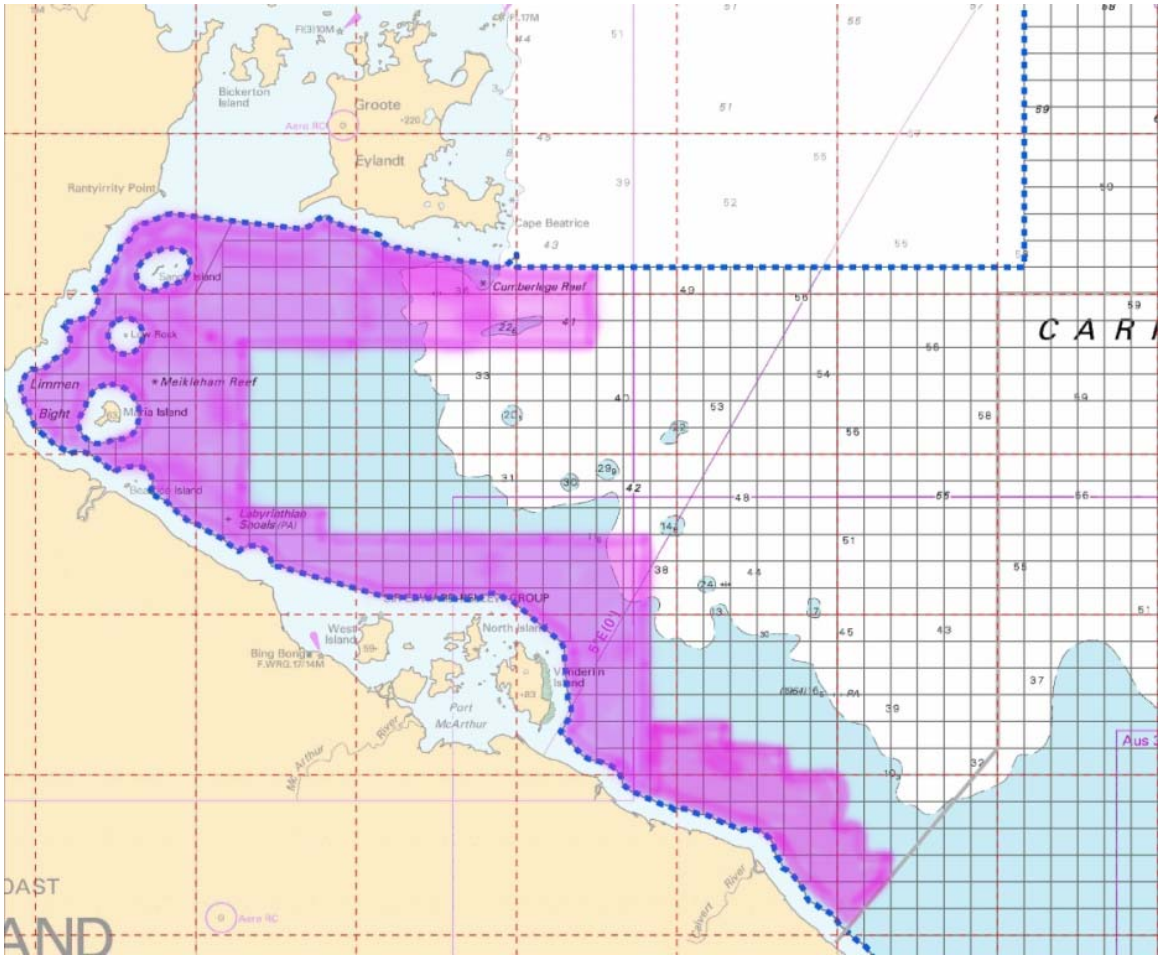
Recreational Fishing in Commonwealth Waters: a preliminary assessment



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Executive Summary

Commonwealth Waters broadly define the marine environment usually more than three nautical miles from the coastline. Waters between three nautical miles and the coastline (including some islands) are considered state/territory waters. Jurisdiction for recreational fishing in Commonwealth Waters usually falls to the state or territory adjacent to the Commonwealth Waters in question but this relationship is governed by the Offshore Constitutional Settlement between the state/territory government and the Australian Government and is variable. Nevertheless, in the majority of cases, state/territory recreational fishing rules such as possession and size restrictions apply to recreational fishers fishing in Commonwealth Waters.

Historically, most recreational fishing activity in Australia was concentrated in inshore waters (within 3 nautical miles). Few boats other than skilled gamefishers and charter operators ventured offshore. However, with improved navigational and safety equipment, more and more recreational fishers are venturing further offshore. Advances in fishing tackle and sharing of specialized techniques through magazines, DVDs and other media has resulted in more fishers accessing offshore fishing grounds.

Despite the anecdotal increasing participation in offshore fishing events, surveys of this component of the recreational fishery are limited and published scientific data on participation, catch and effort is scant.

This report sets out to review existing data sources and identify species and locations of importance to recreational fishers accessing Commonwealth Waters. The report was commissioned by the Department of the Environment, Water, Heritage and the Arts to assist in Marine Bioregional Planning.

A preliminary survey of fishers' attitudes towards marine protected areas in Commonwealth Waters is also reported on and the findings reiterate that recreational fishers are supportive of conservation measures but would like to see evidence of the impact posed by recreational fishing.

Despite the lack of detailed information, this paper highlights the significance of Commonwealth Waters to the Australian recreational fishing community. Many species such as billfish, tuna and other pelagic species are predominantly targeted in Commonwealth Waters and seldom venture into coastal waters. Ongoing access to these species is vital to support the economic and socially important gamefishing sector and its associated tournaments. There are however, concerns for some species (notably deepwater demersal species) about which very little is known. Greater protection for these species may be warranted and there is an urgent need for better data collection from these fisheries.

1.0 Project Scope

This report has been prepared to gather industry information on the location of areas and species of importance for private recreational fishing activities in Commonwealth Waters (not including charter operations) to add to existing data (Moore et al. 2007) to assist the Australian Government's marine bioregional planning process.

This report will provide DEWHA with information on the location and nature of highly valued recreational fishing locations within Commonwealth Waters (i.e. beyond state/Northern Territory waters) for each Marine Planning Region in Australia's Exclusive Economic Zone. In terms of effort, the bulk of recreational fishing areas lie predominantly within State/Territory waters, however, Commonwealth Waters contain access to species and recreational fishing experiences that cannot be duplicated in State/Territory waters. This report considers where these important recreational fishing areas extend into or influence activity in Commonwealth Waters, as well as the location of important recreational fishing areas occurring wholly within Commonwealth Waters.

The focus of information developed for this report is private recreational fishing activity (i.e. *not* commercial, charter or indigenous (customary) fishing activity) and covers, as far as possible, the following:

- geographic location of important ***recreational fishing areas*** in Commonwealth Waters in four of the five marine regions (Southwest, Northwest, North and East Marine Regions,
- key characteristics of recreational fishing locations including numbers of people involved per year, target species, type of gear used and seasonality of recreational fishing activity in each of the important ***recreational fishing areas,*** *and*,
- a general description of any trends or changes in recreational fishing activity and its location in Commonwealth Waters over time.

The concept of importance is one that is not easily measured in recreational fishing activity. While recreational fishing is an activity that generates significant economic activity, the "product" of recreational fishing is for many a social experience. Importance is not measured in terms of quantity of catch or return on time and income invested. Importance cannot also be measured in terms of effort expended in an area or numbers of visitors. Importance for recreational fishers relates more to opportunity or ability to access unique and interesting fishing opportunities.

For many fishers a suitable substitute leisure activity for the recreational fishing experience simply does not exist. Recreational specialisation is the favoured paradigm for understanding the multi-dimensional aspects of fishers' attitudes and behaviours (Bryan, 1977; Ditton et al., 1992; Oh and Ditton, 2006). Along a continuum of specialisation, various different groups of fishers can be identified based on factors such as frequency of participation, choice of equipment, the importance of catching fish, and social setting of the activity (Bryan, 1977). Using the concept of recreational specialisation, various "sub-sectors" of fishers can be identified. This is important from

the perspective of marine park planning because it means that without careful consideration, equity issues may arise because sub-sectors may be: a) impacted more than others due to the spatial arrangement of MPAs, and/or b) unable to find a similar fishing experience in an area remaining open to fishing.

This is a preliminary report incorporating a review of relevant scientific studies, data and other existing information on the location, magnitude and trends associated with private recreational fishing activities (excluding charter operations) in Commonwealth Waters for each marine bioregion. It is not intended to be a review of the bioregionalisation and Commonwealth marine park planning process. This report cannot be considered as a comprehensive overview of all recreational fishing activity in Commonwealth Waters. Importantly, limited input has been provided by the Gamefishing Association of Australia who has chosen to respond to DEWHA separately.

2.0 Methods

The first part of this project consisted of a desktop study to collate existing sources of information on recreational fishing in Commonwealth Waters. Sources consisted of published reports and peer-reviewed articles as well as books and contemporary fishing literature. Expert advice and information was obtained from recreational fishers with a long history and knowledge of fishing in Commonwealth Waters. In most cases, interviewees requested to remain anonymous and the authors respected this request.

The second component involved the preparation of a survey to gain information about fishing activity in Commonwealth Waters as well as perceptions about fishing in Commonwealth Waters. The survey design was improved with advice from Dr Steve Sutton from James Cook University and questions were modeled on similar questions used in previous studies on Queensland recreational fishers.

The survey was emailed and posted to 30 peak bodies representing sport, recreational and gamefishers around the country. Recfish Australia also developed an online survey to gather additional information on the activities and opinions of recreational fishers who fish in Commonwealth Waters (excluding charter fishing activities). The survey was conducted between October 2009 and February 2010 as an online survey with links from the Recfish Australia website. Participants were invited through recreational fishing magazines and fishing forums (Fishing World www.fishingworld.com.au, Fish and Boat North Queensland http://fishandboat.com.au/, and Ausfish http://www.ausfish.com.au/and through direct mailing to an extensive distribution network. A total of 175 responses were obtained.

3.0 Jurisdictional arrangements

The Australian Fisheries Management Authority is responsible for the day-to-day management of Commonwealth fisheries. For further information regarding these fisheries visit the AFMA website[1]. The Commonwealth has generally limited its jurisdiction to commercial fishing with the state/territory fisheries departments assuming responsibility for management of recreational fishing, which is managed using combinations of size and bag limits as well as gear regulations, closed seasons and closed areas. Additionally some species are fully protected from exploitation. This state management of recreational fishing extends into Commonwealth Waters.

Commonwealth Waters are broadly defined as beyond 3 nautical miles (nm) out to the limit of the Australian fishing zone (200 nm). In some areas, notably the Northern Territory and South Australia, straight-line baselines push the extent of state/territory waters a long way offshore and Commonwealth Waters may only start further than 3 nm. For the purposes of this study, the AMSIS (Australian Marine Spatial Information System) GIS layer was used to define Commonwealth Waters, excluding the Great Barrier Reef Marine Park (www.ga.gov.au/amsis).

4.0 Recreational fishing in Commonwealth Waters

4.1 History

Indigenous inhabitants of Australia fished for food (subsistence), culture (customary fishing) and for recreation and focussed their fishing efforts inshore, conducting little if any fishing greater than 3 nm offshore (Roughley 1957). Exceptions to this occurred near settlements that were situated on islands that were already 3 nm or more offshore. This was probably due to the lack of suitable boats and gear, as well as a lack of need due to the relatively abundant supply of fishes in inshore waters during historical times prior to and during the early years of European settlement (Flinders 1814, Roughley 1957).

For the same reasons, the majority of recreational fishing effort in Australian waters, probably up until the 1930s was also focussed inshore of 3 nm. In February 1933 Australia's first marlin was landed off Montague Island, NSW (Smith 1935, cited in Roughley 1957), signalling the symbolic birth of offshore recreational fishing in this country (Roughley 1957, Pollard 1971). Shortly after, the NSW Government commissioned well known angler and author Zane Grey to conduct a survey of the gamefishing potential of NSW waters. Grey subsequently achieved significant captures of large sharks, billfish and tunas (Pollard 1971), confirming the presence of a significant gamefishery. After a brief hiatus during World War Two, recreational fishing in Commonwealth Waters continued to increase in popularity (Roughley 1957) in line with population growth, increasing prosperity, technology and leisure time.

The establishment of the Cairns black marlin fishery in the 1960s brought gamefishing in Australia to world prominence. Offshore fishing effort in Commonwealth Waters now

[1] www.afma.gov.au

occurs throughout the entire country. The only national figure (now 10 years old) shows a relatively small (approx 4-5% in 2000) but growing component of the total effort (Henry and Lyle 2003, Platten et al. 2007a, b, 2008a, b). In some areas, the level of recreational fishing in Commonwealth Waters is much higher (up to 47% of all effort at Narooma/Bermagui), representing a very significant contribution to the economies and social fabric of coastal Australia (Ernst & Young 2006).

4.2 Trends

4.2.1 Access

The potential for private recreational fishers to access Commonwealth Waters has increased in recent years due to improvements in boats and outboard engine technologies, improvements in navigation equipment and GPS, and improvements in fishing gear (Griffiths and Pepperell 2006). Interviews with recreational fishers from several states during this project have also suggested that the recent proliferation of inshore fishing closures, declines in catch rates for some inshore fish stocks, and increases in minimum sizes for some species are also significant drivers resulting in increased recreational interest in offshore areas. On the other hand, due the smaller average size of the boats used by recreational fishers (compared to commercial and charter boats), access for the private recreational fleet to offshore areas remains moderated by factors such as weather conditions, particularly wind strength (Platten et al. 2008b), as well as economic factors such as the price of fuel. Gear restrictions that limit anglers to hook and line fishing activities also ensure that recreational fishing for demersal fishes seldom occurs at depths beyond 200 to 300 metres.

Furthermore, recently there have been moves in some jurisdictions to effectively limit recreational fishing access to offshore waters through the proposed tightening of boating regulations (e.g. preventing vessels less than 4.8 metres legal access to offshore waters, Victoria Department of Transport 2009). With around 70% of the 500,000 plus vessels used for fishing in Australia being in the 4 to 5 metre range (Henry and Lyle 2003), implementation of regulations such as those suggested by the Victoria Department of Transport would certainly cause a significant reduction in recreational fishing effort in the Commonwealth Waters of those jurisdictions, depending on the average size of the boats used offshore and the willingness or ability of fishers to purchase larger vessels. Large offshore developments such as the proposed Liquefied Natural Gas (LNG) projects for the North West Shelf region off the Kimberly coast in Western Australia can also result in significantly restricted access due to restrictions on movements of recreational fishing boats around offshore structures (Woodside Energy 2009).

4.2.2 Private versus charter vessels

The National Recreational and Indigenous Fishing Survey (Henry and Lyle 2003) found that 43% of recreational fishing activity in Australia occurs from boats. Of this, more than 93% of fishing events were conducted from private fishing boats, with only 4% being conducted from charter boats and the remainder from hire boats (Henry and Lyle 2003). Similar figures are evident from a Queensland statewide survey where the percentage of boat only fishing in saltwater has increased from 27% in 1996 to 35% in

2004 (McInnes 2006). Certainly a significant proportion of charter boats fish in Commonwealth Waters, however, without additional information on the percentage of private fishing boats used offshore, it is difficult to ascertain the proportion of recreational fishing effort in Commonwealth Waters that originates from private fishing boats compared to charter vessels. Such a distinction is also largely academic when existing statewide surveys consider charter boats as simply another platform for recreational fishers and don't distinguish between the two activities in their reporting of catch and effort.

4.2.3 Catch rates

There are scarce reliable data which can be used to infer trends relating to catch rates of recreational fishers in Commonwealth Waters. The National Recreational and Indigenous Fishing Survey (Henry and Lyle 2003) provided a "snapshot" of recreational fishing activity throughout Australia, and therefore cannot be used with any confidence to detect or predict trends. Indeed, without well designed, specifically targeted longitudinal research encompassing a variety of data sources (Steffe et al. 1996, Pepperell and Henry 1997, Griffiths and Pepperell 2006), the significant variations in recreational catch rates at various time scales (Gartside et al. 1999, Lowry et al. 2007) will most likely make the process of detecting longer term catch trends by the recreational fishery in Commonwealth Waters a difficult one to achieve with any precision. However general deductions of catch trends may be possible through targeted research for some specific fisheries (e.g. Campbell et al. 2003, Lowry and Murphy 2003, Ernst & Young 2004, 2006) or by interrogating statewide surveys which cover a significant timescale (i.e. the Queensland recreational fishing diary program from 1997 to 2004). It is likely that a patchwork approach to national monitoring of recreational fisheries is possible provided there is sufficient co-operation from State fisheries agencies (Griffiths and Pepperell 2006).

4.2.4 Economic value

While recreational fishing in Commonwealth Waters represents a relatively small component of the total effort (Henry and Lyle 2003, Platten et al. 2008a, b), due to the higher costs involved with offshore fishing, its economic impact is disproportionately large (Pepperell 1994b, Ernst and Young 2004, Ernst and Young 2006).

Because of the lack of comprehensive and consistent surveys of recreational fishing, deduction of the actual economic value attributable to recreational fishing in Commonwealth Waters on a national level is difficult (Galeano et al. 2004). Overall, expenditure in the recreational fishing sector on a national level (including marine, estuarine and freshwater) is in the region of several billion dollars ($1.85 billion in 2000 – Campbell & Murphy 2005). If conservatively, 10% of the expenditure occurs on fishing in Commonwealth Waters (adjusting for growth of the sector since 2000), this then equates to a crude but conservative estimate of $185 million associated with fishing in Commonwealth Waters. The actual figure is likely to be far higher. Ernst and Young (2006) calculated a net economic value of $76.4 million in 2006-06 for just two NSW regions (Port Stephens and Narooma/Bermagui).

4.3 Fishing Methods

4.3.1 Linefishing for Pelagic fishes

Trolling and casting lures and baits are two of the most common methods recreational fishers use to target pelagic fishes in Commonwealth Waters. Drifting live and dead baits set at various levels in the water column is also popular (Figure 18). All of these activities occur from 3 nm out to the limits of the ranges of the boats used, as these methods are not restricted by water depth. During the process of targeting pelagic fishes, recreational fishers generally do not interact with benthic communities. Indeed, trolling and casting do not interact with demersal fishes and benthic communities in offshore waters, though in certain circumstances when targeting pelagic fish recreational fishers may anchor to hold over a stationary feature of interest. This raises the possibility of anchor damage occurring. However the anchoring method is more frequently employed in shallower waters and is rarely (if ever) used in depths of around 100m or more and would certainly pose no higher environmental risk than the anchoring activity of other marine environment user groups.

4.3.2 Linefishing for demersal fishes

Targeting of demersal fishes in Commonwealth Waters is most popular in the shallower areas (60 metres or less) and becomes less common as water depths increase. Gear restrictions that limit anglers to hook and line fishing activities also ensure that recreational fishing for demersal fishes seldom occurs at depths beyond 200 to 300 metres, although the increased availability of electric reels together with braided line technology has seen a small number of recreational fishers targeting demersal fishes on offshore seamounts and plateaus in up to 500 metres of water (Levitt 2009).

4.3.3 Linefishing for sharks and rays

Studies suggest that targeting of sharks and rays by recreational anglers in Commonwealth Waters is uncommon, especially in the tropical and subtropical regions of Australia. In these areas, elasmobranch captures are generally considered as bycatch, resulting in 90-96% of these captures being released (McInnes 2008, Lynch et al. 2009). Survival rates of released sharks have not been comprehensively studied, however they generally appear high, with survival rates of around 90% or higher being expected for most species, depending on several factors (McLoughlin and Eliason 2008). In temperate latitudes, however, there is an increased emphasis on targeting and taking school, gummy, mako and sometimes seven gill shark in areas such as Victoria and Tasmania, where these species are highly valued as foodfish.

Even so, interviews with recreational fishers from these areas suggest that over 50% of temperate sharks are released. This trend probably explains the overall release rate determined for sharks and rays (81.8%) in the National Recreational Fishing Survey (Henry and Lyle 2003). Less than 10% of all shark and ray captures by recreational fishers occur in Commonwealth Waters (Henry and Lyle 2003). Strict bag and size limits in most states provide further protection for sharks and rays from recreational fishers.

4.3.4 Pots and traps for crustaceans

Targeting of various species of crustaceans (crabs, lobsters and bugs) in Commonwealth Waters using pots and traps is most popular in the shallower areas (60 metres or less) and becomes less common as water depths increase.

4.3.5 Spearfishing

Spearfishers target pelagic and demersal finfish as well as crustaceans, but due to the nature of this activity their effectiveness is generally limited to water depths less than approximately 30 metres. Some experienced spearfishers also specialise in bluewater fishing for pelagic species around Fish Aggregating Devices (FADs).

4.4 Catch and release practices

Over the past decade, the recreational fishing industry has invested considerable research into developing best practice methods for releasing a range of species regularly encountered by recreational fishers. The culmination of this research was the *National Strategy for the Survival of Released Line Caught Fish*. At the end of 2007, there were 20 projects under the National Strategy with a total investment of $7.3 million of which FRDC provided $2.4 million and state agencies, industry groups and others have contributed $4.9 million. Prior to the National Strategy survival rates were known for only 4 species but at the end of 2007 this had been extended to 22 species and the list continues to grow.

During the strategy a range of fact sheets and information products were produced on the results of the research and improvements in practices. An immensely popular media campaign, “Gently Does It” communicated the released fish survival message to millions of recreational fishers. These products continue to be available through the Recfishing Research website and continue to be updated as new information becomes available. (www.recfishingresearch.org/released_fish_survival.asp). Initiatives developed as part of the national strategy to improve survival of released fish are widely utilized by recreational fishers operating in Commonwealth Waters.

4.5 Codes of Practice

A national code of practice for recreational and sport fishing was identified as a need in the 1994 National Recreational Fishing Policy. In 1995, working in collaboration with State/Territory and Australian Government agencies, recreational fishers and peak bodies, Recfish Australia developed the first National Code of Practice for Recreational and Sportfishing. The code was refined and updated in 2008. Considerable effort was made to include reference to best practice guidelines (such as the released fish strategy) and to highlight the need for ethical treatment of captured fish.

The code has the support of the Aquatic Animal Welfare Working Group and has been endorsed by State/Territory fisheries management agencies including PIRSA (South Australia)

http://www.pir.sa.gov.au/fisheries/recreational_fishing/code_of_practice2

and Fisheries Queensland

http://www.dpi.qld.gov.au/documents/Fisheries_RecreationalFishing/Rec-fishing-regs.pdf.

