

# Identifying the recreational fishing expenditure of Sydney's recreational fishers and its economic and social importance in regional communities of NSW

A Report to the Recreational Trust Fund,  
NSW Fisheries

By

Dominion Consulting Pty Ltd

**FINAL REPORT**

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The normal disclaimer applies.

## Table of Contents

	<b>Page numbers</b>
Executive summary	4
1. Introduction	8
2. Fishing activity among NSW licence holders	9
3. Awareness of Recreational Fishing Havens (RFHs) and their use by licence holders.	14
4. Saltwater angling trips and travelling characteristics	19
5. Trip expenditure	24
6. Expenditure trips away from Sydney and the recreational fishers expectations	27
7. Socio-economic characteristics of recreational fishers	33
8. Discussion and Conclusions	36
References	40
Appendix one: The survey	41
Appendix two: Who uses recreational fishing havens?	43

## Executive summary

This study of economic and social aspects of recreational fishing in NSW used a telephone survey of 1,254 holders of the NSW recreational fishing licence to examine the expenditure of anglers in NSW and the expenditure of Sydney anglers on their trips to coastal regions of rural NSW. This enabled state wide estimates of fishing activity of Sydney and non-Sydney anglers to be measured and expenditure to be estimated.

All fishers were asked about their knowledge and previous use of recreational fishing havens (RFHs) and also about their likely future use of RFHs.

The expenditure of Sydney anglers on travel statewide and on expenditure at fishing sites away from Sydney was also investigated. This enabled estimates to be made of the annual expenditure of Sydney fishers in popular regional destinations along the NSW coast related to saltwater fishing.

Anglers were also asked about their expectations of amenities and facilities at fishing sites. The socio-economic demography of Sydney fishers was also investigated.

## Results

The results from the study are briefly summarised under each sub-heading.

### *The sample*

From the 374,880 NSW recreational fishing licence holders' details a random sample of four thousand anglers was chosen to enable 1,254 successful survey interviews to be made by the telephone survey fieldwork undertaken by Roy Morgan Research.

Completed interviews with fishers were obtained from Sydney (451) and from fishers in areas outside Sydney (803). This deliberately "over sampled" Sydney anglers with the intention of studying their expenditure patterns and adjusted the results when comparing Sydney and non Sydney data.

### *Days fished in NSW*

Interviewers asked respondents about their days fished in the last 12 months. Recreational Fishing Licence holders (RFLH) fished a total of 7.43 million days in all waters in NSW in 2002, with 6.35million days in saltwater and 1.08 million days in freshwater. The estimate of annual freshwater fishing days was lower than previous estimates, possibly due to drought conditions in NSW in 2002.

### *Angler avidity*

It was apparent that saltwater anglers have three different levels of avidity, with two extremes.

- 52% of anglers fish less than 10 days a year and contribute 15% of days fished
- 38% of anglers fish 10-40 days a year and contribute 46% of days fished
- 10% of anglers fish more than 40 days a year and contribute 39% of total days fished

### *Recreational Fishing Havens*

Respondents were asked about their knowledge and use of Recreational Fishing Havens (RFHs)

- 76% had heard of Recreational Fishing Havens (RFHs) and 23% had not;
- 26% of recreational fishers had fished in a RFH in the past year;
- 34% of all anglers interviewed are very likely and 30% are fairly likely to use RFHs in the future. This indicates that an additional 142,500 anglers may visit RFHs in the next 12 months in addition to the 97,400 anglers visiting RFHs already.

The frequency of visits to different RFHs indicates the popularity of different RFHs along the NSW coast. Botany Bay, George's River were found to be most popular with Sydney residents. Lake Macquarie was most popular with Newcastle and Sydney residents.

#### *Angling trips*

Anglers go on both day and overnight trips. NSW anglers undertake an estimated 4.88 million fishing trips per annum, an average of 12.8 trips each. Approximately 60% of these are day trips and 40% are overnight trips averaging 5.9 days of which 70% of days are spent fishing.

Anglers in NSW are highly dependent on car travel with 50% of trips being greater than 50km travel each way. Only 17% of trips are less than 10km each way. A total of 56.2 million km are travelled each way by car with the average trip being 141 km each way. A significant number of longer trips to fish in saltwater are made by anglers from country centres in NSW. Family members accompany anglers on 50% of all trips while friends are traveling companions on 35% of trips

#### *Angler expenditures*

Trip expenditures by anglers are considered to be directly related to fishing (tackle, bait/berley etc), indirectly related (accommodation, travel, boat fuel and hire), and other expenses (eating out, other entertainment, food and drinks etc). Direct and indirect expenditure are comparable to previous fishing expenditure studies. Other expenditure is relevant here since we are measuring the regional total economic impact to coastal areas by Sydney anglers.

The average day trip angler expenditure was between \$27 per day (non-Sydney ) and \$32 per day (Sydney) on direct expenditure and \$17 per day (NS) and \$57 per day (S) on indirect. For overnight trips direct expenditure was approximately \$12 per day (NS) and \$16 per day (S) on direct expenditure, and \$112 per day (NS) and \$132 per day (S), on indirect expenditure reflecting travel and accommodation.

#### *Estimate of total state expenditure*

For NSW direct expenditure on fishing was estimated at \$164.4 million and indirect expenditure at \$517.4 million. This total of \$681.8 million is for non-capital total expenditure in saltwater angling in NSW. The implication is that NSW statewide expenditure (Direct, indirect and capital items estimated from previous studies) may be approximately \$818 million for recreational fishing licence holders only.

#### *Regional expenditure by Sydney anglers*

The amount of direct, indirect fishing and other expenditure associated with overnight trips and day trips to coastal NSW by licensed saltwater recreational anglers is estimated at \$134.8m. This expenditure is taking place in rural coastal communities and is estimated to support 1,213 jobs directly, with an estimated flow-on economic benefit of 970 jobs.

The most popular north coast destinations for Sydney Anglers were Coffs Harbour, Port Macquarie, Foster-Tuncurry, Nelson Bay/Port Stephens and Newcastle (Lake Macquarie). On the south coast the most popular destinations were Wollongong, Kiama, Nowra, Ulladulla, Bateman's Bay, and Narooma.

#### *Attributes of angling trip locations*

The attributes of desirable fishing locations required by Sydney were examined. Clean environment and catching one or more fish of legal size were the most important attributes. Information on places to fish and places to launch boats were the second most popular attributes. Places to clean fish and places for the kids to fish were less important to anglers than information on the area and other activities for the family.

#### *Socio-economic analysis of angler avidity and trip expenditure*

The socio-economic demography of fishers was examined for all 1,254 completed interviews.

The mean age of licensed angler was 42 years, 86% were male, 77% of all anglers were married or in a relationship, and 69% were parents or guardians. 48 % had education of year 12 or equivalent, mean household income was \$71,000, and 81% of anglers were born in Australia

Preliminary research for Sydney involved obtaining data from the ABS on the mean income, median income and unemployment levels for suburbs in Sydney. A regression model was specified to examine socio-economic features that were statistically significant correlations with the number of days fished in saltwater per annum. Results that were significant for the whole sample indicated that, on average:

- Males fished more days than females;
- Married fishers fished less days than unmarried;
- Fishers educated above year 12 fished less days per annum than less well educated fishers;
- Sydney anglers fished more days than non-Sydney anglers;
- Non NSW resident licence holders fished less days than NSW residents;
- Age of angler, per capita income and being born in or out of Australia, were not significantly correlated with days fished.

Numbers of days fished by Sydney licence holders only are:

- significantly fewer for anglers residing in suburbs with highest average income;
- significantly fewer for anglers residing in suburbs where unemployment is highest;
- significantly fewer for married persons with families than for single persons;
- significantly fewer for those with education beyond year 12 or equivalent.

#### *Trip expenditure*

The trip expenditure model showed that among all fishers in NSW and fishers in Sydney expenditure per day is significantly:

- higher among fishers who fish for more days;
- higher among fishers who spend more days away from home on trips;

In all NSW:

- Expenditure per day is significantly higher by fishers from outside NSW compared with residents;

And in addition, recreational fishing expenditure in Sydney is significantly:

- higher by fishers from the suburbs with highest income;
- lower by fishers from the suburbs with highest unemployment;

These results are indicative of statistically significant differences, but should be interpreted with caution as only avidity and trip behaviour have been examined. The overall message is that recreational fishing is a socially diverse recreational activity and that while demography, social and motivational aspects almost certainly affect fishing behaviour, these aspects merit further study.

#### *Implications of the research*

The study shows the importance of managing the information flow to fishers. From information to anglers comes awareness and potential use of recreational fishing havens affecting trip planning and consequent expenditure in communities in rural coastal NSW.

The study shows that a clean environment and catching a fish of legal size are two of the primary reasons for the recreational fisher's visit to the coast. Other information on places to fish, where to launch boats, clean fish and activities for the family are also desirable. Many of these information requirements can be met by local councils or tourism bodies, providing such information within their own council region. The continuing sustainability of fish supply and management of areas are the role of NSWFW, but may require local management and catch monitoring to maintain angler satisfaction.

There are regional economic benefits to be gained from having additional saltwater fishing trips to the coast. Increased trips and tourism may only expand the national economy marginally, but such activity represents significant transfers of expenditure to rural regions which otherwise may not occur. Interstate saltwater angling is a fishing tourism opportunity that could be developed further to the benefit of regional coastal NSW.

Recreational fishers are currently managed generically and the examination of the socio-economic characteristics gives no reason to move from this approach without more detailed analysis. However knowledge of the participation rates of anglers gives managers and coastal tourist communities more information on who is fishing in coastal NSW. Further socio-economic research may enable a more targeted approach to be taken towards some management issues.

As a result of this research, it is recommended that:

- further analysis of the economic importance of recreational fishing to communities on the north and south coasts of NSW should be undertaken to enable economic benefits to be determined;
- local and regional management strategies for managing recreational fishing activity should be developed, based in part on this type of study, to increase the flow of benefits to rural communities in NSW; and.
- Angler satisfaction from fishing trips to sites in coastal NSW should be measured with a view to enhancing the recreational fishing experience and therefore the flow of economic benefits to the regions.

## **1. Introduction: an economic and social survey of Sydney anglers and their impact on regional NSW**

This survey sets out to establish the level of angler expenditure in NSW, and by Sydney anglers in particular, in order to obtain a greater understanding of the impacts of recreational fishing licence holder (RFLH) expenditure on regional coastal economies in NSW.

In July 2001 the saltwater recreational fishing licence was introduced into NSW requiring all non-exempt anglers to purchase either a 3 day, one month, one year or three year licence. This initiative prompted the need for a greater understanding of the fishing behaviour, expenditure and expectations of anglers. This information was sought to assist management committees and the government to make informed policy and management decisions. It was also intended to allow coastal local government and tourism bodies to better consider the needs of recreational fishers in planning and service delivery. The survey also examined social data from anglers and their expectations for a positive fishing experience.

NSW Fisheries records show that approximately 24% of all recreational fishing licence holders reside in Sydney and 76% in non-Sydney locations (Appendix 1.) In July 2002, 32 Recreational Fishing Havens (RFHs - areas free from commercial fishing) were declared along the NSW coast. Given this survey was contacting licensed fishers statewide in December 2002, it was able to include several questions on angler awareness, use and potential future use of RFHs.

### **Methods**

The Survey Instrument used the first year of the recreational fishing licence database to randomly select anglers for a telephone survey. The telephone survey instrument was designed by the project team and undertaken by Roy Morgan Research Ltd to ensure independence and adherence to quality standards in the execution of the telephone survey. A total of 1,254 successful interviews were completed with NSW recreational fishing licence holders. Of these, 803 resided outside Sydney and 451 resided within Sydney<sup>1</sup>.

The survey asked fishers about the following:

- Angler activity (days fished) in freshwater and saltwater in NSW in the previous year;
- The level of awareness of Recreational Fishing Havens (RFHs), and the past use of areas and intention of Sydney and non-Sydney anglers to use RFHs in the future;
- The trip frequency and duration of Sydney anglers;
- Distance travelled to fishing location on the last angling trip;
- Expenditure by anglers on their last trip and hence estimates of state wide expenditure;
- Expenditure of Sydney anglers in coastal regions of NSW;
- What fishing features are important when visiting rural coastal communities and;
- The socio-economic characteristics of anglers.

The results are reported in seven sections as indicated in the Table of contents. The description of the survey sampling and method are more fully detailed in Appendix 1.

