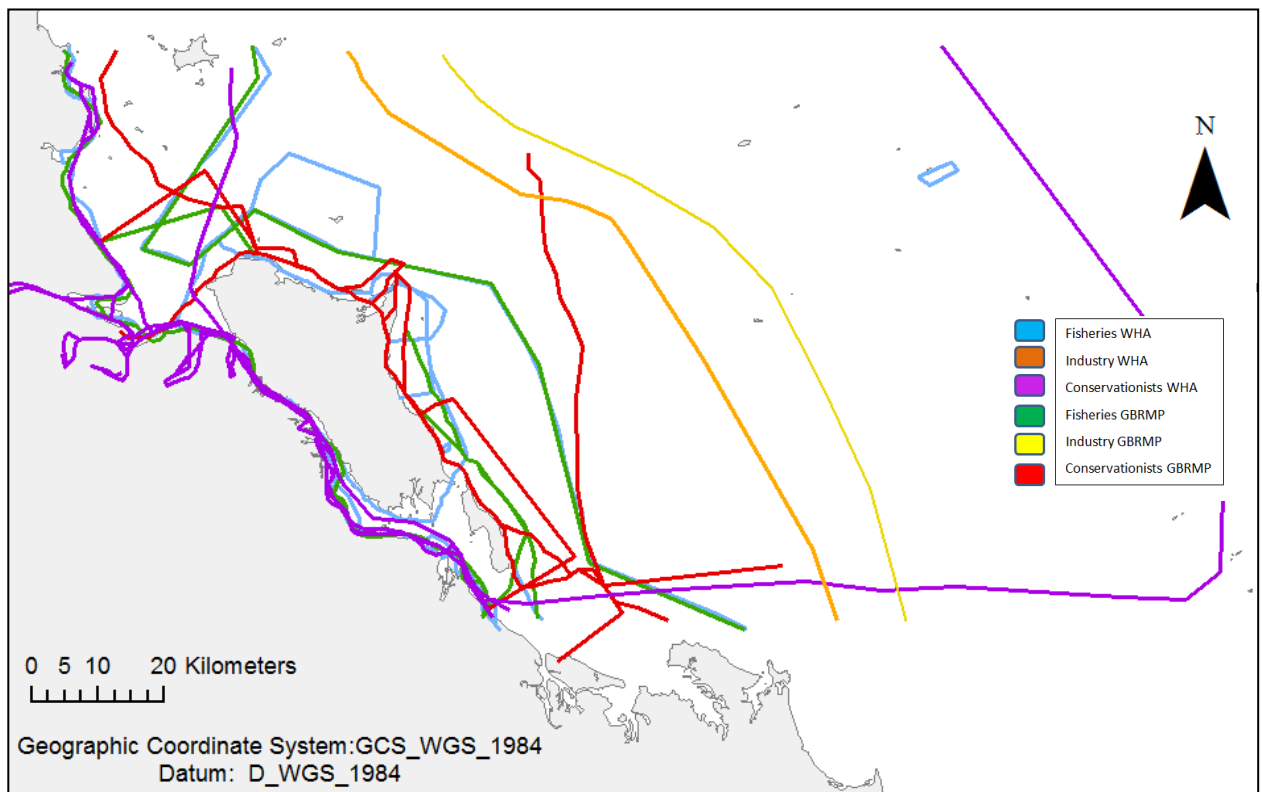
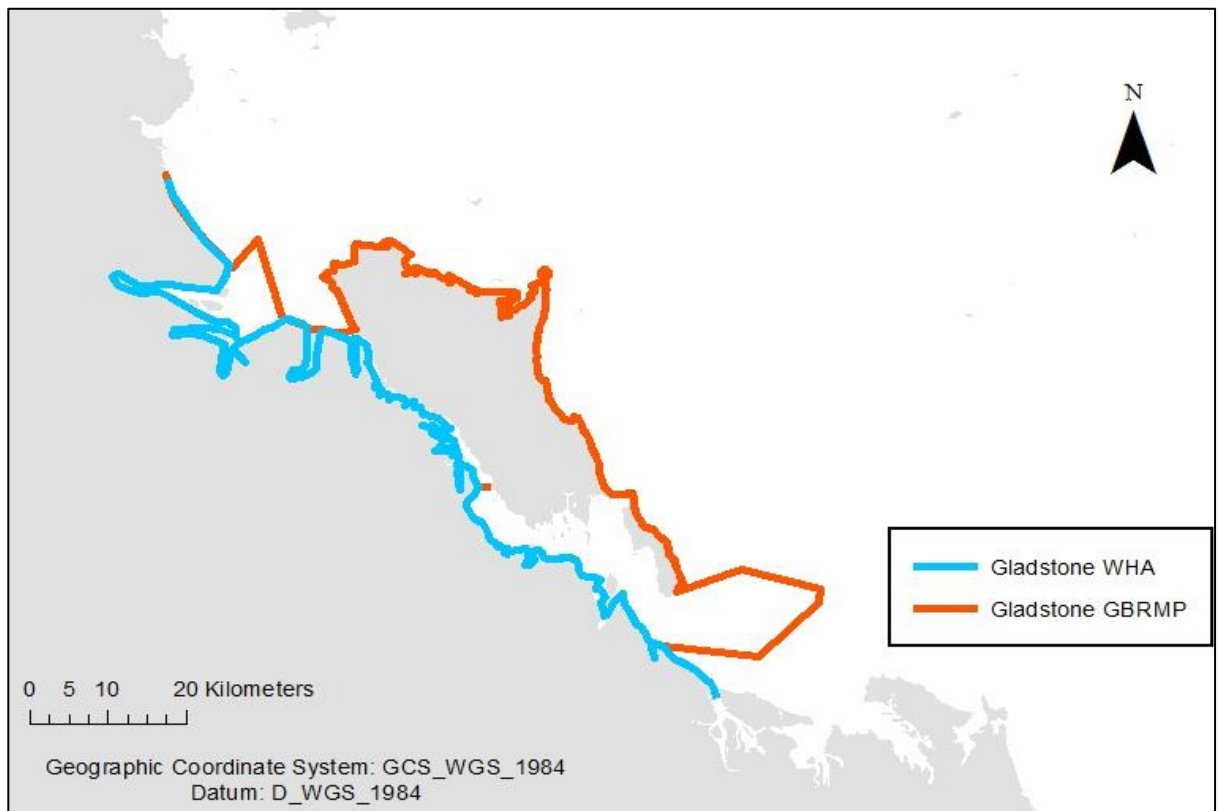


Figure 6.13a: Stakeholders ideas of where the GBRMP and WHA are, divided into stakeholder groups.



6.13b: The Gladstone boundaries of the GBRMP and WHA.

As previously discussed, the Queensland government and GPC both proposed that the development should not be condemned because of the WHL (Chapter 2). Instead, they recommend that Gladstone be excised from the WHA (Seeny 2012 *in* Wordsworth 2012). Accordingly, interviewees were asked if they felt Gladstone should be removed from the GBRWHA. The majority of participants (65.4%) felt that Gladstone should remain as part of the GBRWHA, with many fearing de-listing would lead to further, unprecedented development. Two respondents felt it should be removed, because it does not hold OUV and is ‘too far gone’. One of the 2 respondents who thought it should be excised did not mention any OUV [Figure 6.14].

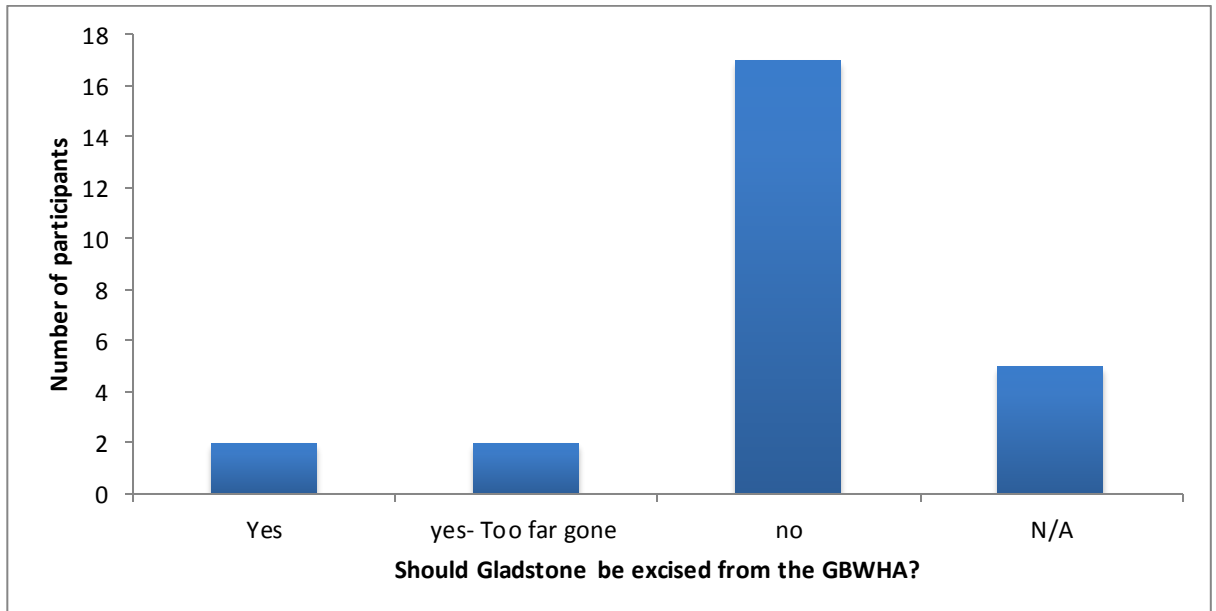


Figure 6.14: Should Gladstone be excised from the WHA?

The following responses given by individuals who were interviewed shows the complexity and perceptions of de-listing:

“I think the WHA is a good idea. Most people think fishermen aren’t conservationists but we don’t destroy because we want to be there every year, working, you don’t destroy what you’re making your living off. I’ve been working here for 20 years, and if you work if properly, you’ve got a living every year, you don’t destroy it” (A.Holland 2012, pers.comm).

“Leo’s idea is it’s about perception. Which I believe, Gladstone Harbour, clearly it’s not part of the GBR, its part of the GBRWHA, but because it defined as being in the GBRWHA there’s this perception around Australia they’re dredging in the GBR. Because if you’re from Perth or wherever, and have no familiarity with Gladstone at all and you see on the news that dredging is going on in the WHA of the GBR, it sounds as though dredging is going on in the GBR” (D.Sparkes 2012, pers.comm)

“It does yes, all the normal things in Gladstone Harbour. It is a bit degraded but it has the same value of the WHA, there’s seagrass, dugongs, turtles, fish, there is even coral reefs. And if they were all of OUV to the GBR that led to the listing then it should include Gladstone Harbour. So why is it particularly any different to Townsville rather? Or other places, except it has been subject to more intense development in the past, and that’s the way the WHA is. Some parts are more developed than others and some parts are hardly developed at all. That’s how it always was and that’s how it still is” (J.Brodie 2012, pers.comm).

“Be realistic when talking about the GBRMPA, Gladstone is at the tail end of it, the harbour, well we know it’s part of it...look, I think if there were moves to take Heron Island out of it you’d have Gladstone jump up and down saying hey, what are you doing. Of course that’s part of the reef. I don’t know if Gladstone itself would be concerned if it stayed where it is or it shifted slightly”. (F.DeWard 2012, pers.comm)

“I don’t think [WHL] had a huge impact because of the feel of the industry town, but it certainly is better than not being World Heritage listed, because that certainly had its positives of looking after marine life and doing studies and spending some money and making sure everything is ok, and if it’s not finding our exactly why it’s not ok” (G. Andrews 2012, pers.comm).

These responses suggest that the consequences of de-listing an area are well understood, and there are a variety of issues that come into play with the WH designation. Further, the boundaries are seen as political.

When the area was declared a WHA there was an expectation (by the WHC) that the GBRMP would cover the entire WHA. The discrepancies in boundaries between the Marine Park and the WHA remain to this day [Figure 3.9, Chapter 3]. Interviewees were asked if the GBRMP should be re-zoned to include Gladstone. The majority of respondents [62.5%] felt the region should remain as it is, while the remaining respondents [37.5%] advocated including the harbour in the Commonwealth managed MPA [Figure 6.15]. One interviewee said:

“But I do think it would be better if the boundaries of the GBRMP and the WH boundaries were the same and the GBRMPA had much more control over what was happening, because I think the staff of the GBRMPA know what they’re doing, and I think the people in Brisbane and Canberra have a very limited understanding of these matters. Plus there’s constant change while the GBRMPA staff are a lot more stable, and in my experience have a lot more expertise” (P3 2012, pers.comm)

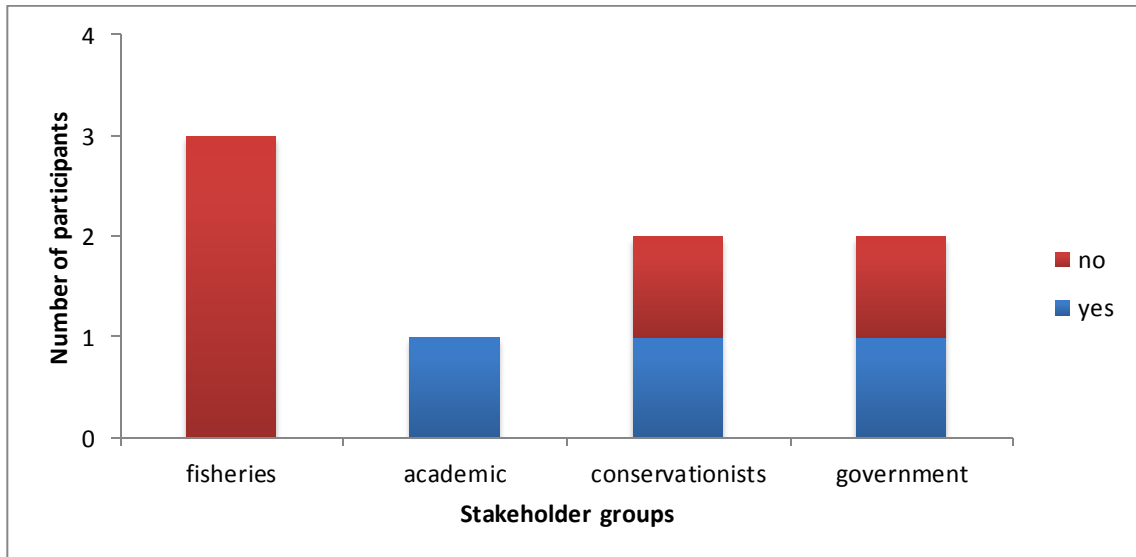


Figure 6.15: Respondent's views on re-zoning the GBRMP

6.4 Who manages the space?

To further aid understanding of the roles and responsibilities of each level of management, respondent's perceptions of the different levels of government and administration were explored. The scaling of management is an important issue within the GPD [chapters 1 and 3]. There are multiple levels of governance for the region, and the perception of decision making and community consultation is at the forefront of MPA management. This means that stakeholder perceptions of management are vital to the effectiveness of protection.

