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# Economic Impact of Recreational Fishing in Port Stephens and Narooma/Bermagui



## Executive Summary

### Background

The NSW Government faces the difficult task of determining how to allocate the marine resources within 3 nautical miles of the NSW coastline between alternative current and future uses.

Up until the late 1990s, this allocation of marine resources between alternative uses was achieved primarily through regulations issued under the *Fisheries Management Act 1994*, which seeks to conserve, develop and share NSW's fishery resources for the benefit of present and future generations.

In 1997, however, the NSW Government introduced the *Marine Parks Act 1997*, which seeks:

- to conserve marine biological diversity and marine habitats by declaring and providing for the management of a comprehensive system of marine parks;
- to maintain ecological processes in marine parks; and
- where consistent with these preceding objectives:
  - to provide for ecological sustainable use of fish (including commercial and recreational fishing) and marine vegetation in marine parks; and
  - to provide opportunities for public appreciation, understanding and enjoyment of marine parks.

Since the introduction of the *Marine Parks Act 1997*, the NSW Government established a number of large marine parks under the Act including:

- the **Lord Howe Island Marine Park**, which was declared effective on 26 February 1999;
- the **Solitary Islands Marine Park**, which was declared effective on 4 April 2001;
- the **Jervis Bay Marine Park**, which was declared effective on 1 October 2002; and
- the **Cape Byron Marine Park**, which was declared effective on 1 November 2002.

More recently, two new marine parks have been declared that encompass some of the most popular recreational fishing locations in the Port Stephens and Narooma/Bermagui regions:

- the **Port Stephens – Great Lakes Marine Park**, which was declared effective from 1 December 2005. This marine park covers approximately 98,720 hectares and extends from Cape Hawke Surf Life Saving Club near Forster, south to Birubi Beach Life Saving Club at the northern end of Stockton Beach and out to the three nautical mile limit of NSW waters. It includes Port Stephens and the Karuah River, the Myall River and Myall and Smiths Lakes and all of their creeks and tributaries to the limit of tidal influence, but does not include Wallis Lake; and
- the **Batemans Marine Park**, which was declared effective from 7 April 2006. This marine park extends in a southerly direction from the most northerly point of Murramarang Beach near Bawley Point to the southern side of Wallaga Lake entrance at Murunna Point and out to the three nautical mile limit of NSW waters. It includes waters off Narooma and Bermagui, including those surrounding Montague Island. It also includes all rivers, estuaries, bays, lagoons and inlets upstream to their tidal limit, tidal lands, and saline and brackish coastal lakes, but excludes Nargal Lake.

## Objectives and structure of this report

The key objectives of this report, which was commissioned by the Australian Fishing Tackle Association (AFTA) and the Boating Industry Association (BIA), are to:

- outline the nature and extent of recreational fishing in the Port Stephens and Narooma/Bermagui areas of NSW (section 2), using the results of AFTA/BIA surveys of recreational fishing in the Port Stephens and Narooma/Bermagui regions, as well as the results of a survey of recreational fishing in Narooma/Bermagui conducted by Dominion Consulting;
- estimate the economic value that recreational anglers derive from fishing in the Port Stephens and Narooma/Bermagui areas (section 3);
- estimate the economic significance of recreational fishing in those areas to the NSW economy and regional economies (section 4); and
- examine the implications that these estimates of the economic value and significance of recreational fishing have for the establishment of the Port Stephens – Great Lakes and Batemans marine parks (section 5).

## Nature and extent of recreational fishing in Port Stephens and Narooma/Bermagui

### *Number of recreational anglers fishing in Port Stephens and Narooma/Bermagui*

In 2005-06, it is estimated that:

- 5,920 recreational anglers fished in the Port Stephens area; and
- 8,244 recreational anglers fished in the Narooma/Bermagui area.