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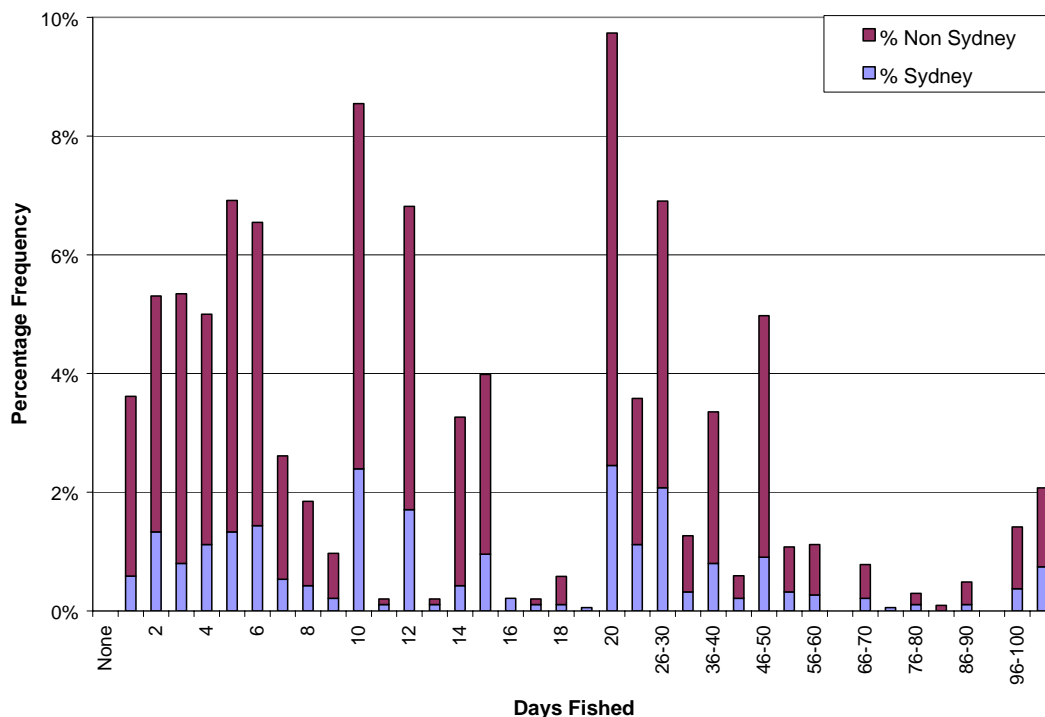
<sup>1</sup> Appendix one gives details of the sampling of 374,800 recreational fishing licence holders and on the field work of the survey which took place in December 2002 and January 2003. The definition of Sydney is also discussed in Appendix 1.



## 2. Fishing activity among NSW licence holders

Each of the 1,254 licence holders that completed the survey provided an estimate of the number of days fished in the previous year (January to December 2002). Figure 1a reports angling frequency, and estimates of total days fished in NSW are reported in Figure 1b.

**Figure 1a: The percentage frequency of days fished in all waters in NSW by recreational fishing licence holders surveyed (n=1,254).**



**Figure 1b: The estimate of the total number of days fished in all waters in NSW by each frequency category for all recreational fishing licence holders (n=1,254).**

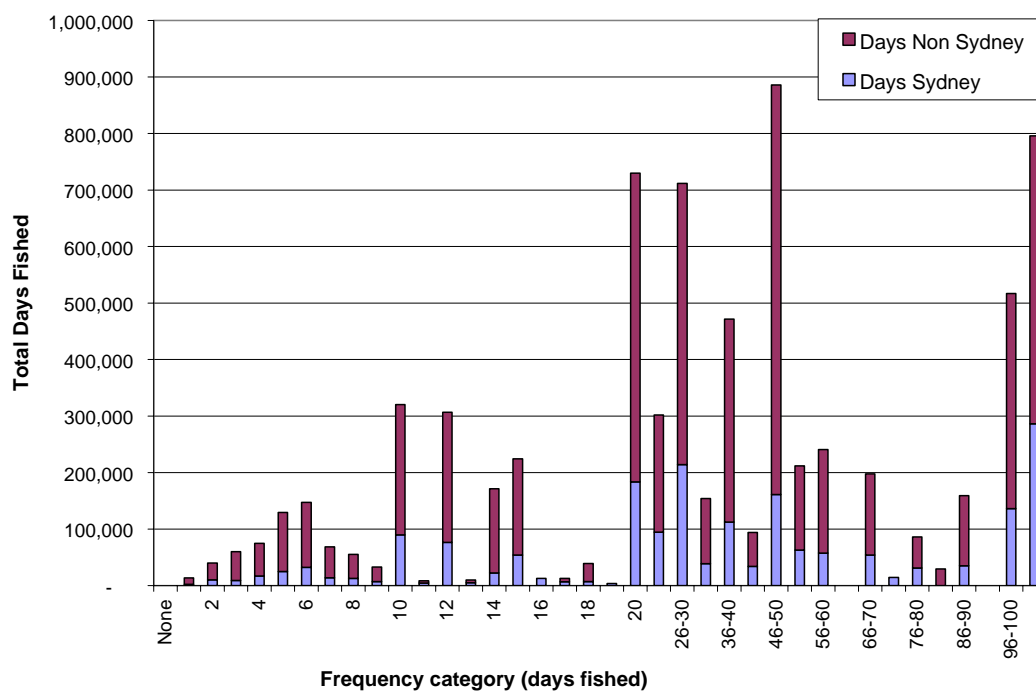
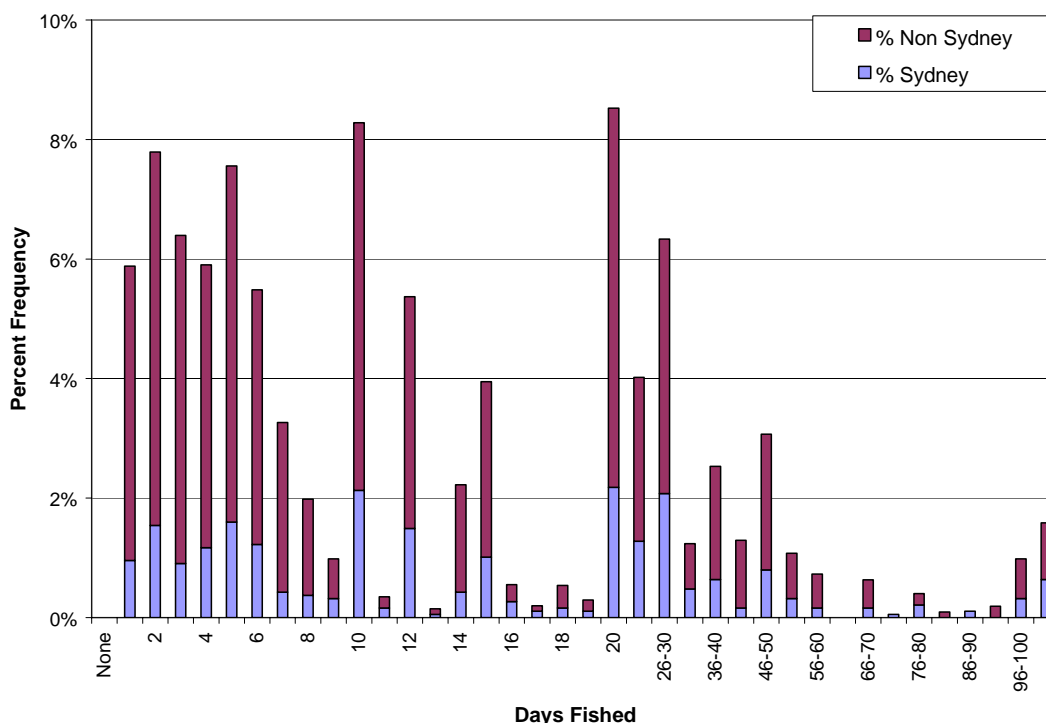


Figure 2a reports the profile of angling frequency in saltwater. Estimates of the total days fished in saltwater in NSW are reported in Figure 2b.

**Figure 2a: The percentage frequency of days fished in saltwater in NSW by recreational fishing licence holders surveyed (n=1,254).**



**Figure 2b: The estimate of the total number of days fished in saltwater in NSW by all recreational fishing licence holders (n=1,254).**

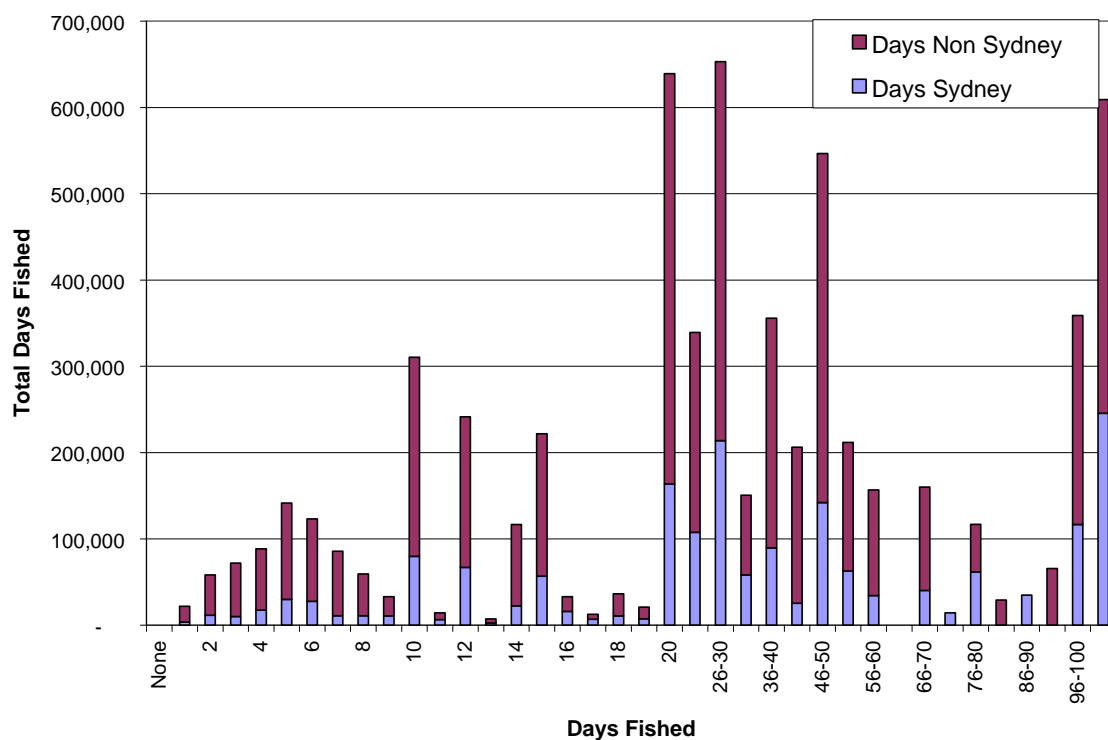
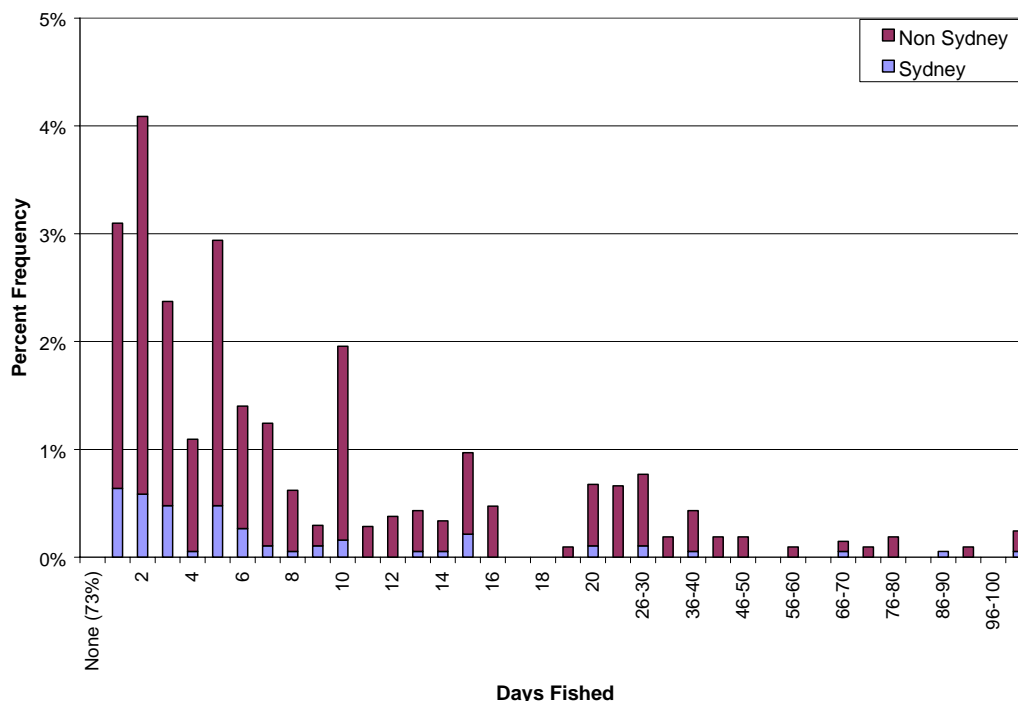
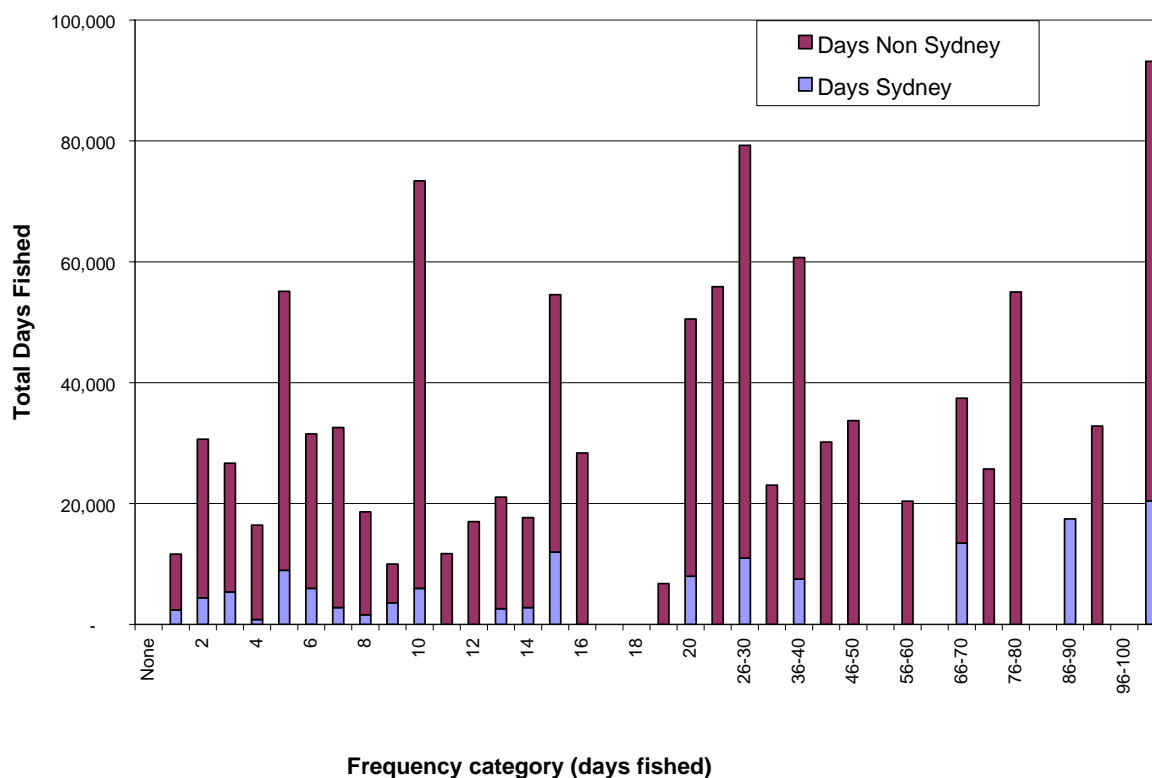