Other recreational fishing organisations have similar codes of practice which dictate how competitions can be run and what species are eligible for records and point scoring (Game Fishing Association of Australia, Australia National Sportfishing Association and Australian Underwater Federation: Spearfishing). In most cases, these codes impose restrictions over and above existing legislation in the interest of conservation of iconic species. Recfish Australia also launched the first national environmental assessment of tournament fishing (NEATFish) which is a five star rating system that considers the tournament's environmental impact alongside social and economic contributions to local communities (www.neatfish.com). The best practices encompassed by the codes of practice and NEATFish are widely utilised by recreational fishers operating in Commonwealth Waters.

4.6 Participation in research

Stakeholder participation in research can lead to several advantages including: reduced operational expenses for research projects as stakeholders are often willing to provide resources (e.g. boats) and time free of charge or with nominal cost, and improved stakeholder understanding and acceptance of research results with greater awareness of environmental problems and the need for adopting solutions (Gasteyer and Flora, 2000). Engagement of stakeholders such as recreational fishers in research also helps to demystify research, so removing or diminishing an important psychological barrier that often precipitates adversarial or obstructive debates from the discussion of research findings (Jentoft, 2005).

Unlike commercial fishers which are required to submit compulsory logbook returns, recreational fishers offer information voluntarily and without this commitment to providing information to better inform management, a significant source of information would be lost. With provision of this information, comes a trust that the information will be used appropriately in an open and transparent manner.

Recreational fishers remain committed to collection and dissemination of research data either through surveys of catch and effort or by participating in tagging and mark-recapture studies. There is a long history of recreational fishers working with researchers on fish tagging, the provision of samples and in habitat research. A large proportion of the effort expended by recreational fishers to assist researchers (and particularly that associated with tagging of pelagic sport and gamefish) occurs in Commonwealth Waters.

5.0 Target species in Commonwealth Waters

Griffiths and Pepperell (2006) found that recreational fishers took a total of 1164 taxa, of which 245 were commercially important in 20 of the 21 Commonwealth fisheries assessed. The list in Table 1 has been compiled from published data and fisher interviews to highlight the most common fish species captured by recreational fishers in Commonwealth Waters. To determine species distributions, we have used information from Randall et al. (1990), Kutier (1993), Kaiola et al. (1993), Gommon et al (1994), Last and Stephens (1994) and Randall (2005). Other sources of information used included phone, e-mail and face to face interviews with fishers from around Australia, as well as Fishbase[2], the Australian Faunal Directory[3], and the Australian Fish Names Standard[4].

Table 1. Species encountered by recreational fishers in Commonwealth Waters.
E = East bioregion, SE = South East bioregion, SW = South West bioregion, NW = North West bioregion, N = North bioregion - = species absent, + = species present, but not generally targeted, ++ = sometimes targeted, +++ = frequently targeted .

Pelagic species	**Bioregion**				
Billfish	**E**	**SE**	**SW**	**NW**	**N**
Broadbill Swordfish *Xiphius gladius*	+++	+++	+++	++	+
Black Marlin *Makaira indica*	+++	++	++	+++	++
Blue Marlin *Makaira nigricans*	+++	+	++	+++	+
Striped Marlin *Tetrapturus audax*	+++	+++	+	+	-
Shortbilled Spearfish *Tetrapturus angustirostris*	+	+	+	+	-
Indo-Pacific Sailfish *Istiophorus platypterus*	+++	+	+	+++	++
Tunas and Bonitos					
Albacore *Thynnus alalunga*	++	++	++	+	-
Bigeye Tuna *Thynnus obesus*	++	++	+	+	+
Bonito *Sarda orientalis, S. australis*	++	++	++	++	+
Dogtooth Tuna *Gymnosarda unicolour*	+++	-	-	+++	+
Frigate Mackerel *Auxis thazard*	++	++	++	+	+
Longtail Tuna *Thynnus tonggol*	+++	+	+	++	+++
Mackerel Tuna *Euthynnus affinis*	+++	+	+	+++	++
Skipjack Tuna *Katsuwonus pelamis*	+++	++	++	+++	+
Southern Bluefin Tuna *Thynnus maccoyii*	+	+++	+++	+	-
Yellowfin Tuna *Thynnus albacares*	+++	++	++	+++	+
Mackerels					
Grey Mackerel *Scomberomorus semifasciatus*	+++				++
School Mackerel *Scomberomorus queenslandicus*	+++	-	+	++	+
Shark Mackerel *Grammatorcynus bicarinatus*	+++	-	+	+++	+
Spanish Mackerel *Scomberomorus commerson*	+++	+	+++	+++	+++
Spotted Mackerel *Scomberomorus munroi*	+++	+	-	++	++
Wahoo *Acanthocybium solandri*	+++	+	+	+++	++
Carangidae					
Amberjack *Seriola dumerili*	+++	+++	+++	++	-
Giant Trevally *Caranx ignobilis*	+++	-	+	+++	+++

[2] http://www.fishbase.org/search.php
[3] http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/home
[4] http://www.fishnames.com.au/

	Bioregion				
Carangidae (cont)	**E**	**SE**	**SW**	**NW**	**N**
Golden Trevally *Gnathanodon speciosus*	+++	-	+	+++	+++
Other trevallies *Caranx* spp., *Carangoides* spp.	+++	++	++	+++	+++
Queenfish *Scomberoides* spp.	++	-	-	+++	+++
Rainbow Runner *Elagatis bipinnulata*	+	+	-	+	+
Samsonfish *Seriola hippos*	+++	+++	+++	++	-
Silver Trevally *Pseudocaranx dentex, P. wrighti, P. georgianus, P. dinjerra*	+++	+++	+++	+++	-
Yellowtail Kingfish *Seriola lalandi*	+++	+++	+++	+	-
Other teleosts					
Barracuda *Sphyraena* spp.	++	+	+	++	+
Cobia *Rachycentron canadum*	+++	++	+++	+++	++
Mahi Mahi *Coryphaena hippurus*	+++	+++	+++	+++	+
Sharks					
Blue Shark *Prionace glauca*	++	++	+	+	-
Grey Nurse *Carcharias taurus*	+	+	+	+	-
Hammerhead *Sphyrna* spp. (various species)	++	++	++	+	+
Mako *Isurus* spp.	++	++	++	-	-
Thresher *Alopias* spp. (various species)	+	+	+	+	-
Tiger Shark *Galeocerdo cuvier*	++	++	++	+	+
Whaler Sharks *Carcharhinus* spp. (various species)	++	++	++	++	+
White Shark *Carcharodon carcharias*	+	+	+	+	-
Bait species					
Blue Mackerel *Scomber australasicus*	+++	+++	++	-	-
Jack Mackerel *Trachurus* spp.	++	++	++	-	-
Pilchards/Sardines *Sardinops neopilchardus*	+	++	++	+	+
Prawns (various species)	++	+	+	++	++
Squid (various species)	++	++	++	+	+
Yellowtail Scad *Trachurus novaezelandiae*	+++	+++	++	-	-
Demersal species					
Tropical reefs					
Bonefish *Albula* spp.	+	-	-	++	+
Chinaman fish *Symphorus nematophorus*	+	-	-	+	+
Coral trouts *Plectropomus* spp. and *Variola* spp.	+++	-	++	+++	+++
Giant Herring *Elops hawaiensis*	++	-	-	++	++
Golden Snapper *Lutjanus johnii*	+++	-	-	+++	+++
Green Jobfish *Aprion virescens*	+++	-	+	+++	+
Groupers and rock cods *Epinephelus* spp.	+++	++	+++	+++	++
Maori Wrasse *Cheilinus undulatus*	+	-	-	+	+
Mangrove Jack *Lutjanus argentimaculatus*	+++	-	+	+++	+++
Other lethrinids *Lethrinus* spp.	+++	+	++	+++	+++
Other lutjanids *Lutjanus* spp	+++	+	++	+++	+++
Other wrasse *Cheilinus* spp., *Coris* spp.	++	+	+	++	++
Painted Sweetlip *Diagramma labiosum*	++	+	-	++	++
Parrotfishes Scaridae	++	-	-	++	+
Pearl Perch *Glaucosoma scapulare*	+++	-	-	-	-
Red Bass *Lutjanus bohar*	+	-	-	+	+
Red Emperor *Lutjanus sebae*	+++	-	+	+++	+++
Red Throat Emperor *Lethrinus miniatus*	+++	-	+	+++	+++
Sea breams *Gymnocranius* spp.	+++	+	-	+++	++
Snapper *Pagrus auratus*	+++	+++	+++	+++	-
Snub Nosed Dart *Trachinotus blochii and T. anak*	++	-	-	+++	+++

	Bioregion				
Tropical Reefs (cont)	**E**	**SE**	**SW**	**NW**	**N**
Spangled Emperor *Lethrinus nebulosus*	+++	-	+++	+++	+++
Teraglin *Atractoscion aequidens*	+++	+	-	-	-
Triggerfish Balistidae	+	-	-	+	+
Tuskfish *Choerodon* spp.	+++	+	++	+++	++
Tropical lobsters *Panulirus* spp.	+++	-	-	+++	++
Western Rock Lobster *Panulirus cygnus*	-	-	+++	+++	-
Rocky reefs					
Australian Salmon *Arripis* spp.	++	+++	+++	+	-
Bigeye (*Priacanthus* spp.)	+	+	-	+	+
Black Jew *Protonibea diacanthus*	+	-	-	++	+++
John Dory *Zeus faber*	+	++	++	+	-
Morwong, Dusky *Dactylophora nigricans*	+	+	+	-	-
Morwong, Jackass *Nemadactylus macropterus*	+	++	++	-	-
Morwongs, other *Cheliodactylus* spp., *Nemadactylus* spp.	++	+++	+++	-	-
Mulloway *Argyrosomus japonicus*	+++	+++	+++	+++	-
Ocean Leatherjacket *Nelusetta ayraudi*	+	++	++	-	-
Pearl Perch *Glaucosoma spp.*	+++	-	-	-	-
Pigfish *Bodianus* spp. (several species)	++	++	++	++	+
Striped Trumpeter *Latris lineata*	+	+++	+++	-	-
Sweep *Scorpis* spp.	+	+	+	-	-
Tailor *Pomatomus saltatrix*	+++	++	+++	++	-
Tarwhine *Rhabdosargus sarga*	+++	++	++	++	+
Trumpeter *Latridopsis forsteri*	+	++	-	-	-
WA Dhufish *Glaucosoma herbarium*	-	-	+++	+++	-
Southern Rock Lobster *Jasus edwardsii*	+	+++	+++	-	-
Eastern Rock Lobster *Jasus verreauxi*	++	+	-	-	-
Shelf and slope					
Alfonsino *Beryx splendens*	++	++	-	-	-
Barracouta *Thyrsites atun*	+	++	+	-	-
Blue Warehou *Seriolella brama*	++	++	++	-	-
Boarfish Family Pentacerotidae	+	+	+	-	-
Deep sea dories Families Zeidae and Cyttidae	+	++	++	+	-
Eastern School Whiting *Sillago flindersi*	++	++	-	-	-
Flathead , Tiger *Neoplatycephalus richardsoni*	++	+++	-	-	-
Flathead, Blue Spotted *Platycephalus caeruleopunctatus*	++	+++	-	-	-
Flathead, Northern Sand *Platycephalus arenarius*	++	-	-	++	+
Flathead, Southern Sand *Platycephalus bassensis*	-	+++	+++	-	-
Flatheads, other (Platycephalidae)	++	+++	++	++	+
Flounders Families Bothidae, Psettodidae, and Pleuronectidae	+	++	++	+	+
King George Whiting *Sillaginodes punctata*	-	+++	+++	-	-
Lings *Genypterus* spp.	+	++	+	-	-
Nannygai / Redfish *Centroberyx* spp.	+	++	++	+	-
Ocean Perch *Helicolenus* spp.	+	++	+	-	-
Rays Bream *Brama brama*	+	+	+	-	-
Red Gurnard *Chelidonichthys kumu*	++	++	++	-	-
Rock cods *Pseudophycis* spp.	+	+	+	-	-
Silver warehou *Seriolella punctata*	++	++	++	-	-
Elasmobranchs					
Elephantfish *Callorhinchus milii*	-	++	++	-	-
Gummy Shark *Mustelus antarcticus*	++	+++	+++	-	-

	Bioregion				
Elasmobranchs (con't)	**E**	**SE**	**SW**	**NW**	**N**
School Shark *Galeorhinus galeus*	++	+++	+++	-	-
Seven Gill Shark *Notorhynchus cepedianus*	+	++	++	-	-
Crustaceans					
Blue Swimmer Crab *Portunus pelagicus*	++	++	++	+	+
Bugs *Ibacus* spp., *Thenus* spp.	++	++	+	+	+
Seamounts and dropoffs					
Bar Cod *Epinephelus octofasciatus, E. ergastularius*	++	++	-	-	-
Bass Groper / Wreckfish *Polyprion americanus*	++	++	++	-	-
Black Cod *Epinephelus daemelii*	+	-	-	-	-
Blue Eye Trevalla *Hyperoglyphe Antarctica*	++	++	+	-	-
Comet Grouper *Epinephelus morrhua*	++	-	-	+	+
Flame Snapper *Etelis coruscans*	++	-	-	+	+
Gemfish *Rexea solandri*	++	++	+	-	-
Hapuku *Polyprion oxygeneios*	++	++	+	-	-
Oblique Banded Groper *Epinephelus radiatus*	++	-	-	+	-
Rosy Jobfish *Pristipomoides filamentosus*	++	+	+	+	-
Rusty jobfish *Aphareus rutilans*	++	-	-	++	+

Table 1 shows that many of the species taken by recreational fishers in Commonwealth Waters are not present in all bioregions. Others may be present in several bioregions, but not targeted, or targeted only infrequently, or targeted only in a particular bioregion. Others may occur only in one bioregion, where they may or may not be specifically targeted, usually depending on whether the species is protected by legislation (e.g. Black cod, Maori Wrasse) or how desirable the species is to the recreational sector.

Table 2. Percentage of the total annual recreational harvest for each species group taken from Commonwealth Waters (from Henry and Lyle 2003).

Species /species group	**% of catch taken in Commonwealth Waters**
Coral Trout (all species)*	84.7%*
Emperors (Lethrinidae)*	70.7 %*
Rock Cod / Gropers*	64.7 %*
Sea Perch / Snappers (Lutjanidae)*	50.2 %*
Wrasse / Tuskfish (all species)*	30.9 %*
Red Emperor*	29.9 %*
Mackerels (all species)*	25.6 %*
Cod (Serranidae)*	24.9 %*
WA Dhufish	82.10%
Tunas / Bonitos (all species)	32.20%
Snapper (*Pagrus auratus*)	26.50%
Morwong (all species)	25.30%
Mulloway / Jewfish (all species)	17.10%

Species /species group	% of catch taken in Commonwealth Waters
Seriola spp.	16.80%
Trevally (all species)	14.90%
Scads / Mackerel	10.50%
King George Whiting (*Sillaginodes punctata*)	10.20%
Lobsters (all species)	10.00%
Sharks / Rays (all species)	10.00%
Blue Mackerel	8.30%
Pike	7.20%
Squid (all species)	7.00%
Leatherjackets (all species)	5.80%
Garfish (all species)	5.60%
Whiting (all others)	5.10%
Sweep	4.90%
Grunters/Trumpeters (all species)	3.80%
Australian Herring	3.30%
Flathead (all species)	2.80%
Australian Salmon (*Arripis* spp.)	2.00%
Blue Crab (*Portunus pelagicus*)	2.00%
Dart (*Trachinotus* spp.)	1.50%
Bream (*Acanthopagrus* spp., all species)	0.70%
Tailor (*Pomatomus saltatrix*)	0.60%
Catfish (all species)	0.60%
Flatfish (all species)	0.60%
Abalone (all species)	0.50%
Barramundi (*Lates calcarifer*)	0.40%
Mullet (all species)	0.20%

* A significant proportion of this figure is probably taken from the Great Barrier Reef Marine Park

Data obtained by Henry and Lyle (2003) on the proportion of the recreational fishing catch taken from Commonwealth Waters (Table 2), indicated that the wide range of species captured offshore appear to fall into two main categories. The first group are those species which occur almost exclusively offshore, and which are specifically targeted by anglers when they undertake trips into Commonwealth Waters. The second group of species for which the proportion of the total catch taken offshore was small (not more than 10% of the total catch, see shaded species in Table 2), were described as incidental captures. This meant that fishers tended not to specifically target these species when fishing offshore, in many cases because they are encountered infrequently or used as bait only.

With the increase in no fishing zones in inshore (State) waters in recent years, the percentages of harvest taken from Commonwealth Waters are likely to have increased for many of the species listed in Table 2 over the past nine years.

6.0 Location of areas of importance to recreational fishing

This section outlines the geographical locations that have been nominated by recreational fishers as of importance to their fishing activities in Commonwealth Waters. In general terms, recreational fishers seldom draw a distinction between fishing in State/Territory Waters and Commonwealth Waters and in reality will adjust their fishing behaviours dependent on the location of their target species. A single trip could include time spent in State/Territory Waters as well as Commonwealth Waters.

These data were collected from phone, e-mail and face to face interviews with prominent recreational fishers, from correspondence with representatives of peak bodies and associations, from articles published over many years in fishing magazines including Fishing World, Modern Fishing, Bluewater Magazine, Club Marine, QLD Fishing Monthly, NSW Fishing Monthly, Barra, Bass and Bream, internet forums and from data published in the scientific and grey literature. Harmon and Studden (2007) was also consulted.

Most of the areas of interest to recreational fishers in Commonwealth Waters are associated with physical and oceanographic features that attract or congregate fishes and/or form habitat for target species of interest. Locations that also provide safe anchorages or a degree of shelter from adverse weather also tend to be highly favoured, especially for locations that were further offshore. Typical locations mentioned by fishers included coral and rocky reefs, canyons, seamounts, offshore islands, and predictable ocean fronts where currents converge or upwellings occur, concentrating plankton and forage fishes and thus attracting predators.

Anglers reported that offshore recreational fishing effort tends to concentrate around day trip distances (60 nm radius or so) from access points that usually relate to reliable boat ramps that are found in every significant town along Australia's coastline. However there is also a significant amount of fishing effort expended by anglers who undertake overnight trips to wider grounds in 5 to 7 metre trailer craft (weather permitting). Travelling further again are significant numbers of anglers who access larger (8 metres plus) motherships, 8 to 15 metre long gameboats, yachts and other suitable watercraft that can overnight at sea and/or travel to virtually every remote location within the EEZ.

Publishing of Areas for Further Assessment within each region has allowed this section to focus on areas of interest to recreational fishers within the AFFAs. Areas are of necessity broad and not confined to GPS marks or specific locations. This reflects the nature of fishing activities in offshore waters which will see fishers covering large

distances in search of fish. The areas also represent the likely future expected expansion of recreational fishing into new areas.

6.1 Eastern Marine Region

While a large proportion of the total recreational fishing effort in the Commonwealth Waters of the Eastern Marine Region occurs from charter vessels (Moore et al. 2007, Australian Government 2008d, DEWHA 2009), fishing from private recreational fishing vessels is also very popular and the relative percentage of effort attributable to private and charter fisheries remains poorly defined. There is no doubt that significant effort is expended by private recreational fishers throughout the region. For example, an analysis of recreational effort in the Eastern Tuna and Billfish Fishery (ETBF) in 2001-02 estimated around 235,000 days were fished on private recreational boats (Galeano et al. 2004).

A summary of the private recreational fishing activities in the region is listed below. Some of the available data on participation and economic impact of recreational fishing in this region has been reviewed by the Australian Government (2008d).

For this report, the entire Coral Sea Conservation Zone is considered as a single Area for Further Assessment and descriptions of fishing locations are provided by bioregional province. Other AFFAs are considered based on their boundaries as published by DEWHA.

6.1.1 Cape Province

Phone and e-mail correspondence with private recreational fishers based along the Queensland coast suggested that activity in the Cape Province region is centred mainly along the eastern edges of the Ribbon Reefs east off Lizard Island and north into the Coral Sea at Ashmore and Boot Reefs. No definitive information on fishing effort is available at this time, however it is known that these areas are visited on a monthly basis by yachts and larger powered recreational craft, as well as several mothership charter fishing operations. The southern parts of the region adjacent to the edge of the Great Barrier Reef are likely to be very important to the commercial charter fishery which in this area is mainly based from Lizard Island. The majority of fishing effort is likely to occur outside the cyclone season of January to April.

6.1.2 Northeast Transition

Phone and e-mail correspondence with private recreational fishers based along the Queensland coast suggested that most activity in the Northeast Transition region is centred mainly in the Coral Sea within and in the immediate vicinity of Osprey Reef, Shark Reef and Bougainville Reef. No definitive information on fishing effort is available at this time, however it is known that these areas are visited on a monthly basis by yachts and larger powered recreational craft, as well as several mothership charter fishing operations. Osprey and Shark Reefs are also important to the commercial charter

fishery which in this area is mainly based from Lizard Island. The majority of fishing effort is again likely to occur outside the cyclone season of January to April.

6.1.3 Northeast Province

Phone and e-mail correspondence with private recreational fishers based along the Queensland coast and perusal of logbooks from spearfishing associations suggested that most activity in the Northeast Province region is centred mainly in the Coral Sea within and in the immediate vicinity of the following reefs; Holmes Reef, Flora Reef, Diane Bank, Willis Islets, Flinders Reefs, Malay Reef, Abington Reef, Diamond Islets, Tregrosse Reefs, Marion Reef, Fredrick Reefs and Samurez Reefs. There are occasional recreational fishing activities conducted by those occupying the manned weather station on Willis Islets (Queensland Bureau of Meteorology *pers comm.*). There is no definitive information on overall fishing effort available at this time, however it is known that all these areas are visited on a regular (weekly to monthly) basis by yachts and larger powered recreational craft, as well as several mothership charter fishing operations. Logbooks held by spearfishing associations (Australian Underwater Federation) suggest that spearfishers in this area take around 1 to 1.5 fish per person per day, with the average size of fish per trip ranging from 3.5 to 6.5 kg depending on the species encountered (mainly targeting Coral trout, tuskfish, various lethrinids and lutjanids (excluding ciguatoxic species), green jobfish, dogtooth tuna, Spanish mackerel, cod (*Epinephelus* spp.), and painted crayfish). The majority of fishing effort is again likely to occur outside the cyclone season of January to April.