6.4.1 The role of local government

While the local council role was not formally addressed in interviews, four local councillors participated in interviews. Each stated their role was similar to anyone else - they are able to have a submission for the EIS process, but that they lacked jurisdictional legal power, as the land for the GPD is all state development land [Figure 6.16].

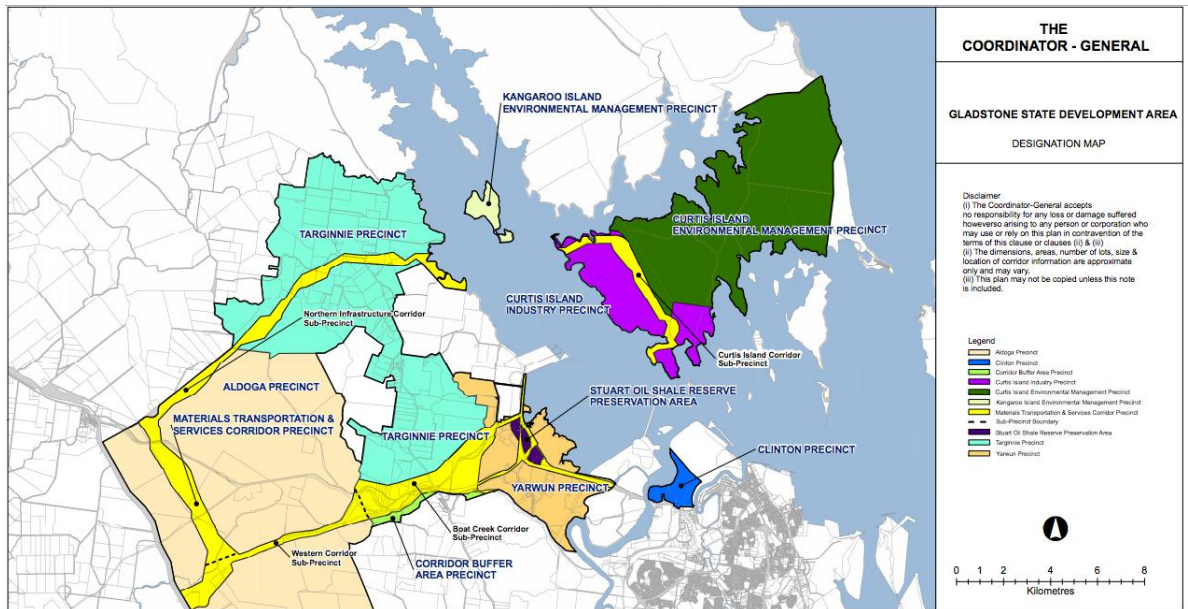


Figure 6.16: Gladstone state development area designation map. (GPCL 2011).

“It’s a question [WH re-zoning] that has never been put to the Gladstone regional council as representatives of this council region. It came out of the blue from GPC we knew nothing about it. And to me the first people you would consult on something like that would be the elected representatives of the community or the community themselves, and neither was done. So how can you be in favour of it if you haven’t been consulted to the reasons why; why you’d want to change it? I know if Gladstone Regional Council wanted to change its boundaries we would have to go talk to the locals” (M.Brushe 2012, pers.comm).

6.4.2 State management

The roles and impressions of the state government from interviews are shown in Figure 6.17. Participants raised concern with the bureaucratic processes associated with the GPD. The main area of concern was a perception of lenient assessments leading to developmental approval, which is strongly linked to second key area of concern, that the criteria for development approval is largely based on economic profit.

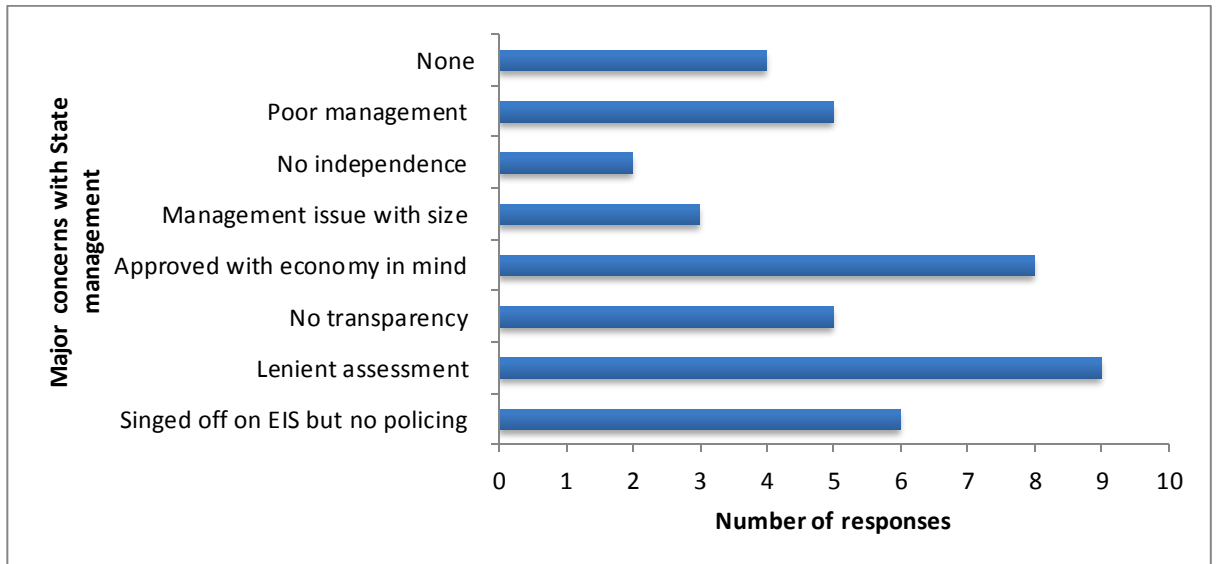


Figure 6.17: The issues respondents mentioned with the development attributed to the Queensland state government.

One fisher interviewed expressed the dissatisfaction with the management of the current development succinctly:

“I don't agree with them doing what they want, just dumping all that stuff out the front over there, if you speak to anyone who lives out there, all the rocks and stuff is all covered over and all the water is muddy and things like that. I don't know how they've done it. Over the years we've looked after the area, to come to an area you can still be so close to town and catch as much product as you want, we used to look after it, any they just come along and do this. We've looked after it all these years and I just thought we may as well have just taken every bloody thing we could have done, because this is what they're doing, they've really just destroyed it all” (N.Samules 2012, pers.comm)

As outlined in chapter 2, the GPC is a government owned corporation (GOC). Respondents were not asked outright if they were aware of this, although the issue of management of GPC was raised in some interviews. When responses were collated it shows that knowledge of the link between the GPC and State government is known in some circles, and not as widely known in others. Figure 6.18 shows that the local stakeholder groups. Conservationists and fishers had approximately 50% express this knowledge. While there were a considerable number of non-responses to this it does not mean these participants did not know the GPC is state owned. Figure 6.18 only shows those who made a comment on this fact.

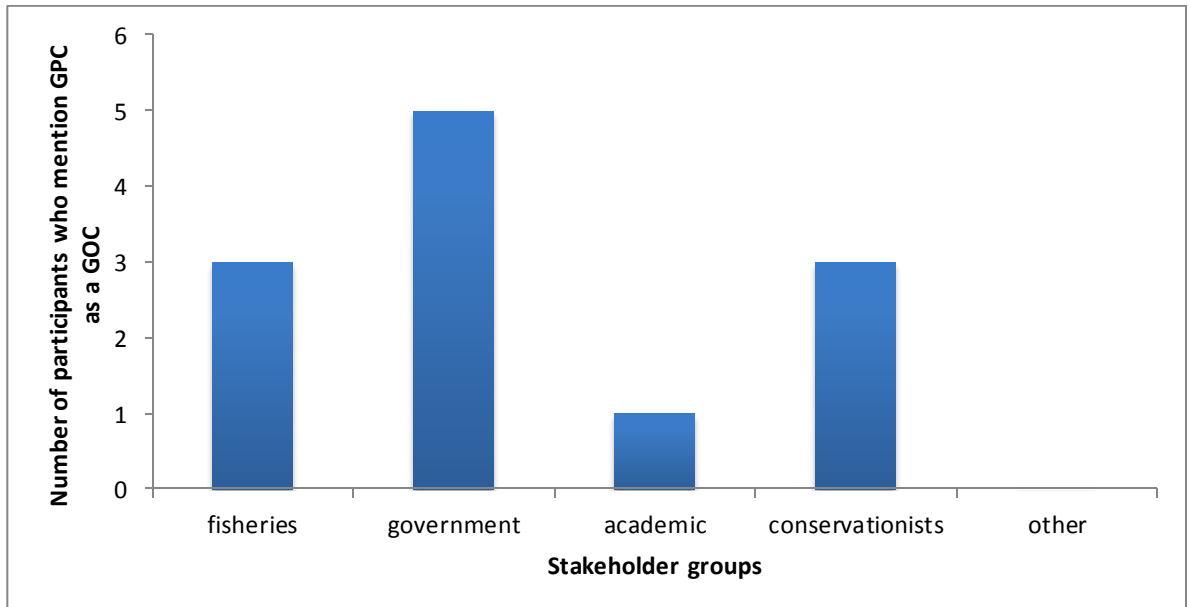


Figure 6.18: stakeholder groups understanding of GPC ownership by the State government.

6.4.3 Federal management

Interviewees were asked for their perception on the role of the GBRMP Authority in the Gladstone region - an area technically out of the Authorities jurisdiction. The majority of participants felt that the response to the impacts was inadequate, and no presence was felt by many [58%]. 54.5% of participants said the institutionalisation of the GBRMPA was the reason they have not been vocal. Others felt the Authority's role within the development was evident through the EIS submission process [10.5%]. Others saw the role through the Local Marine Advisory Council²⁸ (LMAC) [10.5%].

²⁸ LMAC is the community based committee that advises the GBRMPA on local-level issues on a voluntary basis. The committee was established in 1999, to ensure community consultation on a range of issues in the management, social and economically sustainable use, and the conservation of the GBRWHA. The committee is designed as an advisory committee for the public and the GBRMPA, promoting communication between the groups. There are currently 12 LMAC's in the GBR region (GBRMPA 2011c).

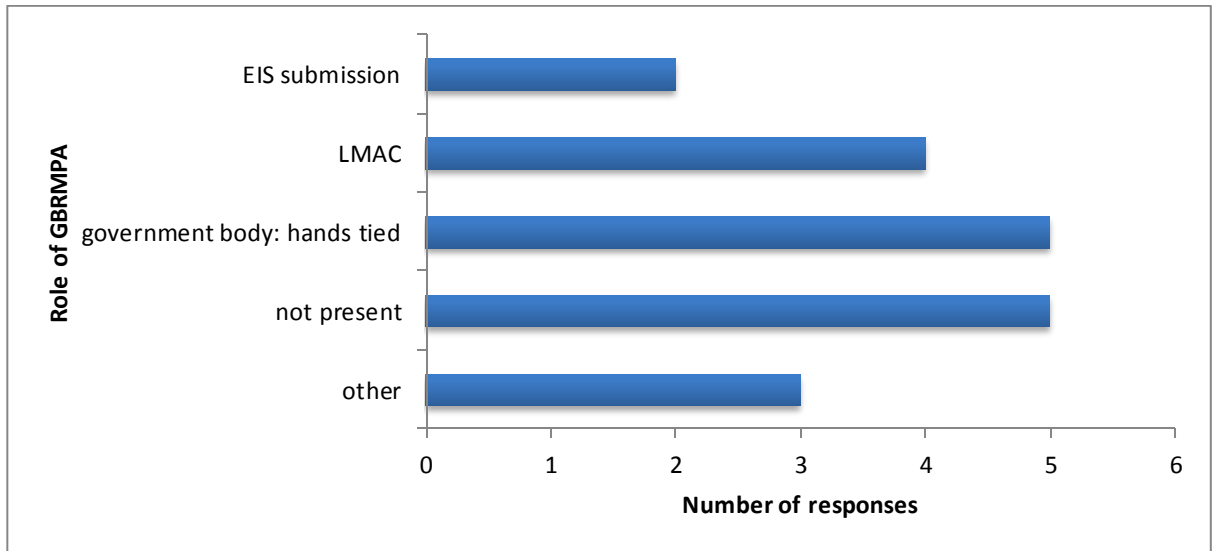


Figure 6.19: Participants perceived presence and involvement of the GBRMPA in Gladstone Harbour.

There were two respondents who talked of the role of the GBRMPA, one outlined discussion between GPC and the Authority, while the other spoke of a cover-up:

“Last year we got blamed for all the turtle deaths in the water. I had MP every day with me, when I did my nets, to monitor me to make sure I wasn't killing the turtles. I would go past 10 dead turtles a day. The way they got rid of them was they had spray paint, they put a big ‘X’ across there back and hid the turtles in the bushes, the reason they painted them was so they didn't get counted. And there was one week where I counted 30+ turtles, and I've got photos of them all, which they just went and buried. And you can't tell me that's not a cover up” (T.Felzon 2012, pers.comm).

In the context of the WHC Mission Report (Douve and Badman 2012) which assessed the threat of development on the OUV of the GBR, respondents were asked if they believed the Federal government was taking the WH in-danger threat seriously. All respondents except one believed the treat was being taken seriously, saying:

“UNESCO said in their report that the GBR would be placed on the WH in-danger list, unless it was turned around rapidly, but the other countries on that list are Afghanistan and Yemen, and the Congo, so it's really not a good list to be on. Unfortunately the government have said ‘yeah don't worry about it, we have already taken care of it, were already responding and its fine. However the devil is really in the detail. So as you probably already know, the federal government have proposed a strategic assessment of the reef, to really capture and look at all this development that's happening up and down the reef. Most of the major development

that has already been applied for won't be captured under that strategic assessment, so they will go ahead under the normal regime of approvals so this is basically, they've given the green light for the process for most of the major developments, there actually isn't going to be much left for the strategic assessment to include" (E.Mckay 2012, pers comm).