Figure 3a shows the profile of angling frequency in freshwater. Estimates of total days fished in freshwater in NSW are reported in Figure 3b.

**Figure 3a: The number of days fished in freshwater in NSW by recreational fishing licence holders surveyed (n =310, nb. 73% of licence holders fished zero days in freshwater).**



**Figure 3b: The estimate of the total number of days fished in freshwater in NSW by all recreational fishing licence holders (n =310, nb. 73% fished zero days in freshwater).**



From these survey responses the total days fished across NSW were estimated by expansion of the sample responses to the total recreational fishing licence population. This involved using different expansion factors for Sydney and non-Sydney respondents as explained in Appendix 1. Annual fishing days in all waters were estimated at approximately 7.43 million days for 2002 as shown in Table 1.

**Table 1: Estimates of total days fished in saltwater and freshwater in NSW in 2002 by Sydney and non-Sydney recreational licence holders.**

Type of Fishing	Days Fished Sydney	Days Fished Other	Total Days Fished
Saltwater	1,822,024	4,526,199	6,348,223
Freshwater	137,078	941,960	1,079,039
	<b>1,959,102</b>	<b>5,468,159</b>	<b>7,427,261</b>

### Discussion

In Figure 1a it is evident that the distribution of days fished in all waters by different licence holders is diverse with numerous anglers fishing less than 15 days a year. The total days fished by anglers in Figure 1b indicates that more avid anglers (>20 days p.a.) contribute most of the days fished.

Figure 2a and Figure 2b for saltwater anglers is similar to the all waters pattern. However Figure 3a and Figure 3b indicate that in freshwater a greater number of total days fished is contributed by less avid and non-Sydney anglers than in saltwater.

It is also noteworthy that in the sample of 1,254 anglers, 75% of anglers did not fish in freshwater. However in contrast all freshwater anglers sampled fish in saltwater for one or more days a year.

The estimate in Table 1 represents an estimate of days fished by RFLH in fresh and saltwater in NSW<sup>2</sup>. The proportion of freshwater angling days estimated was 14.5% of total days fished which is less than previous estimates of about 20% (Pepperell, 1996). The widespread drought in New South Wales may have reduced the number of freshwater anglers during the recent period. Sydney RFLH (120,660) represent 24 % of total licence holders and contribute 26.3% of total days fished in NSW by all RFLH.

The fishing avidity of saltwater RFLH, as indicated by number of days fished in the previous 12 months, is presented in Table 2. These data may be considered as three general groups of saltwater anglers, with two extremes of avidity.

<sup>2</sup> The Recreational Trust Fund Committee members who were presented with a preliminary draft of these results indicated that this effort was only part of the total recreational fishing effort in NSW. It does not include those below 18 years of age, or elderly and concession holders, or fishers in the 18-55 years age group who fish without a licence. The committee suggest the estimate may be of the order of 50% of the total for all anglers in NSW.

**Table 2: The percentage frequency of days fished and the percentage of total days fished by saltwater anglers in NSW.**

Days	% frequency of days fished	% of total days fished
1-5	32%	6%
6-10	20%	9%
11-15	12%	9%
16-20	10%	12%
21-25	4%	5%
26-30	7%	11%
31-35	1%	3%
36-40	3%	5%
41-45	1%	3%
46-50	3%	8%
51-100	4%	18%
100+	2%	10%
	100%	100%

In Table 2 it can be seen that:

- 52% of saltwater anglers fished 10 days or less in the previous year and contributed 15% of total days fished;
- 38% of saltwater anglers fished 11-40 days a year and contributed 46% of total days fished;
- 10% of saltwater anglers fished more than 40 days a year and contributed 39% of total days fished.

This result agrees with previous work (Pepperell, 1996) which estimated that 50% of anglers in NSW fished less than 10 days a year.

The current licence fee is not related to either catch taken, which was not part of the survey, or to days fished, a measure of fishing effort. Avid anglers put in much more effort than occasional anglers. However, given the dispersion of effort levels, current controls on recreational fishing by means of bag limits is preferable to effort limitations among such a diverse fishing population.

### 3. Awareness of Recreational Fishing Havens (RFHs) and their use by licence holders.

Respondents were asked of their awareness of the existence of RFHs. The survey of 1,254 respondents indicated that 76% had heard about RFHs and 23% had not<sup>3</sup>. Anglers who were aware of RFHs were asked if they had been fishing in areas which are now RFHs in the last year? The results are reported in Table 3.

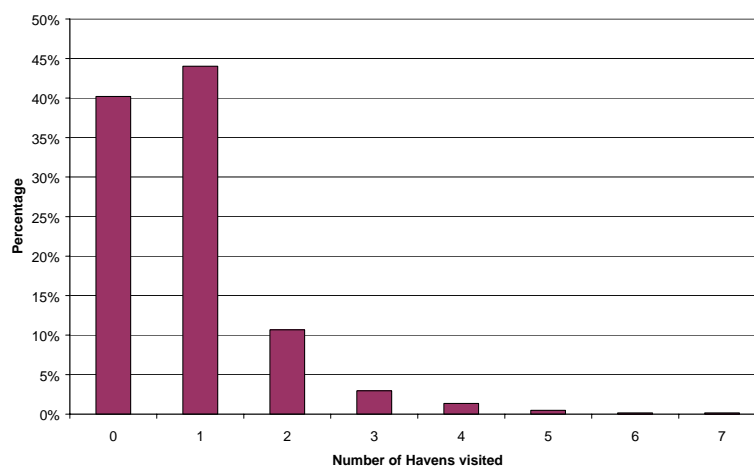
**Table 3: Numbers and percentage of anglers who were aware of RFHs and whether they fished in RFHs in 2002**

Response	Number	Frequency
Heard of RFHs and fished	328	26%
Heard of RFHs, but not fished	474	38%
Unsure	148	12%
Had not heard	304	24%
<b>Total</b>	<b>1,254</b>	<b>100%</b>

In summary, 26% of all anglers interviewed were aware they had fished in a RFH in the past 12 months. This gives a baseline estimate of the level of use of these areas. By inference this would imply that areas that are now RFHs were frequented by at least 97,468 (26% of 374,880 anglers statewide) in 2002. The use of RFHs by other unlicensed anglers and by fishers who were not aware of RFHs may greatly increase this estimate of their initial use.

Respondents were asked about the RFHs in which they had fished in the last 12 months. A list of 20 of the major RFH areas was read out during the telephone interview to respondents for identification. Of the 1,254 licence holders interviewed, 40% had not fished in any of the list of 20 major areas which are now RFHs, 44% had fished in at least one of the 20 areas which are now RFHs in the last 12 months, while 15% had fished in more than one area (Figure 4).

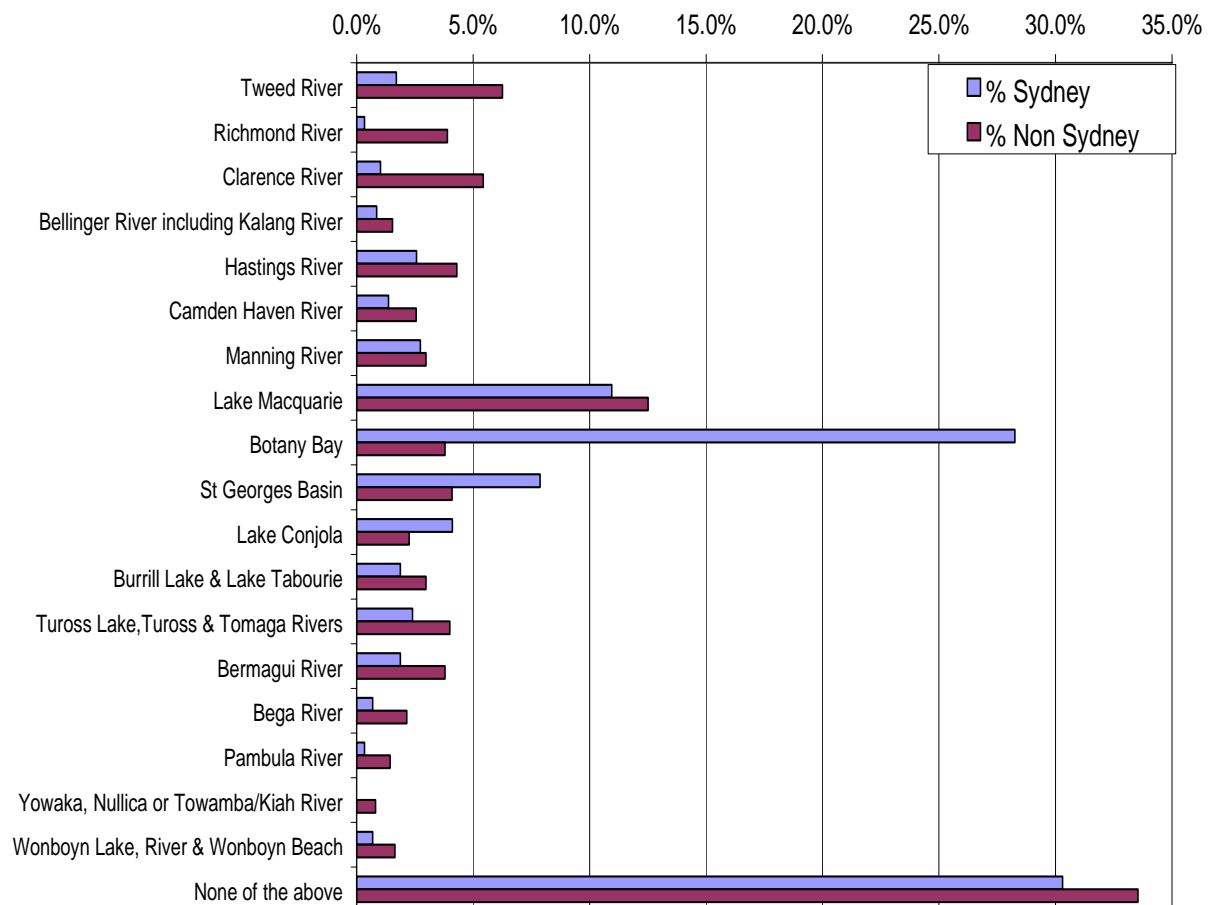
**Figure 4: Number of RFH sites visited in the past year, prior to RFH formation**



<sup>3</sup> Potentially the responses to this question may have been biased by the circulation of an information leaflet to all RFL holders in late December, 2002. Prior to the mail-out, the 400 completed interviews indicated that 73% of licence holders were aware of RFHs. We conclude there was no bias introduced. The effectiveness of the mail-out in raising awareness is questioned.