6.1.4 Kenn Transition and Kenn Province

Phone and e-mail correspondence with private recreational fishers based along the Queensland coast and perusal of logbooks from spearfishing associations suggested that most activity in the Kenn Transition and Kenn Province regions is centred in the Coral Sea within and in the immediate vicinity of the following reefs; Kenn Reef, Wreck Reef, and Cato Bank. Less, but still significant, recreational fishing effort also occurs at Mellish Reef and on the Fraser, Recorder and Moreton Seamounts. There is no definitive information on overall fishing effort available at this time; however it is known that Kenn, Wreck and Cato Reefs are visited on a fairly regular (bi-weekly) basis by yachts and larger powered recreational craft, as well as several mothership charter fishing operations. Mellish Reef is visited less frequently (probably bi monthly) by yachts and private gamefishing boats, but also hosts regular amateur radio visitors to Herald's Beacon Islet every 5 to 7 years, (the only sand cay on Mellish Reef). During these visits, fish may be taken to supplement food supplies and when planned stays are extended due to bad weather. Kenn Reef, Wreck Reef, and Cato Bank are also very important destinations for larger vessels based out of Mooloolaba, Hervey Bay and Gladstone. The seamounts are remote and likely to be fished by recreational anglers only infrequently, often in an opportunistic manner when they are travelling enroute to other locations. While over these seamounts anglers may target species such as billfish and tuna while trolling as well as limited bottom fishing where water depths are less than 400-500

metres. The majority of fishing effort is again likely to occur outside the cyclone season of January to April.

6.1.5 Central Eastern Transition

Phone and e-mail correspondence with private recreational fishers based along the SE Queensland coast suggested that there is little if any significant recreational fishing for demersal fish in this region as water depths exceed 500 metres in the majority of the region. However fishing for demersal fishes occurs in some areas from larger powered recreational craft where water depths are suitable (usually near the continental shelf), and trolling for pelagic fishes such as billfish and tunas occurs from yachts and larger powered recreational craft in many parts of the region, often in an opportunistic manner when fishers are travelling enroute to other locations.

6.1.6 Fraser Area

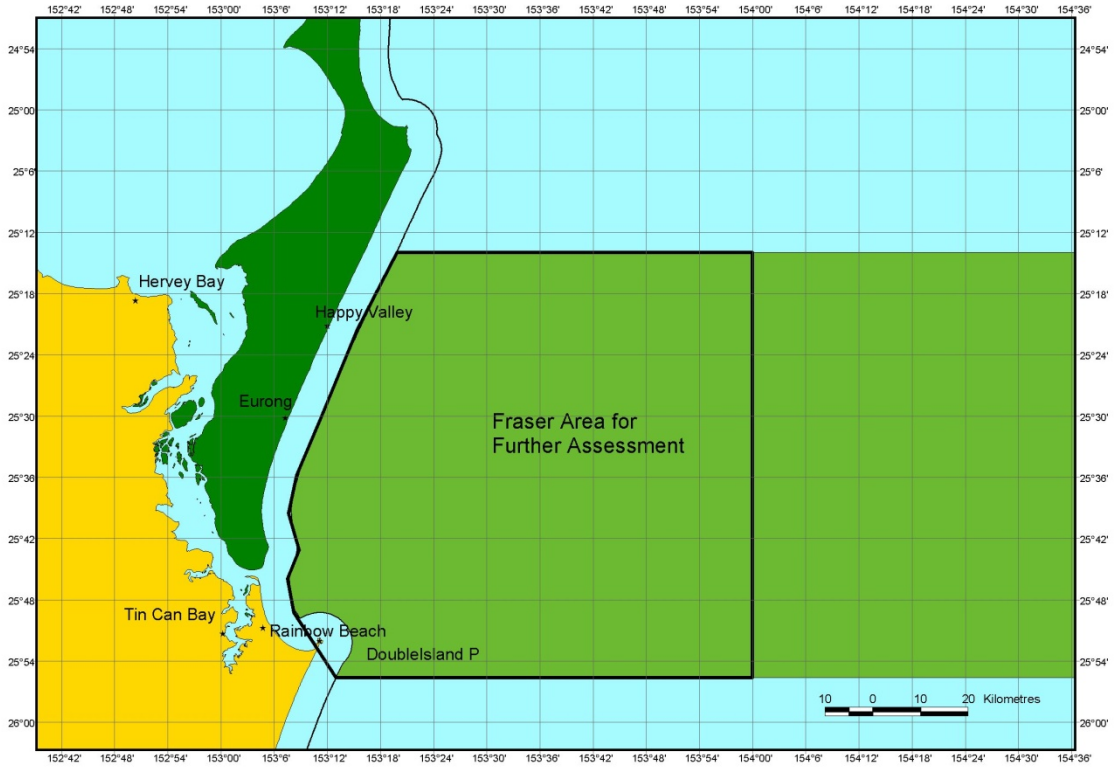

Figure 1: Fraser Area for Further Assessment – black box indicates areas of importance to recreational fishers

Phone and e-mail correspondence with private recreational fishers based along the South East Queensland coast suggested that a large proportion of the total private recreational fishing effort in the Commonwealth Waters off SE Queensland (notably the Sunshine Coast and Hervey Bay areas but also Brisbane metropolitan area) occurs in this region (Figure1).

This is because of the relatively close proximity of Queensland's largest population centres via access points that include Bundaberg, Hervey Bay, Wide Bay bar, Noosa River bar, Mooloolaba, and Caloundra. Fishing locations of significance to private recreational fishers are offshore rocks and islands, reef systems, Fish Aggregation Devices (FADs), shipwrecks, artificial reefs, gravel patches and other bottom features too numerous to list, but including the various scattered reefs and shoals near the Wide Bay bar, including the Gardner Banks and many other reefs and bottom features out to 500 metres depth that lie within Commonwealth Waters. Recreational fishing effort occurs year round in this region mainly from private power boats and yachts, with the majority of effort occurring during weekends but also increasingly during weekdays as well.

6.1.7 Tweed Area

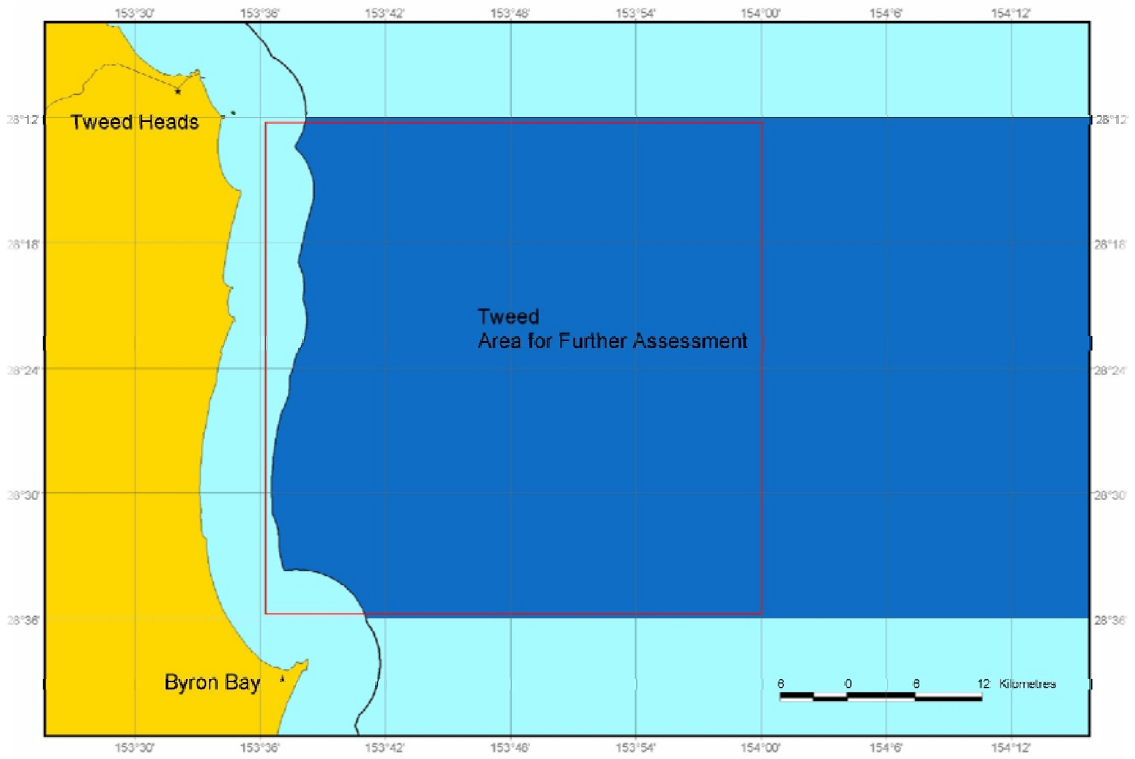

Figure 2: Tweed Area for Further Assessment – red box indicates areas of importance to recreational fishers

Phone and e-mail correspondence with private recreational fishers based along the South East Queensland and Northern New South Wales coast suggested that an even larger proportion of the total private recreational fishing effort in the Commonwealth Waters off SE Queensland and northern NSW occurs in the Tweed Area (Figure 2) compared to the Fraser Area. This is because of the relatively close proximity of Queensland's largest population centres via access points that include Moreton Bay, the Southport Seaway, the Tweed River, Richmond River and various other locations). Fishing locations of significance to private recreational fishers are offshore rocks and islands, reef systems, Fish Aggregation Devices (FADs), shipwrecks, artificial reefs, gravel patches and other bottom features too numerous to list, but including the Tweed Nine

Mile, Norries Reef, Windarra Banks and the Cudgen Heads Canyon, as well as many other reefs and bottom features out to 500 metres depth that lie within Commonwealth Waters. Recreational fishing effort occurs year round in this region mainly from private power boats and yachts, with the majority of effort occurring during weekends but also increasingly during weekdays as well.

6.1.7 Clarence Area

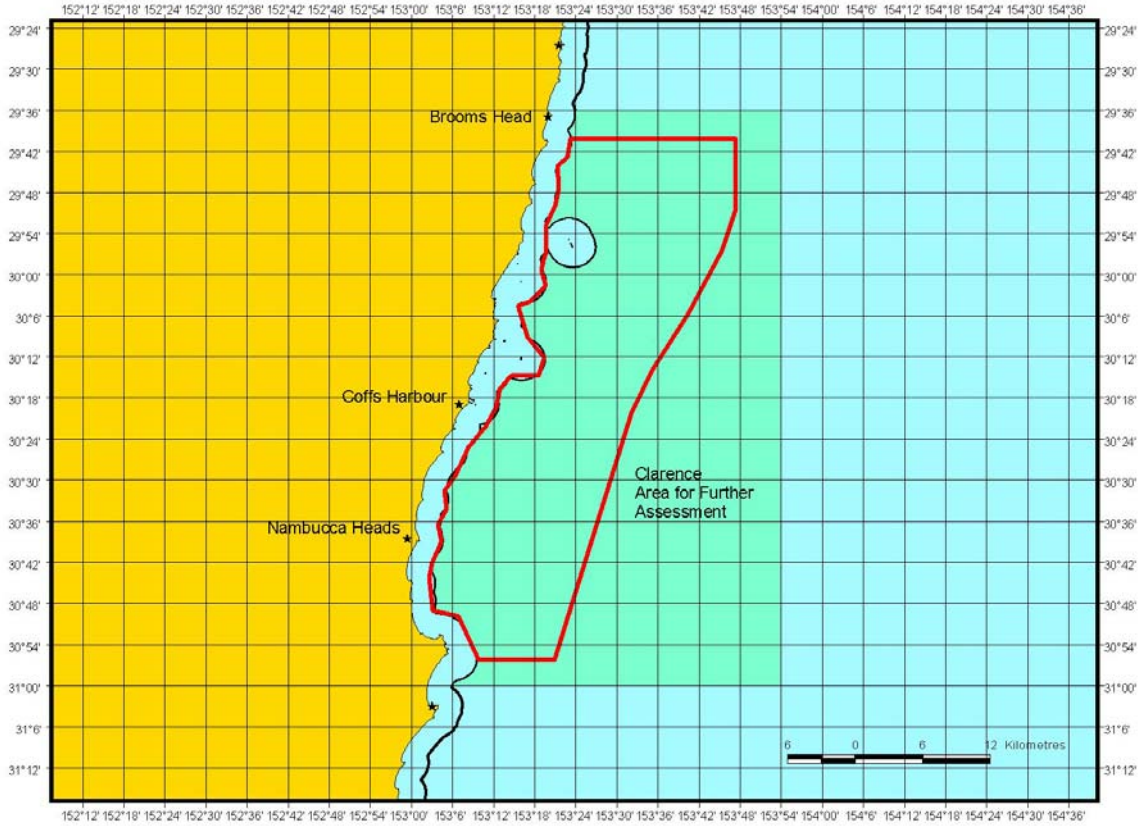

Figure 3: Clarence Area for Further Assessment – red box indicates areas of importance to recreational fishers

Phone and e-mail correspondence with private recreational fishers based along the central New South Wales coast suggested that possibly the largest proportion of the total private recreational fishing effort in the Commonwealth Waters off Australia's east coast occurs in this region. This is because of the relatively close proximity of this area to the large population centres along this part of Australia's east coast, via access points that include Brooms Head, Coffs Harbour, Woolgoolga, Nambucca Heads, Southwest Rocks, Hat Head and Port Macquarie. Fishing locations of significance to private recreational fishers include offshore rocks and islands, reef systems, FADs (Dempster 2004), shipwrecks, artificial reefs, gravel patches and other bottom features too numerous to list, but including reefs and bottom features out to 500 metres depth. Numerous canyons in the area attract gamefishers seeking pelagic species such as marlin and include locations such as Solitary Canyon, Red Rock Canyon, Coffs Canyon, Sawtell Canyon and Nambucca Canyon.

6.1.8 Hunter Area Central Eastern Province

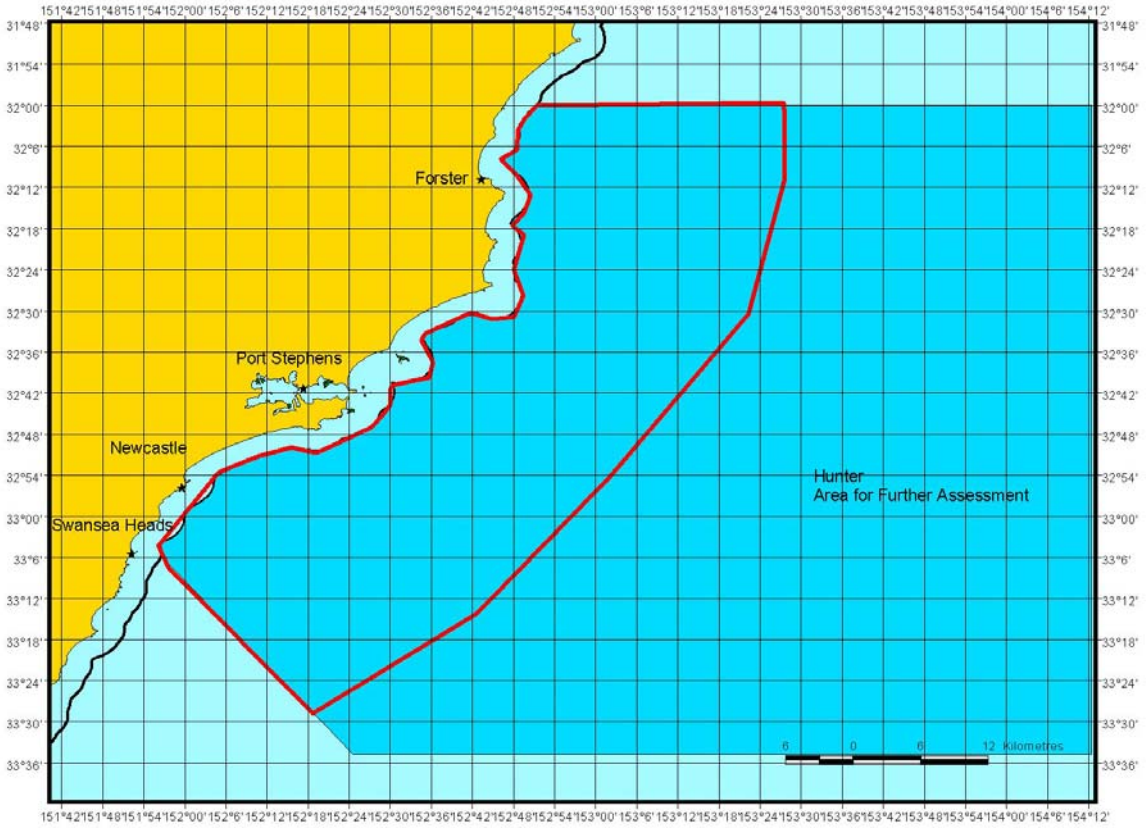

Figure 4: Hunter Area for Further Assessment – red box indicates areas of importance to recreational fishers

The Hunter Area for Further Assessment (Figure 4) represents a significant and traditional region of recreational fishing in Commonwealth Waters. The major centres of Forster Tuncurry, Port Stephens, Newcastle and Swansea Heads provide year round bases for large gamefishing fleets while the location remains suitably close to Sydney Harbour, Botany Bay and Wollongong to attract private recreational fishers from the nation's most heavily populated metropolitan area.

Information on participation rates for offshore angling in this region are available, suggesting that in 2005-06, around 6000 recreational anglers fished in the Port Stephens area alone (Ernst and Young 2006), generating around $50 million in net economic value to the local economy (Table 3).

Table 3. Net economic value and fishing preferences for Port Stephens recreational fishers in 2005-06 (based on Ernst and Young 2006).

Net Economic Value 2005-06	***Preferred Fishing Location***		***Highest Fishing Effort***	
$49.2 million	Offshore Reefs 35%	Offshore Gamefishing 23%	Offshore 53%	More than 3 nautical miles 11%

Recreational fishing effort occurs year round in this region mainly from private power boats and yachts, with the majority of effort occurring during weekends but also increasingly during weekdays as well. Murphy et al. (2002) described gamefishing tournaments in the region, while Scandol et al. (2008) published information on the recreational harvest of a wide range of fish species in NSW waters.

Those species caught predominantly in Commonwealth Waters are included in Table 4, although some of these species also range inshore such that it is likely that at least some of this harvest has occurred in State waters.

Nevertheless, the majority of the harvest for these species is likely to have originated from the Central Eastern Shelf Province, together with the southern section of the Central Eastern Shelf Transition, Lord Howe Province and South East Shelf Transition.

Phone and e-mail correspondence with private recreational fishers suggested that there is little significant recreational fishing for demersal fish in this region as water depths exceed 500 metres in the majority of the region. However fishing for demersal fishes occurs in some areas from larger powered recreational craft where water depths are suitable (i.e. less than 500 metres, usually near the continental shelf).

Nonetheless, there has been a trend towards using electric reels and braided line (Levitt 2009) to fish for demersal species at significant depths and this may be a specialised form of recreational fishing that will emerge in the future. Trolling for pelagic fishes such as billfish and tunas from yachts and larger powered recreational craft occurs in many parts of the region, mainly over the continental shelf edge and canyon areas within 50 km of shore, mainly when weather permits. Due to the nature of the pelagic fishery, it is not easy to delimit a single area of importance as annual fluctuations in current, bait availability and local oceanographic conditions will dictate the distribution of gamefish species.

Table 4. Recreational harvest of fish species found in Commonwealth Waters off NSW from Scandol et al. (2008). The harvest figures will in some cases include fish caught in both State and Commonwealth Waters and should be treated with caution.

Species found in Commonwealth Waters	Estimated annual recreational harvest in NSW (tonnes)
Australian salmon, *Arripis trutta*	150-210
Banded rockcod, *Epinephelus ergastularius*	<10
Bass groper, *Polyprion americanus*	<1
Bigeye, Priacanthidae	<1
Blue mackerel, *Scomber australasicus*	90-200
Blue-eye trevalla, Centrolophidae	<10
Blue crab, *Portunus pelagicus*	150-310
Bluespotted flathead, *Platycephalus caeruleopunctatus*	320-450
Boarfish, Pentacerotidae	<1
Bonito, *Sarda* spp.	40-110
Common jack mackerel, *Trachurus declivis*	10
Eastern school whiting, *Sillago flindersi*	20-50
Frigate mackerel, *Auxis thazard*	<20
Gemfish, *Rexea solandri*	<10
Ghost sharks/elephantfish, Chimaeriformes	<1
Grey morwong, *Nemadactylus douglasii*	130-210
Gummy shark, *Mustelus antarcticus*	<10
Hammerhead shark, *Sphyrna* spp.	10-50
Hapuka, *Polyprion oxygeneios*	<1
Jackass morwong, *Nemadactylus macropterus*	10-20
John Dory, *Zeus faber*	<10
Leatherjackets, Monacanthidae	110-180
Longtail Tuna, *Thynnus tonggol*	<1
Mackerel Tuna, *Euthynnus affinis*	<50
Mahi mahi, *Coryphaena hippurus*	100
Mako sharks, *Isurus* spp.	30-140
Mirror dory *Zenopsis nebulosus*	<1
Mulloway, *Argyrosomus japonicus*	100-500
Ocean perch, Sebastidae	<10
Pilchard, *Sardinops neopilchardus*	<1
Pearl perch, *Glaucosoma scapulare*	<30
Pigfish, *Bodianus* spp.	<20
Red gurnard, Triglidae	<10
Redfish/Nannygai, *Centroberyx affinis*	20-40
Silver trevally, *Pseudocaranx georgianus*	100-210
Snapper, *Pagrus auratus*	180-250
Spanish mackerel, *Scomberomorus commerson*	10-100
Spotted mackerel, *Scomberomorus munroi*	10-100

Sweep, *Scorpis lineolatus*	30-60
Teraglin, *Atractoscion aequidens*	70-110
Tiger flathead, *Neoplatycephalus richardsoni*	20-60
Tiger shark, *Galeocerdo cuvier*	10
Trawl squid, Teuthida	<1
Whaler sharks, *Carcharhinus* spp.	40-160
Yellowfin tuna, *Thynnus albacares*	50-350
Yellowtail kingfish, *Seriola lalandi*	120-340
Yellowtail scad, *Trachurus novaezelandiae*	40-60

6.1.9 Tasmantid-Lord Howe Area

Limited published data exists for this area and it is likely that consultation with residents of Lord Howe Island will be required to confirm locations that will be impacted once a draft plan is produced for the region.