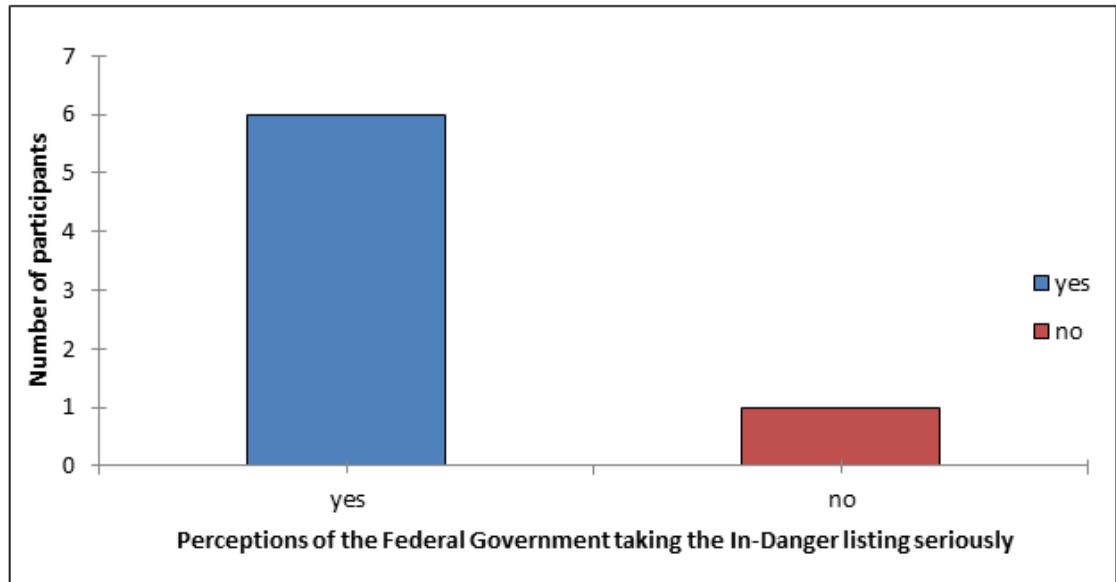


Figure 6.20: Is the UNESCO in-danger listing being taken seriously?

Federal management of the region raised similar concerns to those emerging from State management practices. The commonwealth government's role was seen to relate to, *inter alia*, issues of monitoring failures and obligations arising under the *EPBC Act 1999* (Cth). While there are cross-over areas of concern, there was a far smaller response pool than for the state, implying the Queensland government is seen as more responsible.

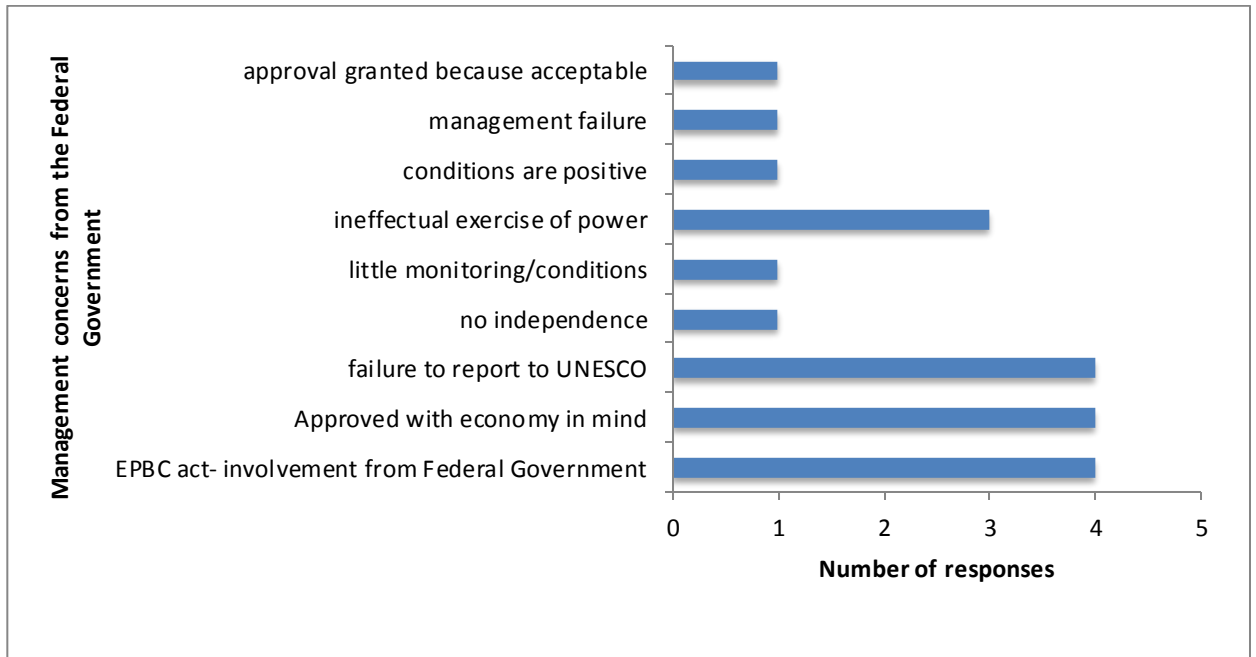


Figure 6.21: Perceptions of the Commonwealth government's role and the associated issues with the GPD.

6.4.4 UNESCO management

Respondents felt there was no real sense of UNESCO presence until the reactive monitoring mission. The involvement was seen as positive, although for one participant, 12 months too late. There was a general sense [Figure 6.12], that there is a need for the WHL as it is a protective measure. The general sentiment towards WH and UNESCO were positive, with the majority of respondents saying it would be best to keep the harbour WHL. Fourteen respondents believed the area is currently not being managed in accordance to the sentiment of the *Convention*. Three interviewees did not specify an opinion about the management of Gladstone Harbour, but felt that the GBRWHA as a whole is being managed well. Other participants expressed the lack of compliance to the *OG*, as the Federal government did not report the development to UNESCO (C. Hunt 2012, pers.comm, J. Aarens 2012, pers.comm). Others mentioned the area was managed in accordance to WHV prior to 2007, when major dredging began (Anon 2012, pers.comm).

“If it was listed for WH, when it was, there much have been a reason for it to be in WH for them to list it. There much have be specific seabed grass, there must have been somebody in the earlier days who must has said Gladstone was unique and should be incorporated into the WHL. But now, because it doesn't suite us and we've got \$60 billion dollars, we want to

cut it, and we can, we can do anything we want, were the ports corp... oh, the harbour was beautiful, before all this shit happened. The water was always beautiful blue colour, now its shit.” (T.Felzon 2012, pers.comm)

“We’re very much aware that what’s happening within Gladstone isn’t within the WH guidelines. But were also practical enough to realise it’s got to happen somewhere and this is where it’s likely to happen” (C.Chapman 2012, pers.comm)

“I think that there was a big rush to have this happen, Deals have been done for the sale of LNG that meant that they had to get that product out by the end of 2014. We have a State government that was desperate for funds they were rapidly going broke so I believe that the approvals process was probably not the thorough investigation it should have been” (M.Brushe 2012, pers.comm).

The high-user perceptions above show there is an implicit understanding that the WHC is not in charge of management, rather it is a designation designed to enhance protection which takes place on a federal and state level.

6.5 Conclusion

The results presented in this chapter provide a perspective of the high-users of Gladstone. Given the opportunity to voice their opinions these stakeholders demonstrated the multi-level linkages of the impacts of the GPD - socially, environmentally and politically. Better understanding the stakeholders’ views of the environmental qualities of Gladstone, and their views on the impacts of the development provided an improved basis for the managerial assessment of the GBR. The issues of highest concern are environmentally based. Concerns about environmental degradation clearly feature in interviewee responses. The high-users interviewed for this study showed an implicit understanding of that it means for the site to be WHL, from the OUV to management, internationally to locally. The overall sentiment of the results show that management of the natural environment has fallen short of what is expected by high-users of the region, and the environment has been degraded.

Chapter 7:

Great Barrier Reef at a Crossroads

“The Great Barrier Reef World Heritage Area is at a crossroads and decisions that will be taken in the immediate future will be decisive for the long-term health of the property as a whole...developments and operations in Gladstone Harbour and on Curtis Island impact on the OUV of the property” (Douvere and Badman 2012, 4-5).

The GBR is recognised as one of the most pristine coral environments (Brodie *et al.* 2001; Pandolfi *et al.* 2003), and management of the area has been heralded globally as ‘best practice’ (Day *et al.* 2002; Day 2008; Ruckelshause *et al.* 2008). While the accolade is undisputed for many zones, there is a gap in the efficacy of management for regions that are not under the jurisdiction of GBRMPA such as the GPD [Figure 1.2]. The extreme concern about the adverse impact of rapid and large-scale coastal development on the environment noted in the UNESCO Mission Report (Douvere and Badman 2012) involves the same concerns that were instrumental in creating the GBRMP in 1975 - the global demand for fuel and Australia’s resource rich commodities. This takes on especial significance in a time when Australia is rapidly developing coal export facilities (Peterson and Cullen 2012).

This chapter discusses high-user group’s perceptions about the GPD and why the ‘best practice’ management of the GBRMP title is at risk. Flowing from the results outlined in Chapter 6 this chapter frames the data from into discussions linking the policy and literature about WH and marine park management into key themes. Section 7.1 outlines the stakeholder positions on the development and examines the interaction between the key groups. Section 7.2 explores the OUV in the region and the stakeholder understandings of the natural attributes and the perceived threats to them in light of the development. Section 7.3 looks at the important issue of management of boundaries and zoning of the GBRWHA and the (potential) threat of the site being added to the WH *in-danger* list. Section 7.4 assesses the environmental implications of the GPD, and how these interact with the legal scope of the development. Section 7.5 outlines the managerial and jurisdictional overlap in

Gladstone, with the interactions between international, federal, state and stakeholders in terms of management and power.

7.1 Gladstone livelihoods risking the reef or reef at risk?

7.1.1 Attitudes towards the development

The GPD is the first port to be developed in the current context of increasing demand for extractive industry expansion in Queensland, with others ear-marked for expansion [Appendix C]. The GPD involves the largest dredging project ever undertaken in the GBRWHA (ABC 4corners2011). The development has not only received international criticism from UNESCO (Douvere and Badman 2012), but the vast majority of surveyed stakeholders in the region are opposed to the development [Figure 6.6]. This was especially noted through the fishers, who expressed concerned for the loss of livelihood and the degradation of the marine environment [Figures 6.10-12; N.Samules 2012, pers.comm and A.Holland 2012, pers.comm chapter 6.2]. The concern was for the entire GBR ecosystem. Both recreational and commercial fishers rely on a healthy ecosystem, determined by functionality of the entire region (Day 2002). Both user groups expressed the need for conservation for future generations. The fishing community conveyed a sentiment of sustainable fishing to ensure protection into perpetuity.

7.1.2 Fisheries as conservationists?

Marine conservation literature generally highlights the fishing industry as exploitive (Dayton *et al.* 1995; Jennings & Kaiser 1998; Myers & Worm 2003; Mapstone *et al.* 2008), with a short term outlook rather than conservation into perpetuity (Mapstone *et al.* 2008). However sustainable fishing is possible when managed correctly, especially with MPAs as a tool (Lauck *et al.* 1998; Fletcher *et al.* 2005). The fisherman interviewed in Gladstone expressed their love for the reef and conservation values - not only for work, but also for an intrinsic perpetuity of the ecosystem. This attitude matches that of the Gladstone fishers in Ledee *et al.* (2012), showing a positive attitude toward environmental protection in the GBRMP.

7.2 Gladstone Harbour: Possessing Outstanding Universal Values

7.2.1 Monitoring of WH

Credibility of the WH List depends on the extent to which listed properties maintain their OUV; in other words, in determining how well the property's attributes are protected and conserved. Properties inscribed on the list are subject to periodic reporting requirements in which each property's 'state of conservation' is regularly documented and submitted to the WHC (Gillespie 2010). Maintenance of WH status by the state party is a function of the WH monitoring process (Turtinen 2000). Monitoring is an important and effective tool held by the WHC since it provides the necessary information at site level, enabling a comprehensive evaluation to take place ensuring that WH objectives are met in management processes and actions through the state party (Furtado 2004). For properties perceived to be under threat the periodic reporting mechanism is supplemented by the 'reactive monitoring' process as occurred in March 2012 with the UNESCO visit to the GBRWHA.

The reactive monitoring visit was aimed at assessing the potential damage with a view to solve issues threatening the GBRWHA, as *ad hoc* monitoring of this type is designed to do (Furtado 2004). The mission statement expressed, as some stakeholders did, that while the OUV of the entire GBR remains (currently) there is extreme concern with the port developments impacts on the region (Douvere and Badman 2012). This concern is captured in the stakeholder responses to the GPD, with the majority of respondents believing the region is not currently being managed in accordance with WH values.

7.2.2 What and where are the *Outstanding Universal Values*?

An explicit definition of 'OUV' was not written into the *Convention* or the *OG* (Cleere 1996) when the GBR was listed in 1981. Nonetheless, the values of the site were implicit, as can be gleaned from the nomination dossier:

“The Great Barrier Reef is no doubt the world’s most extensive stretch of coral reef and is probably the richest area in terms of faunal diversity in the world” (UNESCO 1981).

At the time of listing, the GBRWHA was recognised by the Federal Government for its “unparalleled aerial vista” and “abundance and diversity of shape, size and colour of marine fauna and flora in coral reefs” (Environment Australia 2001 *in* Pocock 2010, 367). The WH listing is based on natural criteria of OUV as defined in Article 2 of the *Convention*- “natural features consisting of physical and biological formations or groups of such formations, which are of OUV from the aesthetic or scientific point of view”. The level of understanding of the environmental attributes for which the WHA was initially listed are still present to high-users, with understandings of the seagrass, mangroves, turtle breeding grounds, dugong sanctuaries, and coral at Facing Island and Curtis Island noted in interviews. All but one respondent mentioned at least one natural feature of significance in the region (Figure 6.7; [anon] 2012, pers.comm Chapter 6.2).

The high and diverse level of interview responses indicated a comprehensive understanding, both overtly and implicitly for the natural attributes that give the area OUV. This is further shown in Graph 6.14, where most respondents felt the region should remain in the WHA rather than being excised as suggested by GPC and the state government (Levingstone 2012; Tin 2012; Sparkes 2012). This indicates that high users of the region interact with the WH values; recognising the values which should be protected in the context of the international obligation enforcing the idea that a WH inscription brings accolades and is a source for celebration and pride (Spalding 2002; Van Da Aa *et al.* 2010).

7.2.3 Gladstone Harbour OUV

From the results it is clear that the rubric of OUV does not apply to parts of the Gladstone region. The Gladstone region is touted by the GPC as the ‘industrial city of the 21st Century’ (GPC 2012 participant observation). While the stakeholders recognise OUV in the Gladstone region, there was no real/significant connection between the area being crowned as WH and the practice and protection measures in place through management and legislation to ensure the continuity of the environmental qualities of the region, especially in light of the current developments (J. Brodie 2012, pers.comm Chapter 6.2).