When Sydney and non-Sydney anglers were compared, there was no significant difference in the total visitation rates to RFHs between the two groups. However the RFH locations visited by Sydney residents were obviously different from those fished by non-Sydney anglers as reported in Figure 5.

**Figure 5: The percentage visitation rate to RFHs by Sydney and non-Sydney residents<sup>4</sup>.**



The frequency of past use of areas that are now RFLHs can be seen to be related to the residence of the anglers as reported in Table 5a. Non-Sydney anglers mainly visited all areas and Lake Macquarie and Northern NSW in particular. The relative importance of Lake Macquarie and Botany bay/St Georges basin to licence holders can be seen in that a total of 47% of Sydney anglers used these areas, having 31% of the total angling visits among all of those surveyed statewide. Table 4 shows that of 168 visits to Lake Macquarie in the sample, 27% were from Sydney, 56% from Newcastle and surrounding postcodes, 13% elsewhere in NSW and 3% from interstate.

<sup>4</sup> The category "none of the above", represents visits to areas for fishing, not included in the 20 areas read out to respondents in the telephone survey.

**Table 4: The home postcodes of RFL holders visiting Lake Macquarie**

Region	Postcodes	Frequency	%
Sydney	2000-2249	45	27%
Newcastle region	2250-2500	94	56%
Other NSW	2500-2999	22	13%
Victoria		4	2%
Queensland		2	1%
Total		167	100%

**Table 5a: The percentage frequency of total visits to areas that are now RFL holders in the past year by Sydney and non-Sydney RFL holders.**

Haven	% Sydney	% Non Sydney	% Total
Tweed River	1.7%	6.3%	4.6%
Richmond River	0.3%	3.9%	2.6%
Clarence River	1.0%	5.4%	3.8%
Bellinger River including Kalang River	0.9%	1.5%	1.3%
Hastings River	2.6%	4.3%	3.7%
Camden Haven River	1.4%	2.6%	2.1%
Manning River	2.7%	3.0%	2.9%
Lake Macquarie	11.0%	12.5%	11.9%
Botany Bay	28.3%	3.8%	13.0%
St Georges Basin	7.9%	4.1%	5.5%
Lake Conjola	4.1%	2.3%	3.0%
Burrill Lake & Lake Tabourie	1.9%	3.0%	2.6%
Tuross Lake Including Tuross & Tomaga Rivers	2.4%	4.0%	3.4%
Bermagui River	1.9%	3.8%	3.1%
Bega River	0.7%	2.2%	1.6%
Pambula River	0.3%	1.4%	1.0%
Yowaka, Nullica or Towamba/Kiah River	0.0%	0.8%	0.5%
Wonboyn Lake, River & Wonboyn Beach	0.7%	1.6%	1.3%
None of the above	30.3%	33.5%	32.3%
Total	100%	100%	100%

The survey asked fishers regarding their likely use of RFHs on future trips. Results indicated that 64.7% of all licence holders were either very likely, or fairly likely to use RFHs in the next 12 months as reported in Table 5b.

**Table 5b: The attitude to future use of RFHs as a percentage of fishers sampled and the estimated number of licence holders.**

	Very Likely	Fairly Likely	Not Very Likely	Not at All Likely	Can't Say	Total
Percentage of sample	34.4%	30.3%	21.7%	10.3%	3.3%	100%
Estimated Number of anglers	128,847	113,601	81,314	38,565	12,556	374,883



A total of 32.0% of those interviewed were not very likely, or not at all likely to use RFHs, while 3.3% could not say. Freshwater fishers accounted for many of the “not likely” replies as did fishers from inter state.

## Discussion

RFHs were established in July 2002. This survey, conducted in December and January 2002, sought to identify the use of these areas in 2002, and also asked about expected use in the future.

The results indicated that 26% of licensed anglers had been fishing in an area which has since been established as a RFH. By expansion of the sample, this suggests that an estimated 97,400 licensed anglers had fished in RFH areas in the 12 months prior to their establishment. Secondly, the survey established that 28.7% of all anglers (64.7% less 26%) indicated they would be likely, or very likely to visit an RFH area in the next 12 months (Table 6). This translates to an additional 143,312 anglers as reported in Table 6.

This result is viewed as a ‘snapshot’ of use, and intentions to use RFHs in the future. It is likely that these intentions will translate into an increase in RFH use through time.

**Table 6: Estimated numbers of RFLH visiting RFHs. (The final column indicates additional projected “very likely” or “fairly likely” users in survey responses).**

Recreational Fishing Haven	% Use	Angler numbers to date	Additional Projected Use
Tweed River	5%	4,466	6,527
Richmond River	3%	2,516	3,677
Clarence River	4%	3,711	5,424
Bellinger River including Kalang River	1%	1,258	1,839
Hastings River	4%	3,585	5,240
Camden Haven River	2%	2,076	3,034
Manning River	3%	2,830	4,137
Lake Macquarie	12%	11,699	17,098
Botany Bay	13%	12,705	18,569
St Georges Basin	6%	5,409	7,906
Lake Conjola	3%	2,893	4,229
Burrill Lake & Lake Tabourie	3%	2,516	3,677
Tuross Lake, Tuross & Tomaga Rivers	3%	3,334	4,872
Bermagui River	3%	3,019	4,412
Bega River	2%	1,572	2,298
Pambula River	1%	1,006	1,471
Yowaka, Nullica or Towamba/Kiah River	1%	503	735
Wonboyn Lake, River & Wonboyn Beach	1%	1,258	1,839
None of the above	32%	31,700	46,330
<b>Total</b>	<b>100%</b>	<b>98,056</b>	<b>143,312</b>

The survey reveals a considerable likelihood among licence holders in visiting RFHs in the future. If all fishers who indicated they were very likely, or fairly likely to use RFHs in the

future actually do so, then a 146% increase in angler numbers visiting RFH would be experienced compared with 2002 levels. Given that Table 2 indicates that about half of all anglers fish less than 10 days per annum, and that RFHs may be visited on future trips, the impact of this increase in fisher numbers need not necessarily be translated into a proportional increase in fishing effort in RFHs. However future work will need to investigate changes in fishing effort in RFHs as an evolving issue for management.

#### 4. Saltwater angling trips and traveling characteristics

An angling trip may be as short as a few hours within a single day, or may involve longer trips of one, several or many nights away from home. This section examines the trip characteristics of city and country anglers. Part of the trip characteristics involves driving to various fishing locations. This is examined in some detail since vehicle travel will contribute a substantial amount to angler expenditure and informs management of the importance of recreational fishing access to different groups in the community as implied by their preparedness to undertake long trips to the coast.

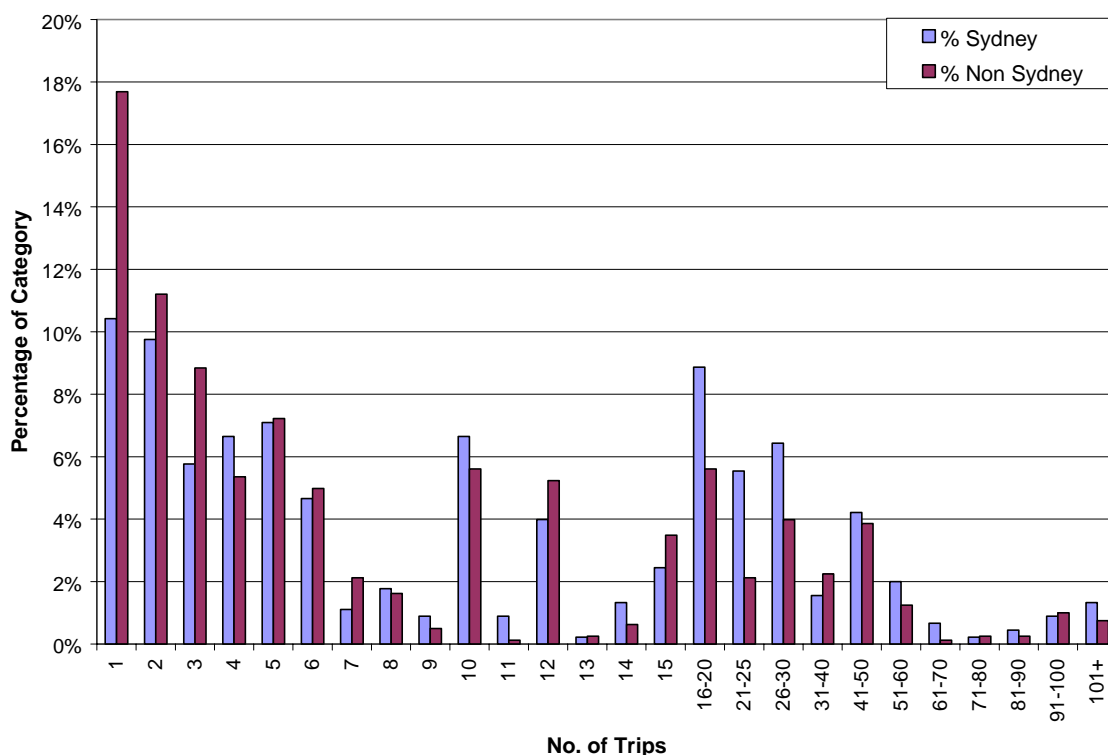
The survey establishes a profile of angling trips in saltwater, and enables estimates of total number of angling trips in saltwater in NSW to be made. Table 7 below shows that the typical NSW fisher from Sydney averages more fishing trips per year (14.8 trips p.a.), than non-Sydney fishers (11.7 trips p.a.), although the total number of trips undertaken by Sydney-siders accounts for only 29% of the total number of fishing trips by fishers in NSW.

**Table 7: The average number of fishing trips per year for Sydney and non-Sydney fishers.**

	Total trips	%	Trips per fisher
<b>Sydney</b>	1,429,087	29%	14.8
<b>Other</b>	3,455,107	71%	11.7
<b>Total</b>	<b>4,884,194</b>	<b>100%</b>	<b>12.8</b>

Figure 6 below compares the behaviour of Sydney fishers with other NSW fishers, and shows that Sydney-siders tend to have more fishing trips than other fishers from NSW.

**Figure 6: The percentage frequency of trips by Sydney and non-Sydney anglers.**



Trips are considered as either single day trips or overnight trips. This categorisation enables comparisons with tourism data, such as the National Visitor Survey if required.

**Table 8a: The percentage of day trips and overnight fishing trips per year for Sydney and non-Sydney fishers.**

	Sydney	Other	Total
Day-trips	64%	58%	60%
Overnight trips	36%	42%	40%
Total	100%	100%	100%

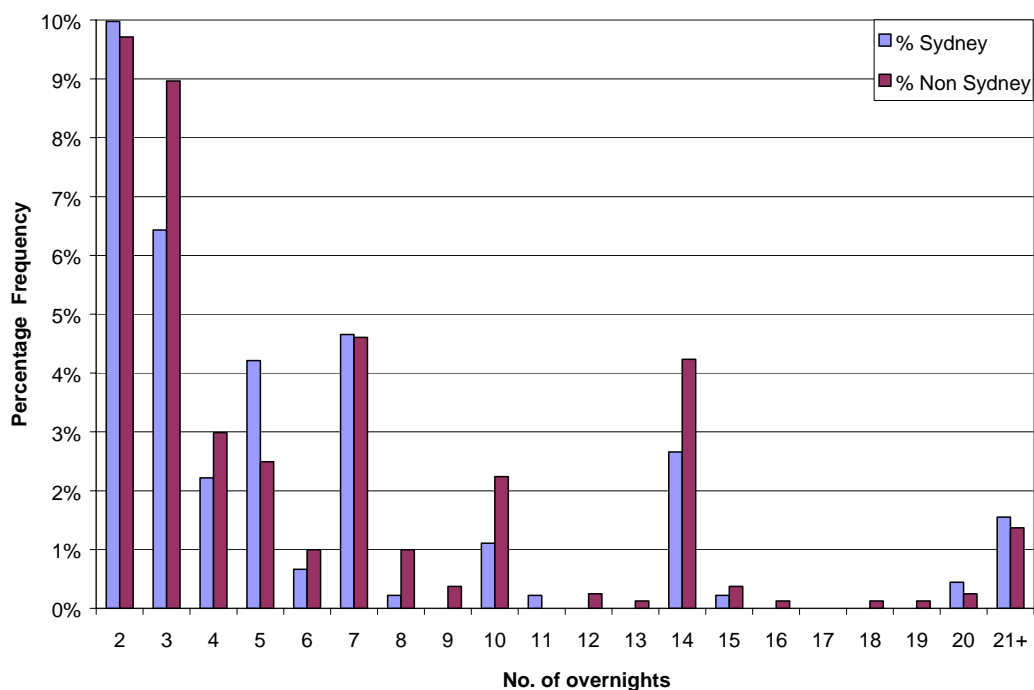
In Table 8a approximately 60% of fishing trips in NSW and 64% of trips by Sydney-siders were day trips. In Table 8b the behaviour of those who engage in overnight trips (40% of trips) is compared with the average trip length which includes day trips. Those who go on overnight trips average 5.9 day trips, with Sydney-siders averaging slightly shorter trips.