Tasman Basin Province

Phone and e-mail correspondence with private recreational fishers suggested that there is little significant recreational fishing for demersal fish in this region as water depths exceed 500 metres in the majority of the region. Features such as the Brisbane Guyot, Queensland Guyot, Britannia Guyots, Stradbroke Guyot, Derwent Hunter Guyot, Barcoo Bank and Taupo Bank are infrequently fished by recreational fishers trolling for pelagic fishes such as billfish and tunas, usually in an opportunistic manner when recreational fishers in yachts and larger powered recreational craft are travelling enroute to other locations. Opportunistic fishing for demersal fishes may occur rarely over the seamounts and guyots in some of these areas, weather permitting, but only in areas (e.g. Taupo Bank) where water depths are 500 metres or less.

Lord Howe Province

Phone, face to face and e-mail correspondence with private recreational fishers based on Lord Howe Island and also visitors to the area from Queensland and New South Wales suggested that fishing from charter boats represents by far the largest amount of recreational effort in this region perhaps between 5 and 7 times as many people fishing from charter boats than private boats. Around 20 local anglers represent the majority of private recreational fishing effort in the region.

Local fishers resident at Lord Howe Island suggest there has been a major shift in emphasis in Lord Howe's fishing grounds and target fish with the introduction of the Lord Howe Island Marine Parks. Prior to this, around 50% of the total catch might once have come from Commonwealth Waters, but now this has risen to around 90% of the total catch. Reasons for this change appear to have included enforcement of minimum size limits on kingfish (not considered necessary prior to marine parks legislation), which has seen a shift to the targeting of larger legal sized kingfish and resulted in increased fishing in deeper waters. This has had several downsides like increased mortality rates

for black cod and other non target species through barotrauma, and worst of all a greatly increased loss of catch effort to the numerous sharks that frequent the region (Speare et al. 2004). The majority of the private recreational fishing effort in the region is centred around Lord Howe Island itself from the shore, in the lagoon and around both the Admiralty Islet Group and Balls Pyramid out to a depth range of 200 metres. Elizabeth Reef is visited on a monthly basis by private vessels including yachts and larger powered recreational craft. Middleton Reef is closed to fishing while the area around Gifford Tablemount and Gifford Guyot is rarely, if ever, fished recreationally.

6.1.10 Norfolk Area

Phone and e-mail correspondence with residents and visitors to the Norfolk Area suggested that the majority of private recreational fishing in the region occurs in the shelf waters surrounding Norfolk Island out to the 500 metre depth contour where both pelagic and demersal fishes are targeted. Wanganella Bank is fished occasionally for both demersal and pelagic fish, usually in an opportunistic manner, weather permitting, or when recreational fishers in yachts and larger powered recreational craft are travelling enroute to other locations. However, in recent years, Wanganella Bank has also become a very important destination for recreational charter boats based in New Zealand and also Norfolk Island.

6.1.11 Batemans Area

Phone and e-mail correspondence with private recreational fishers based along the central and southern New South Wales, Eastern Victorian and Tasmanian coasts suggested that a large proportion of the total private recreational fishing effort in the Commonwealth Waters off Australia's east coast occurs in this region. This is because of the relatively close proximity of this area to the large population centres along this part of Australia's east coast, via access points that include the Shoalhaven River, Jervis Bay, Ulladulla, Batemans Bay, Moruya Heads, Narooma, Bermagui, Merimbula and Eden and various other locations. Fishing locations of significance to private recreational fishers include offshore rocks and islands, reef systems, FADs, shipwrecks, artificial reefs, gravel patches and other bottom features too numerous to list, but including the Bermagui Canyon, Montague Seamount, Moruya Canyon, Tuross Canyons and The Kink.

Recreational fishing effort occurs year round in this region, but with increasing frequency during the summer months when tropical pelagic fishes enter the region during feeding migrations (Pepperell 1990, 1994a, 1997, Speare 2003). Recreational fishing mainly occurs from private power boats and yachts, with the majority of effort occurring during weekends but also increasingly during weekdays as well.

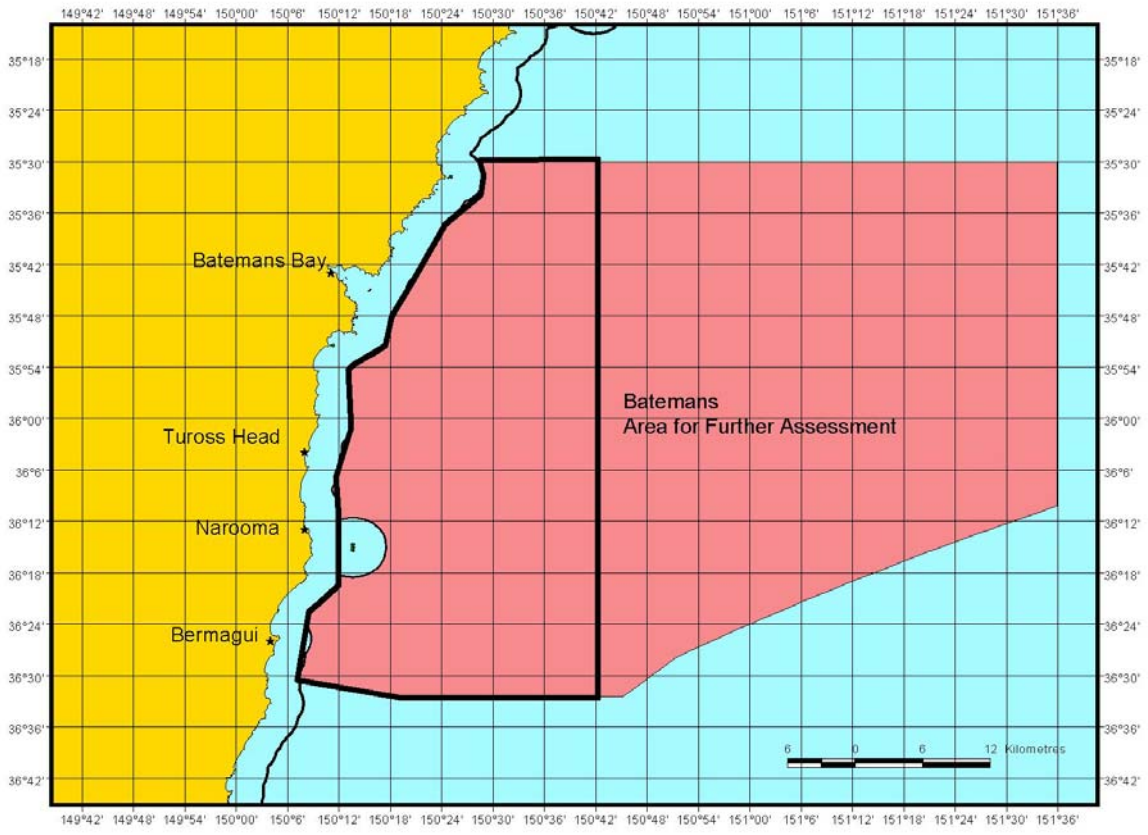

Figure 5: Batemans Area for Further Assessment – black box indicates areas of importance to recreational fishers

Information on participation rates for offshore angling in this region are available, suggesting that in 2005-06, around 8200 recreational anglers fished in the Narooma/Bermagui region alone (Ernst and Young 2006), generating around $27 million in net economic value to the local economy (Table 5).

Table 5. Net economic value and fishing preferences for Bermagui/Narooma recreational fishers in 2005-06 (based on Ernst and Young 2006).

Net Economic Value 2005-06	***Preferred Fishing Location***		***Highest Fishing Effort***	
$27.2 million	Offshore Reefs 18%	Offshore Gamefishing 36%	Offshore 69%	More than 3 nautical miles 47%

6.2 Northern Marine Region

The Commonwealth Waters of the Northern Marine Region contain several important recreational fishing destinations of great value to the industry as these waters can offer private anglers relatively accessible wilderness fishing of very high quality. It is thought that a significant proportion of the total recreational fishing effort in the Commonwealth Waters of this region occurs from private anglers who undertake guided fishing tours based from motherships or the various fishing lodges located in areas such as Cape Don, Arnhemland, Wessels, Groote and Mornington Islands, Gove and Weipa, however fishing by private recreational fishing vessels is also very popular, especially closer to shore in the end of the summer runoff and into the dry winter months. A large proportion of the fishing effort in the area particularly at locations such as Karumba and Weipa in Queensland consists of visiting recreational fishers who may stay for extended periods. The relative percentage of effort attributable to private and guided fisheries remains poorly defined, nevertheless there is no doubt that significant effort is expended by private recreational fishers throughout the region and the potential for expansion is appreciable (Chris Makepeace *pers comm.*). A comprehensive study of the Karumba based recreational fishery was completed by Greiner and Patterson (2007) who demonstrated the significant differences in behaviour of resident and visiting fishers.

The majority of offshore fishing by this group in this region is done from powerboats in the 4 to 7 metre size range, though trolling from yachts is also very popular for people who are cruising and/or travelling through to other destinations. The larger yachts, 8 to 15 metre gameboats and other suitable watercraft can overnight at sea and/or travel to virtually every remote location within the EEZ.

A summary of the key areas used for recreational fishing activities in Commonwealth Waters in this region is listed below. Much of this information has been obtained from phone and e-mail correspondence with residents and visitors to the region, as well as resources such as Mellon (1983) and Flynn (2009), various fishing magazines and other similar recreational fishing oriented references. Some of the available data on participation and economic impact of recreational fishing in this region has already been reviewed by the Australian Government (2008a).

Detailed maps of areas of importance to recreational fishers have been collated by the Amateur Fishermans Association of the Northern Territory after consultation with fishing clubs like Darwin Game, Palmerston Game, Nhulunbuy and Groote Eylandt and unaffiliated NT fishers.

AFANT has also provided a comprehensive response to DEWHA on behalf of all recreational fishers in the Northern Territory.

In addition to the information provided below, areas of recreational fishing importance also exist in the Queensland part of the Gulf of Carpentaria AFFA and the West Cape

York AFFA. Additional consultation with resident fishers in these areas and with peak bodies in Queensland will need to occur once a draft management plan is available for the area.

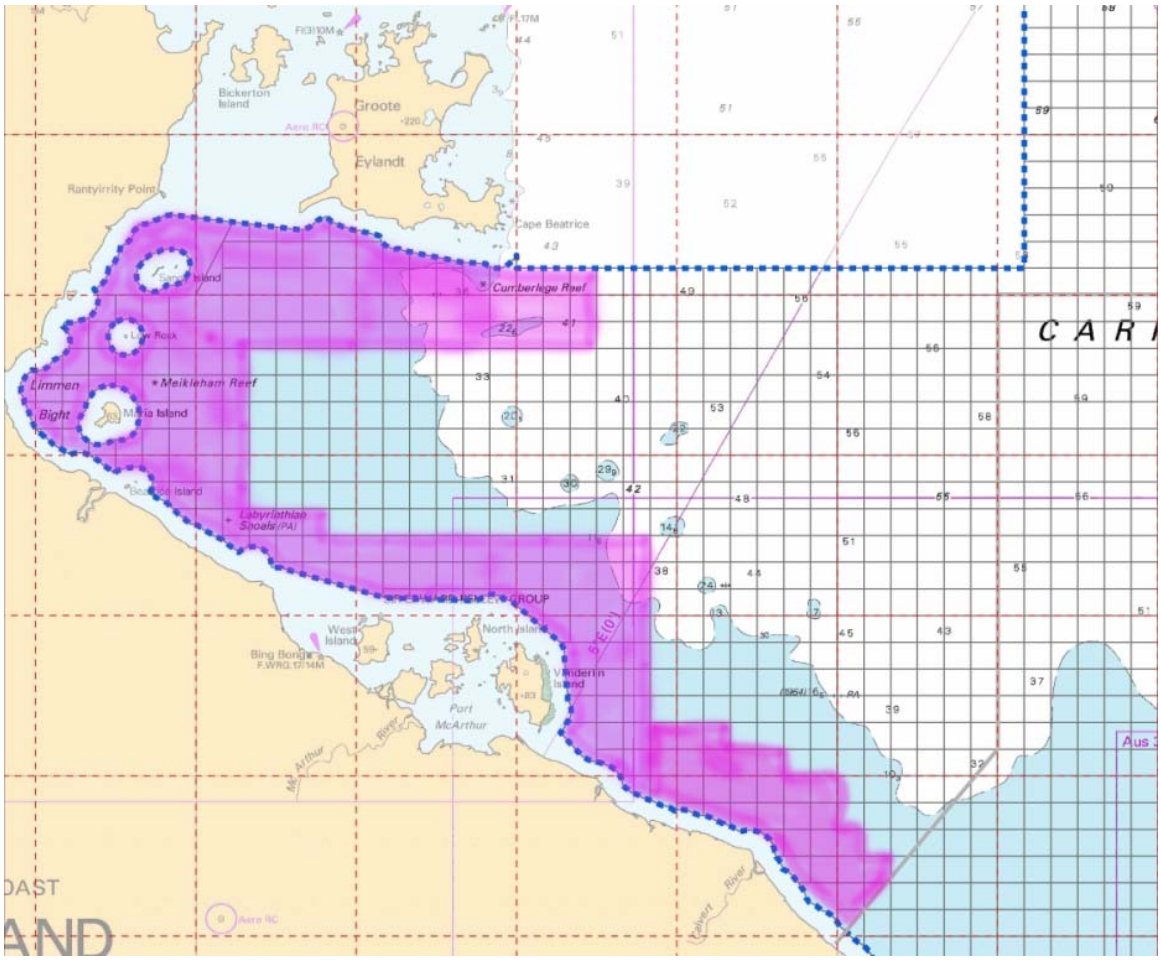

Figure 6: Gulf of Carpentaria Area for Further Assessment – purple shading indicates areas of importance to recreational fishers

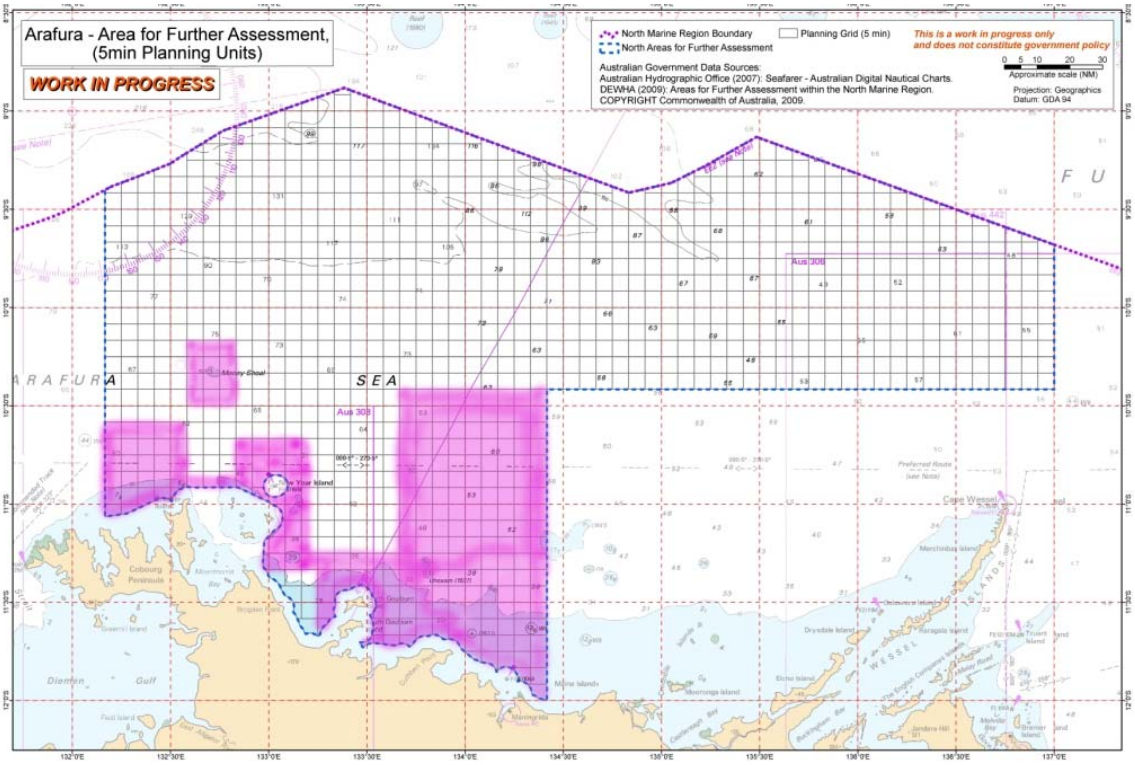

Figure 7: Arafura Area for Further Assessment – purple shading indicates areas of importance to recreational fishers

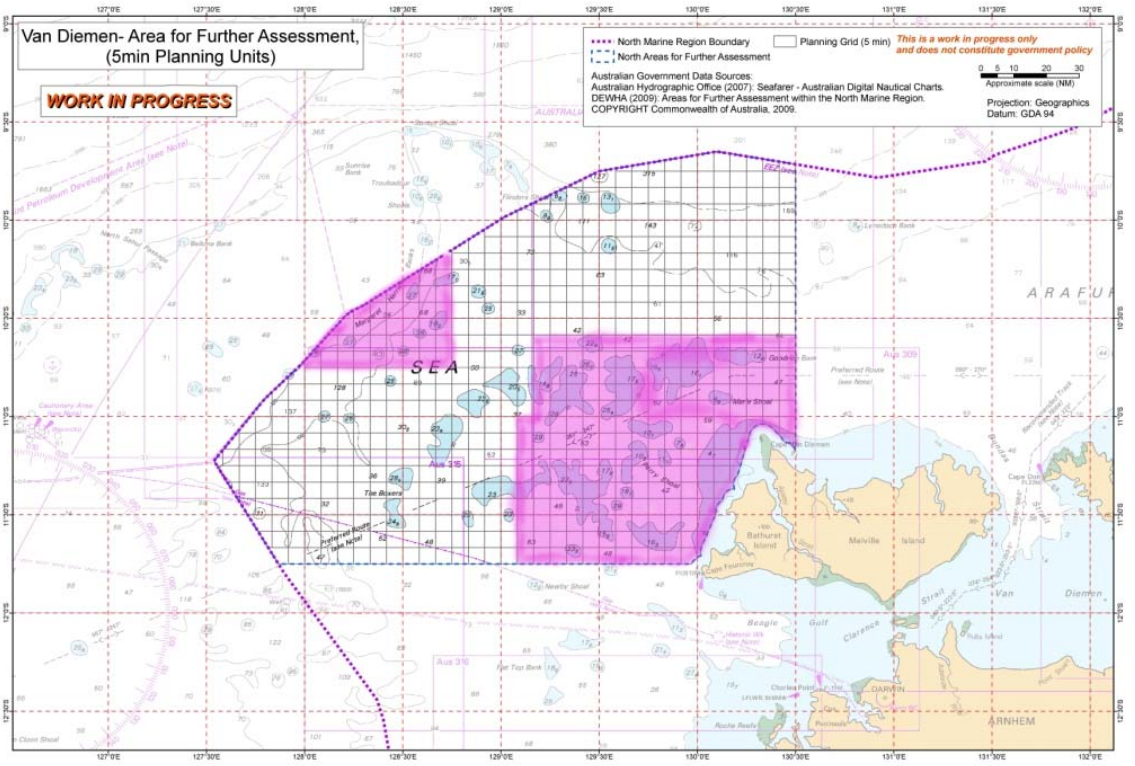

Figure 8: Van Diemen Area for Further Assessment – purple shading indicates areas of importance to recreational fishers

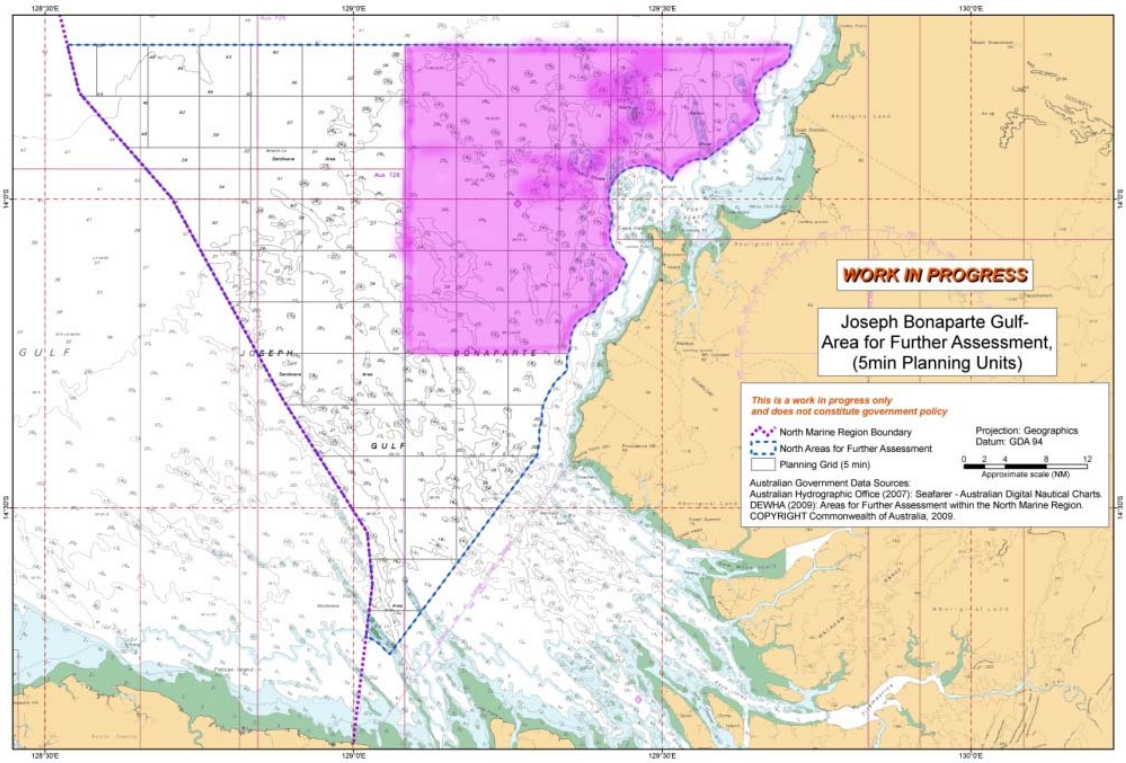

Figure 9: Joseph Bonaparte Gulf Area for Further Assessment – purple shading indicates areas of importance to recreational fishers

6.3 North-west Marine Region

The Commonwealth Waters of the North-west Marine Region contains a large number of important recreational fishing destinations of great value to the industry and local communities as these waters can offer private anglers both accessible and remote wilderness fishing of very high quality. A large proportion of the total recreational fishing effort in the Commonwealth Waters of this region occurs from private recreational fishers. The mining boom in northern WA and the associated development of infrastructure has resulted in a lot on interest in the region from a recreational fishing perspective. Historically, the major centres such as Broome, Port Hedland, Derby and Exmouth have earned a reputation as globally significant gamefishing destinations. The Broome Indo-Pacific sailfish fishery is of particular relevance. The region's premier gamefishing tournament is the GAMEX tournament, a four-star NEATFish accredited event run out of Exmouth. The majority of offshore fishing by this group in this region is done from powerboats in the 4 to 7 metre size range, as well as gameboats between 8 and 15 metres, though trolling from yachts is also very popular for people who are cruising and/or travelling through to other destinations. The larger yachts, 8 to 15 metre gameboats and other suitable watercraft which can overnight at sea can travel to virtually every remote location within the EEZ. Some of the available data on participation and economic impact of recreational fishing in this region has already been reviewed by the Australian Government (2008b).