The natural attributes the area is WHL for are things which high-user stakeholders fear to be at risk because of the unprecedented level of development [6.10 and 12; Appendix A]. These are not only under threat in Gladstone, but many natural features including marine flora and fauna are facing increased stress from climate change, ocean acidification, invasive species, agricultural runoff, and the huge number of developments in the wider GBR which have been flagged by the UNESCO Mission Report (Douvere and Badman 2012). These issues combined will have a cumulative, detrimental impact of the environment of the GBR which has been recognised by high-users.

7.3 The Great Barrier Reef *in-danger*

7.3.1 WH support

While an intricate understanding of the WH listing from a governance perspective was missing from most stakeholders' knowledge, response to the question of excising Gladstone from the WHA was perceived negatively by the majority of respondents [Figure 6.14]. Most interviewees believed that the harbour should remain part of the GBRWHA, feeling the WH designation was a 'checking power'. Two stakeholders saw it as too late for the Gladstone region feeling the environmental impacts were already too great to warrant WH status.

One of the controversies surrounding the GPD and the WHL claims that a nebulous 'international heritage community' cannot and should not threaten Queensland's economic development. This sentiment was clearly expressed by the Deputy Premier, Jeff Seeney when he said:

"I've heard that suggestion [to excise Gladstone from the GBRWHA] from the Ports Corporation and it's something that I would like to talk further with them about because I think that the whole Great Barrier thing is overdone at times, it is misrepresented by some of you good folk in the media. If there is going to be a continual misrepresentation of those boundaries, then I think that will build a

case for the realignment of the boundaries in the way that the Ports Corporation have suggested” (Seeny 2012 *in* Wordsworth 2012).

The difference in perspectives shows or evidences the political ecology paradigm through unequal distribution of power, the stakeholders views, which are prioritising the environment have been made secondary to the business in the region. The symbolic impact of the *Convention* - the idea of a global commons protected into perpetuity (Spalding 2002; Frey and Steiner 2011) is visible through stakeholder perspectives. The level of engagement by the high-users with the natural attributes within the Gladstone region of the GBR proves that the ideals presented to UNESCO in 1981 are still in existence and lived today. The very reason for preserving a site under the WH rubric is to enable people to view and benefit them in ways that enhance preservation and sustainability (Ryan and Silcvanto 2009). WH “can no longer be framed primarily within the national context” (Graham and Howard 2008, 1), due to the increasingly global nature of heritage and identity. This reflects the rise of globally orientated conservation efforts led by organisations such as UNESCO.

7.3.2 In-Danger?

If no obvious changes to the current management trajectory were made following the reactive mission to the GBRWHA, the UNESCO mission stipulated that an *In-Danger* listing for the GBRWHA will be contemplated (Douvere and Badman 2012). Listing a site as WH *In-Danger* occurs when the WHC believes the site is threatened and major operations are needed with potential required assistance to ensure its protection (*Convention*, Articles 11.4). The List-in-Danger is used in cases where national authorities are unable or unwilling to take the required preventive measures or where national authorities consider that an international warning will serve to give added urgency to national action (Ryan and Silvancto 2009). Australia has had encounters with the List-in-Danger in the past with the threat to Kakadu’s WH status in the 1990’s (Maswood 2000). Interviewee’s expressed some fear that the Queensland state government will act as the ‘roadblock’ to the Federal government’s attempts at rectifying the damage to the reef [Figure 6.20], although not all respondents were as optimistic about the federal government’s response, as reiterated in parliament question time with Greens Sen. Larissa Waters facing hostility when questioning the development (Waters 2012).

7.4 Boundaries

7.4.1 Jurisdictional overlap and gaps

The discrepancy between the boundaries of the protected area, the state marine park, and the WHA has led to the current poor state of management in the Gladstone Harbour. This has led to misperceptions of the management of the space. While there was a high level of understanding of connectivity in the region, many users did not see the harbour as part of the GBR, because it did not contain the coral reef structures for which the region is famous [Figure 6.9]. Yet, the biological connectivity of the region is well recognised in marine literature (Wright 1977; Wolanski 2001; Fernandes *et al.* 2005). The connectivity of oceanography has been shown through recent satellite mapping, showing the plumes of suspended sediment associated with the turbid waters of dredging has a far reaching impact. It is estimated to have spread 34km - with a significant increase in sediment concentrations during the dredging period (Petus and Delvin 2012).

Mapping is a political exercise and the process gives weight to the legal concept of territory which legitimises the boundary-making (Dorsett 2007). This applies to the adherence to the notion of a boundary. If the spatially-defined regulatory decisions initially made for the protected area are not maintained by the managers of the space, then the boundaries become meaningless - this is a potentially significant threat for the integrity of the GBRWHA with the current developments.

7.4.2 Stakeholder engagement with boundaries

While the environmental qualities, and in turn, environmental impacts of the GPD were apparent to stakeholders, knowledge of boundaries was not a priority for many stakeholders. Many held the idea of WHL and connectivity with some ambiguity of how these factors are actually mapped, zoned and implemented. The commercial fishers - both those with knowledge surrounding the WHA and those without did not feel a 'WH' presence in terms of activity or visibility in the region. The engagement with boundaries and management extended to the MPA area, with very little interaction with GBRMPA [Figure 6.17; T. Felzon 2012, pers.comm Chapter 6.4.3]. This is further seen with the inaccuracy of

boundary drawing in figure 6.13a, where fishers had general, but not accurate understandings of the zones.

7.5 Deteriorating environmental conditions: Coincidental or causal?

7.5.1 There must be something in the water...

A large element of the contention surrounding GPD is whether the dredging is having environmental impacts, leading to fish disease which has caused the shutdown of major commercial fishing business in the region. This debate is highly polarised because it involves economic consequences - in both livelihood loss and potential compensation if proven true²⁹ (P10 2012, pers.comm). Dredging is known to have adverse environmental impacts (Salvat 1987; Schaffelke *et al.* 2005; Petus and Delvin 2012). The amounts of fish disease, dead turtles and dugongs that have been recorded have not been seen previously [Figure 4.6]. At a localised level the 2010 floods have been blamed for the fish disease – with claims the influx of fresh water caused the issues (Queensland Government [Department of Agriculture, Fisheries and Forestry] 2012). Despite this intervening factor, a majority of stakeholders still believe dredging is causing an adverse impact [Figure 6.11, 6.12].

7.5.2 Missing data: the need for more information

The exact cause of diseased fish within Gladstone Harbour rests unresolved. This is likely to remain because baseline studies of environmental conditions done prior to the initial dredging in 2008 are insufficient (Landos 2012, pers.comm; Figure 6.10). Put simply, this means there is deficient data to support claims about causes for fish disease. What is known is that dredging causes the uplifting and re-suspension of sea floor sediments. In Gladstone

²⁹ The compensation is the legal case for the Gladstone commercial fisheries who are claiming their industry has been adversely affected by the dredge spoil, both within the western basin region and the wider Gladstone region, based on disease caused directly by the dredge plumes.

this has the potential to be toxic sediment given the industrial history of the Port and Harbour.

7.6 Management of the GBRWHA: overlap or oversight?

Environmental regulation is a complicated issue in our federal system of government, especially with the intergovernmental management of the GBRWHA. Each level of government has some responsibility for conserving and preserving the natural and built environments and heritage. The complicated interconnectedness between different governments can lead to equally complicated environmental regulation – and the GPD provides an excellent example of this (Gillespie 2012c). For this reason interviewees were asked to comment on their perceptions about environmental regulation and management.

7.6.1 Federal management

The obligations of WH site management – outlined in the *OG*, with the transition of ostensibly international conservation values, through global, to national, state and local scales presents a challenge to all signatories to the *Convention* (Hazen 2008; Gillespie 2010). Stakeholder perceptions of federal management show a belief that the commonwealth government has been ineffectual in its legal obligations, and the approval was done with the short-term economy, not environmental well-being in mind [Figure 6.21].

Since ratification of the *Convention* in 1974, Australian states have questioned the federal role in managing listed areas (Boer 1992). WH properties in Australia are managed by a complicated array of state and commonwealth regulations, and Aboriginal/commonwealth or state agreements (Beem 2005), intertwining spatial regulation of the GBRWHA with multiple levels of law (Boer and Wiffen 2006). The Federal government recognises that the size and scope of the region makes management complex, made more so by the jurisdictional overlap between local, state, national and international interests and responsibilities (Australian Government [DERM] 2012). Arguably, having multiple layers of protection has not provided the Gladstone region with the highest environmental protection a WHA should be granted under the management objectives of the Australian government [Table 2.2].

7.6.2 Gladstone regional management as a GBRWHA

As Gladstone Harbour is part of the WHA, but not the commonwealth marine park, the state's role is seemingly dominant in Gladstone under the existing legislative structure. While there is no push for re-zoning to increase protection of the Gladstone region, there is little desire to have the area removed from the GBRWHA. This shows stakeholders mixed feelings towards including it in the GBRMP, which was the intention of the WHL in 1981:

“The Committee noted that only a small proportion of the area nominated for the World Heritage List had been proclaimed within the Great Barrier Reef Region as defined in the Great Barrier Reef Marine Park Act, 1975, and the Committee requested the Australian Government to take steps to ensure that the **whole area** is proclaimed under relevant legislation as soon as possible and that the necessary environmental protection measures are taken” (UNESCO 1981).
(Emphasis added)

The idea of re-zoning the GBRMP had a mixed response from stakeholders, with a slight majority opposed to this [Figure 6.14]. A similar sentiment was expressed with the rezoning in 2003 (Ledee *et al.* 2012). The negative sentiment towards MPAs could also be linked to the role of the GBRMPA in the region. The majority of stakeholders believe there is either no presence or little presence of the GBRMPA because they are a government body, acting in accordance with the current commonwealth government's direction [Figure 6.17].

7.6.3 State management of the region

The Queensland governments regulation of the Gladstone developments has fallen short of expectations. Most stakeholders feel the problems with the GPD arise from a combination of poor management, issues with transparency (rather, lack thereof), inadequate assessment and little by way of monitoring [Figure 6.17]. Furthermore, the role of the GPC being a government owned corporation was noted in Figure 6.16 and seen as problematic to the oversight of the development.

The stakeholder perception of the development was very negative [Figure 6.6], this was not based solely on the direct impact or a '*not in my backyard*' response, seen in other instances

(Van der Aa *et al.* 2010). Rather they tended to reflect a broader environmental protection perspective. This shows stakeholders concerns for the broader environment, which is part of the political ecology framework, as the concern is global, rather than self-motivated. While a similar study in Tasmania found stakeholders caring more about their environment than elsewhere (Trenouth *et al.* 2012), the stakeholder responses in Gladstone were found to see the boarder environmental implication of development on the entire GBR and inland Queensland (where the coal extraction is taking place), rather than just a focus on the Gladstone region.

There is a clear perception that the high users of the region have been left without access to what is a public, universal resource (the harbour) because of the quasi-private (GPC) management style for the region. Concerns were also expressed about a poor, or lack of, community consultation. Stakeholders felt they were left out of the decision making process, and are now left trying to engage in a struggle without any real power. The maintenance of a WHA's integrity over time presents challenges for managers, who need to balance demands of development and preservation (Gillespie 2010). This balance has seemingly not been achieved in the Gladstone region of the GBRWHA.

7.6.4 History repeating

In the 1970s and 1980s it was the conservative Queensland government of Premier Jo Bjelke-Petersen who pushed for oil exploration in the GBR, with the Federal Labor government listing the region to prevent this. Today, it is the conservative (Liberal) state government under the leadership of the Premier Campbell Newman pushing the same rhetoric - claiming Queensland is a 'coal state' not a 'coral state'. Newman has famously said:

“We will protect the environment but we are not going to see the economic future of Queensland shut down. We are in the coal business. If you want decent hospitals, school and police on the beat you need to understand that”
(Newman 2012 in Donagey 2012).

The major difference between these two incidences is the federal government's response. Under the current federal government regime Minister for Heritage and the Environment Tony Burke, rather than see the development blocked, signed off on all the EIS applications

[Appendix B], and failed to report to UNESCO, a requirement of WHL [chapter 2]. The concerns are encapsulated by Professor Ove Hoegh-Guldberg:

“Amid the outcry over bloated barramundi and fishing companies going broke, the recent development of Gladstone Harbour raises the question: how sensible is it to pursue the short-term gains of Central Queensland’s gas resources over the long-term benefits of managing the Great Barrier Reef as an ecosystem deserving World Heritage listing? This – and the growing stress on the Great Barrier Reef from climate change – emphasise the irony that the Great Barrier Reef continues to be haunted by society’s addiction to fossil fuels – in 1975 and now today” (Hoegh-Guldberg 2012).

When the fossil fuel demand emerged prior to the 1981 WHL [chapter 3.2.2], the Federal government responded by protecting the region with the *GBRMP Act 1975* - the legislation which allowed the region to gain international acclaim under the *Convention*. It is once again time for the federal government to implement powers under the GBR intergovernmental agreement [chapter 3.5.3] and the *EPBC Act* [chapter 3.4.3] to ensure the region is protected according to WH standards.

7.7 Conclusion

While the Gladstone region has recognisable attributes which led high-users to understand the OUV of the region, the development and strong industrial history of Gladstone has led to the harbour and port being, in effect, spatially excluded from the rest of the GBR. Under a political ecology framework, ecological, political and economic factors are at play and, arguably, the rights to the space have been removed from the users in favour of increasing private-company (and government revenue) gains. This is reinforced by the fact that the WHA does not match the MPA boundary; different obligations arise under different jurisdiction frameworks. High user groups are clearly cognisant of these issues, although not in an overly legalistic manner; in other words the concerns are not necessarily framed as stemming from legal or, more correctly, constitutional tensions between different levels of government in our federal system. While the entire GBR is not at risk (Dourve and Badham

2012), the implications of what is happening at Gladstone Harbour are of great concern to the entire reef. High users understand the concept of connectivity in marine areas and clearly articulate the idea that one area of the reef is not immune from adverse developments taking place in another area. Not only is the environment at threat, arguably the threat extends to the reputation of Australia's commitment to protecting our environment and respecting our international agreements.

Chapter 8:

Conclusion: Protection into Perpetuity?

The size of the Great Barrier Reef World Heritage Area underlies its 'outstanding universal value'; there is considerable danger in attempting to reduce the significance to specific site locations. The World Heritage value of the Great Barrier Reef is a consequence of many attributes combining to produce a whole which cannot be reduced, without loss, to disconnected components" (Lucas et al. 1997, 3).