**Table 8b: The average number of days for all fishing trips and for overnight fishing trips per year for Sydney and non-Sydney fishers.**

Trip length	Sydney	Other	Total
Overnight trips (in days)	5.6	6.0	5.9
All trips (in days)	2.7	3.1	3.0

The percentage frequency of overnight trips lengths is presented in Figure 7.

**Figure 7: The percentage of overnight fishing trips per year for Sydney and non-Sydney fishers.**

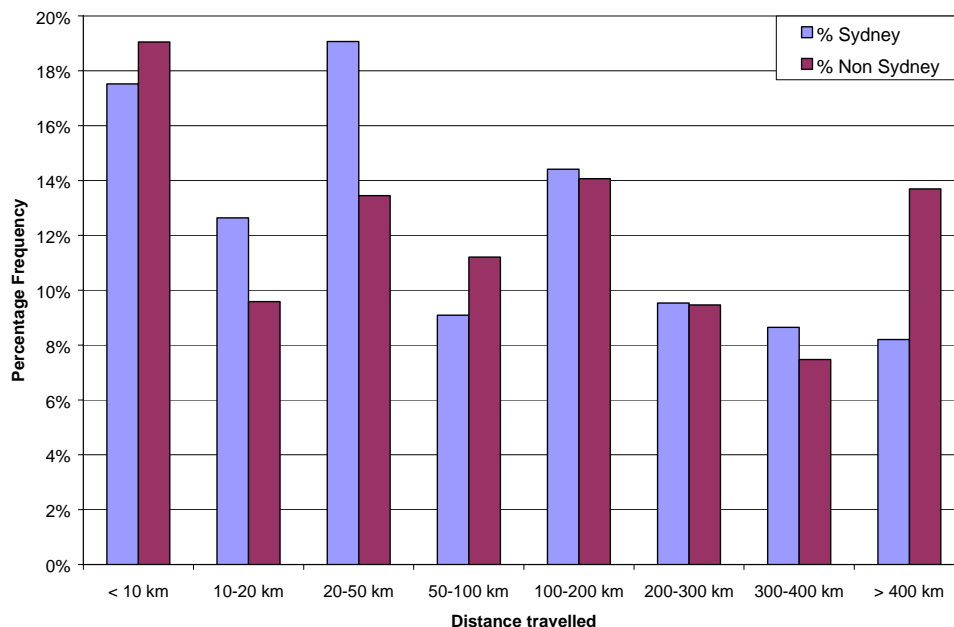


In Figure 7 the majority of trips away are for less than a week, with two week and three week trips being common.

### Distance Travelled by anglers

Most saltwater anglers use cars to pursue both day and overnight trips. Anglers were asked about the distance (each way) undertaken on their last fishing trip. Figure 9 reports the percentage frequency by distances.

**Figure 9: The frequency by percentage of distances travelled (each way) to angling sites by Sydney and non-Sydney anglers (n=1,254).**



The results in Figure 9 indicate the range of different travelling behaviours on the last trips of those interviewed. Approximately 50% of fishing trips were less than 50km (each way) from home. Conversely, NSW country dwellers and visitors from interstate drive long distances one way on saltwater fishing trips.

Expansion of the last reported trip<sup>5</sup> gives estimates of 333 million km travelled by anglers one way annually of which;

- 38 million km are travelled for overnight trips by Sydney fishers;
- 41 million km are travelled on daytrips by Sydney fishers;
- 162 million km are travelled for overnight trips by non-Sydney fishers and;
- 92 million km are travelled on daytrips by non-Sydney fishers.

The residence of anglers and the frequency of their journeys of different distances on their last saltwater fishing trip is reported in Table 9 and Figure 10 below.

<sup>5</sup> Expansion was on the basis of the days fished by anglers on their last stated trip, as a proportion of the total days per annum fished by the anglers times the expansion factors from sample to whole population.

**Table 9: The frequency of distances (one way) travelled from home postcode to fishing destination on the last saltwater recreational fishing trip.**

			Distance in Kms (one way)									
State	Area	Post Code	5	15	35	75	150	250	350	450	Can't Say	Grand Total
NSW	Sydney	2000-2099	28	22	9	5	9	10	11	11		105
NSW	Sydney	2100-2199	26	17	62	29	43	28	20	16	3	244
NSW	Sydney	2200-2299	63	36	36	14	25	7	10	12	3	206
		<b>All Sydney</b>	<b>117</b>	<b>75</b>	<b>107</b>	<b>48</b>	<b>77</b>	<b>45</b>	<b>41</b>	<b>39</b>	<b>6</b>	<b>555</b>
		<i>Percent</i>	<i>21%</i>	<i>14%</i>	<i>19%</i>	<i>9%</i>	<i>14%</i>	<i>8%</i>	<i>7%</i>	<i>7%</i>	<i>1%</i>	<i>100%</i>
NSW	Non-Sydney	2300-2399	7	10	15	9	11	15	6	3	2	78
NSW	Non-Sydney	2400-2499	56	16	35	21	7	3	6	6	2	152
NSW	Non-Sydney	2500-2599	43	22	20	18	25	8	11	4	2	153
ACT	Canberra	2600-2699	3		1	3	22	20	6	17	1	73
NSW	Non-Sydney	2700-2799	2	3	9	21	13	7	13	8	3	79
NSW	Non-Sydney	2800-2899	1			1		1	3	5		11
NSW	Non-Sydney	2900-2999			1	1	2	10	1	4	1	20
		<b>NSW non-Sydney</b>	<b>112</b>	<b>51</b>	<b>81</b>	<b>74</b>	<b>80</b>	<b>64</b>	<b>46</b>	<b>47</b>	<b>11</b>	<b>566</b>
		<i>Percent</i>	<i>20%</i>	<i>9%</i>	<i>14%</i>	<i>13%</i>	<i>14%</i>	<i>11%</i>	<i>8%</i>	<i>8%</i>	<i>2%</i>	<i>100%</i>
		<b>All NSW</b>	<b>229</b>	<b>126</b>	<b>188</b>	<b>122</b>	<b>157</b>	<b>109</b>	<b>87</b>	<b>86</b>	<b>17</b>	<b>1,121</b>
Vic	Non-NSW	3000-3999		4	2	1		3	6	48	1	65
Qld	Non-NSW	4000-4999	3	4	3	8	21	7	6	10	1	63
SA	Non-NSW	5000-5999			1					2	1	4
Tas	Non-NSW	7000-7999								1		1
		<b>Non-NSW</b>	<b>3</b>	<b>8</b>	<b>6</b>	<b>9</b>	<b>21</b>	<b>10</b>	<b>12</b>	<b>61</b>	<b>3</b>	<b>133</b>
		<i>Percent</i>	<i>2%</i>	<i>6%</i>	<i>5%</i>	<i>7%</i>	<i>16%</i>	<i>8%</i>	<i>9%</i>	<i>46%</i>	<i>2%</i>	<i>100%</i>
		<b>Grand Total</b>	<b>232</b>	<b>134</b>	<b>194</b>	<b>131</b>	<b>178</b>	<b>119</b>	<b>99</b>	<b>147</b>	<b>20</b>	<b>1,254</b>
		<i>Percent</i>	<i>19%</i>	<i>11%</i>	<i>15%</i>	<i>10%</i>	<i>14%</i>	<i>9%</i>	<i>8%</i>	<i>12%</i>	<i>2%</i>	<i>100%</i>

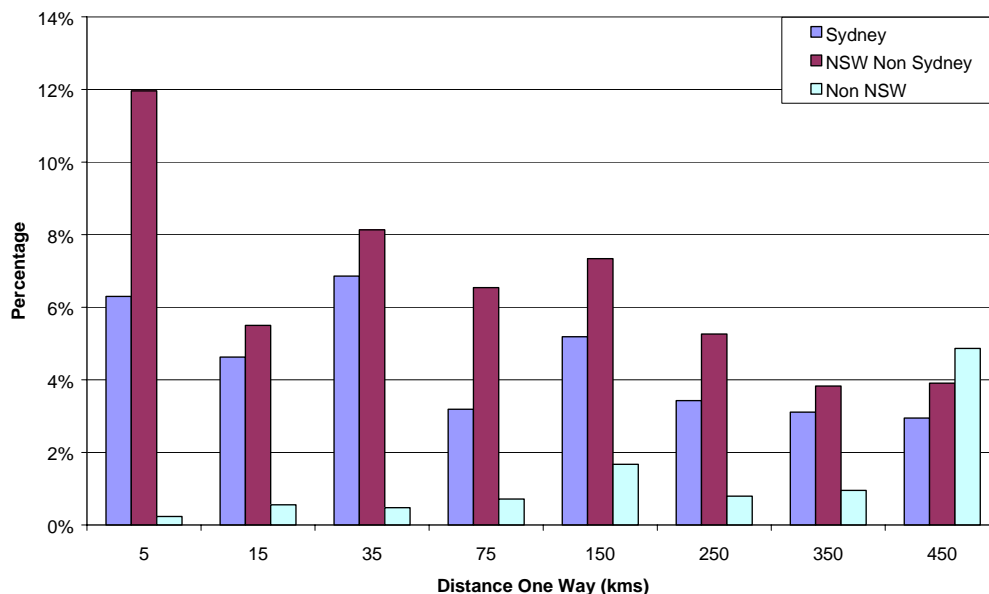
In Table 9 and Figure 10 it is apparent that non-NSW anglers were few in number, but travel long distances. This is explored further in Table 10.

**Table 10: The percentage frequency of anglers, the percentage of the total kms travelled and average distances per trips for saltwater anglers from different regions.**

Anglers home region	% No. of anglers	% of total Kms	Average Km travelled (one way)
Sydney	44%	36%	116
NSW Non-Sydney	44%	42%	135
Non-NSW	10%	22%	295

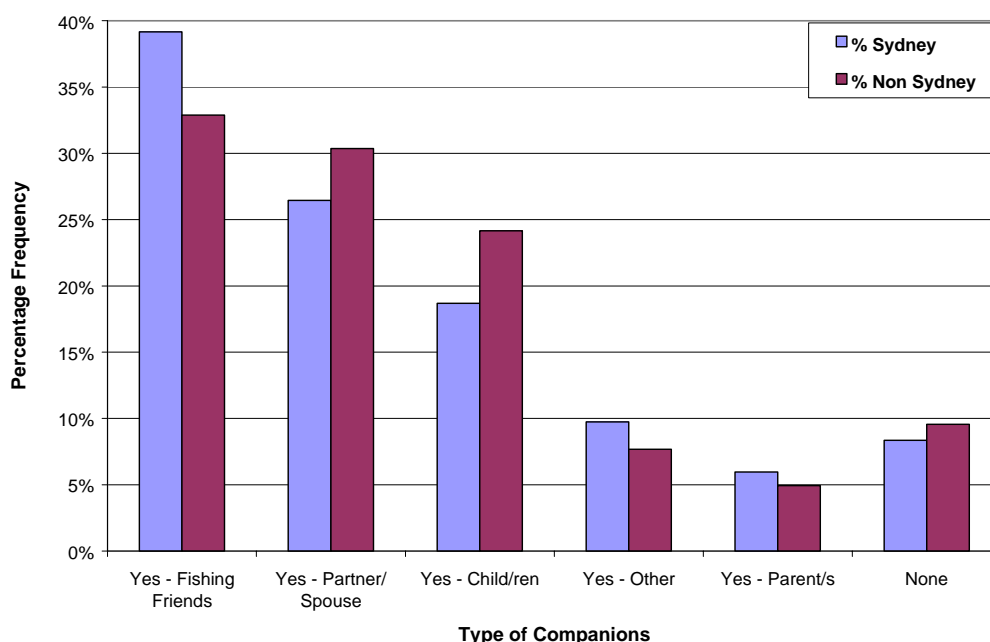
In Table 10 it is apparent that although non-NSW saltwater anglers are 10% of RFLHs they travel 22% of the total distance travelled by anglers, reflected in an average distance per trip of 295km (one way). Non-Sydney anglers have a greater average distance travelled than Sydney anglers due to a greater percentage of trips of 250km or more by non-Sydney anglers.

**Figure 10: The percent frequency of distance travelled by anglers on their last recreational saltwater fishing trip (one way) by Sydney, non-Sydney and non-NSW residents (n=1,254)**



Anglers are often accompanied on fishing trips by companions or family members. Figure 11 presents the frequency of the categories of companions on trips. Overall, friends represent 35%, partner/spouse 28%, and children 22%, of companions on all trips.

**Figure 11: The percentage frequency of different categories of companions on fishing trips compared for Sydney and Non Sydney anglers.**



Anglers fishing in saltwater in NSW have a variety of trip and travelling characteristics. These have implications for management with a significant number of fishers coming on trips from outside NSW. This fishery tourism is part of significant expenditure by all saltwater anglers and will be investigated in the next section.