### *Recreational angler demographics*

Recreational angling in Port Stephens and Narooma/Bermagui is an activity that attracts mainly men:

- aged between 30 and 59 years old (74% of recreational anglers in Port Stephens and 68% of recreational anglers in Narooma/Bermagui);
- whose highest level of education is high school (67% of recreational anglers in Port Stephens and 45% of recreational anglers in Narooma/Bermagui). However, over 30 per cent of the recreational anglers surveyed in Port Stephens had a university degree, college diploma or post graduate education, as did over 40 per cent of recreational anglers surveyed in Narooma/Bermagui; and
- who earn less than \$100,000 of gross income per annum (over 74% of recreational anglers in Port Stephens and over 68% of recreational anglers in Narooma/Bermagui). A large proportion of recreational anglers earn less than \$50,000 per annum (over 31% of recreational anglers in Port Stephens and over 40% of recreational anglers in Narooma/Bermagui).

### ***Preferred types of recreational fishing***

Recreational anglers:

- in Port Stephens prefer to fish offshore reefs (over 35% of recreational anglers), troll lures or live bait offshore for gamefish (23%), fish the beach or onshore reefs (over 21%), fish in bays and estuaries (over 19%);
- in Narooma/Bermagui prefer to troll lures or live bait offshore for gamefish in Narooma/Bermagui (over 36% of recreational anglers in Narooma/Bermagui), fish in bays and estuaries (over 27% of recreational anglers in Narooma/Bermagui), fish offshore reefs (over 18% of recreational anglers in Narooma/Bermagui), or fish the beach or onshore reefs (over 18% of recreational anglers in Narooma/Bermagui). The face-to-face interviews conducted by Dominion Consulting in their survey of recreational anglers in Narooma/Bermagui produced a broadly consistent set of results regarding the preferences of recreational anglers:
  - estuary fishing (27%);
  - beach fishing (12%);
  - fishing from rocks/wharf (22%);
  - ocean bottom fishing (22%); and
  - ocean game fishing (16%);
- prefer to fish on the bottom with bait (over 71% of recreational anglers in Port Stephens and over 45% of recreational anglers in Narooma/Bermagui). However, the second most popular fishing technique preferred by recreational anglers was casting or trolling artificial lures (over 10% of recreational anglers in Port Stephens and over 36% of recreational anglers in Narooma/Bermagui);
- prefer to fish from their own boats (over 75% of recreational anglers in Port Stephens and 60% of recreational anglers in Narooma/Bermagui) or their friends' boats (over 17% of recreational anglers in Port Stephens and 15% of recreational anglers in Narooma/Bermagui). These results were consistent with the results of Dominion Consulting's survey of recreational anglers in Narooma/Bermagui which indicated that around 65 per cent of recreational anglers fished from either their own or 'accessed' boats; and
- prefer to keep the occasional fish for consumption by family or friends (over 63% of recreational anglers in Port Stephens and over 52% in Narooma/Bermagui). In Port Stephens, over 26 per cent of recreational anglers indicated that they kept all the fish they caught up to the bag limit, whereas in Narooma/Bermagui, only 11 per cent of recreational anglers indicated they followed this practice. Over 29 per cent of recreational anglers in Narooma/Bermagui indicated that they released all of the fish they caught regardless of their size, whereas in Port Stephens only 5.7 per cent of recreational anglers followed this practice.

### ***Views regarding the establishment of marine parks in NSW***

Most recreational anglers fishing in the Port Stephens and Narooma/Bermagui regions:

- oppose the creation of the Port Stephens – Great Lakes Marine Park (more than 84 % of recreational anglers surveyed in Port Stephens opposed the creation of that park with more than 64% strongly opposing the creation of that park) and the Batemans Marine Park (more than 63 % of recreational anglers surveyed in Narooma/Bermagui opposed the creation of that marine park, with 50% strongly opposed to the creation of that marine park);
- are concerned that the creation of these marine parks will have an adverse impact on their ability to catch fish in those areas (77% of recreational anglers in Port Stephens believe that the creation of the Port Stephens – Great Lakes Marine Park will adversely affect their ability to catch fish in that area and over 68% of recreational anglers in Narooma/Bermagui believe that the creation of the Batemans Marine Park will adversely affect their ability to catch fish in that area). In particular, most recreational anglers believe the establishment of these marine parks will have a significantly adverse impact on their ability to catch fish in those areas ( over 66% of recreational anglers in Port Stephens and over 54% of recreational anglers in Narooma/Bermagui);
- would support the creation of those parks if they were reasonably satisfied that their favourite fishing locations would not be affected by the creation of the marine park (over 64% of recreational anglers in Port Stephens and over 45% of recreational anglers in Narooma/Bermagui);
- would reduce the number of times they visit Port Stephens and Narooma/Bermagui by more than 50 per cent if the creation of the Port Stephens – Great Lakes Marine Park and the Batemans Marine Park prevented them from fishing in their normal locations (over 75% of recreational anglers in Port Stephens and over 63% of recreational anglers in Narooma/Bermagui). Over 49 per cent of recreational anglers surveyed in Port Stephens indicated that they would no longer come to Port Stephens to fish if they were prevented from fishing in their normal locations and 22 per cent of recreational anglers would reduce the number of times they visit by more than 50 per cent. Similarly, over 31 per cent of recreational anglers surveyed in Narooma/Bermagui indicated that they would no longer fish in the area if the creation of the Batemans Marine Park prevented them from fishing in their normal locations, and over 27 per cent of recreational anglers indicated they would reduce their number of visits by more than 50 per cent;
- oppose the inclusion of Recreational Fishing Havens within marine parks (over 57% of recreational anglers in Port Stephens and over 68% of recreational anglers in Narooma/Bermagui). In particular, a large proportion of recreational anglers strongly oppose the inclusion of Recreational Fishing Havens within marine parks (41% of recreational anglers in Port Stephens and over 54% of recreational anglers in Narooma/Bermagui). This reflects the continuing concern amongst recreational anglers that the inclusion of Recreational Fishing Havens within marine parks could result in no-take ‘sanctuary zones’ within those Recreational Fishing Havens. At the same time, however, it is also important to note that a significant proportion of recreational anglers either support the inclusion of Recreational Fishing Havens within marine parks or are indifferent (41% of recreational anglers in Port Stephens and over 31 per cent of recreational anglers in Narooma/Bermagui). In particular, a significant proportion of recreational anglers strongly support the inclusion of Recreational Fishing Havens within marine parks (over 21% of recreational anglers in Port Stephens and over 18% in Narooma/Bermagui). This support presumably reflects their view that the inclusion of Recreational Fishing Havens within marine parks would preserve the status of these areas and would not result in the creation of no-take ‘sanctuary zones’ within those areas.

### ***Recreational fishing effort***

The AFTA/BIA survey of recreational anglers in Port Stephens suggests that they:

- spend most of their time fishing offshore waters (53%), particularly offshore reefs other than those around the islands (16%), the offshore reefs around Cabbage Tree Island, Little Island and Boondelbah Island (14%), waters more than 3 nautical miles offshore (11%) and the waters surrounding Broughton Island (10%);
- spend around 35 per cent of their time fishing inland waters, particularly Port Stephens Bay (18%) and its estuaries (14%); and
- spend around 12 per cent of their time fishing inshore waters (e.g. off the beach and the rocks).

The AFTA/BIA survey of recreational anglers in Narooma/Bermagui suggests that they:

- spend most of their time fishing offshore waters (69%), particularly the waters more than 3 nautical miles offshore (47%) and the waters surrounding Montague Island (20%);
- spend around 17 per cent of their time fishing inland waters, particularly Wagonga Inlet (16%); and
- spend around 13 per cent of their time fishing inshore waters (e.g. off the beach and the rocks).

The much higher proportion of time spent fishing more than 3 miles offshore is explained by the fact that most of the recreational anglers interviewed were offshore gamefishing enthusiasts.

By contrast, the results of the survey of recreational anglers conducted in Narooma/Bermagui by Dominion Consulting are broadly consistent with the results of the AFTA/BIA survey of recreational anglers in Port Stephens. That survey indicates that recreational anglers in Narooma/Bermagui:

- spend most of their time fishing offshore waters (38% to 40%), particularly ocean game fishing (16% to 23%) and ocean bottom fishing (17% to 22%);
- spend around 28 to 43 per cent of their time fishing inland waters, particularly estuary fishing from a boat (15 to 22%) or the shore (12 to 20%); and
- spend around 17 to 34 per cent of their time fishing inshore waters, particularly fishing from rocks/wharf (9% to 22%) and beach fishing (8% to 12%).