8.1 Coral Reef crisis

Coral reefs are dying at a rapid rate. Predictions indicate that under current climate projections (IPCC 2007), there will be no coral left by 2050. These predictions are being proven in the GBR, with a recent survey showing there is 50% less coral cover today than in 1970 (De'ath *et al.* 2012). The GBR is facing unprecedented pressures: pressures including agricultural runoff causing increased eutrophication, overfishing and COTS outbreaks. One of the most dominant threats the GBR is currently facing is the growth in coastal industrial development.

Throughout history, the GBR has been central to the Australian identity – from indigenous use of the region till today. The GBR is a symbol of Australia. But this symbolic image has been significantly tarnished globally because of the current developments in Gladstone Harbour. This is seen through the media especially [Appendix G] These developments show that economic development and conservation hold divergent purposes. This divergence is detrimental to the region's natural environmental values.

Gladstone was chosen for this study based on its location within the GBRWHA, but out of the GBRMP. It is one of the few locations within the GBR where there is a boundary anomaly. The space the Gladstone Harbour and Curtis Island inhabit is important, as boundaries determine which government has jurisdiction over various parts of the Area (Lucas *et al.* 1997) and what the implications of this are. In the case of the GBRMP, the Commonwealth has jurisdiction. In the case of the islands managed and protected by the state and areas beyond the low water mark and port exclusion zones, the Queensland

Government has jurisdiction. But the Commonwealth has international obligations under the *Convention*. Because the GPD is the first major development out of the extensive list flagged by the federal government – it is crucial to assess the implications of the development as they occur. The three LNG processing plants on Curtis Island, the two existing coal terminals and the WICET expansion, the dredging and Fishermans Landing reclamation are all part of this development. The GPD is occurring in an already heavily industrialised space. The impact on the coastal environment at Gladstone is a huge concern to the maintenance of overall environmental quality of the GBR.

8.2 WH under threat

The global image of the vast, pristine reef embodied by the GBR is reinforced because of the global protection the region gains from being WH listed. The listing of 30 years is now under threat, and the future existence of the reef compromised if the government management of the GBR continues along the current trajectory. This was confirmed by UNESCO's reactive monitoring mission in March 2012 which found that the threats to the reef are real and have the potential to compromise its OUV (Douvere and Badman 2012). A reactive monitoring mission only takes place when compliance with the *Convention* and its *OG*'s is compromised (Turtinen 2000). The mission was also a precursor to the threat of an *in-danger* listing, which has been identified as a possible future event if the WHC deems the site's OUV to be compromised.

The designation of WH is seen as 'once-given, always remains', considering the low removal rate. Interestingly, the *in-danger* list is mostly comprised of sites in developing regions and regions experiencing turmoil. For Australia to have the GBR added to this list would, bring into question all conservation efforts Australia is party to, both domestically and on the international level. The significance of this potential *de-listing* or *in-danger* listing cannot be overemphasised as a signal of Australia's unwillingness to commit to the conservation of places of significant environmental and heritage value. As it stands this unwillingness indicates a strong commitment to the natural resource boom, rather than to the protection of a global asset in a conservation / development clash.

The federal government has a duty and responsibility as a signatory to the *Convention* to manage the site for the entire world into perpetuity. This sits in contrast with current plans

to use this location, along with others within the GBRWHA as a coal exporting hub. The WH listing is not an honour in name alone; rather it brings an additional layer of obligation to protect the site for the world (Vernhes 1990).

8.3 OUV under-valued

Not only are the developments taking place threatening the WH listing, there are also threats to the best-practice mantel (Day 2008) that the GBRMPA has earned through 37 years of continual practice, management, community consultation and scientific development in the region. While the March mission stated the OUV of most of the GBR is still present (Douve and Badman 2012), the high-user perceptions of this vary significantly - especially when focusing on Gladstone.

The views and perceptions of high-users of the space – the residents, those who make a living of the marine environment, and those who place high-value on the marine environment have been neglected within the development process. These stakeholders value the region, recognise the OUV and see worth in conservation of the region, which mirror the WH listing in terms of value-placement. Yet the management of the space is not upheld to these values. The developments have damaged the OUV according to the stakeholders, and are threatening the continued health and survival of the region. Not only is the perception of the natural environment damaged, but the actualities of the environment have been degraded. There has been a loss of seagrass and mangroves. The impacts on the marine life, with high rates of dugong and turtle stranding's (Queensland Government [DERM] 2012), potential impacts on humpback whales (Smith *et al.* 2012), and reports of fish, crab and associated marine species, the implications and areas of assessment are far reaching.

Most interview respondents articulated that the WHL should not be removed from sections of the reef, as proposed by the GPC. For high-user groups who embrace ideas around connectivity in these seascapes, the entire regions listing and environmental attributes that led to the listing could be damaged beyond repair by unfettered development in and around Gladstone Harbour. Protection of the entire region in international environmental law is a well-established idea, with the Lucas report recommending the WHA be extended, rather than become smaller, as this would damage the OUV in WHA (Lucas *et al.* 1997).

The high user perceptions of the GBR management are often ignored, with tourism and tourist perceptions favoured in research. This thesis represents high user's views of a region that is often unexplored in the social/physical science paradigm. The small region of coastal areas managed under the state government, rather than the GBRMP Authority is under-analysed, although clearly hugely important for the GBR, especially the WH title. The connectivity of the region is recognised in a practical sense both physically and socially, with the reef guardian and reef-to-ridge programs well established. These institutions run through the GBRMP Authority which provides the area protection, but are intended for the commonwealth MPA protection. This study is unique in its exploration of the small percent of the region not protected through the physical/social paradigm.

8.4 The high users

The high-users perceptions outlined through this study were gathered primarily using semi-structured interviews in Gladstone in July 2012. The interviews were supplemented by mapping exercises and participant observation. The data represents a small quantity of the stakeholders, but shows how those who interact with the region on a high frequency basis perceive the developments. The fieldwork further explored how the boundaries, borders and management impact on the stakeholders' understandings of the space. Knowing if the users of the space see the OUV is integral for best practice management, as it enables community engagement and consultation. Involving high users of a space ensures user's commitment to the protection of the region (Oracion *et al.* 2005; Thiele *et al.* 2005).

The high users of the area expressed discontent with the current practices of both the state and federal government. There are multiple interests in Gladstone with interconnected managerial bodies. These developments have shown that in this WH site, like other WH sites globally, multiple interests collide (Gillespie 2012a). The mismanagement is an element of the development the stakeholders see as problematic, and attribute to the current conflict between conservation and development in the region.

This mismanagement is in large part attributed to the existing management practises surrounding the mapping of the region. Boundaries are political – oftentimes being simple

lines in a complex environment (Gillespie 2012a). The successful translation of maps into practice is falling short at all levels of governance – with the area being misused and mismanaged by both the federal and state government. This has led to the stakeholders having misconceptions about the governance and regulation of the space. This was shown through the perception of borders in Figure 6.13a. Recognition of these factors serves to devalue the regions OUV.

An intricate understanding of the implications, governance, and legislation of the WHL was missing from the majority of stakeholders, yet the sentiment and weighting of the listing was not. Without knowing the legislative structures, the stakeholders articulated a broad and accurate range of values for which the site was, and remains to be listed. Further, understandings of the symbolic nature of the ‘governance’ of the WHC were apparent. While the knowledge of boundaries was not accurate, the level of conservation matched the expectation of a WH and protected area.

8.5 Whole-reef at risk

While the development is taking place in a small section of the GBRWHA and outside of the GBRMP, the impacts are significant. The significance is shown through the movement of the dredge plumes, which have been mapped 32km out of the enclosed harbour region (Petus and Delvin 2012). The cumulative impacts span further than this, with major concerns regarding the increased shipping in the GBR. The increased exports translate to increase large ships in the GBR, and this inevitably leads to increased risks of accidents like the 2010 Shen Neng 1. The ship spilled a 3km line of oil into the GBR after travelling off course from Gladstone carrying coal (Shen Neng 1 2010). Not only is the shipping of concern, but the precedent for development is also worrying. Gladstone is the first of 11 port developments to take place (Douvere and Badman 2012). The question that must be asked is whether the reef can endure such devastating implications for the ecosystem if the other developments occur in a similar matter.

This study could be applied to all developments and stakeholder groups within the GBR, or any other WHA that is under threat from development, both within and outside of an Australian context. Because of the multi-scaled management of the issue application of the

method and approach exemplified in study can occur in any environmental region where governance takes place on multiple levels. The marriage of science and management can also be expanded, with an increased integration of physical science and biology with the human perceptions and understandings, and vice versa.

The current trajectory of coral reef studies focuses on management of the region – as protection is crucial in these uncertain times for coral reef ecosystems. This study contributes to this management paradigm by incorporating the natural environment with social science, which is a progression in marine conservation studies (Smith 2002). Using the political ecology framework places this study within a broad area of research looking at the systemic issues within politically-driven management of a natural area. This could be taken further with this study – especially looking into the privatisation of a public area, a poignant issue given a WHA is nominally protected for the world and future generations. The assessment of a public, environmental good being managed by a private corporation also requires further study.

8.6 Final Remarks

While the economic value of the GBR can be measured, its intrinsic value cannot. This study sought to answer two interlinked questions: does the current management approach reflect the WH values, and how are high users of the space engaged with the WH values for which the site is listed. It is evident through the respondents' views that the GPD has been poorly managed by the GPC, the state government and the federal government. These bodies have not represented the management values outlined in the *Convention* or *OG*; which impacts upon the engagement with WH values by high-users. Assessing the multi-governance scales of environmental management through perceptions about values and boundaries shows that there is conflict between environmental heritage values and the developments economic gains. These are the same issues that inflicted the GBR in the 1970s. While the government is restraining from drilling in the reef, both the federal and state governments have fallen short in protecting the GBR from damages associated with natural resource extraction. The current developments are a concern not only to the environment and people who live and work in these regions, but the WH listing because of the environmental degradation. This study also shows that the State and Federal

governments have compromised the protection and longevity of the GBRWHA by prioritising economic gains “the long term viability of the GBR in anything like its current state must be called into question” (Brodie and Waterhouse 2012). The Great Barrier Reef is at a crossroads because of developments like the port expansion and LNG processing facilities in Gladstone. Decisions made now by all levels of government are crucial for the future integrity of the entire reef.

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Appendices

Appendix A the WHC description of the GBR and the OUV present on the WH GBR web page (UNESCO 1992-2012a)

Brief Description

The Great Barrier Reef is a site of remarkable variety and beauty on the north-east coast of Australia. It contains the world's largest collection of coral reefs, with 400 types of coral, 1,500 species of fish and 4,000 types of mollusc. It also holds great scientific interest as the habitat of species such as the dugong ('sea cow') and the large green turtle, which are threatened with extinction.

Outstanding Universal Value

Brief synthesis

As the world's most extensive coral reef ecosystem, the Great Barrier Reef is a globally outstanding and significant entity. Practically the entire ecosystem was inscribed as World Heritage in 1981, covering an area of 348,000 square kilometres and extending across a contiguous latitudinal range of 14° (10°S to 24°S). The Great Barrier Reef (hereafter referred to as GBR) includes extensive cross-shelf diversity, stretching from the low water mark along the mainland coast up to 250 kilometres offshore. This wide depth range includes vast shallow inshore areas, mid-shelf and outer reefs, and beyond the continental shelf to oceanic waters over 2,000 metres deep.

Within the GBR there are some 2,500 individual reefs of varying sizes and shapes, and over 900 islands, ranging from small sandy cays and larger vegetated cays, to large rugged continental islands rising, in one instance, over 1,100 metres above sea level. Collectively these landscapes and seascapes provide some of the most spectacular maritime scenery in the world.

The latitudinal and cross-shelf diversity, combined with diversity through the depths of the water column, encompasses a globally unique array of ecological communities, habitats and species. This diversity of species and habitats, and their interconnectivity, make the GBR

one of the richest and most complex natural ecosystems on earth. There are over 1,500 species of fish, about 400 species of coral, 4,000 species of mollusk, and some 240 species of birds, plus a great diversity of sponges, anemones, marine worms, crustaceans, and other species. No other World Heritage property contains such biodiversity. This diversity, especially the endemic species, means the GBR is of enormous scientific and intrinsic importance, and it also contains a significant number of threatened species. At the time of inscription, the IUCN evaluation stated "... if only one coral reef site in the world were to be chosen for the World Heritage List, the Great Barrier Reef is the site to be chosen".

Criterion (vii): The GBR is of superlative natural beauty above and below the water, and provides some of the most spectacular scenery on earth. It is one of a few living structures visible from space, appearing as a complex string of reefal structures along Australia's northeast coast.

From the air, the vast mosaic patterns of reefs, islands and coral cays produce an unparalleled aerial panorama of seascapes comprising diverse shapes and sizes. The Whitsunday Islands provide a magnificent vista of green vegetated islands and spectacular sandy beaches spread over azure waters. This contrasts with the vast mangrove forests in Hinchinbrook Channel, and the rugged vegetated mountains and lush rainforest gullies that are periodically cloud-covered on Hinchinbrook Island.

On many of the cays there are spectacular and globally important breeding colonies of seabirds and marine turtles, and Raine Island is the world's largest green turtle breeding area. On some continental islands, large aggregations of over-wintering butterflies periodically occur.

Beneath the ocean surface, there is an abundance and diversity of shapes, sizes and colours; for example, spectacular coral assemblages of hard and soft corals, and thousands of species of reef fish provide a myriad of brilliant colours, shapes and sizes. The internationally renowned Cod Hole near Lizard Island is one of many significant tourist attractions. Other superlative natural phenomena include the annual coral spawning, migrating whales, nesting turtles, and significant spawning aggregations of many fish species.

Criterion (viii): The GBR, extending 2,000 kilometres along Queensland's coast, is a globally outstanding example of an ecosystem that has evolved over millennia. The area has

been exposed and flooded by at least four glacial and interglacial cycles, and over the past 15,000 years reefs have grown on the continental shelf.

During glacial periods, sea levels dropped, exposing the reefs as flat-topped hills of eroded limestone. Large rivers meandered between these hills and the coastline extended further east. During interglacial periods, rising sea levels caused the formation of continental islands, coral cays and new phases of coral growth. This environmental history can be seen in cores of old massive corals.

Today the GBR forms the world's largest coral reef ecosystem, ranging from inshore fringing reefs to mid-shelf reefs, and exposed outer reefs, including examples of all stages of reef development. The processes of geological and geomorphological evolution are well represented, linking continental islands, coral cays and reefs. The varied seascapes and landscapes that occur today have been moulded by changing climates and sea levels, and the erosive power of wind and water, over long time periods.