## 5. Trip expenditure

Recreational fishing licence holders were asked about expenditure per day on their last fishing trip. This involved recalling expenditure for a range of items. Trips may be for just one day, or when for more than one day, include expenses such as accommodation.

The individual expenditure in each category per day fished is reported in Table 11.

**Table 11: Average expenditure per item in dollars (\$) per fishing day for all trips (day trips and overnight trips) by Sydney and non-Sydney anglers.**

Expense Category	Expense Type	Non Sydney day trip	Non Sydney Overnight trip	Sydney day trip	Sydney Overnight trip	Grand Total
Direct Exp	Tackle	13.26	3.31	15.60	5.43	10.11
	Bait & Berley	10.35	7.98	13.34	9.80	10.33
	Other Fishing Equip	4.32	1.00	3.35	1.37	2.82
<b>Total Direct</b>		<b>27.93</b>	<b>12.30</b>	<b>32.28</b>	<b>16.60</b>	<b>23.26</b>
Indirect Exp	Accommodation	0.00	33.34	0.00	33.27	13.29
	Boat Fuel	8.47	7.14	12.89	10.88	9.44
	Boat Hire	1.75	4.07	5.49	3.47	3.46
	Fishing Clothes	2.33	2.93	3.75	6.62	3.38
	Travel	35.02	85.00	35.34	57.94	51.53
<b>Total Indirect</b>		<b>47.57</b>	<b>132.48</b>	<b>57.48</b>	<b>112.18</b>	<b>81.08</b>
<b>Total Direct and Indirect</b>		<b>75.50</b>	<b>144.77</b>	<b>89.76</b>	<b>128.78</b>	<b>104.34</b>
Other	Eating Out	7.78	17.69	9.15	21.73	12.57
	Other Entertainment	6.83	14.28	6.99	18.06	10.32
	Other Food & Drink	8.03	18.16	8.30	22.44	12.68
	Other Expenditure	10.48	16.37	10.58	11.62	12.24
<b>Total Other</b>		<b>33.11</b>	<b>66.49</b>	<b>35.03</b>	<b>73.84</b>	<b>47.81</b>
<b>Grand Total</b>		<b>108.61</b>	<b>211.27</b>	<b>124.79</b>	<b>202.62</b>	<b>152.15</b>

The indirect costs are for the total activity and no attempt was made to attribute indirect costs by percentage of trip spent fishing. The implications of this expenditure statewide can be seen in Table 12 which reports a state wide expenditure estimate using the results of the survey.

## Discussion

The results in Table 11 and Table 12 indicate that expenditure by anglers is spread between direct, indirect and other categories. A national review of estimation methods in McIlgorm and Pepperell, (1999) indicate that “other expenditure” measured in the survey is relevant to regional economies, but should not be included in expenditure attributable to recreational fishing, if we wish to be consistent with previous estimates<sup>6</sup>.

<sup>6</sup> For example the direct and indirect expenditure of Table 8 (\$ 681.8m) would constitute 64.4% of total Statewide expenditure, if following the proportions from other studies nationally presented in Table 2.2a of McIlgorm and Pepperell, (1999). The implication is that statewide expenditure (Direct, indirect and capital items) may be 20% higher to reflect capital expenditure in travel, becoming \$818m (and may be as high as \$1,058 m. This estimate is for Recreational fishing licence holders only).



**Table 12: Total expenditure in millions of dollars (\$) per annum by day trips and overnight trips for Sydney and non-Sydney anglers.**

Expense Category	Expense Type	Non Sydney day trips	Non Sydney Overnight trips	Sydney day trips	Sydney Overnight trips	Grand Total
Direct Exp	Tackle	34.75	6.32	25.43	4.96	71.46
	Bait & Berley	27.14	15.22	21.75	8.96	73.06
	Other Fishing Equip	11.32	1.91	5.46	1.25	19.93
<b>Total Direct</b>		<b>73.21</b>	<b>23.44</b>	<b>52.63</b>	<b>15.17</b>	<b>164.45</b>
Indirect Exp	Accommodation	0.00	63.53	0.00	21.78	85.30
	Boat Fuel	22.19	13.60	15.05	7.12	57.96
	Boat Hire	4.58	7.75	6.41	2.27	21.02
	Fishing Clothes	6.12	5.58	4.38	4.33	20.41
	Travel	91.70	161.90	41.20	37.90	332.70
<b>Total Indirect</b>		<b>124.59</b>	<b>252.36</b>	<b>67.05</b>	<b>73.40</b>	<b>517.39</b>
<b>Total Direct and Indirect</b>		<b>197.80</b>	<b>275.80</b>	<b>119.68</b>	<b>88.57</b>	<b>681.84</b>
Other	Eating Out	20.39	33.71	10.69	14.22	79.01
	Other Entertainment	17.90	27.20	8.16	11.82	65.07
	Other Food & Drink	21.04	34.60	9.70	14.69	80.02
	Other Expenditure	27.47	31.19	12.35	7.61	78.61
<b>Total Other</b>		<b>86.79</b>	<b>126.69</b>	<b>40.89</b>	<b>48.33</b>	<b>302.70</b>
<b>Grand Total</b>		<b>284.59</b>	<b>402.49</b>	<b>160.57</b>	<b>136.90</b>	<b>984.54</b>

Table 11 indicates the average daily expenditure of both Sydney and non-Sydney day trip fishers and fishers undertaking overnight trips. The daily direct and indirect fishing expenditure of Sydney anglers on day trips is 61% higher than the equivalent non-Sydney angler. This appears to be due to higher direct tackle and bait/berley expenditure, boat fuel and boat hire expenditure as well as expenditure on travel. Sydney anglers who overnight tend to spend less per day on travel, accommodation and boat hire than non-Sydney fishers, though as these are daily averages the length of the angling trip is important.

The average day trip angler expenditure was between \$27 per day (non-Sydney ) and \$32 per day (Sydney) on direct expenditure and \$17 per day (NS) and \$57 per day (S) on indirect. For overnight trips direct expenditure was approximately \$12 per day (NS) and \$16 per day (S) on direct expenditure and \$112 per day (NS) \$132 per day and (S) on indirect expenditure reflecting travel and accommodation.

The estimated total expenditures reported in Table 11 show a statewide expenditure by recreational fishers on items directly related to fishing of \$164.4m. Expenditure on indirect items are higher at \$517.4m with travel being the highest expenditure category<sup>7</sup>. Boat fuel costs are likely an underestimate<sup>8</sup>. Total travel costs of non-Sydney residents reflected long journeys undertaken by residents of inland towns as reported in Table 9.

<sup>7</sup> The travel expenditure method follows Dominion's 2001 Snowy Mountain study estimating expenditure of the of the total kilometers travelled, times the imputed mileage rate (50cents/ km). Thus the \$332.7m the two way imputed total expenditure associated with RFLH travel in NSW. It is a conservative estimate and may underestimate the kms undertaken by day trippers.

<sup>8</sup> A coding issue with a category of \$0-25 for boat fuel was ambiguous (zero expenditure or positive) and was treated as zero expenditure on the basis of conservatism.

Other expenditure was estimated at \$302.7m and reflects the expenditure of anglers and their companions/families on eating out, food and drinks, entertainment and general expenditure on recreational fishing trips. The purpose of including this is to illustrate the regional significance of this expenditure, to the region in which it is made. Some previous surveys have not included these kinds of items in “recreational fishing costs” for a variety of reasons (McIlgorm and Pepperell, 1999). All indirect costs were stated “as is” and were not apportioned in any way to reflect other uses.

Consistency with past estimates can be seen in reviewing the direct and indirect expenditure estimates with estimates in McIlgorm and Pepperell (1999) and the draft results of the recent National Survey (Henry and Lyle, 2003). Any comparison should be treated with caution however, since the surveys may have utilized different methodologies. The following points are noteworthy:

- The current results are consistent with Pepperell, (1996) as interpolated in McIlgorm and Pepperell, (1999) where Direct and indirect expenditure associated with saltwater fishing was estimated to be \$470.7m per year in 1998 terms.
- The current results are higher than the National Survey expenditure estimates for NSW of \$274m ( Henry and Lyle, 2003). (\$550m total expenditure estimates, less \$276m boat and trailer expenditure).

The results in Table 12 also show expenditure on fishing tackle to be \$71.5m, \$19.9m in other fishing equipment and \$20.4m in fishing clothes – A total of \$111.8m. A survey of retail sales of fishing tackle across Australia estimated total sales of Fishing Tackle to be \$550m nationally and approximately \$200m of this would be attributable to NSW (Dominion, 2003). We suggest that the estimate in the current study is consistent with the national survey of the tackle industry (Dominion, 2003).

The trip expenditure of Sydney anglers outside Sydney is substantial. Firstly day trippers spend \$160.6m per annum and overnights \$136.9m. Of this, we follow the method used in the Snowy mountain study (Dominion, 2001) that one third of total travel expenditure is assumed to remain in the rural region. Thus the expenditure by Sydney overnights in coastal NSW was \$96.46m in 2002. Day trippers travelling 75km or more were 35% of day trips. This led to \$38.4m going along the NSW coast also.

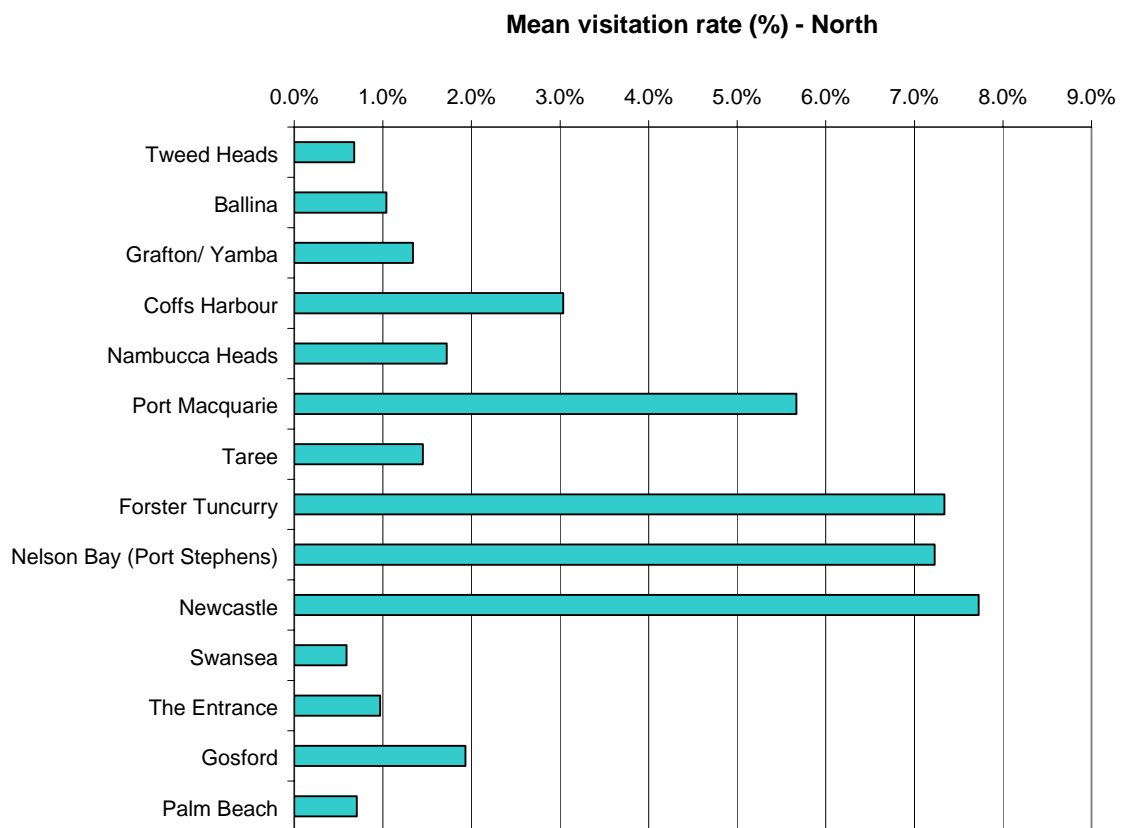
It is estimated that day trippers and overnights from Sydney expended a total of \$134.8m along the coast of rural NSW. This will be investigated in the next section.