6.3.1 Bonaparte Area

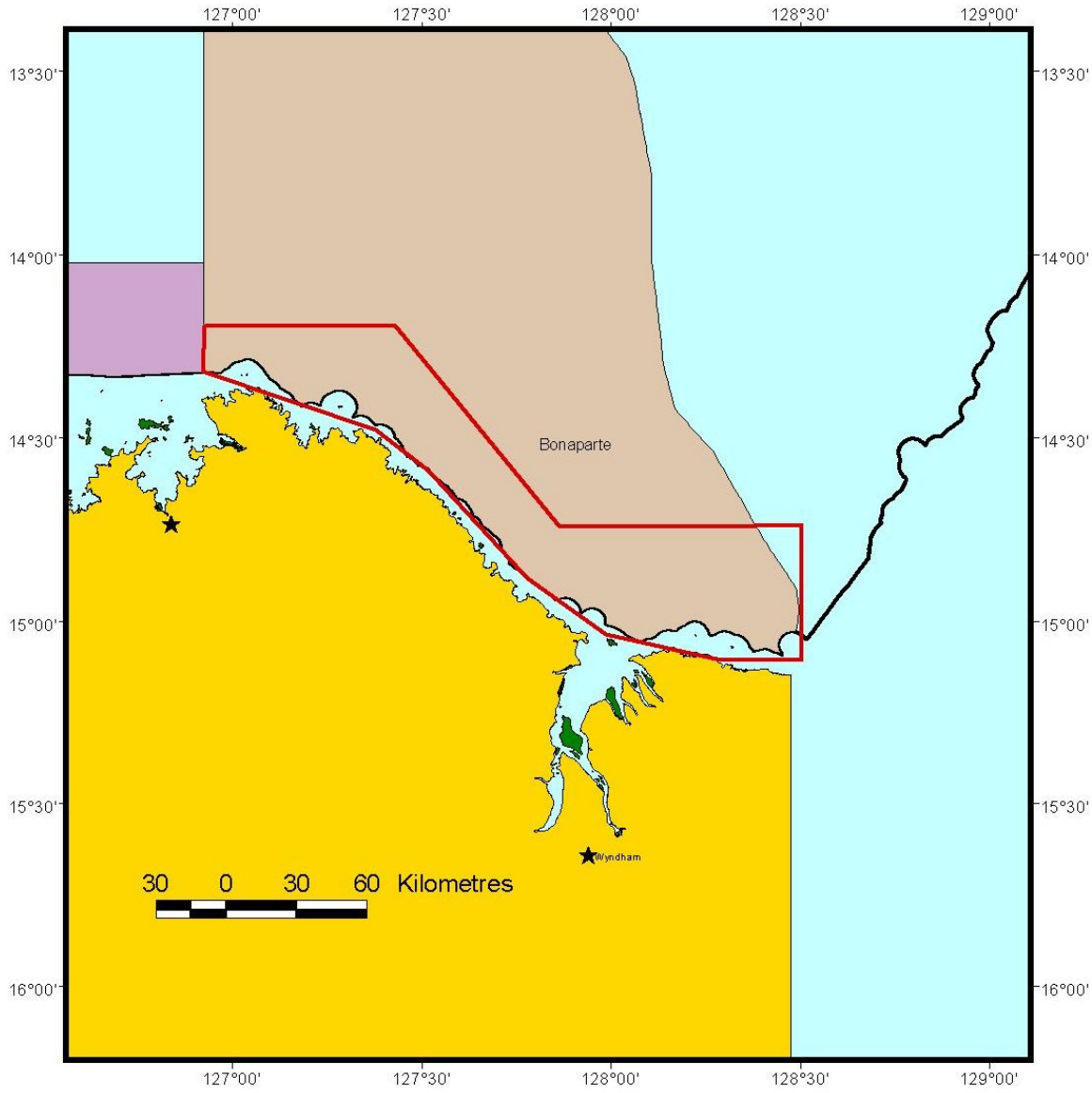

Figure 10: Bonaparte Area for Further Assessment – red box indicates areas of importance to recreational fishers

Further to the west and south of Bynoe Harbour, as you enter Western Australia there few major coastal communities (and also no easy access for the public) until Wyndham(Figure 10). Various offshore reefs are occasionally accessed by private boats out from the Ord River mouth, but recreational fishing pressure is limited, though chartered mothership operations and cruising yachts occasionally access the various sand banks, offshore islands and reefs throughout this entire region.

6.3.2 Kimberley North Area

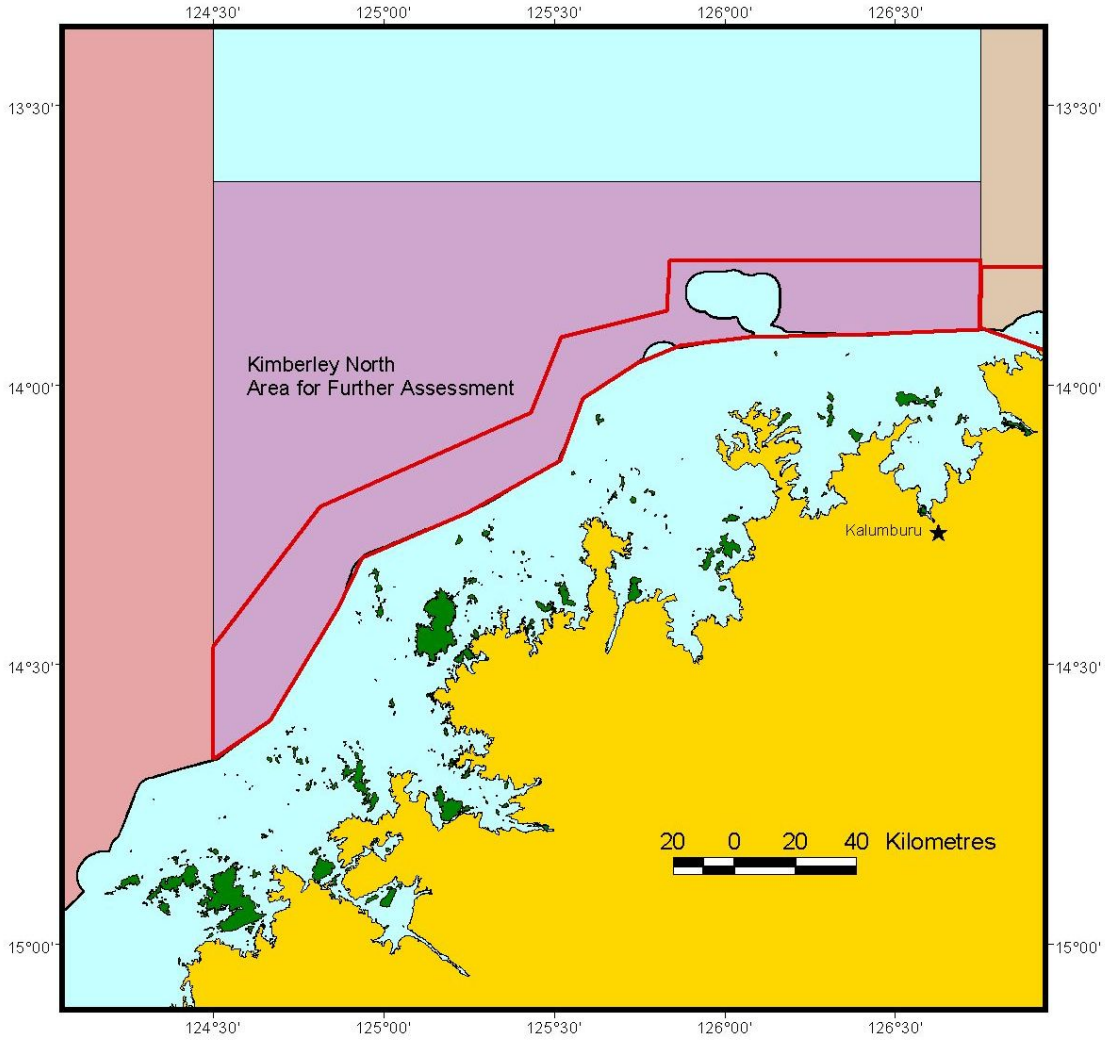

Figure 11: Kimberley North Area for Further Assessment – red box indicates areas of importance to recreational fishers

Limited access points further west into the eastern parts of the Kimberley tend to restrict most private recreational fishing activities to within a day or two travel by boat from remote access points such as Kalumburu, and Port Warrender Road (Figure 11).
Some of the locations fished from these access points by larger private powered recreational craft (as well as mothership charter operations and cruising yachts), include the islands offshore from Vansittart Bay and Admiralty Gulf, the latter including well known locations such as Troughton Island (which is accessible by aircraft as well as boat), Cassini Island and the nearby Long Reef. Most of these locations are within state waters but the potential opportunity for expansion into Commonwealth Waters must be considered in marine planning options for the area.

6.3.3 Kimberley Area

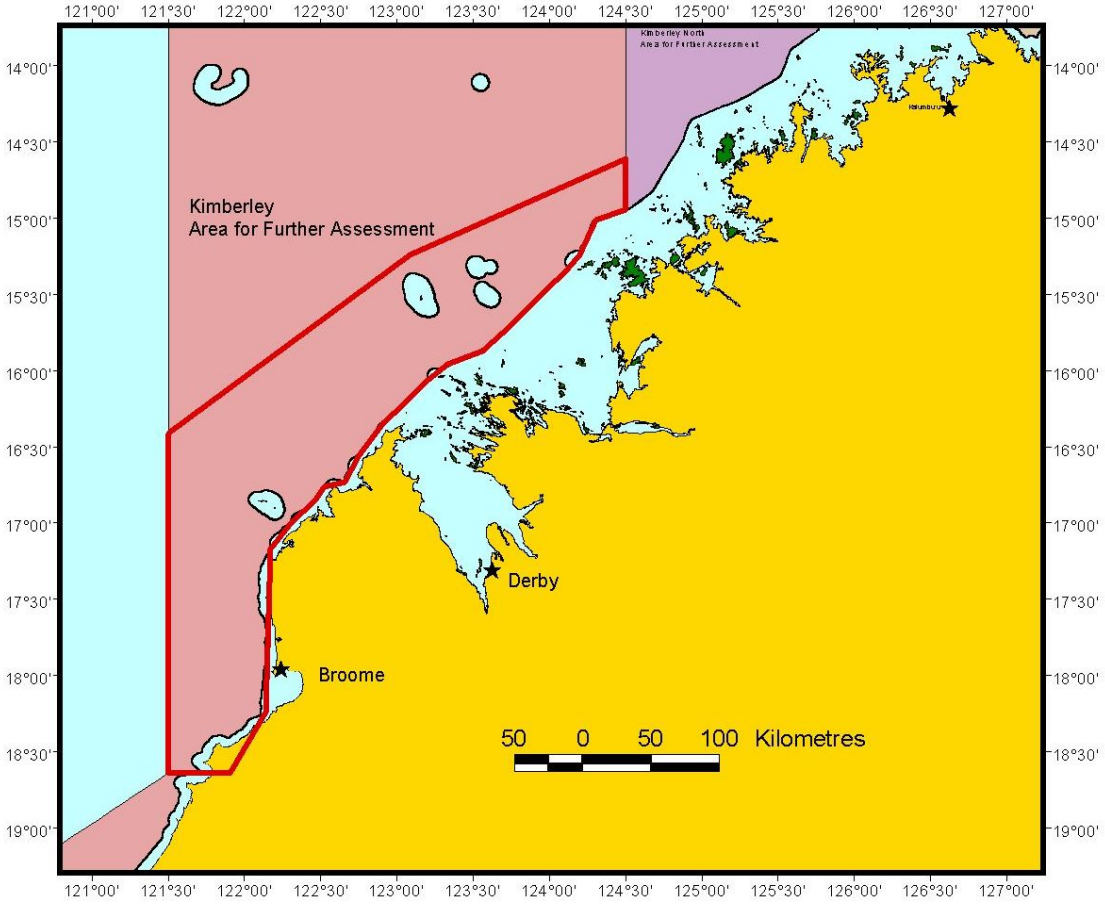

Figure 12: Kimberley Area for Further Assessment – red box indicates areas of importance to recreational fishers

The Kimberly Area (Figure 12) is remote and is mostly fished by recreational anglers based from cruising yachts (Richards 2007) or charter boats; however dedicated private anglers are also entering the area in increasing numbers relying on modern boating and outboard technology and improved navigation equipment. Charter operations based in Broome and Derby take recreational fishers to many of the islands off the Kimberley coast, including the Buccaneer Archipelago, and Montgomery Reef.

Charter operations based in Broome and Derby regularly take recreational fishers to many of the offshore islands in the region, including Scott and Seringapatam Reefs. The ICUN II area on Ashmore Reef is also fished occasionally by recreational fishers on cruising yachts. At the time of writing, one to two recreational fishing charter trips operate out to Scott Reef per year. The location has the potential to provide significant opportunities for pelagic sport fishing, however, given the distance from Broome and closest landfall and associated costs, only a limited number of charter operators are prepared to take recreational fishers out to Scott Reef (Woodside Energy 2009).

6.3.4 Pilbara North Area

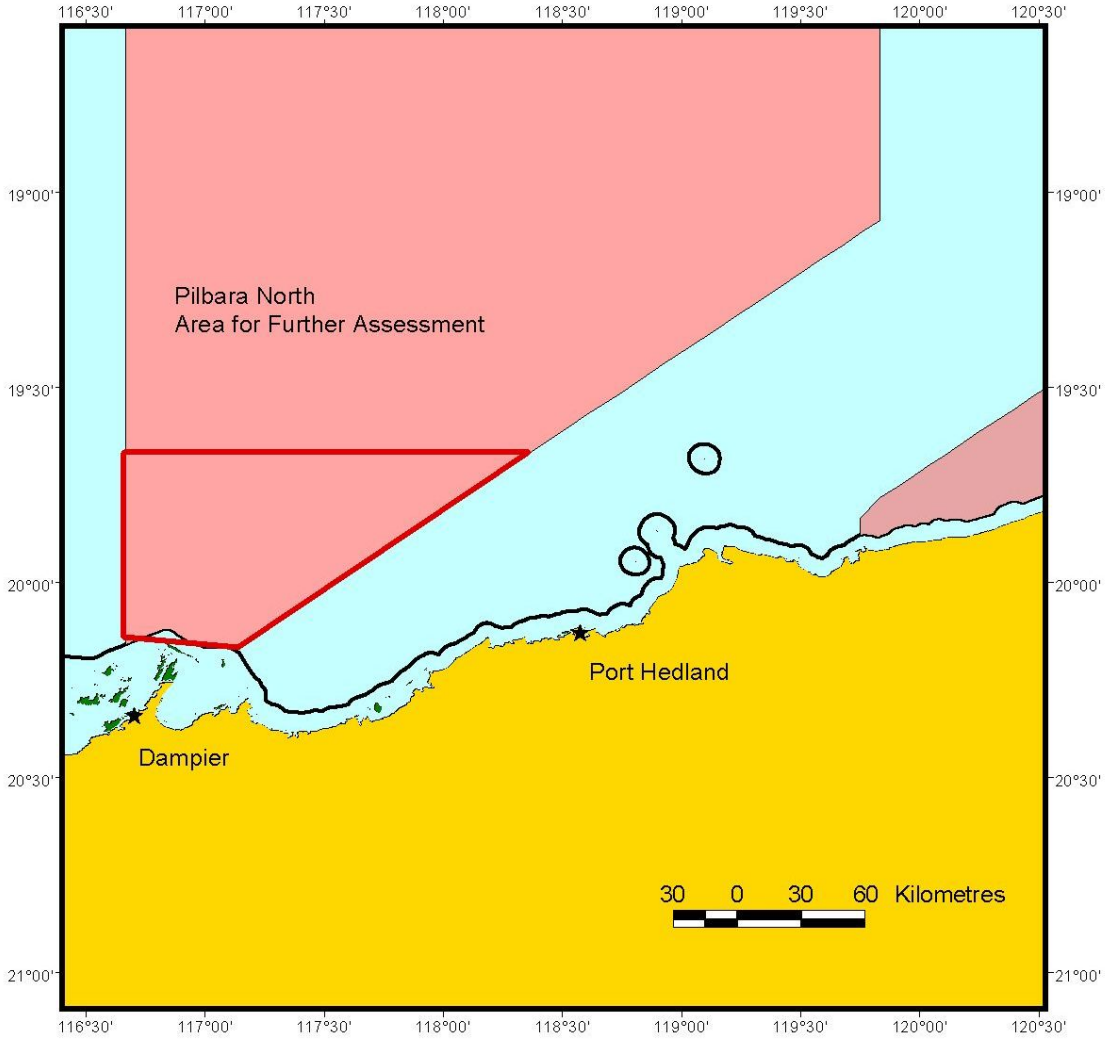

Figure 13: Pilbara North Area for Further Assessment – red box indicates areas of importance to recreational fishers

Within the Pilbara North Area (Figure 13), Imperieuse Reef, Clerke Reef, Mermaid Reef, Rowley Shoals have all historically been important areas. Mermaid Reef is already closed to fishing.

6.3.5 Gascoyne Area

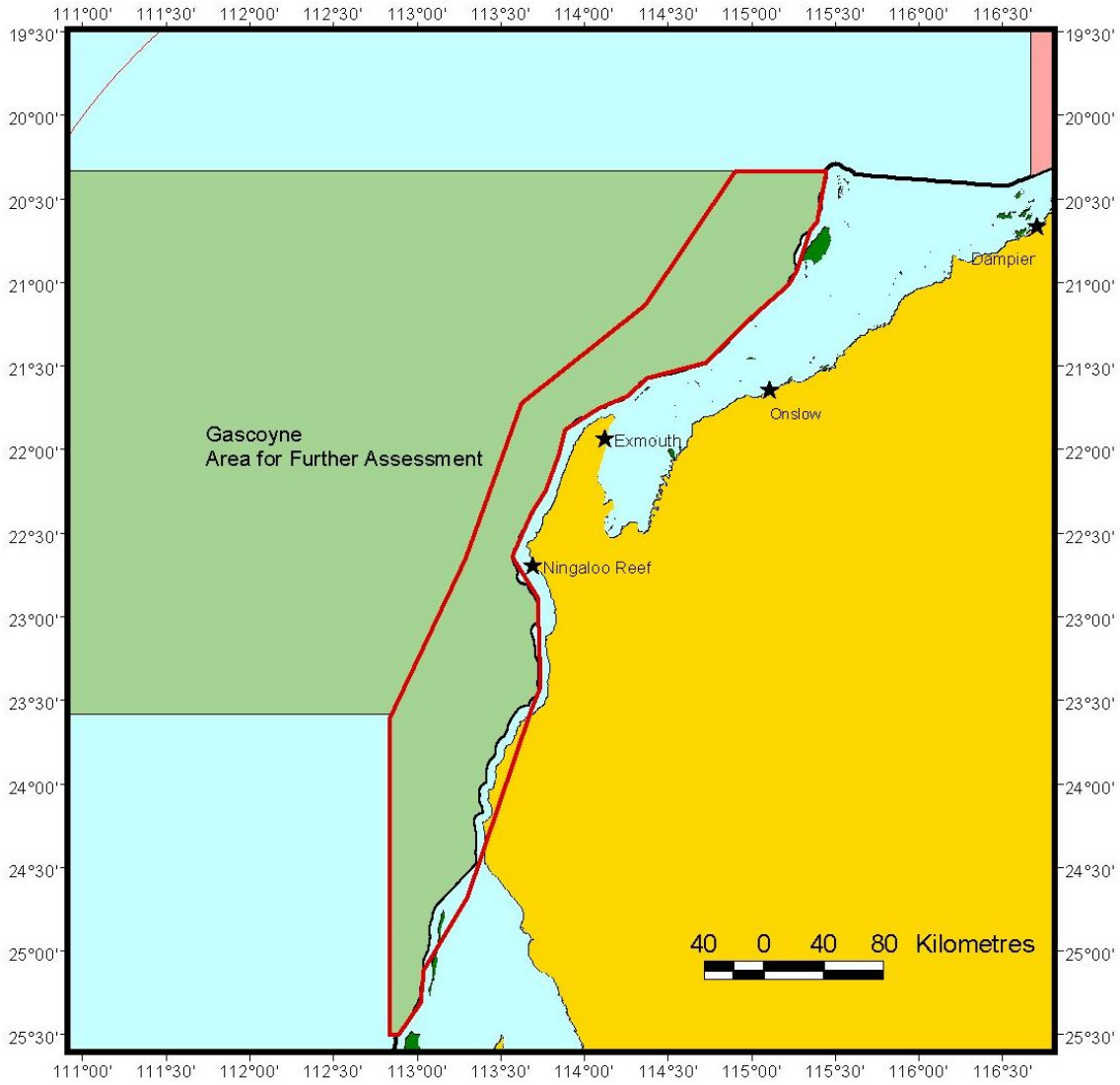

Figure 14: Gascoyne Area for Further Assessment – red box indicates areas of importance to recreational fishers

The Gascoyne Area (Figure 14) represents a significant centre for recreational fishing in the North-west Marine Region. The area attracts both resident fishers and visitors from other parts of WA and Australia and international tourists. Safe anchorages close to Exmouth and Dampier include Montebello Islands, Barrow Island and Dampier Archipelago greatly increase the capacity of private recreational fishers to access Commonwealth Waters.