### ***Recreational fishing catch***

AFTA/BIA survey data for Port Stephens indicates that:

- Port Stephens bay (22%) and estuaries (23%) are the most important sources of whiting, flathead, bream and mulloway;
- offshore reefs (other than the reefs surrounding Broughton Island, Cabbage Tree Island, Little Island, Boondelbah Island, and Seal Rocks) are the most important source of snapper, morwong and kingfish (56%), one of the most important sources of sharks (20%), and the second most importance source of trevally, tailor and Australian salmon (16%) and yellowfin tuna (17%);
- the waters surrounding Broughton Island are the second most important source of snapper, morwong, kingfish (19%);
- the waters surrounding Cabbage Tree Island, Little Island and Boondelbah Island are an important source of trevally, tailor and Australian salmon (18%); and

- the waters more than 3 nautical miles off the coastline are the most important source of yellowfin tuna (64%), marlin (94%) and large sharks.

AFTA/BIA survey data for Narooma/Bermagui indicates that:

- Wagonga inlet is the most important source of whiting, bream flathead and mulloway (56%);
- the waters surrounding Montague island are the most important source of snapper, morwong and kingfish (79%) as well as small sharks (33%); and
- most yellowfin tuna (98%), marlin (98%) and sharks (67%) are caught more than 3 nautical miles off the coastline.

## Economic value of recreational fishing in Port Stephens and Narooma/Bermagui to recreational anglers

Estimates of the gross and net value of recreational fishing in Port Stephens and Narooma/Bermagui to recreational anglers (2005-06)

	Port Stephens		Narooma/Bermagui	
	Total	\$/day	Total	\$/day
<b>GROSS VALUE OF RECREATIONAL FISHING</b>	<b>\$80,791,939</b>	<b>\$291.13</b>	<b>\$44,545,558</b>	<b>\$313.60</b>
<b>Less: OPERATING COSTS</b>				
<b>On water costs</b>				
Boat fuel, repairs and maintenance, mooring/storage, licences	\$10,349,436	\$37.29	\$2,485,955	\$17.50
Charter boat hire, fishing guides	\$1,883,952	\$6.79	\$1,078,859	\$7.60
Bait, berley, ice, fishing licences, tournament entry costs	\$2,031,827	\$7.32	\$969,637	\$6.83
Opportunity cost of time spent fishing	\$6,688,830	\$24.10	\$3,274,799	\$11.80
<b>Offwater costs</b>				
Travel costs	\$2,861,477	\$10.31	\$5,861,410	\$41.26
Accommodation	\$7,727,313	\$27.84	\$3,636,763	\$25.60
<b>Total operating costs</b>	<b>\$31,542,835</b>	<b>\$113.66</b>	<b>\$17,307,423</b>	<b>\$121.84</b>
<b>NET VALUE</b>	<b>\$49,249,105</b>	<b>\$177.46</b>	<b>\$27,238,135</b>	<b>\$191.75</b>

AFTA/BIA survey data on expenditure by recreational anglers within Port Stephens and Narooma/Bermagui, and Dominion Consulting survey data on expenditure by recreational anglers within Narooma/Bermagui, were used to derive estimates of both:

- the gross value of recreational fishing within Port Stephens and Narooma/Bermagui to recreational anglers:
  - the gross value of recreational fishing in Port Stephens to recreational anglers was estimated to be \$80.8 million per annum (or \$291 per day spent recreational fishing); and
  - the gross value of recreational fishing in Narooma/Bermagui to recreational anglers was estimated to be \$44.5 million per annum (or \$314 per day spent recreational fishing);
- the net value of recreational fishing in Port Stephens and Narooma/Bermagui to recreational anglers:
  - the net value of recreational fishing in Port Stephens to recreational anglers was estimated to be \$49.2 million per annum (or \$177 per day spent recreational fishing); and
  - the net value of recreational fishing in Narooma/Bermagui to recreational anglers was estimated to be \$27.2 million per annum (or \$192 per day spent recreational fishing).