## 6. Expenditure on trips away from Sydney and the recreational fishers expectations

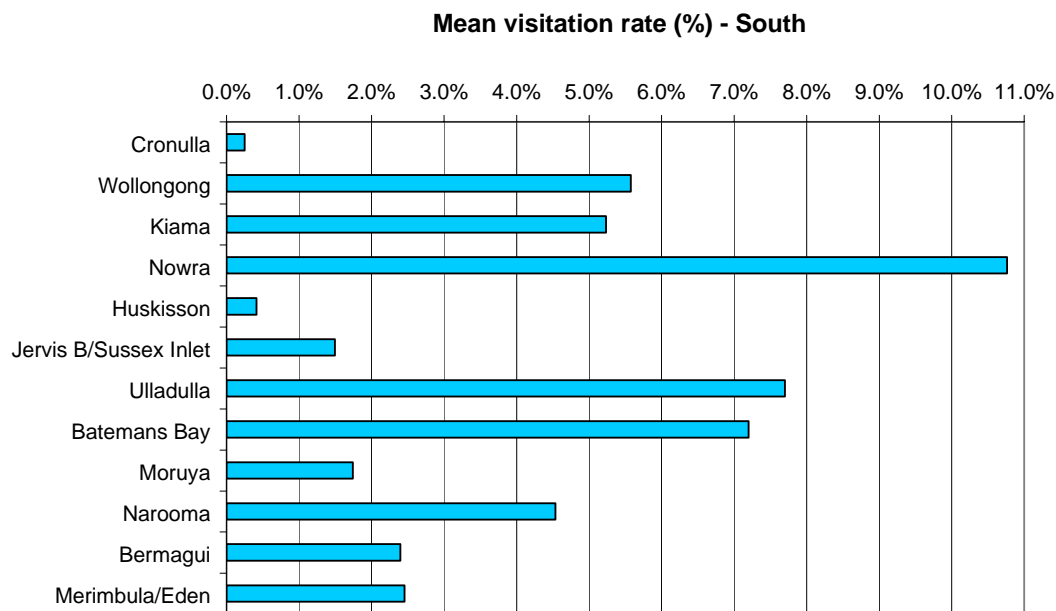
One of the intentions of the study was to examine the trip behaviour of Sydney anglers and the impact of their expenditure on different coastal communities in NSW. There were 451 angler interviews completed by Sydney residents. Of these, 254 had their last fishing trip away from Sydney, of which 165 were overnights, while 89 were day trips.

Anglers were asked about the destination of their last 3 fishing trips which involved overnights away from Sydney. The mean number of visits for each town, are expressed as a mean percentage of the total visits by Sydney anglers in their last three fishing trips and are presented in Figure 12a&b.

**Figure 12a: The destination of the last three overnight trips on the NSW north coast undertaken by Sydney anglers as a percentage of total trips ( North and South).**



**Figure 12b: The destination of the last three overnight trips on the NSW south coast undertaken by Sydney anglers as a percentage of total trips ( North and South).**



The total trip expenditure on fishing items, accommodation, other expenses and travel costs for overnight trips and day trips away from Sydney was estimated at \$134.8m for direct, indirect and other expenditure. It is assumed that this expenditure ends up within the communities visited. For the travel costs associated with a trip, one third is assumed to be associated with rural communities (Dominion, 2001). The data in Table 13 uses the visitation rates to rural towns to apportion this expenditure across the different communities along the NSW coast. Thus the Table is indicative of expenditure in the area in and around a given township. The survey asked for the nearest town visited and so estimates include expenditure in areas adjacent to the towns reported.

In Table 13 the most popular north coast destinations for Sydney Anglers were Coffs Harbour, Port Macquarie, Foster-Tuncurry, Nelson Bay/Port Stephens and Newcastle. On the south coast most popular destinations were Wollongong , Kiama, Nowra, Ulladulla, Bateman's Bay, and Narooma.

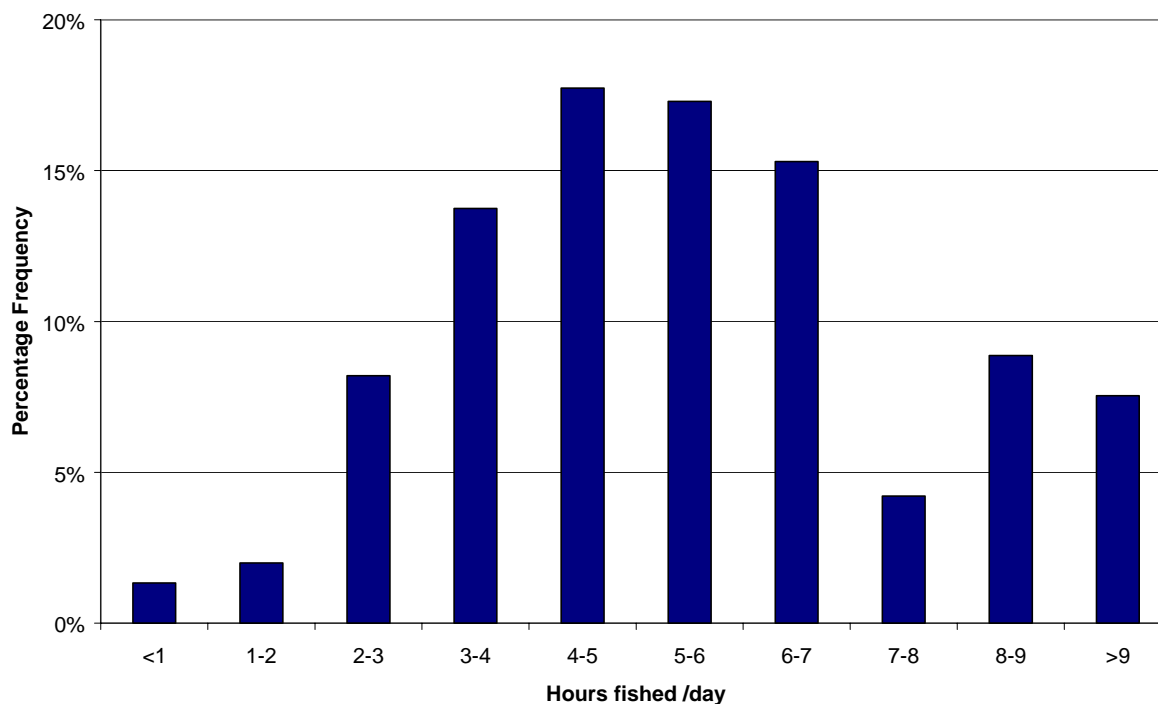
**Table 13: Estimates of regional annual expenditure (\$million) by Sydney anglers day trips and overnight trips in different coastal communities of NSW in 2002.**

Town	NRMA Distance (km)	Mean visitation rate %	Expenditure estimate (\$ millions)
Tweed Heads	851	0.7%	0.9
Ballina	740	1.0%	1.4
Grafton/ Yamba	643	1.3%	1.8
Coffs Harbour	527	3.0%	4.1
Nambucca Heads	477	1.7%	2.3
Port Macquarie	379	5.7%	7.6
Taree	299	1.5%	2.0
Forster Tuncurry	302	7.3%	9.9
Nelson Bay (Port Stephens)	207	7.2%	9.7
Newcastle	160	7.7%	10.4
Swansea	127	0.6%	0.8
The Entrance	97	1.0%	1.3
Gosford	70	1.9%	2.6
Palm Beach	0	0.7%	1.0
Cronulla	0	0.3%	0.3
Wollongong	84	5.6%	7.5
Kiama	114	5.2%	7.1
Nowra	155	10.8%	14.5
Huskisson	183	0.4%	0.6
Jervis B/Sussex Inlet	195	1.5%	2.0
Ulladulla	246	7.7%	10.4
Batemans Bay	281	7.2%	9.7
Moruya	309	1.7%	2.3
Narooma	352	4.5%	6.1
Bermagui	382	2.4%	3.2
Merimbula/Eden	470	2.5%	3.3
Other Town/Can't say		8.8%	11.9
<b>Total</b>		<b>100.0%</b>	<b>134.8</b>

## Features of trips when away from Sydney

All Sydney anglers were asked about attributes of their trip behaviour when away from Sydney. For example the question “On a trip away from Sydney, in a typical day, how many hours a day do you spend fishing?” led to the responses reported in Figure 12.

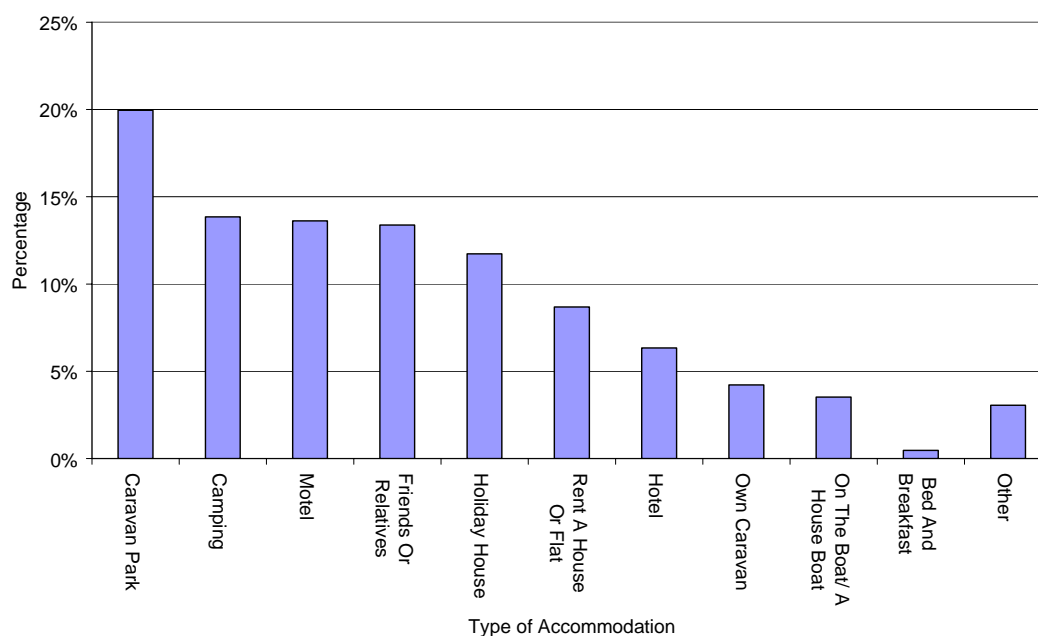
**Figure 12: The frequency of hours spent fishing by Sydney anglers when on a fishing trip away from Sydney ( n= 165).**



Sydney anglers were asked about trip companions and indicated that while 6% of trips were made alone, 39% were with friends and 41% with spouse and children (25% spouse and 16% children), 5% parents and 7% others.

Previous studies in NSW have shown the diversity in accommodation used by fishers (Dominion, 2001). The accommodation preferences of Sydney anglers are reported in Figure 13.

**Figure 13: The types of accommodation used by Sydney anglers when on a fishing trip away from Sydney.**

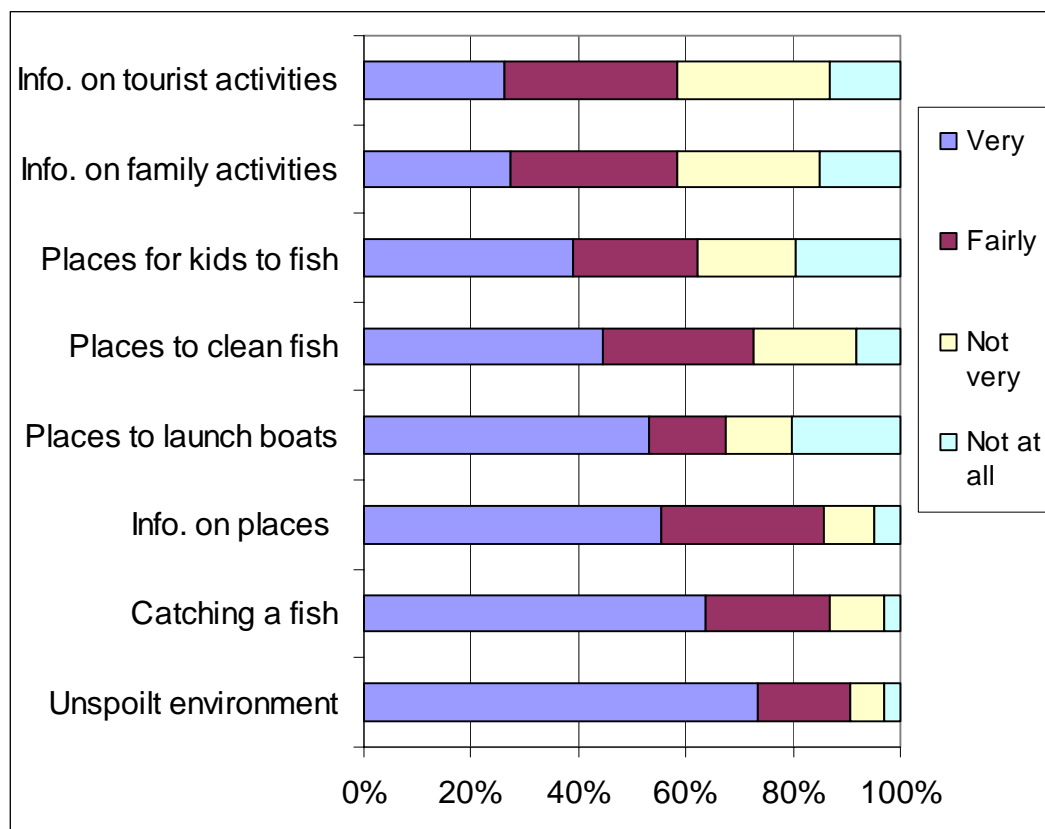


Fishers use a range of accommodation types with caravan, camping, motel accommodation as well as relatives and friends. The “other” category was mentioned quite frequently and may refer to fishers sleeping in their own vehicles, as was noted in the Snowy Mountain survey (Dominion, 2001).