Other significant locations include Exmouth Wide and the canyons south of Exmouth Wide and waters surrounding Ningaloo Reef.

According to the federal environment department (Environment Australia 2002), recreational fishing is a major activity in Ningaloo Marine Park with an increase in recent years in recreational fishing for billfish (especially sailfish), marlin and tuna.

It is estimated that approximately 25 per cent of this activity in Ningaloo Marine Park takes place in Commonwealth Waters. This area is regarded as one of the best in the world for catching small individuals of billfish species. There is a high level of tag and release of billfish and tuna by game fishing clubs. A 1998–99 survey by Fisheries estimated fishing effort in both Commonwealth Waters and State waters of Ningaloo Marine Park from private boats is in the order of 45,000 angler days per annum (Fisheries Western Australia unpublished data).

Significant measures to sustainably manage recreational fishing are already in place in the region. A review of recreational fishing in the Gascoyne region of Western Australia (Fisheries Western Australia 1999), of which Ningaloo Marine Park is a part, recognised that there were major management issues with recreational fishing such as increased fishing pressure, both from increased participation and improvements in technology. This has led to some localised depletion of key recreational species.

In 1991, Fisheries Western Australia imposed additional restrictions on the areas, methods and level of recreational fishing within the State waters of Ningaloo Marine Park. As all fishers in Commonwealth Waters will travel through the State waters, those restrictions and possession limits also apply to the fishers in Commonwealth Waters. Key recommendations of the Gascoyne region review (Fisheries Western Australia 1999) included increasing restrictions on recreational fishing, including trip and bag possession limits.

6.3.6 Abrolhos Extension – Kalbarri

It is likely that a significant level of recreational fishing in this area (Figure 15) occurs in Commonwealth Waters. Further fine scale assessment will need to be considered once a draft management plan for the area is published.

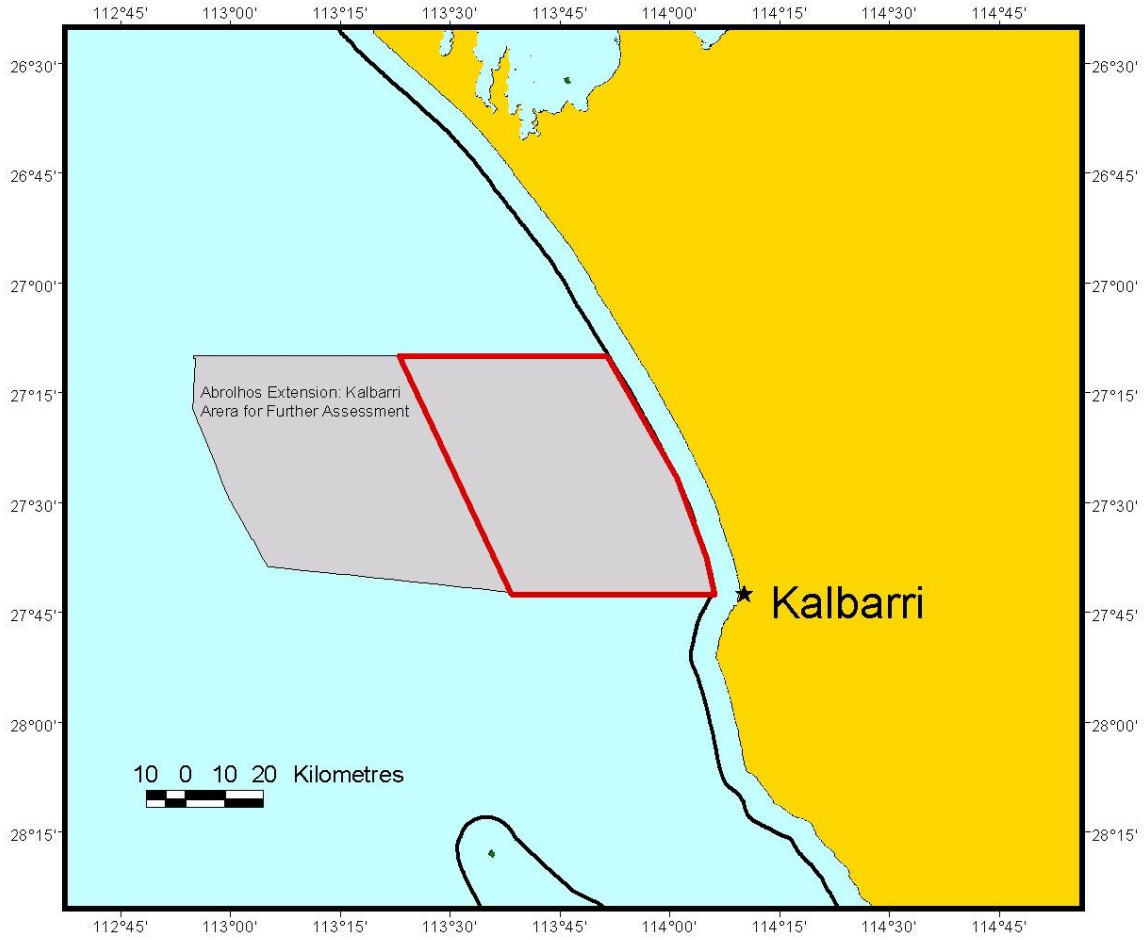

Figure 15: Abrolhos Extension - Kalbarri Area for Further Assessment – red box indicates areas of importance to recreational fishers

6.4 South-west Marine region

The Commonwealth Waters of the South-west region contain a large number of important recreational fishing destinations of great value to the industry and local communities as these waters can offer private anglers both accessible and remote wilderness fishing of very high quality. A significant proportion of the total recreational fishing effort in the Commonwealth Waters of this region occurs from private recreational fishers from the region's major access points of Kalbarri, Geraldton, Perth, Albany, and Esperance. Fish Aggregating Devices deployed in the Perth Canyon provide gamefishing options within easy access of most trailerable craft out of Perth. The relative percentage of effort attributable to private and charter fisheries remains poorly defined, nevertheless there is no doubt that significant effort is expended by private recreational fishers throughout the region. The majority of offshore fishing by this group in this region is done from powerboats in the 5 to 8 metre size range, or gameboats between 8 and 15 metres, though trolling from yachts is also very popular for people who are cruising and/or travelling through to other destinations. The larger yachts, gameboats and other suitable watercraft which can overnight at sea can travel to virtually every remote location within the EEZ. Some of the available data on

participation and economic impact of recreational fishing in this region has already been reviewed by Gardner et al. (2006) and the Australian Government (2008c).

Information below is presented by Areas for Further Assessment and while areas of recreational fishing interest are identified, they should not be considered exhaustive. Information was predominantly sourced from published GPS coordinates and locations mentioned on the internet and in fishing guide books.

6.4.1 Houtman Abrolhos Area

According to Sumner (2008), recreational fishers mainly visit the Houtman Abrolhos Islands (Figure 16) during the rock lobster season when the weather is more favourable for boating. Recreational fishers at the Houtman Abrolhos Islands can be placed in four groups:

1) recreational fishers that stay for one or more nights on large private power boats or yachts;
2) commercial rock lobster fishers and their friends and family that stay on the islands in camps;
3) recreational fishers that visit the islands on day trips from the mainland in smaller boats, and
4) recreational fishers on vessels owned by tour operators.

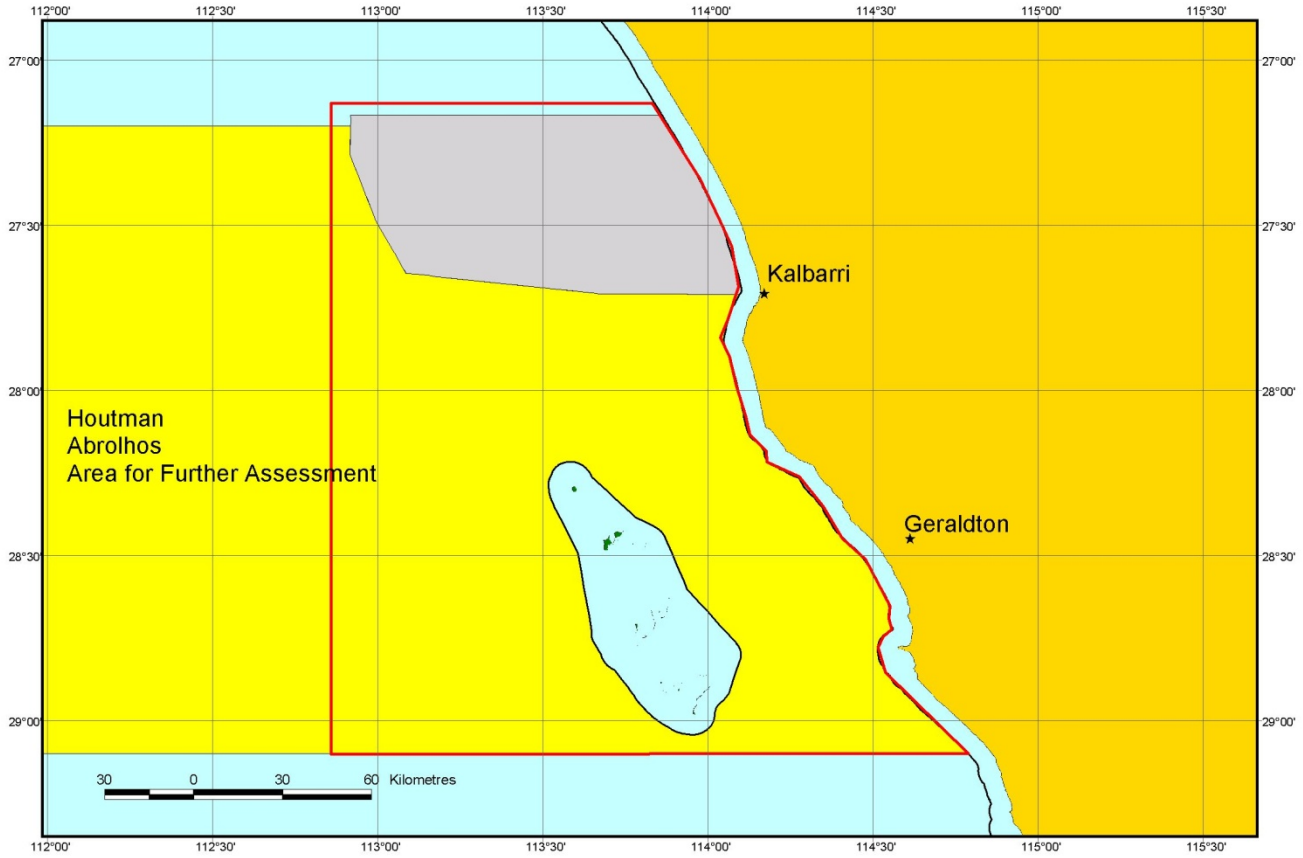

Figure 16: Houtman Abrolhos Area for Further Assessment – red box indicates areas of importance to recreational fishers

6.4.2 Jurien Bay Area

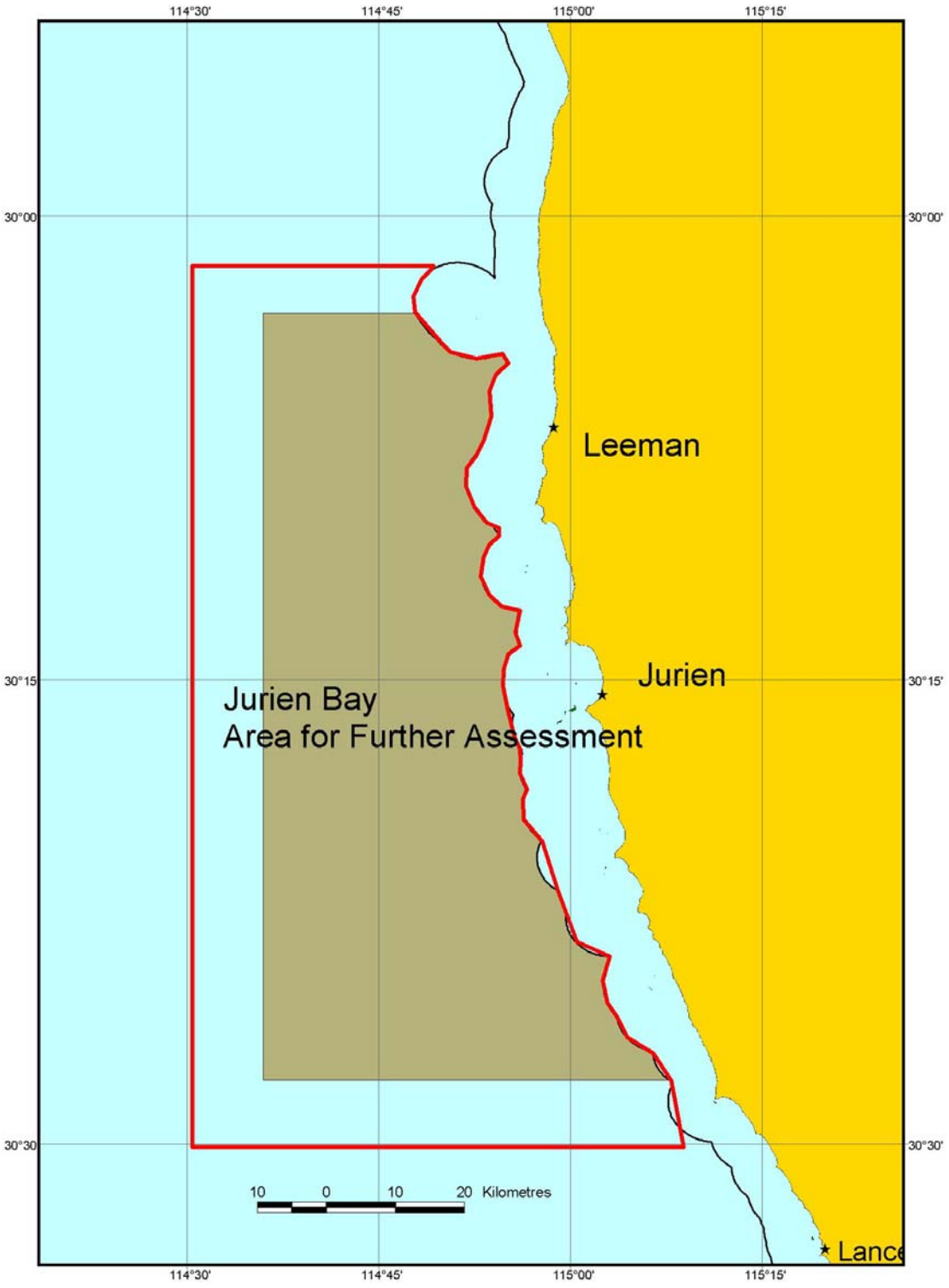

Figure 17: Jurien Bay Area for Further Assessment – red box indicates areas of importance to recreational fishers

6.4.3 Perth Canyon Area

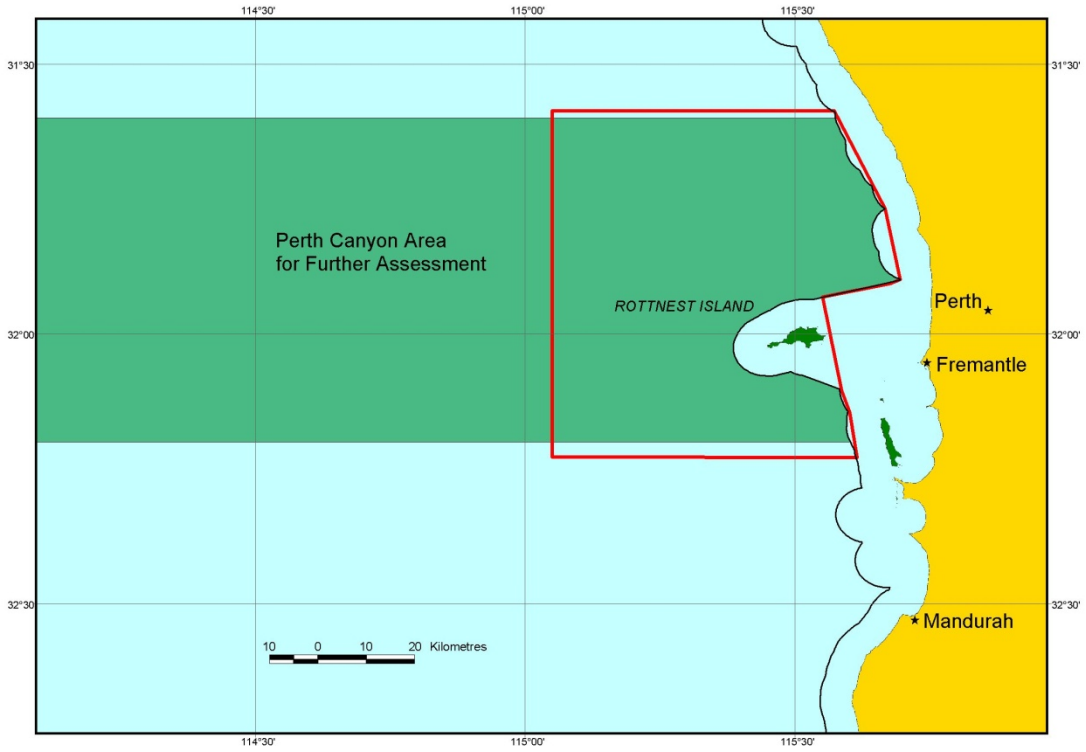

Figure 18: Perth Canyon Area for Further Assessment – red box indicates areas of importance to recreational fishers

The Perth Canyon Area (Figure 18) represents one of the most significant areas of Commonwealth Waters accessed by recreational fishers based in Perth and surrounding centres including Fremantle and Mandurah. Numerous Fish Aggregating Devices have been deployed and attract pelagic species such as tuna and marlin. Ongoing access to this valuable gamefishing opportunity must be considered as paramount.

6.4.4 Southwest Corner Area

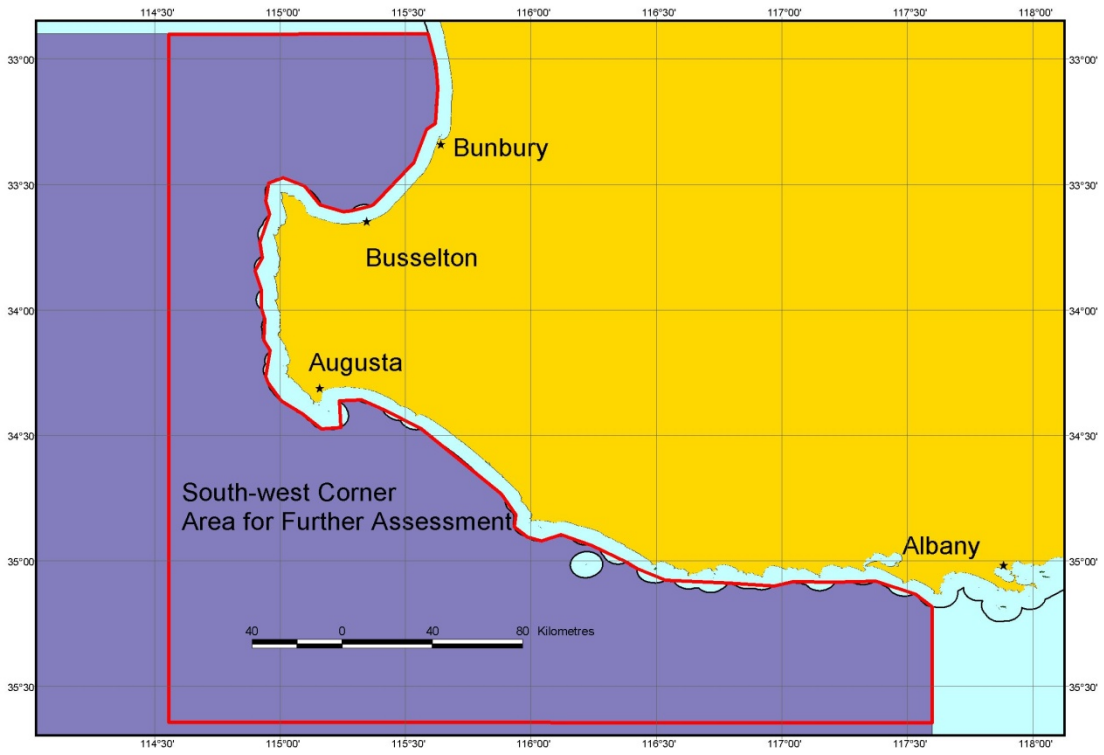

Figure 19: Southwest Corner Area for Further Assessment – red box indicates areas of importance to recreational fishers

In a similar manner to the Perth Canyon Area, the South-west Corner Area for Further Assessment (Figure 19) is of considerable importance due to its proximity to large coastal communities and lying within easy access of Perth.

6.4.5 Recherche Area

Figure 20: Recherche Area for Further Assessment – red box indicates areas of importance to recreational fishers

The Western Australian Department of Fisheries has recently published a report on the efficacy of sanctuary areas for the management of fish stocks and biodiversity in WA Waters (Penn and Fletcher 2010). The review considers the current range of threats to fish stocks and biodiversity in WA continental shelf waters and assesses the relative efficacy of various management strategies available to protect marine fish stocks and biodiversity.

A range of strategies to protect marine ecosystems including established habitat protection areas which prohibit trawling over large areas of WA's continental shelf essentially have the same practical outcome as the declaration of sanctuary areas (Penn and Fletcher 2010). Additional gear restrictions and seasonal and spatial closures mean that any further benefits of sanctuary areas need to be carefully considered in light of the current measures already in place in WA waters (Penn and Fletcher 2010). Any consideration of MPAs should be in light of overall planning objectives for the entire region (Penn and Fletcher 2010).