One-third of the GBR lies beyond the seaward edge of the shallower reefs; this area comprises continental slope and deep oceanic waters and abyssal plains.

Criterion (ix): The globally significant diversity of reef and island morphologies reflects ongoing geomorphic, oceanographic and environmental processes. The complex cross-shelf, longshore and vertical connectivity is influenced by dynamic oceanic currents and ongoing ecological processes such as upwellings, larval dispersal and migration.

Ongoing erosion and accretion of coral reefs, sand banks and coral cays combine with similar processes along the coast and around continental islands. Extensive beds of *Halimeda* algae represent active calcification and accretion over thousands of years.

Biologically the unique diversity of the GBR reflects the maturity of an ecosystem that has evolved over millennia; evidence exists for the evolution of hard corals and other fauna. Globally significant marine faunal groups include over 4,000 species of molluscs, over 1,500 species of fish, plus a great diversity of sponges, anemones, marine worms, crustaceans, and many others. The establishment of vegetation on the cays and continental islands exemplifies the important role of birds, such as the Pied Imperial Pigeon, in processes such as seed dispersal and plant colonisation.

Human interaction with the natural environment is illustrated by strong ongoing links between Aboriginal and Torres Strait Islanders and their sea-country, and includes numerous shell deposits (middens) and fish traps, plus the application of story places and marine totems.

Criterion (x): The enormous size and diversity of the GBR means it is one of the richest and most complex natural ecosystems on earth, and one of the most significant for biodiversity conservation. The amazing diversity supports tens of thousands of marine and terrestrial species, many of which are of global conservation significance.

As the world's most complex expanse of coral reefs, the reefs contain some 400 species of corals in 60 genera. There are also large ecologically important inter-reefal areas. The shallower marine areas support half the world's diversity of mangroves and many seagrass species. The waters also provide major feeding grounds for one of the world's largest populations of the threatened dugong. At least 30 species of whales and dolphins occur here, and it is a significant area for humpback whale calving.

Six of the world's seven species of marine turtle occur in the GBR. As well as the world's largest green turtle breeding site at Raine Island, the GBR also includes many regionally important marine turtle rookeries.

Some 242 species of birds have been recorded in the GBR. Twenty-two seabird species breed on cays and some continental islands, and some of these breeding sites are globally significant; other seabird species also utilize the area. The continental islands support thousands of plant species, while the coral cays also have their own distinct flora and fauna.

Integrity

The ecological integrity of the GBR is enhanced by the unparalleled size and current good state of conservation across the property. At the time of inscription it was felt that to include virtually the entire Great Barrier Reef within the property was the only way to ensure the integrity of the coral reef ecosystems in all their diversity.

A number of natural pressures occur, including cyclones, crown-of-thorns starfish outbreaks, and sudden large influxes of freshwater from extreme weather events. As well

there is a range of human uses such as tourism, shipping and coastal developments including ports. There are also some disturbances facing the GBR that are legacies of past actions prior to the inscription of the property on the World Heritage list.

At the scale of the GBR ecosystem, most habitats or species groups have the capacity to recover from disturbance or withstand ongoing pressures. The property is largely intact and includes the fullest possible representation of marine ecological, physical and chemical processes from the coast to the deep abyssal waters enabling the key interdependent elements to exist in their natural relationships.

Some of the key ecological, physical and chemical processes that are essential for the long-term conservation of the marine and island ecosystems and their associated biodiversity occur outside the boundaries of the property and thus effective conservation programs are essential across the adjoining catchments, marine and coastal zones.

Protection and management requirements

The GBR covers approximately 348,000 square kilometres. Most of the property lies within the GBR Marine Park: at 344,400 square kilometres, this Federal Marine Park comprises approximately 99% of the property. The GBR Marine Park's legal jurisdiction ends at low water mark along the mainland (with the exception of port areas) and around islands (with the exception of 70 Commonwealth managed islands which are part of the Marine Park). In addition the GBR also includes over 900 islands within the jurisdiction of Queensland, about half of which are declared as 'national parks', and the internal waters of Queensland that occur within the World Heritage boundary (including a number of long-established port areas).

The World Heritage property is and has always been managed as a multiple-use area. Uses include a range of commercial and recreational activities. The management of such a large and iconic world heritage property is made more complex due to the overlapping State and Federal jurisdictions. The Great Barrier Reef Marine Park Authority, an independent Australian Government agency, is responsible for protection and management of the GBR Marine Park. The *Great Barrier Reef Marine Park Act 1975* was amended in 2007 and 2008, and now provides for “the long term protection and conservation ... of the Great

Barrier Reef Region” with specific mention of meeting "... Australia's responsibilities under the World Heritage Convention".

Queensland is responsible for management of the Great Barrier Reef Coast Marine Park, established under the *Marine Parks Act 2004* (Qld). This is contiguous with the GBR Marine Park and covers the area between low and high water marks and many of the waters within the jurisdictional limits of Queensland. Queensland is also responsible for management of most of the islands.

The overlapping jurisdictional arrangements mean that the importance of complementary legislation and complementary management of islands and the surrounding waters is well recognised by both governments. Strong cooperative partnerships and formal agreements exist between the Australian Government and the Queensland Government. In addition, strong relationships have been built between governments and commercial and recreational industries, research institutions and universities. Collectively this provides a comprehensive management influence over a much wider context than just the marine areas and islands.

Development and land use activities in coastal and water catchments adjacent to the property also have a fundamental and critical influence on the values within the property. The Queensland Government is responsible for natural resource management and land use planning for the islands, coast and hinterland adjacent to the GBR. Other Queensland and Federal legislation also protects the property's Outstanding Universal Value addressing such matters as water quality, shipping management, sea dumping, fisheries management and environmental protection.

The Federal Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) provides an overarching mechanism for protecting the World Heritage values from inappropriate development, including actions taken inside or outside which could impact on its heritage values. This requires any development proposals to undergo rigorous environmental impact assessment processes, often including public consultation, after which the Federal Minister may decide, to approve, reject or approve under conditions designed to mitigate any significant impacts. A recent amendment to the EPBC Act makes the GBR Marine Park an additional 'trigger' for a matter of National Environmental Significance which provides additional protection for the values within the GBR.

The GBR Marine Park and the adjoining GBR Coast Marine Park are zoned to allow for a wide range of reasonable uses while ensuring overall protection, with conservation being the primary aim. The zoning spectrum provides for increasing levels of protection for the 'core conservation areas' which comprise the 115,000 square kilometres of 'no-take' and 'no-entry' zones within the GBR.

While the Zoning Plan is the 'cornerstone' of management and provides a spatial basis for determining where many activities can occur, zoning is only one of many spatial management tools and policies applied to collectively protect the GBR. Some activities are better managed using other spatial and temporal management tools like Plans of Management, Special Management Areas, Agreements with Traditional Owners and permits (often tied to specific zones or smaller areas within zones, but providing a detailed level of management not possible by zoning alone). These statutory instruments also protect the Outstanding Universal Value of the property.

Many Aboriginal and Torres Strait Island peoples undertake traditional use of marine resource activities to provide traditional food, practice their living maritime culture, and to educate younger generations about traditional and cultural rules and protocols. In the GBR these activities are managed under both Federal and Queensland legislation and policies including Traditional Use of Marine Resource Agreements (TUMRAs) and Indigenous Land Use Agreements (ILUAs). These currently cover some 30 per cent of the GBR inshore area, and support Traditional Owners to maintain cultural connections with their sea country.

Similarly non-statutory tools like site management and Industry Codes of Practice contribute to the protection of World Heritage values. Some spatial management tools are not permanently in place nor appear as part of the zoning, yet achieve effective protection for elements of biodiversity (e.g. the temporal closures that are legislated across the GBR prohibit all reef fishing during specific moon phases when reef fish are spawning).

Other key initiatives providing increased protection for the GBR include the comprehensive *Great Barrier Reef Outlook Report* (and its resulting 5-yearly reporting process); the *Reef Water Quality Protection Plan*; the *GBR Climate Change Action Plan*; and the *Reef Guardians Stewardship Programs* which involve building relationships and working closely

with those who use and rely on the GBR or its catchment for their recreation or their business.

The 2009 Outlook Report identified the long-term challenges facing the GBR; these are dominated by climate change over the next few decades. The extent and persistence of damage to the GBR ecosystem will depend to a large degree on the amount of change in the world's climate and on the resilience of the GBR ecosystem to such change. This report also identified continued declining water quality from land-based sources, loss of coastal habitats from coastal development, and some impacts from fishing, illegal fishing and poaching as the other priority issues requiring management attention for the long-term protection of the GBR.

Emerging issues since the 2009 Outlook Report include proposed port expansions, increases in shipping activity, coastal development and intensification and changes in land use within the GBR catchment; population growth; the impacts from marine debris; illegal activities; and extreme weather events including floods and cyclones.

Further building the resilience of the GBR by improving water quality, reducing the loss of coastal habitats and increasing knowledge about fishing and its effects and encouraging modified practices, will give the GBR its best chance of adapting to and recovering from the threats ahead, including the impacts of a changing climate.

Long Description

The Great Barrier Reef is a site of remarkable variety and beauty on the north-east coast of Australia. It is the world's most extensive stretch of coral reef and is probably the richest area in terms of faunal diversity in the world. Its great diversity reflects the maturity of an ecosystem which has evolved over millions of years on the north-east continental shelf of Australia. The site contains a huge diversity of species including over 1,500 species of fish, about 360 species of hard coral, 5,000 species of mollusc, and more than 175 species of bird, plus a great diversity of sponges, anemones, marine worms and crustaceans, among others.

The reef system, extending to Papua New Guinea, the reef comprises some 2900 individual reefs of all sizes and shapes covering more than 20,000 km², including 760 fringing reefs, which range in size from under 1ha to over 10,000 ha and vary in shape to provide the most spectacular marine scenery on Earth. There are approximately 600 continental islands including many with towering forests and freshwater streams, and some 300 coral cays and unvegetated sand cays. A rich variety of landscapes and seascapes, including rugged mountains with dense and diverse vegetation and adjacent fringing reefs, provide spectacular scenery.

The form and structure of the individual reefs show great variety. Two main classes may be defined: platform or patch reefs, resulting from radial growth; and wall reefs, resulting from elongated growth, often in areas of strong water currents. There are also many fringing reefs where the reef growth is established on subtidal rock of the mainland coast or continental islands.

The site includes major feeding grounds for the endangered dugong and nesting grounds of world significance for two endangered species of marine turtle, the green and the loggerhead, as well as habitat for four other species of marine turtle; given the severe pressures being placed on these species elsewhere, the Great Barrier Reef may be their last secure stronghold. It is also an important breeding area for humpback and other whale species.

A wide range of fleshy algae occurs, many of which are small and inconspicuous but which are highly productive and are heavily grazed by turtles, fish, molluscs and sea urchins. In addition, algae are an important component of reef building processes. 15 species of seagrass grow throughout the reef area forming over 3,000 km² of seagrass meadows and providing an important food source for grazing animals, such as dugongs.

The Great Barrier Reef, and in particular the northern sector, is important in the historic and contemporary culture of the Aboriginal and Torres Strait Islander groups of the coastal areas of north-east Australia. This contemporary use of and association with the Marine Park plays an important role in the maintenance of their cultures and there is a strong spiritual connection with the ocean and its inhabitants.

**Appendix B The federal minister for the environment,
Tony Burke's sign off on the port development and
Dredging, including examples of the conditions attached
(Australian Government [DSEWPC] 2012).**




Australian Government

Department of Sustainability, Environment, Water, Population and Communities

Approval

Australia Pacific LNG Project - Development of a LNG Plant and Ancillary Onshore and Marine Facilities on Curtis Island - EPBC 2009/4977

This decision is made under sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

person to whom the approval is granted	Australia Pacific LNG Pty Limited
proponent's ABN	ABN: 68 001 646 331
proposed action	<p>The development, construction, operation and decommissioning of a multi-train liquefied natural gas (LNG) processing plant (LNG Facility) and associated ancillary onshore and marine facilities within the Curtis Island Industry Precinct of the Gladstone State Development Area, in the south-west section of Curtis Island adjacent to Gladstone:</p> <ul style="list-style-type: none">• as described in the proponent's referral received under the EPBC Act on 6 July 2009; and• as described in the proponent's Environmental Impact Statement and supplementary information provided pursuant to section 35(2) of the QLD SDPWO Act.
decision	<p>To approve the proposed action for each of the following controlling provisions:</p> <ul style="list-style-type: none">• World Heritage properties (sections 12 and 15A, EPBC Act)• National Heritage Places (sections 15B and 15C, EPBC Act)• Listed threatened species and communities (sections 18 and 18A, EPBC Act)• Listed migratory species (sections 20 and 20A, EPBC Act)
conditions of approval	This approval is subject to the conditions specified below.
expiry date of approval	This approval has effect until 22 February 2061.
name and position	The Hon Tony Burke MP Minister for Sustainability, Environment, Water, Population and Communities
signature	
date of decision	21. 2. 11

Conditions

LNG plant and ancillary onshore and marine facilities site

1. The LNG plant and ancillary onshore and marine facilities site is substantially in accordance with the area outlined on the map at [Figure 1](#).
2. Dredging is to be limited to a maximum of 900,000m³ for the construction dock on Curtis Island.

Visual impact of construction and operation

3. The proponent must minimise the visual impact of the construction and operation of the LNG Facility by:
 - (a) constructing the LNG plant and ancillary onshore and marine facilities within the site identified in [Figure 1](#);
 - (b) applying a colour scheme to the LNG facility and buildings, other than the LNG storage tanks and any necessary corrosion-protected structures and pipe insulation, from the palette of predominant colours found in the locality (Curtis Island) except where to do so would be in contravention of health and safety legislative requirements;
 - (c) ensuring site works minimise tree (including mangrove) clearing, with stabilisation and rehabilitation works on disturbed areas fully implemented within twelve months of completing each component of the LNG Facility (the worker accommodation facility and associated infrastructure; LNG storage tanks; and LNG trains and ancillary equipment and infrastructure, including marine loading and offloading facilities); and
 - (d) minimising light spill and direct views of lights outside the LNG facility boundary except where to do so would be in contravention of health and safety legislative requirements.

Conduct of construction and operation workforce

4. The proponent must not bring private motor vehicles onto the LNG site, or private watercraft into waters within 100 metres of the LNG site boundary, except for activities directly relating to pre-clearance surveys, site clearance, and the construction and operation of the LNG plant and ancillary onshore and marine facilities.
5. The proponent must not bring animals and plants (including domestic cats and dogs and other potential pests and weeds), other than for landscaping and rehabilitation purposes onto the LNG plant and ancillary onshore and marine facilities site, or onto Curtis Island.