## Economic significance of recreational fishing in Port Stephens and Narooma/Bermagui to the NSW economy and regional economies

Estimates of the economic impact of recreational fishing in Port Stephens and Narooma/Bermagui on the NSW economy and regional coastal economies (2005-06)

IMPACTS	Direct Effect	Flow-on Effects			TOTAL IMPACT
		Production induced	Consumption induced	Total flow-on	
<b>GROSS OUTPUT (\$m)</b>					
Hunter	\$38.2	\$14.5	\$12.4	\$26.9	\$65.1
Southern	\$15.4	\$4.4	\$5.8	\$10.2	\$25.7
<b>NSW</b>	<b>\$53.7</b>	<b>\$25.2</b>	<b>\$31.9</b>	<b>\$57.1</b>	<b>\$110.8</b>
<b>VALUE-ADDED (\$m)</b>					
Hunter	\$10.2	\$6.3	\$6.0	\$12.3	\$22.5
Southern	\$4.6	\$1.9	\$2.9	\$4.8	\$9.4
<b>NSW</b>	<b>\$17.5</b>	<b>\$11.1</b>	<b>\$15.1</b>	<b>\$26.2</b>	<b>\$43.7</b>
<b>HOUSEHOLD INCOME (\$m)</b>					
Hunter	\$7.0	\$2.8	\$3.0	\$5.9	\$12.9
Southern	\$3.8	\$1.1	\$1.6	\$2.7	\$6.5
<b>NSW</b>	<b>\$11.6</b>	<b>\$6.3</b>	<b>\$7.9</b>	<b>\$14.2</b>	<b>\$25.8</b>
<b>EMPLOYMENT (no.)</b>					
Hunter	100	35	41	76	176
Southern	166	37	63	101	267
<b>NSW</b>	<b>469</b>	<b>169</b>	<b>256</b>	<b>425</b>	<b>894</b>

AFTA/BIA survey data on expenditure by recreational anglers within Port Stephens and Narooma/Bermagui, and Dominion Consulting survey data on expenditure by recreational anglers within Narooma/Bermagui, were also used in conjunction with a multi-regional economic input-output model to estimate the economic contribution of recreational fishing in Port Stephens and Narooma/Bermagui to:

- gross output in the NSW economy and regional coastal economies. It was estimated that in 2005-06:
  - recreational fishing in Port Stephens and Narooma/Bermagui contributed \$110.8 million to the gross output of the NSW economy;
  - recreational fishing in Port Stephens contributed \$65.1 million to the gross output of the Hunter region;
  - recreational fishing in Narooma/Bermagui contributed \$25.7 million to the gross output of the Southern region;
- value added in the NSW economy and regional coastal economies. It was estimated that in 2005-06:
  - recreational fishing in Port Stephens and Narooma/Bermagui contributed \$43.7 million to the value added in the NSW economy;
  - recreational fishing in Port Stephens contributed \$22.5 million to the value added in the Hunter region;
  - recreational fishing in Narooma/Bermagui contributed \$9.4 million to the value added in the Southern region;

- household income in the NSW economy and regional coastal economies. It was estimated that in 2005-06:
  - recreational fishing in Port Stephens and Narooma/Bermagui contributed \$25.8 million to household income in NSW;
  - recreational fishing in Port Stephens contributed \$12.9 million to household income in the Hunter region;
  - recreational fishing in Narooma/Bermagui contributed \$6.5 million to household income in the Southern region;
- employment in the NSW economy and regional coastal economies. It was estimated that in 2005-06:
  - recreational fishing in Port Stephens and Narooma/Bermagui generated 894 jobs in the NSW economy;
  - recreational fishing in Port Stephens generated 176 jobs in the Hunter region;
  - recreational fishing in Narooma/Bermagui generated 267 jobs in the Southern region.