6.4.6 Great Australia Bight Area

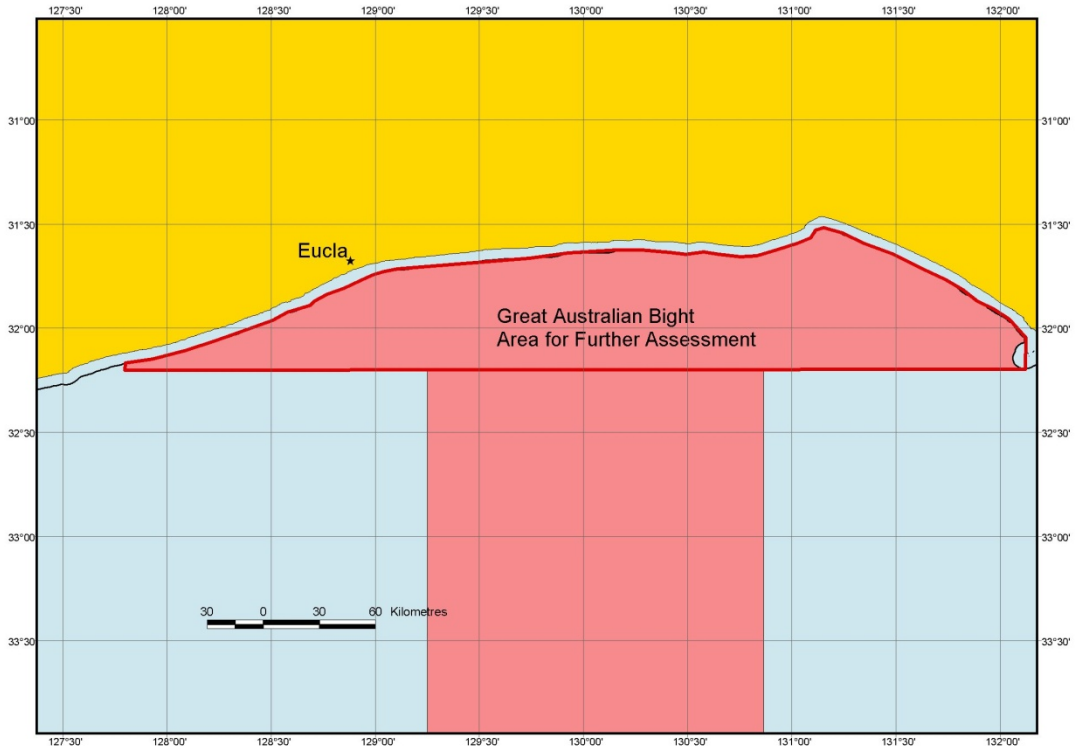

Figure 21: Great Australia Bight Area for Further Assessment – red box indicates areas of importance to recreational fishers

The Great Australia Bight Area for Further Assessment (Figure 21) represents remote, wilderness fishing opportunities for both Western and South Australian recreational fishers lying on the border of these two states. Extreme weather conditions generated in the Southern Ocean restrict fishing activities to windows of good weather and few private recreational fishing vessels are likely to venture too far offshore of this exposed coastline.

6.4.7 Western Eyre Area

Recreational fishing in the Western Eyre Area (Figure 22) includes private fishers operating out of Port Lincoln, Ceduna and Coffin Bay. Visits to Flinders Reef and Nuyts Archipelago occur on a monthy basis while fishing further offshore (within Commonwealth Waters) for Southern Bluefin Tuna is also popular, particularly when the weather is favourable. Some long range charter vessels operate in the area.

Most of the recreational fishing activity in Commonwealth Waters in South Australia is concentrated in this area given the access of offshore sheltered anchorages and the proximity to larger centres such as Port Lincoln and Coffin Bay (McGlennon (1999), Mcleay et al. (2003)).

Given the limited windows of opportunity to access Commonwealth Waters and the reliance on fishing schools of pelagic species such as Southern Bluefin Tuna, it is difficult to identify areas of significance. More discussions with the South Australian Gamefishing Association will be required once draft boundaries of marine reserves are available for discussion.

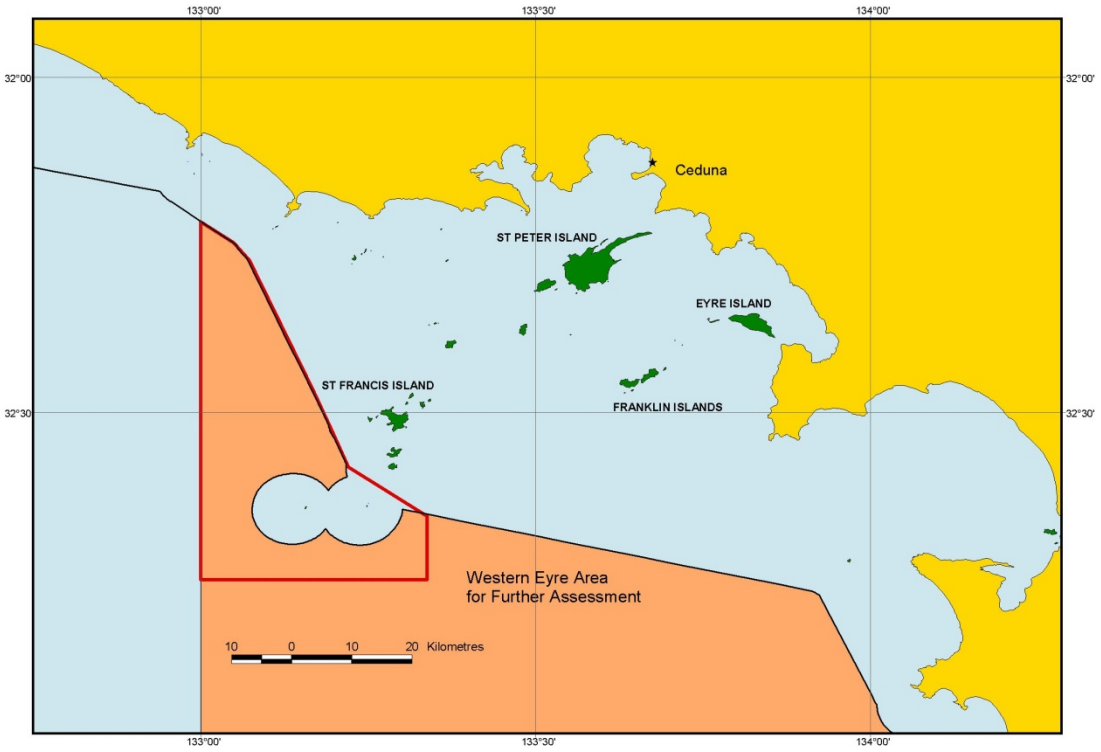

Figure 22: Western Eyre Area for Further Assessment – red box indicates areas of importance to recreational fishers

7.0 Survey of recreational fishing activity in Commonwealth Waters

7.1 Demographics

Caution should be exercised when interpreting the results due to the relatively small sample size. Nevertheless the responses received are consistent with previous surveys of recreational fishing activity, perceptions and activities. The majority (58.7%) of responses came from anglers based in NSW and Queensland (Figure 23). The distribution of respondents is broadly representative of where the highest concentrations of recreational fishers live according to the 2001 national survey (Henry and Lyle 2003) with South Australia possibly being under represented.

	NT	ACT	NSW	QLD	SA	TAS	VIC	WA
State/Territory	1.1%	2.2%	29.4%	29.4%	1.1%	2.2%	18.5%	16.3%

Figure 23. Location of residence for respondents.

Demographic information showed that 96% of respondents were male (Figure 24), and the age categories of the respondents is shown in Figure 25.

Gender	Response Percent
Male	96.0%
Female	4.0%

Figure 24. Gender of respondents.

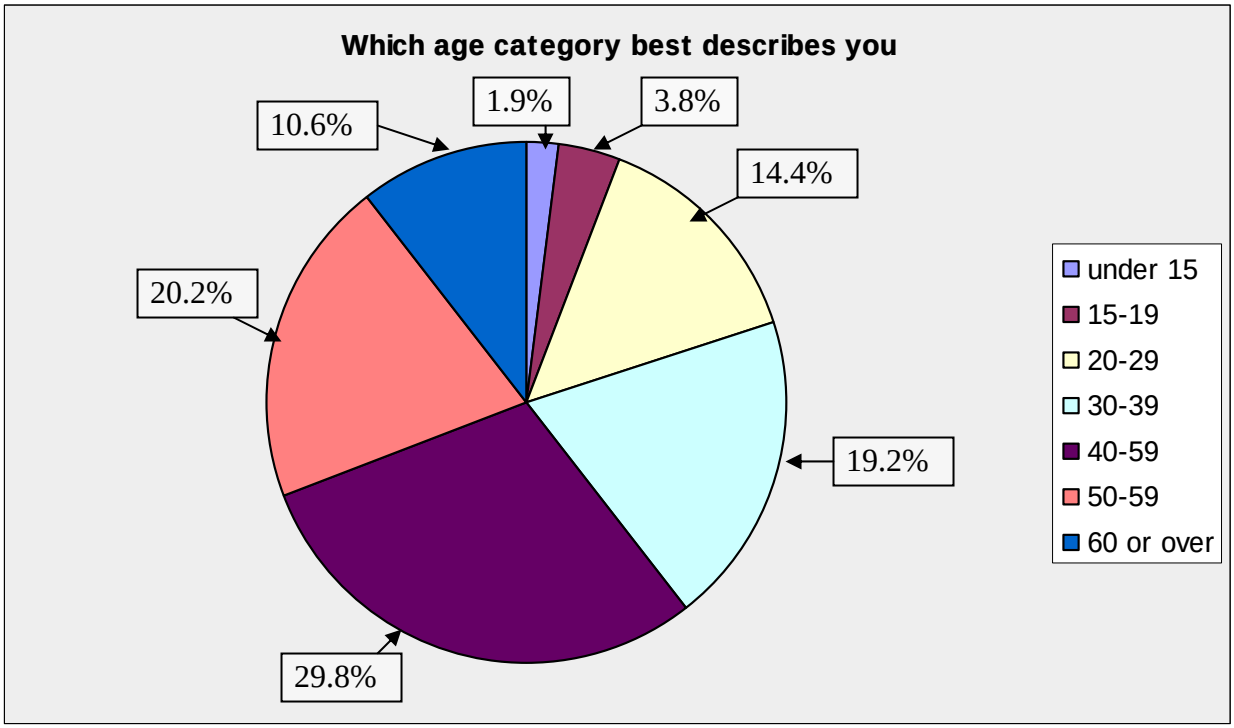

Figure 25. Age categories of respondents.

Almost half the respondents were aged between 30-39 (19.2%) and 40-49 (29.8%) with a further 20.2% aged between 50 and 59 (Figure 25). This is consistent with the age distribution of Australian recreational fishers (Henry and Lyle 2003; McInnes 2006) and indicates that a broadly representative cross section of recreational fishers responded to the survey.

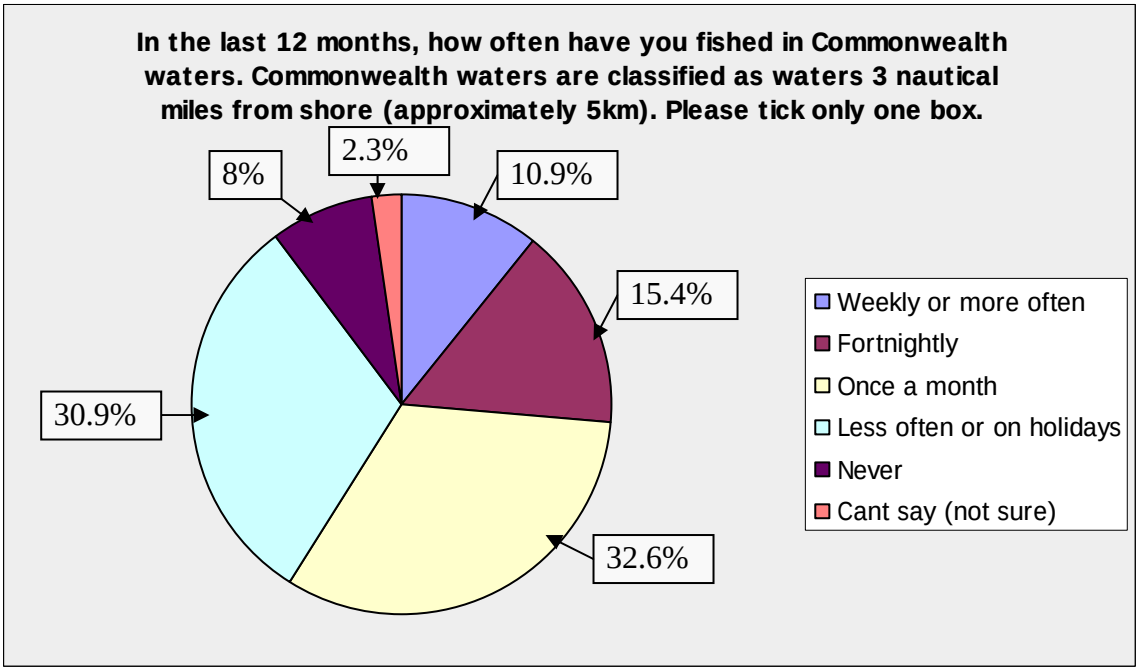

Figure 26. Proportion of respondents who had fished in Commonwealth Waters in the last 12 months.

7.2 Fishing Activity

The majority of respondents (63.5%) fished in Commonwealth Waters either once a month or less often on holidays (Figure 26). The size of the boats they used were mostly in the 4.8 to 5.9 metre range (50.3% of correspondents), with 25.5% using boats between 6 and 8 metres in length (Figure 27).

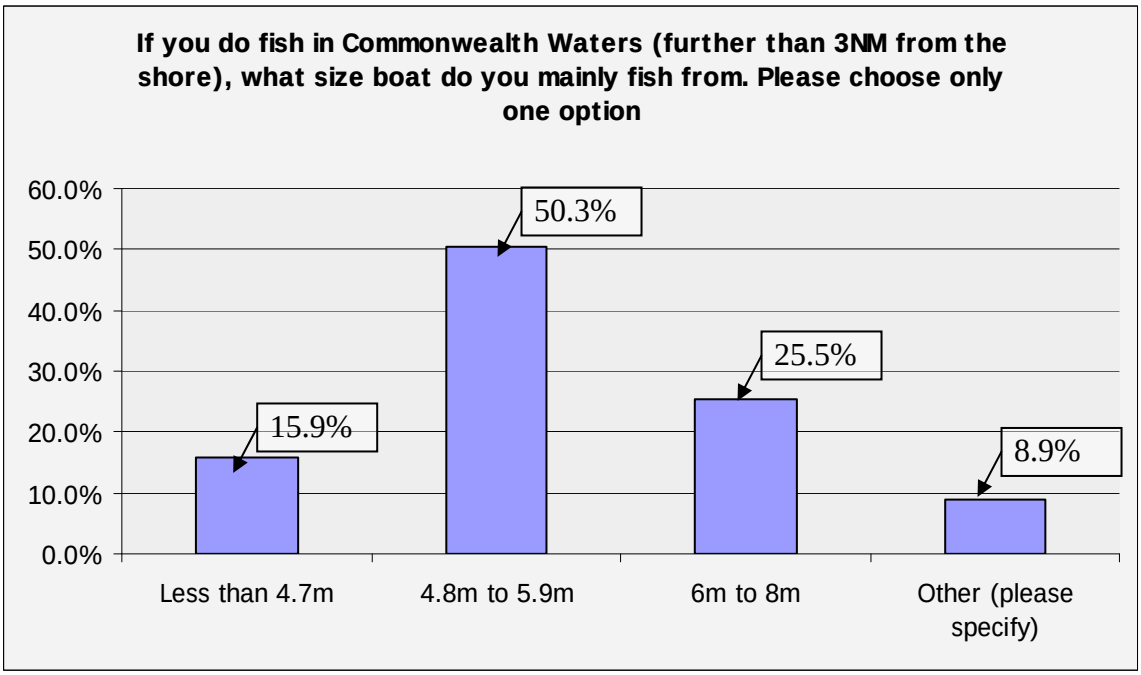

Figure 27. Size of boats used in Commonwealth Waters greater than 3 nautical miles offshore.

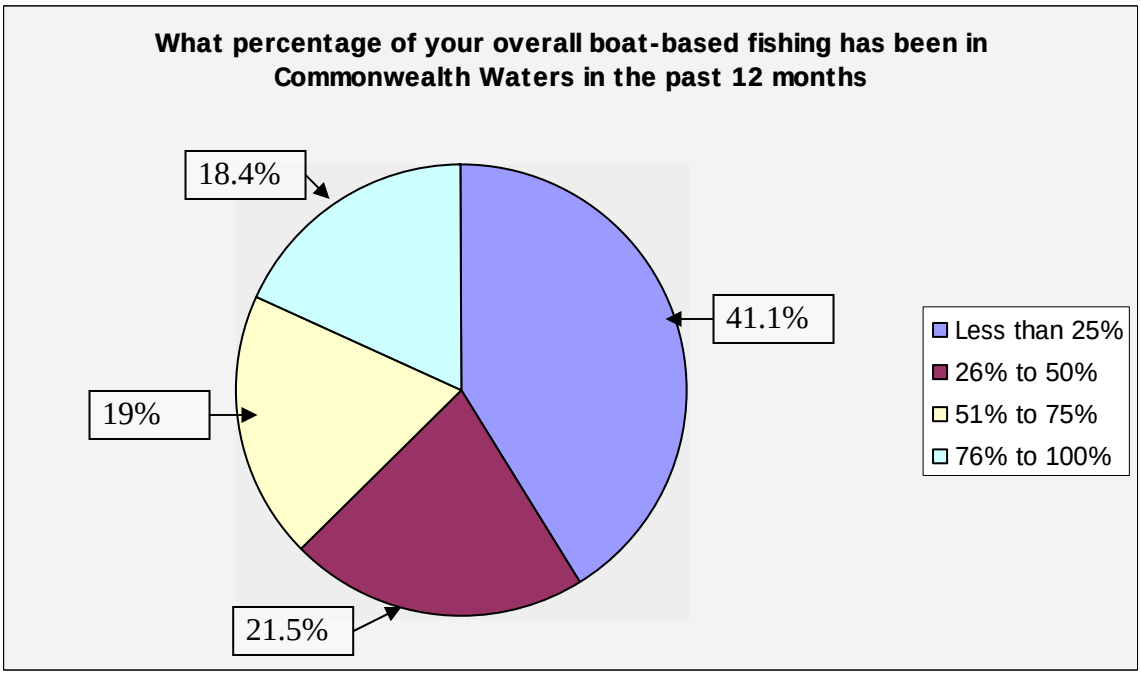

Figure 28. Percentage of overall boat based fishing in Commonwealth Waters in the previous 12 months.

A large percentage of fishers (37.4%) fished in Commonwealth Waters at least half the time they went fishing, though the majority of fishers fished in Commonwealth Waters less than 25% of their fishing trips (Figure 28).

Trolling lures or livebaits was the most common fishing method used by anglers in Commonwealth Waters (75.2% of respondents), followed by bait fishing with purchased bait (69.4%) and fishing with lures from stationary or drifting boats (59.2%). Drop lining, fly and spearfishing were the least common methods used (Figure 29).

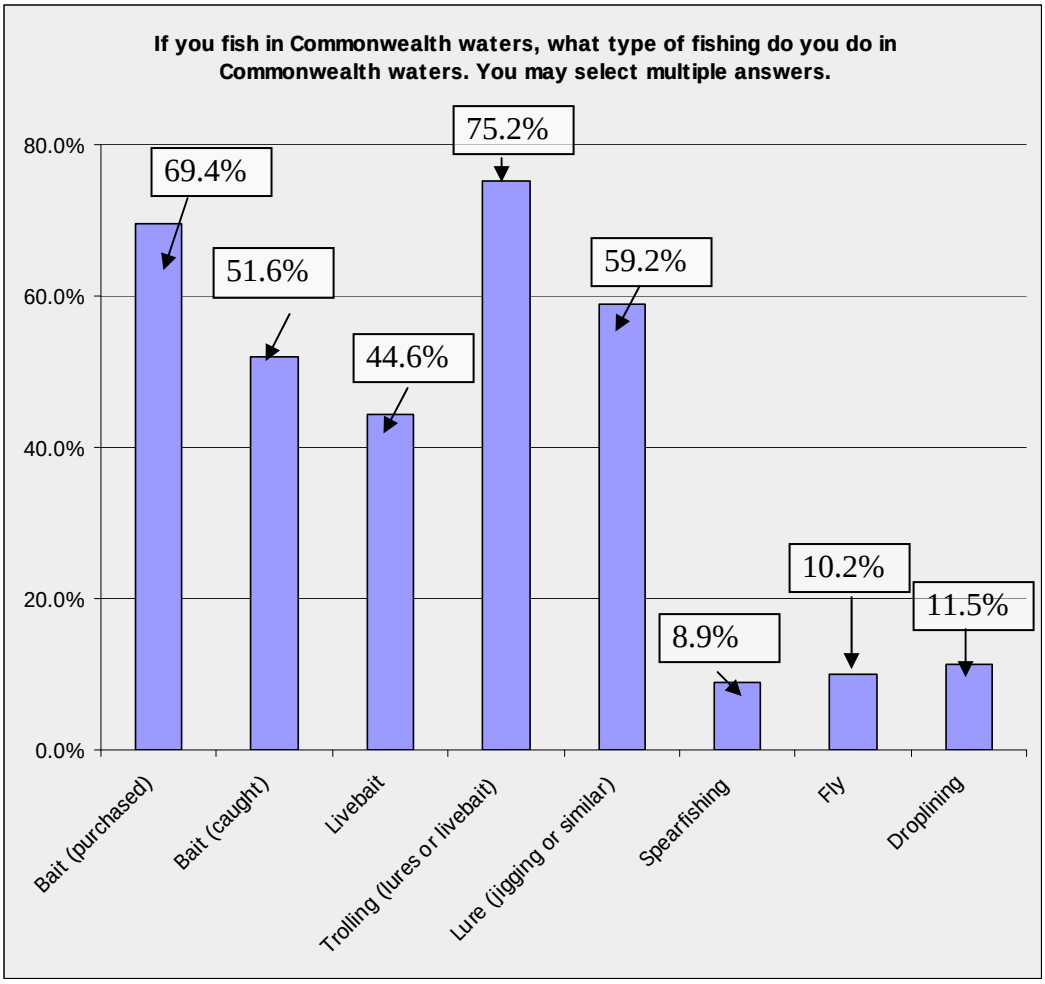

Figure 29. Types of fishing techniques used by recreational fishers in Commonwealth Waters.