Note: For clarity, plants that are brought to Curtis Island for landscaping and rehabilitation purposes must be native Australian species sourced from the South Eastern Queensland and/or Brigalow Belt bioregion/s)

6. Entry into the Curtis Island Environmental Management Precinct, as identified in [Figure 2](#), must be prohibited for all the proponent's construction workers, construction contractors, and its employees, whilst they are rostered on shifts or accommodated by the proponent on Curtis Island, except with the prior consent in writing of the authority responsible for the management of this Precinct.

7. An induction program must be implemented for all the proponent's employees and sub-contractors at the time or before they commence work on Curtis Island. The induction program must include:
 - (a) an overview that clearly explains to all the proponent's employees and sub-contractors engaged on the construction and operation of the LNG Facility that they are working in a World Heritage Area and an explanation of the environmental values of the World Heritage Area;
 - (b) information on listed species and ecological communities and other native species that are found in the area, and the related responsibilities of the proponent, its employees and subcontractors;
 - (c) an explanation of the Rodds Bay Dugong Protection Area, and Great Barrier Reef Marine Park zoning on the eastern side of Curtis Island, Rodds Peninsula and the Capricorn Bunker group, and the responsibilities of the proponent, its employees and subcontractors within and in relation to these areas. This explanation must include the provision of maps depicting the zones, an explanation as to what can and cannot be done in the various zones, and information about how important the terrestrial and marine environments of the Capricorn Bunker group are to conserving biodiversity within the Great Barrier Reef Marine Park; and
 - (d) information that has the objective of fostering a culture of environmental awareness of the values of the area and also raises awareness among all employees and sub-contractors of the compliance and enforcement programs of the Great Barrier Reef Marine Park Authority and penalties that apply for offences.
8. The obligations under conditions 4, 5, 6 and 7 must also apply to any visitors to the LNG site, or to Curtis Island, who are under the direction or control of the proponent.
9. Within 20 business days of the final investment decision to proceed with the proposed action, the proponent must submit to the Minister for approval:
 - (a) a Curtis Island Environment Protection Code of Conduct for the construction workforce while on site and while travelling to and from the mainland and the construction site; and
 - (b) a code of conduct implementation strategy for enforcing compliance with the Curtis Island Environment Protection Code of Conduct.
10. The code of conduct shall include, but not necessarily be limited to, the requirements set out in conditions 4, 5, 6 and 7.
11. The approved Curtis Island Environment Protection Code of Conduct must be implemented.
12. At least 60 business days before the commissioning of the first LNG train, the proponent must review, and if necessary revise, the Curtis Island Environment Protection Code of Conduct and implementation strategy and provide the Minister with evidence that this review has been carried out. If the Curtis Island Environment Protection Code of Conduct and/or implementation strategy are revised, the revised document or documents must be submitted to the Minister for approval within 20 business days of the review being finalised. Once the Minister has approved in writing the revised code of conduct and/or implementation strategy, the approved code of conduct and/or implementation strategy must be implemented.

Offsets

Plan to secure and manage environmental offsets

13. An Environmental Offsets Plan to offset the loss of habitat and associated World Heritage and National Heritage values caused by the construction and operation of the LNG facility, must be developed.
14. The Plan must address, but not necessarily be limited to, impacts on vegetation, biodiversity and landscape aesthetics arising from:
 - (a) the development and operation of the LNG facility;
 - (b) other activities on Curtis Island that are associated with the LNG Facility (including workers' accommodation facilities, port works for the project, and ancillary works); and
 - (c) increased risks to biodiversity values of the World Heritage and National Heritage property arising from increased shipping movements and other subsequent or indirect impacts beyond the immediate development site such as water quality impacts and increased recreational access arising from the development and operation of the LNG facility.
15. The Plan must detail:
 - (a) the principles adopted in the Plan. These principles must reflect the objective of identifying, protecting, conserving, presenting, transmitting to future generations and, if necessary, rehabilitating, the World Heritage and National Heritage values of the Great Barrier Reef property;
 - (b) the predicted total loss (in extent and type) of areas of ecological and aesthetic value, (including remnant vegetation, high value regrowth, significant conservation species, habitat, biodiversity corridors, scenic vistas of outstanding natural beauty);
 - (c) the methodology for identifying the requirements for environmental offsets for specific components of the LNG Facility over the life of the project;
 - (d) a proposed timeline for implementing the Environmental Offsets Plan;
 - (e) relevance to any Commonwealth or State government requirements for offsets;
 - (f) in relation to any land retained at the time of preparation of the Plan, the location, size and environmental values of the offsets (land);
 - (g) in relation to any land retained at the time of preparation of the Plan, the management measures, including funding, required to secure, maintain and enhance the values of the proposed offset (land); and
 - (h) a system for reporting to the Minister on offset arrangements, their management and how offset values are being maintained.
16. The Environmental Offsets Plan must as a minimum include:
 - (a) to offset direct impacts, the securing by the proponent of an offset property:

**DEPARTMENT OF SUSTAINABILITY, ENVIRONMENT, WATER,
POPULATION AND COMMUNITIES**

Approval

Port of Gladstone Western Basin Strategic Dredging and Disposal Project, Gladstone, Qld (EPBC 2009/4904)

This decision is made under sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999*.

Proposed action

person to whom the approval is granted	Gladstone Ports Corporation Ltd
proponent's ACN	131 965 896
proposed action	To undertake the Port of Gladstone Western Basin Strategic Dredging and Disposal Project as described in the referral received on 20 May 2009 (EPBC2009/4904).

Approval decision

Controlling Provision	Decision
World Heritage properties (sections 12 & 15A)	Approved
National Heritage places (sections 15B & 15C)	Approved
Listed threatened species and communities (sections 18 & 18A)	Approved
Listed migratory species (sections 20 & 20A)	Approved

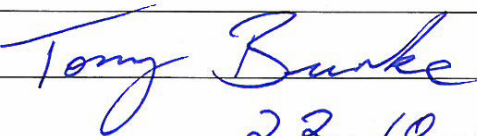
conditions of approval

This approval is subject to the conditions specified below.

expiry date of approval

This approval has effect until twenty years from the date of this decision

Decision-maker

name and position	The Hon. Tony Burke MP Minister for Sustainability, Environment, Water, Population and Communities
Signature	
date of decision	22.10.10

**Appendix C The Commonwealth government interim
report for UNESCO on developments in the GBRWHA
(Australian Government [DESWPC] 2012).**

Title	Brief Description	Supporting Documentation
2011/6072 Bedrock Landscape Supplies, Cape Cleveland	To construct and operate a staged sand extraction 29 km southeast of Townsville, Queensland.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=6072
2011/6005 Mackay City Council, Water Recycling Facility	To construct and operate the new Water Recycling Facility to service the growing population demands of Sarina in Plane Creek.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referrals&limit=999999&text_search=2011%2F6005
2011/5965 Xstrata Coal Queensland Pty Ltd, Rolleston Coal Expansion Project	To expand the existing Rolleston mine through open cut mining near Rolleston Queensland.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=5965
2011/6034 Bow Blackwater CSG Pty Ltd, Blackwater to Gladstone gas pipeline project	To develop a gas transmission pipeline from Blackwater to Gladstone in Queensland.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=6034
2011/6092 Aust-Pac Capital, Wongai Underground Coal Mine Project, Queensland	To construct and operate a new underground coal mine in the Laura Basin, 150 km northwest of Cooktown, Queensland.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=6092
2011/5979 Port of Townsville Limited, Port Expansion Project	To expand the port of Townsville. The action is for dredging, disposal, land reclamation and construction of infrastructure.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?limit=999999&name=current_referrals&text_search=2011%2F5979
2011/6069 Fitzroy Terminal Project Pty Ltd, Fitzroy Terminal Project	Develop and operate a coal export facility at Port Alma and in the Great Barrier Reef Marine Park.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referrals&limit=999999&text_search=2011%2F6069

2010/5561 Adani, Abbot Point Stormwater Return Dam	To construct a stormwater return dam and associated infrastructure at Abbot Point.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?limit=999999&name=current_referrals&text_search=2010%2F5561
2010/5521 GKI Resort Pty Ltd, Tourism & Marina Development	To develop a tourism/marina development on Great Keppel Island.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referrals&limit=999999&text_search=2010%2F5521
2010/5514 CassTech, The Burdekin Cassava Project	To convert existing grazing and cropping land to a cassava farm install a starch factory, gluten free flour mill, biomass pellet mill and feedlot, south west of Home Hill.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referrals&limit=999999&text_search=2010%2F5514
2010/5448 Cassowary Coast Regional Council, Sewerage Treatment Plant & Outfall	To construct and operate a sewerage treatment plan and associated infrastructure.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referrals&limit=999999&text_search=2010%2F5448
2010/5711 Whitsunday Regional Council, Proserpine Waste Water Treatment Facility Upgrade	The upgrade of the Proserpine Waste Water Treatment Facility to include state of the art technology and reuse of treated effluent in the surrounding and adjacent agricultural areas.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=5711
2010/5736 Adani Mining Pty Ltd, Carmichael Coal and Rail Project	To develop an open-cut and underground coal mine and associated infrastructure 160 km north west of Clermont Queensland, and the construction of a rail link.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=5736
2009/4737 Waratah Coal, Incorporated Establishment of Galilee Coal Mine and Associated Infrastructure	To establish a new coal mine, railway, and coal stockyards, and supporting infrastructure to export high volatile, low sulphur, steaming coal from near Alpha in the Galilee Basin to Abbot Point.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referrals&limit=999999&text_search=2009%2F4737

<p>2009/4837 North Queensland Bulk Ports Corporation, Abbott Point Multi Cargo Facility</p>	<p>To develop a Multi Cargo Facility at Abbott Point. The facility will involve dredging of a shipping access channel, swing basin and berth pockets, reclamation to construct a protected harbour, and construction of a haul road, port access and services corridor.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_app.pl?limit=999999&name=current_referrals&text_search=2009%2F4837</p>
<p>2009/5228 MM Land Pty Ltd, Pacific View Drive, Wongaling Beach</p>	<p>To subdivide an approximate 6.7 hectare site into a residential development at 10 Pacific View Drive, Wongaling Beach.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_app.pl?name=current_referral_detail&proposal_id=5228</p>
<p>2009/5211 Tropical Resort Developments Pty Ltd, Cairns Queensland</p>	<p>To develop the Tropical Paradise Resort Precincts Development.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_app.pl?name=current_referral_detail&proposal_id=5211</p>
<p>2009/5158 Xstrata Coal Queensland Pty Ltd, Balaclava Island Coal Export Terminal</p>	<p>To undertake the construction of a Coal Export Terminal at Balaclava Island and on the mainland adjacent to Balaclava Island.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_app.pl?limit=999999&name=current_referrals&text_search=2009%2F5158</p>
<p>2009/5008 Shell CSG (Australia) Pty Ltd, Development of high pressure gas pipeline</p>	<p>To develop a high-pressure gas pipeline and associated infrastructure from either the Gladstone City Gate or a new facility, to Curtis Island.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_app.pl?name=current_referrals&limit=999999&text_search=2009%2F5008</p>
<p>2009/5007 Shell CSG (Australia) Pty Ltd, Development of a Liquefied Natural Gas Facility</p>	<p>To develop a Liquefied Natural Gas Facility on the southern end of Curtis Island.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_app.pl?name=current_referrals&limit=999999&text_search=2009%2F5007</p>
<p>2009/5173 Gladstone Area Water Board & SunWater Limited, The Lower Fitzroy River Infrastructure Project</p>	<p>The proposal involves the raising of the existing Eden Bann Weir, construction and operation of a new weir near Rockwood crossing, and construction and operation of associated water infrastructure.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_app.pl?limit=999999&name=current_referrals&text_search=2009%2F5173</p>

<p>2009/4758 Taylor Family Trust, Taylor Family Health Retreat</p>	<p>To develop a health resort on the western side of the Tully-Mission Beach Road.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_app.pl?name=current_referrals&limit=9999999&text_search=2009%2F4785</p>
<p>2008/4429 SunWater, Connors River Dam and Pipelines</p>	<p>Construction and operation of the Connors River Dam and water distribution pipeline(s) and associated infrastructure, near Mt Bridget, Fitzroy River Basin, Central Queensland.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_app.pl?name=current_referrals&limit=9999999&text_search=2008%2F4429</p>
<p>2008/4468 Hancock Coal, Coal Terminal Expansion, and Associated Infrastructure</p>	<p>To construct and operate onshore and offshore infrastructure for the 60 million tonne per annum Abbot Point Coal Terminal 3. Including 2 bunds and 4 stockyard rows; sediment ponds; a storm water return dam; and the option of 2 offshore berths or a connection to the proposed Multi-cargo Facility.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_app.pl?name=current_referrals&limit=9999999&text_search=2008%2F4468</p>
<p>2008/4648 Hancock Prospecting Pty Ltd, Mine and Rail Development</p>	<p>To construct and operate a coal mine and supporting rail link Central Queensland.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_app.pl?name=current_referrals&limit=9999999&text_search=2008%2F4648</p>
<p>2008/4616 Nemouna Eco-Efficient Development, Gannors Beach Queensland</p>	<p>Establishment of a community title residential development at the Esplanade, Gannors Beach, Queensland</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_app.pl?name=current_referral_detail&proposal_id=4616</p>
<p>2008/4593 Chalco Australia Pty Ltd, Amurkam Bauxite Project Abbot Point Transport Corridor</p>	<p>To develop a common user transport corridor to link the proposed alumina refinery to the proposed Port Abbot port facilities approximately 25 km northwest of Bowen.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_app.pl?name=current_referral_detail&proposal_id=4593</p>

<p>2008/4594 Chalco Australia Pty Ltd, Aurukun Bauxite Project Abbot Point Refinery</p>	<p>To develop an alumina refinery, landing facility and road, residue storage facility (RSF) and slurry pipeline to the RSF near Abbot Point approximately 25km northwest of Bowen.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=4594</p>
<p>2008/4595 Chalco Australia Pty Ltd, Aurukun Bauxite Project Abbot Point Infrastructure</p>	<p>To develop a port facility for ship loading and unloading for movement of raw materials and products into and out of Abbot Point.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=4595</p>
<p>2008/4406 BG International Ltd & QGC Ltd, Queensland Curtis LNG Project - Swing Basin and Channel Dredging</p>	<p>To carry out dredging works, including associated spoil disposal, within the Port of Gladstone to construct a swing basin, channel extensions and deepening required for shipping associated with the Queensland Curtis LNG Project.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=4406</p>
<p>2008/4060 Santos Ltd, Construction of Bridge and Road to Access Proposed Natural Gas Liquefaction Park</p>	<p>To construct a bridge from the mainland near Gladstone across to Curtis Island with connecting roads either side, connect the proposed LNG Park on Curtis Island (around the Hamilton Point area) with the existing Landing Road near Gladstone in Central Queensland.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=4060</p>
<p>2008/4313 SunWater, Construction and Operation of Nathan Dam</p>	<p>Construction and Operation of Nathan Dam on the Dawson River and associated infrastructure</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referrals&limit=999999&text_search=2008%2F4313</p>
<p>2008/3971 Pathold No 84 Pty Ltd, Ecotourism resort on Wild Duck Island</p>	<p>Development of an ecotourism resort on 118 ha of leasehold land on Wild Duck Island.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referrals&limit=999999&text_search=2008%2F3971</p>