## Implications for the establishment of the Port Stephens – Great Lakes and Batemans Marine Parks

### *Existing studies of the socio-economic impact of establishing the Port Stephens – Great Lakes and Batemans marine parks*

The Marine Parks Authority has already conducted socio-economic assessments of the impact of establishing both:

- the Port Stephens – Great Lakes Marine Park, the results of which were released in the report entitled *Socio-Economic Assessment of the Port Stephens – Great Lakes Marine Park* and the accompanying report on *The Estimated Economic Impact of the Proposed Port Stephens – Great Lakes Marine Park on Commercial Activities*, which provides estimates of the economic impact of restrictions on commercial fishing within the marine park; and
- the Batemans Marine Park, the results of which were released in the report entitled *Socio-Economic Assessment of the Batemans Marine Park* and the accompanying report on *The Estimated Economic Impact of Batemans Marine Park on Commercial Activities*, which provides estimates of the economic impact of restrictions on commercial fishing within the marine park.

At the time those socio-economic assessments were conducted, however, the draft zoning plan had not been finalised. As a result, the Authority noted that it was difficult to quantify the effect that these marine parks and their zoning would have on recreational fishing since:

- sanctuary zones were not determined and any displacement of recreational fishing was unknown; and
- the extent to which the recreational fishing experience would be improved by reduced commercial fishing and improved habitat was also unknown.

As a result, the socio-economic assessments did not quantify the economic costs and benefits associated with prohibiting recreational fishing within sanctuary zones, or the economic impact that these restrictions on recreational fishing would have on the NSW economy and regional coastal economies.

However, the socio-economic assessments did use a qualitative analysis to conclude that although the establishment of these marine parks was likely to cause 'some initial dislocation' of recreational fishing, it was expected that those effects would be 'outweighed by enhanced recreational fishing experiences (both quantity

and quality of catch) through reduced commercial catch, and enhanced conservation protection benefiting recreational fishers elsewhere' in the marine parks.

### ***Implications of the high net value of recreational fishing in Port Stephens and Narooma/Bermagui***

The high net value that recreational anglers are estimated to derive from their recreational fishing activities in Port Stephens and Narooma/Bermagui has a number of important implications for the zoning of the Port Stephens – Great Lakes and Batemans marine parks.

In particular, as discussed further in section 5 of this report, it means that considerable caution needs to be exercised when considering the establishment of 'sanctuary zones' in popular recreational fishing areas, since as indicated in the tables below, the potential economic costs per annum of preventing recreational anglers from fishing in those zones could be quite high.

#### **Potential economic costs arising from a reduction in recreational fishing in Port Stephens**

<b>LOCATION</b>	<b>Number of days spent fishing in the area</b>	<b>Assumed proportion of area affected</b>	<b>Net loss</b>
<b>Inland waters</b>			
Port Stephens bay	48,705	10%	\$864,349
Port Stephens estuaries	39,129	20%	\$1,388,804
Myall Lakes	8,384	30%	\$446,343
<b>Total</b>	<b>96,218</b>		<b>\$2,699,496</b>
<b>Inshore waters</b>	<b>33,440</b>	<b>10%</b>	<b>\$593,434</b>
<b>Offshore waters</b>			
Offshore reefs	43,083	10%	\$764,562
Broughton Island	26,467	20%	\$939,379
Cabbage Tree Island, Little Island, Boondelbah Island	40,142	40%	\$2,849,523
Seal rocks	8,458	100%	\$1,501,058
More than 3 nautical miles offshore	29,708	0%	\$0
<b>Total</b>	<b>147,858</b>		<b>\$6,054,523</b>
<b>TOTAL DAYS FISHING IN PORT STEPHENS</b>	<b>277,516</b>		<b>\$9,347,453</b>

#### **Potential economic costs arising from a reduction in recreational fishing in Narooma/Bermagui**

<b>LOCATION</b>	<b>Number of days spent fishing in the area</b>	<b>Assumed proportion of area affected</b>	<b>Net loss</b>
<b>Inland waters</b>			
Wagonga Inlet	22,553	10%	\$432,472
Wallaga Lake	1,978	5%	\$18,968
<b>Total</b>	<b>24,532</b>		<b>\$451,440</b>
<b>Inshore waters</b>	<b>18,992</b>	<b>10%</b>	<b>\$364,187</b>
<b>Offshore waters</b>			
Offshore reefs	3,165	10%	\$60,698
Montague Island (and surrounding reefs)	28,884	20%	\$1,107,735
More than 3 nautical miles offshore	66,473	0%	\$0
<b>Total</b>	<b>98,523</b>		<b>\$1,168,433</b>
<b>TOTAL DAYS FISHING IN NAROOMA/BERMAGUI</b>	<b>142,047</b>		<b>\$1,984,059</b>