If you fish in Commonwealth Waters, what species do you target in Commonwealth Waters. You may select multiple answers.	
Answer Options	**Response Percent**
Tuna	50.3%
Marlin	25.8%
Mackerel	49.7%
Trevally (including Kingfish and Amberjacks)	50.3%
Pelagic (midwater to surface) Sharks e.g. mako, blue	25.2%
Demersal (bottom dwelling) Sharks e.g. gummy, school	20.8%
Tropical Reef Fish (Coral Trout, Emperors, Tropical Snappers etc)	44.0%
Rocky Reef Fish (Snapper, Dhufish, Pearl Perch, Mulloway etc)	64.2%
Deepwater Species (Hapuku, Bar Cod etc)	6.3%
Squid	28.9%
Other (please specify)	13.8%

Figure 30. Most common species groups targeted by recreational fishers in Commonwealth Waters.

Demersal rocky reef fishes were the most commonly targeted species (64.2% of respondents), followed by pelagics such as tuna and trevallies (50.3% of respondents), mackerels (49.7%), tropical reef fish (44%), squid (28.9%) and marlin (25.8%) (Figure 30). Other species included Mulloway and Jewfish, Flathead, Mahi Mahi and King George Whiting.

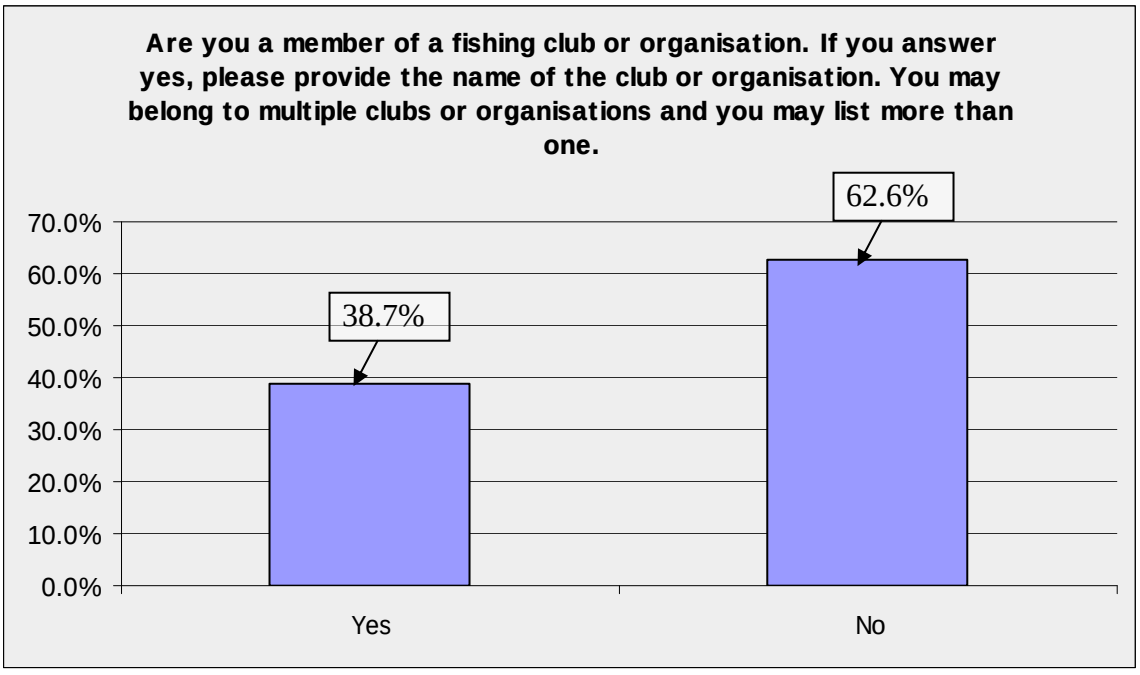

Figure 31. Respondents membership of fishing clubs.

38.7% of respondents were members of fishing clubs or organisations (Figure 31).

7.3 Attitudinal Survey

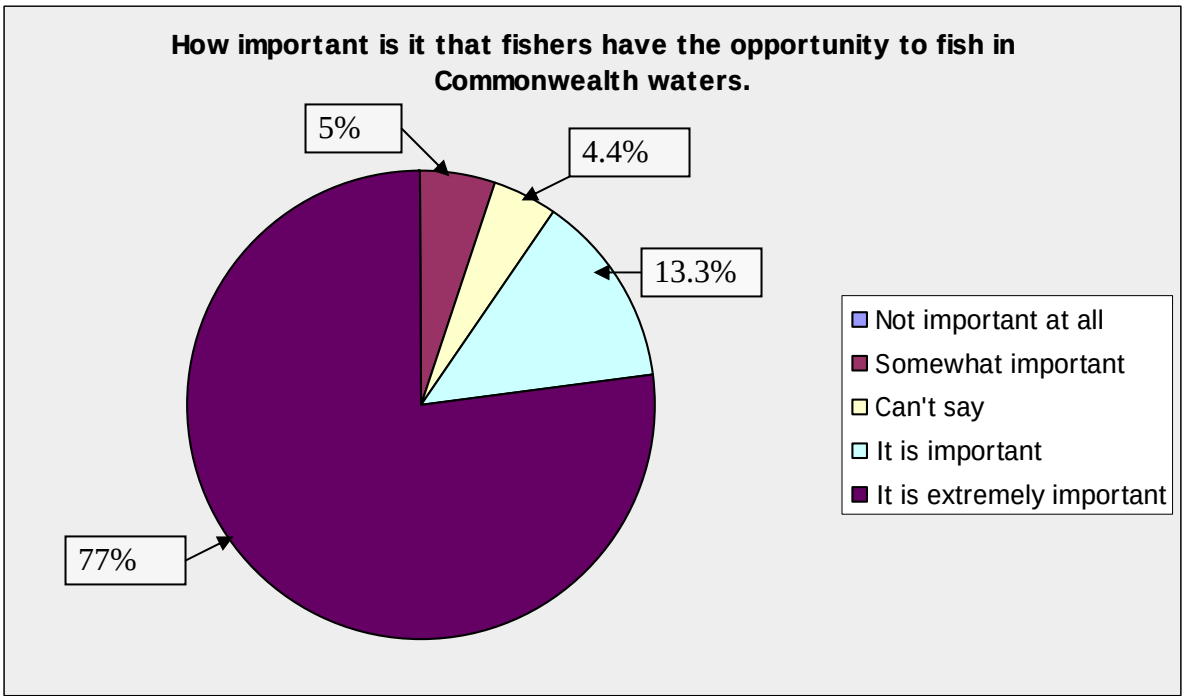

Figure 32. Perception of importance of the opportunity to be able to fish in Commonwealth Waters.

Over 90% of respondents considered the opportunity to be able to fish in Commonwealth Waters to be either important (13.3%) or very important (77% of respondents) (Figure 32). None of the respondents considered that the opportunity to access Commonwealth Waters was unimportant.

Narrowing the comments down to their personal fishing experiences; In comparison to other fishing opportunities available to them in non-Commonwealth Waters, over 86% of respondents considered the opportunity to fish in Commonwealth Waters to be either important (22.3%) or extremely important (64.3% of respondents) (Figure 33). Only 2.7% considered fishing opportunities in Commonwealth Waters to be unimportant compared to their activities in other areas (Figure 33).

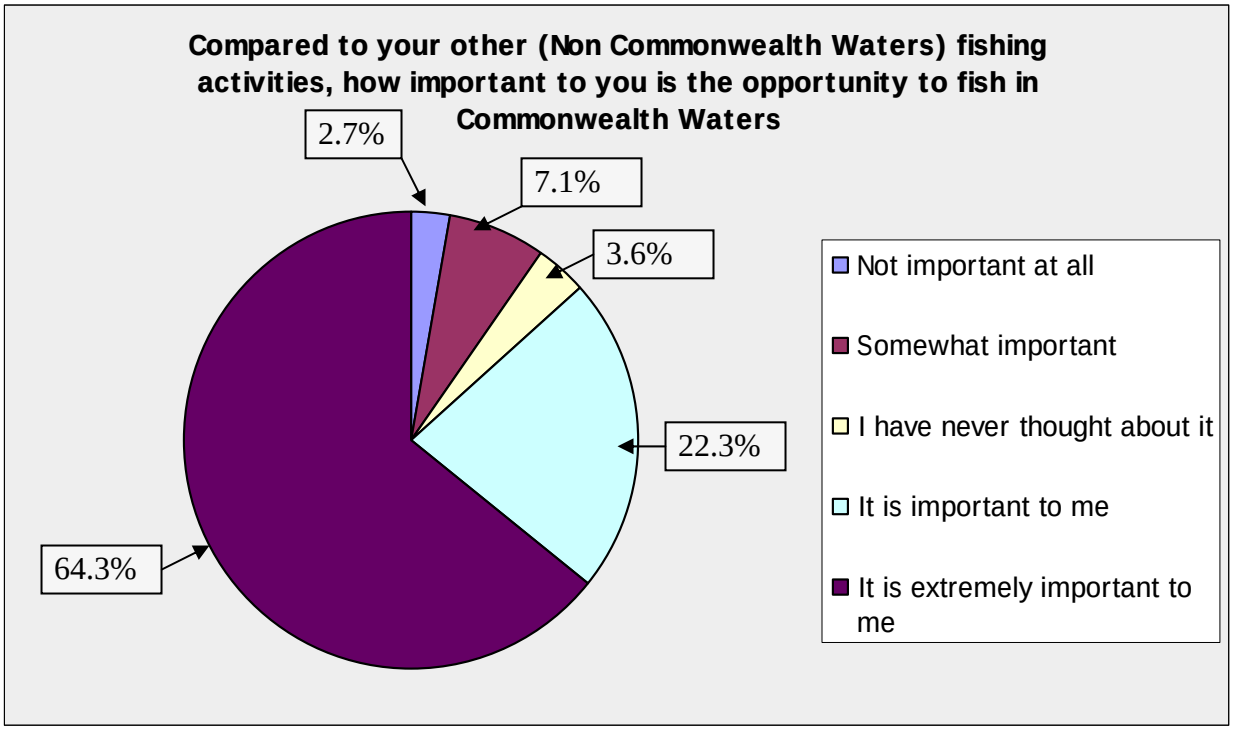

Figure 33. Comparative perception of the importance of the opportunity to be able to fish in Commonwealth Waters compared to fishing in State waters.

Commercial fishing and illegal and unregulated fishing were considered by respondents to be the activities with the highest impacts on fish stocks, followed by loss of habitat and pollution (Figure 34). Impacts of climate change and from legal fishing by recreational anglers were considered to be the factors least likely to have detrimental impacts on fish stocks (Figure 34).

When respondents were asked about their views on multiple use marine parks, over 60% either agreed (21.4%) or strongly agreed (49.1%) that multiple use marine parks are preferable to reserves that lock out recreational fishers (Figure 35). Over 82% agreed (12.5%) or strongly agreed (75%) that any zoning decisions (and particularly those relating to no take or no fishing zones) must be risk assessed and evidence based (Figure 35). Over 87% either agreed (24.3%) or strongly agreed (63.1%) that any loss of access by recreational fishers should be compensated for by initiatives such as buyout of commercial fishing effort, establishment of artificial reefs, and provision of exclusive recreational only fishing areas (Figure 35).

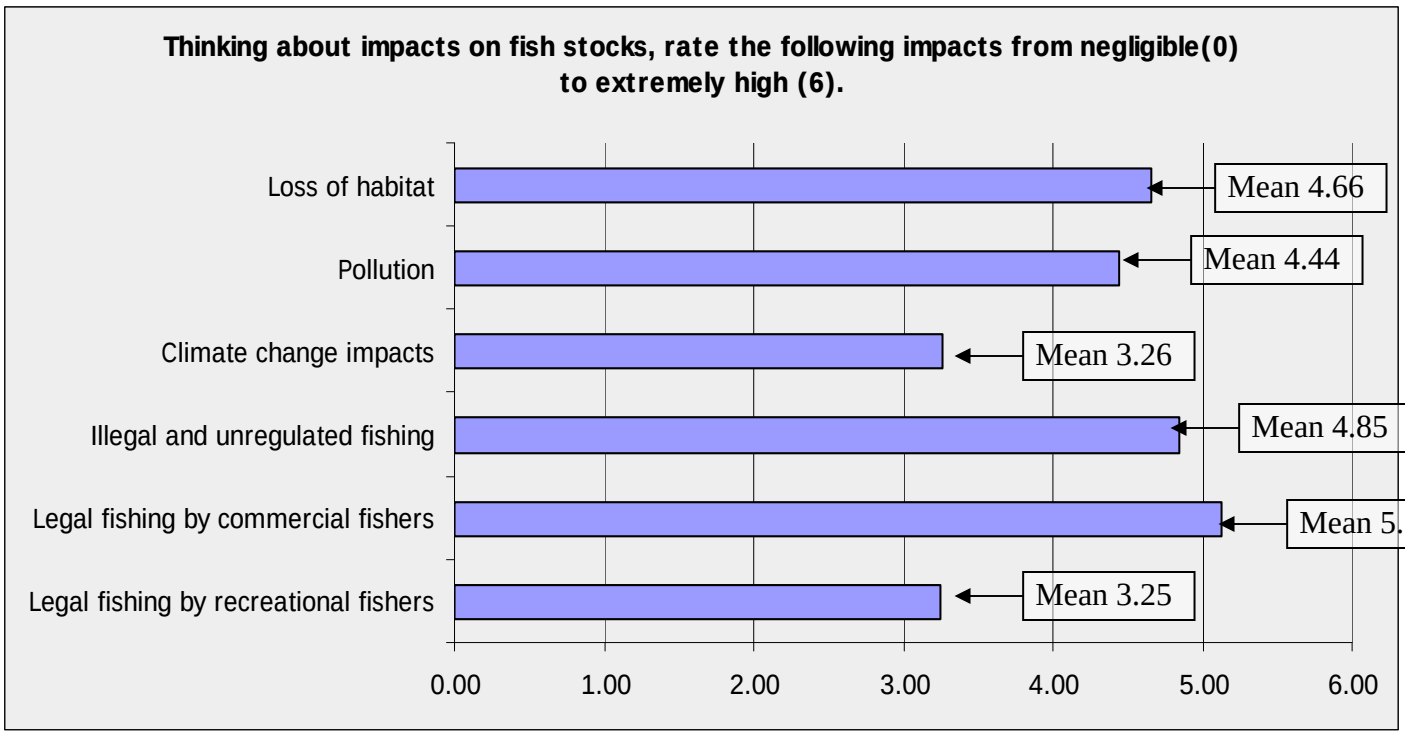

Figure 34. Perceptions of the relative impacts of various activities on fish stocks.
Unsure = -1, No Impact = 0, Low Impact = 1, Moderate Impact = 2, High Impact = 3, Extremely high impact = 4

With reference to Marine Parks, please answer the following questions. Choose which option best suits your opinion.					
Answer Options	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
Multiple use marine parks are preferable to reserves that lock recreational fishers out of areas.	14.3%	8.1%	7.1%	21.4%	49.1%
Any zoning (especially no take/no fishing zones) must be risk assessed and evidence based.	3.6%	2.7%	6.25%	12.5%	75%
Any loss of access must be mitigated for (i.e buyout commercial effort, artificial reefs, exclusive recreational fishing only areas)	3.6%	1.8%	7.2%	24.3%	63.1%

Figure 35. Opinions related to zoning in multiple use marine parks.

When asked about their opinions on no take zones in multiple use marine parks, nearly 50% of respondents either agreed (32.7%) or strongly agreed (16%) that no take zones are important reference areas for scientific research (Figure 36). Over 60% of respondents agreed (44.2%) or strongly agreed (16%) with the statement that no take zones were important for protection of vulnerable habitats or species against identified risks (Figure 36). Over 42% of respondents agreed (29.4%) or strongly agreed (13.4%) with the statement that no take zones were important components of overall marine management, but over 65% of respondents agreed (27.9%) or strongly agreed (38.7%) with the statement that no take zones were a tool which allowed managers and bureaucrats to avoid real habitat management issues (Figure 36). Only one third of

respondents agreed (15.3%) or strongly agreed (18%) with the statement that no fishing zones do no good at all (Figure 36).

Consider your responses to these statements about marine parks and especially sanctuary (no fishing) zones. Answer Options	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Are an important principle for provision of some reference areas for scientific research.	11.5%	17.7%	22.1%	32.7%	16%
Are important to protect vulnerable habitats or species against an identified risk.	10.7%	14.1%	15%	44.2%	16%
Are an important part of overall marine management.	17%	25.9%	14.3%	29.4%	13.4%
Are a tool that allows the avoidance of real habitat management issues.	3.6%	12.6%	17.2%	27.9%	38.7%
Do no good at all.	15.3%	27%	24.4%	15.3%	18%

Figure 36. Opinions related to no take zones in multiple use marine parks

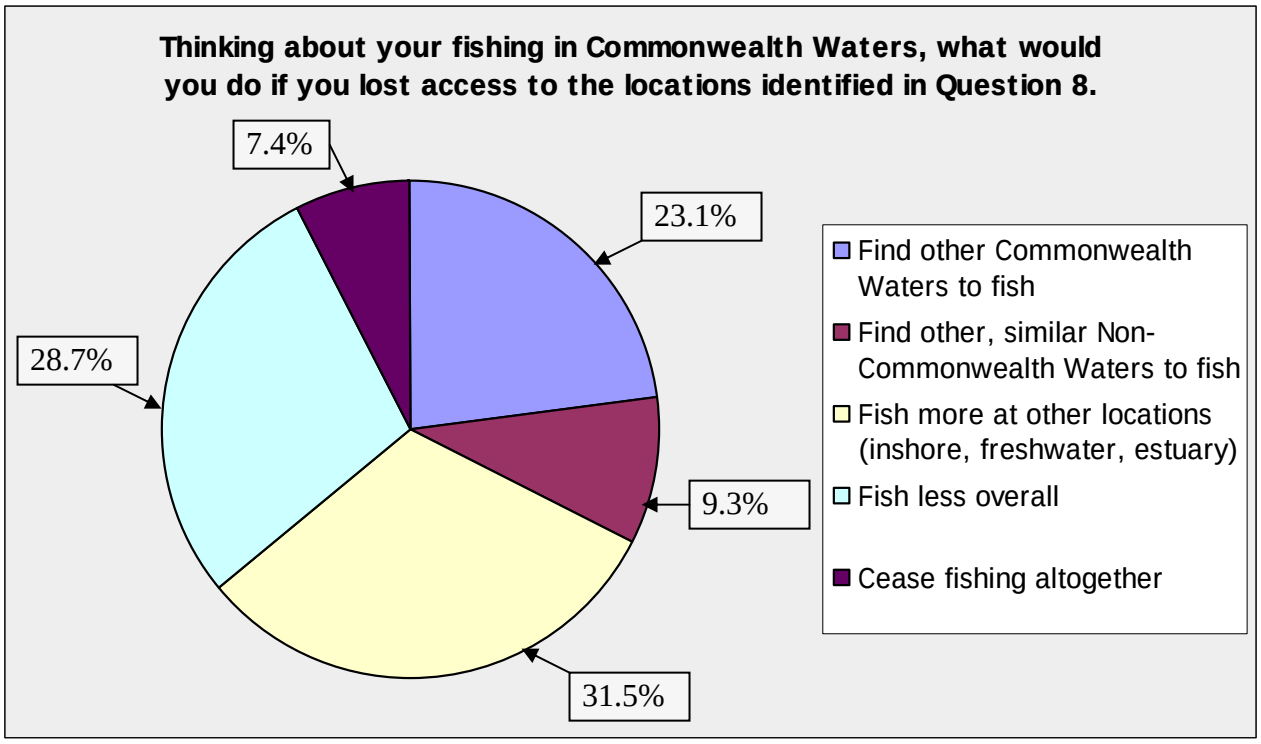

Figure 37. Opinions on fisher behaviour in the instance of loss of access to Commonwealth Waters.

When posed with the question of what they would do if they lost access to the fishing locations they identified as using in Commonwealth Waters, 7.4% of respondents stated they would stop fishing altogether (Figure 37).

For those who indicated they would continue fishing, 28.7% indicated they would fish less overall, 23.1% stated they would find other Commonwealth Waters to fish, 9.3% said they would find similar, non-Commonwealth Waters to fish, and 31.5% said they would fish more at other inshore, estuary or freshwater locations (Figure 37).

8.0 Discussion

This report provides up to date information on recreational fishing in Commonwealth Waters to inform the Australian Government's Marine Bioregional Planning process. Historically recreational fishing activities in Commonwealth Waters have been limited to large gamefishing boats with sophisticated and expensive navigation and other electronic aids or by accessing offshore waters on recreational fishing charters. Recent advances in affordable GPS and sonar together with safer and more fuel efficient vessels and the advent of the Internet have meant that the popularity of offshore fishing for private recreational fishers has increased tremendously over the past decade.

Respondents to our survey demonstrated that a wide range of vessels access Commonwealth Waters to fish for a range of different species. The survey also demonstrated that there was generally support for marine protected areas but engagement with fishers was required and multi-use marine parks were preferable to no-fishing sanctuaries.

In considering the areas of importance to recreational fishers, it is important to note that within the broad areas defined, there will be locations of particular relevance. It is anticipated that these will only be revealed once a draft management plan is available for each region which sets out the boundaries of marine reserves and the IUCN zoning to be applied. Additional sources of information should be considered at that time, especially information that will be provided by the gamefishing sector.

Engagement with recreational fishers at the earliest stage possible in the marine bioregional planning process is vital to improve both understanding and acceptance of the process by recreational fishers whilst minimizing undesirable outcomes for both recreational fishers and the government (Recfish Australia 2006, 2007). The need for engagement with fishing stakeholders in the planning of MPAs, including in data collection, and the advantages of doing so are well documented (e.g. Baelde, 2001; Manson and Die, 2001; Scholz, et al., 2004; Lunn and Dearden, 2006). It is hoped that this report provides a valuable opportunity to include the expert advice of the recreational fishing community and represents a significant step in incorporating stakeholder feedback.

Without full engagement of the recreational sector in the marine bioregional planning process, the outcomes from this process could have significant unintended detrimental impacts on the otherwise very substantial socio economic benefits of recreational fishing throughout Australia. It is also important for the Australian Government to

acknowledge the impact of MPAs on recreational fishing activities, particularly the fact that recreational fishers generally do not receive compensation for these impacts. It is vitally important to realize that initiatives such as artificial reefs, stock enhancement and other recreational fishing development initiatives should be undertaken by the Federal Government in Commonwealth Waters to offset impacts that may accrue from fishing closures that will be implemented as part of the marine bioregional planning process (Recfish Australia 2007).

9.0 Acknowledgements

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