2008/4647 Hancock Prospecting Pty Ltd, Alpha Coal Project - Port Options Development	To construct and operate a coal port.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=4647
2007/3613 Coolgarue Aboriginal Corporation for CDEP, Palm Island Sponge Aquaculture Project	The establishment and operation of an in-sea aquaculture farm in the Palm Island group of islands.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=3613
2007/3580 Laguna Pty Ltd resort expansion	Redevelopment and expansion of the existing Wilderness Resort and associated infrastructure located on Hook Island, Whitsunday Shire, Queensland.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=3580
2007/3482 Starline Australia Holdings, Reef Cove Resort - Final Stage	To develop the final stage of the Reef Cove Resort site and associated infrastructure over a total area of 5.9 ha, False Cape, Cairns.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referrals&limit=999999&text_search=2007%2F3482
2006/2527 SunWater, Water for Bowen Project	Develop, maintain and operate and maintain a new water transport scheme between the Burdekin River and the Bowen area.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referrals&limit=999999&text_search=2006%2F2527
2006/2939 Shute Harbour Marina Development Pty Ltd, Construction of Marina Facility	To develop a marina facility with associated infrastructure and an onshore development comprising tourism, commercial and residential elements at Shute Harbour, Queensland.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=2939
2005/2390 Cairns Regional Council, Groundwater extracted from Mulgrave River Aquifer, bore field and associated infrastructure	To construct and operate a bore field and associated delivery, treatment and storage infrastructure, near Aloomba, Cairns, Queensland.	http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=2390

<p>2005/2159 Satori Resorts Ella Bay Pty Ltd, Ella Bay Residential and Tourism Development</p>	<p>To develop a residential and tourism development of approximately 450 ha located at Ella Bay.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referrals&limit=999999&text_search=2005%2F2159</p>
<p>2003/922 LG Chem Ltd, Construction of a Chlor-Alkali/Ethylene Di-Chloride (CA/EDC) plant, Gladstone State Development Area</p>	<p>To construct and operate a Chlor-Alkali/Ethylene Di-Chloride (CA/EDC) plant, at Gladstone State Development Area on Landing Road, west of the city of Gladstone, Queensland.</p>	<p>http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=922</p>

Appendix D The meaning and list of WH sites in-danger, as of October 2012 (UNESCO 1992-2012e)

Taken directly from the WH in-danger web page.

“World Heritage in Danger

The List of World Heritage in Danger is designed to inform the international community of conditions which threaten the very characteristics for which a property was inscribed on the World Heritage List, and to encourage corrective action. This section describes the List of World Heritage in Danger and gives examples of sites that are inscribed on the List.

Armed conflict and war, earthquakes and other natural disasters, pollution, poaching, uncontrolled urbanization and unchecked tourist development pose major problems to World Heritage sites. Dangers can be ‘ascertained’, referring to specific and proven imminent threats, or ‘potential’, when a property is faced with threats which could have negative effects on its World Heritage values.

Under the 1972 World Heritage Convention, the World Heritage Committee can inscribe on the List of World Heritage in Danger properties whose protection requires ‘major operations (...) and for which assistance has been requested’.

Inscribing a site on the List of World Heritage in Danger allows the World Heritage Committee to allocate immediate assistance from the World Heritage Fund to the endangered property. It also alerts the international community to these situations in the hope that it can join efforts to save these endangered sites. The listing of a site as World Heritage in Danger allows the conservation community to respond to specific preservation needs in an efficient manner. Indeed, the mere prospect of inscribing a site on this List often proves to be effective, and can incite rapid conservation action.

Inscription of a site on the List of World Heritage in Danger requires the World Heritage Committee to develop and adopt, in consultation with the State Party concerned, a programme for corrective measures, and subsequently to monitor the situation of the site. All efforts must be made to restore the site's values in order to enable its removal from the List of World Heritage in Danger as soon as possible.

Inscription on the List of World Heritage in Danger is not perceived in the same way by all parties concerned. Some countries apply for the inscription of a site to focus international attention on its problems and to obtain expert assistance in solving them. Others however,

wish to avoid an inscription, which they perceive as a dishonour. The listing of a site as World Heritage in Danger should in any case not be considered as a sanction, but as a system established to respond to specific conservation needs in an efficient manner.

If a site loses the characteristics which determined its inscription on the World Heritage List, the World Heritage Committee may decide to delete the property from both the List of World Heritage in Danger and the World Heritage List. To date, this provision of the Operational Guidelines for the Implementation of the World Heritage Convention has been applied twice” (UNESCO 1992-2012e).

List in-danger

Afghanistan

Cultural Landscape and Archaeological Remains of the Bamiyan Valley (2003)

Minaret and Archaeological Remains of Jam (2002)

Belize

Belize Barrier Reef Reserve System (2009)

Central African Republic

Manovo-Gounda St Floris National Park (1997)

Chile

Humberstone and Santa Laura Saltpeter Works (2005)

Colombia

Los Katíos National Park (2009)

Côte d'Ivoire

Comoé National Park (2003)

Mount Nimba Strict Nature Reserve (1992) *

Democratic Republic of the Congo

Garamba National Park (1996)

Kahuzi-Biega National Park (1997)

Okapi Wildlife Reserve (1997)

Salonga National Park (1999)

Virunga National Park (1994)

Egypt

Abu Mena (2001)

Ethiopia

Simien National Park (1996)

Georgia

Bagrati Cathedral and Gelati Monastery (2010)

Historical Monuments of Mtskheta (2009)

Guinea

Mount Nimba Strict Nature Reserve (1992) *

Honduras

Río Plátano Biosphere Reserve (2011)

Indonesia

Tropical Rainforest Heritage of Sumatra (2011)

Iran (Islamic Republic of)

Bam and its Cultural Landscape (2004)

Iraq

Ashur (Qal'at Sherqat) (2003)

Samarra Archaeological City (2007)

Jerusalem (Site proposed by Jordan)

Old City of Jerusalem and its Walls (1982)

Madagascar

Rainforests of the Atsinanana (2010)

Mali

Timbuktu (2012)

Tomb of Askia (2012)

Niger

Air and Ténéré Natural Reserves (1992)

Palestine

Birthplace of Jesus: Church of the Nativity and the Pilgrimage Route, Bethlehem (2012)

Panama

Fortifications on the Caribbean Side of Panama: Portobelo-San Lorenzo (2012)

Peru

Chan Chan Archaeological Zone (1986)

Senegal

Niokolo-Koba National Park (2007)

Serbia

Medieval Monuments in Kosovo (2006)

Tanzania, United Republic of

Ruins of Kilwa Kisiwani and Ruins of Songo Mnara (2004)

Uganda

Tombs of Buganda Kings at Kasubi (2010)

United Kingdom of Great Britain and Northern Ireland

Liverpool – Maritime Mercantile City (2012)

United States of America

Everglades National Park (2010)

Venezuela (Bolivarian Republic of)

Coro and its Port (2005)

Yemen

Historic Town of Zabid (2000)

* Indicates trans boundary site

Appendix E Interview list

	Name	Position	Date (2012)	Location	Notes
1	Paul Macdonald	Researcher		Phone	
2	Colin Hunt	Researcher	25 th June	Phone	
3	P3	Researcher	3 rd July	Phone	
4	Fred De Ward	Gladstone regional Councillor	5 th July	Gladstone	
5	Matt Landos	Researcher	8 th July	Phone	
6	P6	Resident/ consultant for industry	9 th July	Gladstone	
7	P7	Fisher	9 th July	Gladstone	
8	P8	Researcher/ conservationist.	10 th July	Phone	
9	Wendy Tubman	Conservationist	10 th July	Phone	
10	John Sherrif	GPCL scientist	10 th July	Gladstone	Joint interview
11	Megan Ellis	GPCL scientist	10 th July	Gladstone	Joint interview
12	Cheryl Watson	Curtis island Resident/ conservationist	11 th July	Gladstone	
13	P9	Conservationist/ Researcher	11 th July	Gladstone library	
14	Allan Holland	Fisher	11 th July	Gladstone	
15	Jan Aarnes	Gladstone Resident	12 th July	Gladstone	Plus GCC meeting and Q&A with GPC
16	Errol "Blue" Thompson	Fisher, Gladstone LMAC rep.	12 th July	Gladstone	
17	Gareth Andrew	Fisher	13 th July	Gladstone	
18	Ted Wittinger	Fisher, owner fish market	13 th July	Gladstone	
19	Michael McCabe	Conservationist	13 th July	Phone	
20	Sue Arnold	Conservationist	15 th July	Phone	
21	Maxine Brushe	Gladstone Councillor	16 th July	Gladstone	
22	Neville Samuels	Crab fisheries	16 th July	Gladstone	Joint interview
23	Sam Samuels	Crab fisheries	16 th July	Gladstone	Joint interview
24	Colin Chapman	Gladstone Regional council	16 th July	Gladstone	
25	Gail Sellers	Gladstone Mayor	16 th July	Gladstone	
26	Jon Brodie	Researcher	17 th July	Phone	
27	Trevor Felzon	Fisher	17 th July 1pm	Gladstone	
28	Darren Brown	Fisher	17 th July	Gladstone	

29	David Sparkes	Gladstone citizen, journalist.	20 th July	Gladstone	
30	P10	Australian Maritime safety Authority (AMSA)	31 th July	Phone	
31	P11	Conservationist	31 st July	Phone	
32	David Williamson	Researcher	30 th July	Phone	
33	Elissa McKay	Sen. Larissa Waters media advisor.	3 rd August	Phone	
34	Ove Hough- Guldborg	Researcher	5 th August	Phone	

Appendix F The interview questions

School of Geosciences Honours 2012

Madeline Davey

Begin with: self-introduction, confidentiality: speak for self or organisation, recorded, transcript option, pull out, anonymous.

- Ask about job/ position:

1. Ask for a description of the port development, what happening who's in control when did it being, when did you find out etc.
2. What do you think of the development? Do you see both positive and negative impacts because of it?
3. What are the impacts you see as especially problematic?
4. Did you have any role in the consultation process pre-development? Or have you had any role with consultation, for the port or UNESCO or government since?
5. How and why do you think the development was approved?
6. Do you know who owns the GPCL?
7. Do you think, both prior to and since the development, the GBR WHA should include Gladstone?
8. Do you know why the region was initially included on the list?
9. Do you believe the federal government are taking the in danger threat seriously?
10. Do you feel the WHC have an active role in Gladstone, or the GBR in general?
11. What do you see as the role and purpose of world heritage listing?
12. Can you explain the different zoning boundaries in the region? (map them)
13. Considering the developments, do you think the region should be rezoned, if so how and why? MAP
14. Do you know why the Gladstone region was never included in the GBRMPA zone (only if mapping is accurate...)
15. Do you think the area is managed properly, according to environmental standards and WH values? Who do you see as the key manager of the region?

16. Do you see GBRMPA having a role in the management?
17. The media has reported a lot on the development, focusing on damaged and diseased fish. Have you noticed a decline in the state of the natural environment including to marine animals? If so what?
18. What do you think are the short term and cumulative impacts of this?
19. What are the major impacts this is having on local fisheries? Both commercial and recreational?
20. What is the response you have seen from Fisheries, if any?
21. Do you believe the compensation to the fisheries is enough?
22. There have been conflicting reports on the number of active fisheries in the region, do you know how many there are that are operational?
23. What is the major concern to the fisheries in the region?
24. Do you think the contamination is caused by the flood plumes or the dredging or neither?
25. Have you seen a noticeable decline in the water quality?
26. Do you believe enough is being done to ease the impacts of the development?
27. Is there a local emphasis on conservation of the region?
28. Are you aware of the environmental offsets? Do you know what they are and where they're occurring?

Appendix G The Media Coverage: a sample of the last 12 months of ABC media coverage of the GPD

Date	Title	URL
Tue Oct 2, 2012	Warning bell for Barrier Reef	http://www.abc.net.au/news/2012-10-02/warning-bell-for-barrier-reef/4292214
Wed Sep 26, 2012	Environmental concern over Gladstone harbour channel 'significant project'	http://www.abc.net.au/news/2012-09-26/concern-over-gladstone-harbour-channel-project/4282462
Wed Sep 26, 2012	Gladstone harbour channel plan a 'significant project'	http://www.abc.net.au/news/2012-09-26/gladstone-harbour-channel-plan-declared-significant-project/4281298
Fri Aug 31, 2012	Sick fish compo bid tipped to drag on	http://www.abc.net.au/news/2012-08-31/sick-fish-compo-bid-tipped-to-drag-on/4235494
Wed Aug 29, 2012	Commercial fishers left off water quality panel	http://www.abc.net.au/news/2012-08-29/commercial-fishers-left-off-water-quality-panel/4235494
Thu Aug 30, 2012	Gladstone fishers setback in compensation bid	http://www.abc.net.au/news/2012-08-30/fishers-lose-court-appeal/4232570
Wed Aug 1, 2012	Port rejects latest dredging sick fish claims	http://www.abc.net.au/news/2012-08-01/port-rejects-latest-claims-dredging-causing-sick/4169216
Mon Jul 23, 2012	Panel to deliver report card on Gladstone Harbour water	http://www.abc.net.au/news/2012-07-23/panel-to-deliver-report-card-on-gladstone-harbour/4147806
Thu Jul 19, 2012	New Gladstone fishing compo deal looms	http://www.abc.net.au/news/2012-07-19/new-fishing-compo-deal-looms/4141178
Tue Jul 17, 2012	Judge considers compensation case for fishers	http://www.abc.net.au/news/2012-07-17/judge-considers-compensation-case-for-fishers/4135566
Fri Jun 29, 2012	Dredging in Gladstone Harbour	http://www.abc.net.au/news/2012-06-29/dredging-in-gladstone-harbour/4100538
Thu Jun 28, 2012	Gladstone Ports Corp accused of cover-up	http://www.abc.net.au/news/2012-06-28/gladstone-ports-corp-accused-of-cover-up/4097246
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