We stress that these are only very rough estimates of the economic cost per annum of preventing recreational anglers in Port Stephens and Narooma/Bermagui from fishing in sanctuary zones due to the limited information available at this stage about the nature and extent of recreational fishing that is occurring within those zones and the net value that recreational anglers derive from recreational fishing in those zones. In order to derive those estimates, we have had to make a range of simplifying assumptions about the nature and extent of recreational fishing within the proposed sanctuary zones and the extent to which recreational anglers are able and willing to switch their fishing activities to other areas within the marine park (i.e. the elasticity of demand for fishing within those sanctuary zones).

However, these rough estimates are sufficiently high to suggest that there is a need for further, more detailed, research into the magnitude of those costs and whether the benefits from restricting recreational fishing are more than sufficient to outweigh those costs.

In particular, prior to finalising the draft zoning plans, there is an **urgent need for further research** into:

- **the nature and extent of recreational fishing currently occurring within the proposed sanctuary zones.** At this stage, there is insufficient information available to provide a reasonably accurate estimate of the extent to which the creation of the proposed recreational fishing zones will affect recreational fishing. The information collected by the Marine Parks Authority in its current process of consultation should assist in this regard;
- **the magnitude of the economic costs that recreational anglers would incur as a result of not being able to fish within the proposed sanctuary zones.** In particular, it is important to develop a better understanding of the extent to which recreational anglers consider other areas within the marine park to be substitutable for their preferred fishing areas within the proposed sanctuary zones. Available evidence suggests that it is unrealistic to expect that recreational anglers will consider that fishing areas in other parts of the marine park to be perfect substitutes for their current preferred locations within the proposed sanctuary zones;
- **the magnitude of the economic benefits arising from prohibiting recreational fishing within the proposed sanctuary zones.** This would include the economic benefits arising from:
  - any reduction in the damage that recreational fishing is causing to marine biodiversity within the proposed sanctuary zones. The key issue that needs to be resolved at this stage is whether there is a threat of serious or irreversible damage to marine biodiversity in these areas if recreational fishing is not prohibited in those zones (i.e. whether or not there is a justification for triggering the application of the 'precautionary principle' and the introduction of restrictions on recreational fishing as a precautionary measure to avoid that serious and irreversible environmental damage). This requires the identification of the nature and extent of recreational fishing within those proposed sanctuary zones and an assessment of the risk that this poses to the marine environment in those zones. Such a 'fishing risk assessment' could be achieved by adopting much the same approach that the Commonwealth Government used to assess the environmental risks arising from commercial fishing activities within the South-East Marine Region;
  - any net 'spillover' effects on the quantity and quality of the catch by recreational anglers in other areas of the marine parks arising from the imposition of the proposed restrictions on commercial and recreational fishing (i.e. any positive spillover effects less any negative spillover effects arising from increased fishing pressure on the remaining popular fishing areas outside the proposed sanctuary zones);
  - any increases in the benefits derived by other users of these marine resources (e.g. diving and ecotourism), taking into account any capacity constraints on the expansion of such activities (e.g. constraints on port facilities and any constraints on the frequency with which tour operators are allowed to visit sanctuary zones);

- **alternative options for conserving marine biodiversity within the popular recreational fishing areas currently earmarked to be sanctuary zones that do not impose unnecessary restrictions on recreational fishing in those areas.** For example, before declaring any popular recreational fishing areas to be no-take 'sanctuary zones', consideration should be given to alternative options such as:
  - **establishing special habitat protection zones.** For example, if an area has been earmarked as a 'sanctuary zone' in order to protect grey nurse sharks (e.g. those congregating around Broughton Island or Montague Island), consideration could be given instead to creating a 'special habitat zone' in that region that allows the trolling of artificial lures and prevents the use of wire traces. Similarly, if an area has been earmarked as a sanctuary zone to protect bottom dwelling fish species (e.g. black cod) or marine flora, consideration could be given instead to the creation of a 'special habitat protection zone' that allows recreational fishing that does not use weighted baits or heavy lures designed for bottom fishing. Consideration could also be given to seasonal closures of special habitat protection zones that would prohibit fishing, and other potentially harmful activities, within those zones during spawning seasons in order to protect spawning fish; and
  - **allowing 'no-take' recreational fishing (i.e. 'catch and release'), within 'sanctuary zones'.** For example, Florida allows catch and release fishing by trolling in a number of its 'Sanctuary Preservation Areas' (SPAs) within the Florida Keys National Marine Sanctuary, which protects America's only living barrier coral reef and thousands of acres of seagrass. These SPAs have been set up to protect popular shallow coral reefs and prohibit activities such as spearfishing, shell collecting, tropical fish collecting, fishing and other activities that result in the harvest of marine life by divers and fishermen. In addition, any direct physical impact to corals in these areas is also prohibited.

### ***Implications of the significant contribution that recreational fishing makes to regional coastal economies and the NSW economy***

The significant contribution that recreational fishing in Port Stephens and Narooma/Bermagui makes to regional coastal economies and the NSW economy also has important implications for the establishment of the Port Stephens – Great Lakes and Batemans marine parks.

In particular, as illustrated in the table below, it means that if the creation of these marine parks significantly reduces (or increases) the current level of expenditure by recreational anglers in Port Stephens and Narooma/Bermagui, this will significantly reduce (or increase) the level of gross output, value added, household income and employment in the Hunter and Southern regional coastal economies and the NSW economy.

Once again, this highlights:

- **the need to exercise caution when considering the creation of no-take 'sanctuary zones' in popular recreational fishing areas** in view of the potentially adverse economic impact that a reduction in recreational angler expenditure could have on regional coastal economies; and
- **the need for further research** into:
  - the nature and extent of recreational fishing within the proposed sanctuary zones;
  - the extent to which the creation of the proposed sanctuary zones would reduce the number of recreational anglers fishing in Narooma/Bermagui and the level of their expenditure in the region;
  - the extent to which the proposed restrictions on commercial and recreational fishing within the marine park would increase the number of other visitors (e.g. divers and eco-tourists) to the area and their level of expenditure in the area; and

- alternative options for conserving marine biodiversity within the popular fishing areas currently earmarked to be no-take sanctuary zones that do not impose unnecessary restrictions on recreational fishing in those areas (e.g. the use of special habitat protection zones, or allowing catch and release within sanctuary zones, as outlined above).

### Economic impact of a changes in the level of expenditure by recreational anglers in Port Stephens and Narooma/Bermagui

	Gross output \$m	Value added \$m	Household income \$m	Employment
<b>Hunter</b>				
20% increase	\$781.2	\$269.4	\$154.8	211
10% increase	\$716.1	\$247.0	\$141.9	193
<b>No change</b>	<b>\$651.0</b>	<b>\$224.5</b>	<b>\$129.0</b>	<b>176</b>
10% reduction	\$585.9	\$202.1	\$116.1	158
20% reduction	\$520.8	\$179.6	\$103.2	141
<b>Southern</b>				
20% increase	\$308.0	\$113.0	\$78.6	321
10% increase	\$282.4	\$103.5	\$72.0	321
<b>No change</b>	<b>\$256.7</b>	<b>\$94.1</b>	<b>\$65.5</b>	<b>267</b>
10% reduction	\$231.0	\$84.7	\$58.9	240
20% reduction	\$205.3	\$75.3	\$52.4	214
<b>NSW</b>				
20% increase	\$1,329.3	\$524.8	\$309.8	1,072
10% increase	\$1,218.5	\$481.1	\$284.0	983
<b>No change</b>	<b>\$1,107.8</b>	<b>\$437.3</b>	<b>\$258.2</b>	<b>894</b>
10% reduction	\$997.0	\$393.6	\$232.3	804
20% reduction	\$886.2	\$349.9	\$206.5	715