## Recreational fisher expectations

All 451 anglers from Sydney were asked about their preferences for angling site features when on a trip to a coastal region of NSW.

**Figure 14: Responses to questions on the importance of the attributes of the fishing experience among Sydney anglers (n=451).**



The questions show that fishing in an unspoilt environment is ranked as very important by 72% of anglers, followed by catching one or more legal sized fish, (63%). These attributes are not independent of each other. Information on places to fish, and launching boats are very important to more than half of the respondents (55%), and places to clean fish and for the kids to fish are very important to approximately 40%. Although information for the family and on the area has only 26% of the very important response, it is ranked highest in the fairly important category. Places for kids to fish and to launch boats were ranked as not important by 20% of respondents, generally those without families or boats.

## Discussion

The movements of Sydney anglers in taking overnight recreational fishing trips has been investigated and it has been found that a total of \$134.8m is associated with overnight fishing trip activity going from Sydney to coastal NSW. The implications of this expenditure for many coastal townships is significant.

Most of the towns on the NSW north and south coast benefit from expenditure by tourists and visitors with a variety of recreational motivations. It should be noted that the substantial expenditures shown in Table 13 are just the Sydney-based contribution to local/regional fishing expenditure. All along the coast the impact of non-Sydney and interstate angler expenditure would also be significant. The estimated expenditure associated with non-Sydney residents overnighting is \$395.9m and is higher than Sydney anglers due to greater numbers of anglers and higher per fisher travel expenditure, accommodation and boat hire costs.

### *Rural economic benefits*

In rural NSW, expenditure of \$1.0m in the recreational sector is estimated to generate 9 direct jobs in the economy (Dominion, 2002). Thus the overnight expenditure on fishing of licensed Sydney fishers of \$134.8m would have 1,213 full time jobs associated with it. These jobs would be in businesses selling tackle, bait and berley, accommodation, travel, boat fuel, boat hire and also include the expenditure by visiting fishers on food, drinks and entertainment.

The flow-on effects of these expenditures would be 0.8 (Dominion, 2003<sup>9</sup>) implying that a further 970 jobs are related to this overnight based fishery-driven tourism associated with Sydney's anglers.

Figure 14 indicates the expectations of Sydney anglers in respect of the locations chosen for fishing. A clean environment and a good chance of catching a legal sized fish are the prime considerations for most fishers in selecting their fishing location. Information on places to fish, boat launching sites and the attractions of the local area are also important and can be provided for visiting anglers by local councils.

The next section appraises the socio-economic characteristics of anglers and examines the avidity and trip expenditure characteristics of Sydney anglers in particular.

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<sup>9</sup> assuming the same classification of goods as the tackle sales industry nationally (see Dominion, 2002).



## 7. Socio-economics characteristics of recreational fishers

The socio-economic characteristics of the sample of recreational fishers interviewed are reported in Figure 14 below.

**Figure 14: The socio-economic characteristics of the telephone survey sample.**

		Freq	%
<b>Age</b>	< 18	4	0.3%
	18-24	94	7.5%
	25-34	241	19.2%
	35-44	329	26.2%
	45-54	351	28.0%
	>55	235	18.7%
<b>Sex</b>	Male	1077	86%
	Female	177	14%
<b>Marital Status</b>	Married or relationship	969	77%
	Single	211	17%
	Other (Divorced, separated, widowed)	74	6%
<b>Parent/Guardian</b>	Yes	863	69%
	No	391	31%
<b>No. of Children</b>	1	150	17%
	2	397	46%
	3	212	25%
	4	76	9%
	5	16	2%
	>6	8	1%
<b>Education</b>	Primary School	18	1%
	Year 10/ 4th Form	250	20%
	Year 11/ 5th Form	103	8%
	Year 12/ 6th Form	286	23%
	Some secondary school	84	7%
	Trade Or Tafe Certificate(s)	186	15%
	University Degree/ Tertiary Education	309	25%
	Other	18	1%
<b>Household income</b>	< \$20,000	42	3%
	\$20,000 - \$29,999	63	5%
	\$30,000 - \$39,999	78	6%
	\$40,000 - \$59,999	191	15%
	\$60,000 - \$79,999	181	14%
	\$80,000 - \$99,999	120	10%
	\$100,000 - \$119,999	94	7%
	\$120,000 - \$139,999	36	3%
	>\$140,000	77	6%
	Can't say/refused	372	30%
<b>Country of Birth</b>	Australia	1020	81%
	Europe	121	10%
	Africa/Middle East/Other	45	4%
	Asia/ South East Asia	34	3%
	New Zealand/Pacific Islands	23	2%
	North America	8	1%
	Central and South America	3	0%

The sample of 1,254 RFLH were asked a range of questions about their economic and socio-economic characteristics.

- Approximately 86% of fishers were male and 14% female;
- Mean age was 42.6 years (s.d. 11.8);
- 77% were married or in a relationship, 17% single and 6% widowed;
- 69% were parents or guardians;
- 63% of families had 1 or 2 children;
- 48% had education beyond year 12 or equivalent;
- Mean household income was \$71,836 (s.d. \$38,583) (but 30% of respondents did not respond to this question);
- 81% of the sample had been born in Australia.

### **Socio-economic determinants of fishing activity and expenditure**

Preliminary research has been undertaken on the relationship between days fished in saltwater and the socio-economic characteristics of fishers. A multiple regression model was specified to examine socio-economic features that were significant in determining the number of days fished by licence holders in saltwater per annum<sup>10</sup>. Results indicated that in all NSW:

- Males fished significantly more days than females;
- Married fishers fished significantly less days than unmarried fishers;
- Fishers educated above year 12, fished significantly less days per annum than those below year 12 level of education;
- Sydney anglers fished significantly more days than non-Sydney anglers;
- Non NSW residents fished significantly less days than NSW residents.
- Age of angler (licence holder), per capita income and being born in or out of Australia were not significant in determining days fished. (However 30% of respondents did not state their income and thus were not included in the regression model).

Expenditure per day on the last fishing trip statewide was examined and it was found that expenditure per day is significantly higher:

- among fishers who fished for more days;
- among fishers who spent more days away from home;
- by fishers from outside NSW.

#### *Sydney results*

Preliminary research for Sydney involved obtaining data from the ABS on the mean and median income and unemployment of anglers living in Sydney from the 2001 census for each postcode. Preliminary modeling has indicated that fishing is a socially diffuse recreation.

Days fished by Sydney licence holders are:

- significantly less for anglers from suburbs with highest average income;
- significantly less for anglers from suburbs where unemployment is highest;
- significantly less for married persons with families;
- significantly less for those with education beyond year 12 or equivalent.

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<sup>10</sup> details of the multiple regression modeling can be obtained from the author.

Expenditure per day on the last fishing trip by Sydney licence holders was examined and it was found that expenditure per day is significantly<sup>11</sup>:

- higher among fishers with higher days fished;
- higher among fishers with higher days away from home on trips;
- higher by fishers from the suburbs with highest income;
- lower by fishers from the suburbs with highest unemployment;

This is the first attempt to examine the socio-economic characteristics of saltwater fishers in NSW and in suburbs of Sydney. In examining the socio-economic drivers of “days fished”, fishing is found to be a very diverse recreation covering a wide range of income and social groups.

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<sup>11</sup> The regression results presented should be treated with caution as days fished by Sydney residents may be significantly greater than for non-Sydney anglers, but this is not to say the mean activity of non-Sydney residents is not important.

## 8. Discussion and Conclusions

This report has investigated a range of issue and the results are presented below. The management implications are discussed and relevant recommendations made.

### *Days fished in NSW*

Our interviews asked respondents about their days fished in the last 12 months. Recreational Fishing Licence holders (RFLHs) fished a total of 7.43 million days in all waters in NSW in 2002, of which 6.35million days were fished in saltwater and 1.08 million days in freshwater.

### *Angler avidity*

The study has confirmed previous studies of NSW fisheries of the differences in the avidity of recreational fishers. Saltwater anglers have three different levels of avidity, with two extremes:

- 52% of anglers fish less than 10 days a year and contribute 15% of days fished;
- 38% of anglers fish 10-40 days a year and contribute 46% of days fished;
- 10% of anglers fish over 40 days a year and contribute 39% of total days fished.

This finding has significant implications for management as the range of services and policies provided by management must cater for both the infrequent and the avid angler. Further research could determine if the licensing of anglers has changed the composition and behaviour of the angling population, especially with respect to avidity.

### *Recreational Fishing Havens*

The survey revealed that as of December 2002, 76% of anglers interviewed (all of whom were licensed) had heard of the Recreational Fishing Havens implemented in July 2002. Approximately 26% of anglers had been to an area that is now an RFH in the previous year. The survey revealed that 34% of anglers interviewed were very likely to visit RFHs in the next year. An additional 30% were fairly likely. This is indicative of a potential 64% increase over current use and shows a high level of expectation of RFHs.

The frequency of visits indicated the popularity of different RFHs along the NSW coast. Botany Bay and George's River were found to be most popular with Sydney residents. Lake Macquarie was most popular with Newcastle and Sydney residents. The next step for management would be some measurement of angler satisfaction from fishing trips to RFHs in coastal NSW.

### *Number and length of angling trips*

Anglers go on both single day and overnight trips. NSW anglers undertake an estimated 4.88 million trips per annum, an average of 12.8 trips each. Approximately 60% of these are day trips and 40% are overnight trips, the latter averaging 5.9 days of which 70% of days are spent fishing.

Anglers in NSW are highly dependent on car travel with 50% of trips to fishing destinations being greater than 50km travel one way. Only 17% of trips are less than 10km one way. A total of 56.2 million km are travelled one way on car travel with the average trip being 141 km one way. A significant number of longer trips to fish in saltwater are made from country centres in NSW. Companions on fishing trips are primarily family members (50% of all trips) and friends (35%). The traveling behaviour of anglers from different areas in NSW and from interstate, is an area of recreational fishing tourism that is worthy of further investigation.

*Angler expenditures*

Expenditures by anglers are considered to be on items directly associated with fishing (tackle, bait/berley etc), indirectly associated (accommodation, travel, boat fuel and hire), and other expenses (eating out, other entertainment, food and drinks etc). Direct and indirect expenditure are comparable to previous fishing expenditure studies. Other expenditure is relevant here since we are interested in measuring the total regional expenditure brought to coastal areas by Sydney anglers.

The average day trip expenditure per angler was between \$27 per day (non-Sydney) and \$32 per day (Sydney) on direct expenditure and \$17 per day (NS) and \$57 per day (S) on indirect. For overnight trips direct expenditure was approximately \$12 per day (NS) and \$16 per day (S) on direct expenditure, and \$112 per day (NS) and \$132 per day (S), on indirect expenditure reflecting travel and accommodation. These estimates do not include 'other', expenses such as food, drink.

*Estimate of total state expenditure*

For NSW direct expenditure was estimated at \$164.4m and indirect at \$517.4m. This total of \$681.8m is for non-capital total expenditure on saltwater angling in NSW. The implication is that NSW statewide expenditure (Direct, indirect and capital items estimated from previous studies) may be approximately \$818m for recreational fishing licence holders only.

*Regional expenditure by Sydney anglers*

The amount of direct, indirect fishing and other expenditure by Sydney-based licensed anglers associated with overnight trips and day trips to coastal is estimated at \$134.8m. This expenditure in rural coastal communities is estimated to support 1,213 jobs and has an estimated flow-on economic benefit of 970 jobs.

The most popular north coast destinations for Sydney Anglers were Coffs Harbour, Port Macquarie, Foster-Tuncurry, Nelson Bay/Port Stephens and Newcastle (Lake Macquarie). On the south coast the most popular destinations were Wollongong, Kiama, Nowra, Ulladulla, Bateman's Bay, and Narooma. The councils in coastal areas could benefit from accessing these estimates of expenditure by recreational fishing tourists.

*Attributes of angling trip locations*

The desirable attributes of Sydney anglers for good trip destinations were examined. Clean environment and catching one or more fish of legal size were the most important features. Information of places to fish and places to launch boats were the second most popular attributes. Places to clean fish and of places for the kids to fish were less popular than information on the area and activities for the family. There are a range of secondary facilities, such as places to clean fish and launch boats and information of fishing areas, which local councils can provide to enhance the quality of angling experience.

*Socio-economic analysis of angler avidity and trip expenditure*

The socio-economic demography of fishers was examined for all 1,254 completed interviews. The mean age of licensed angler was 42 years, 86% were male, 77% of all anglers were married or in a relationship, and 69% were parents or guardians. 48 % had education of year 12 or equivalent, mean household income of \$71,000, and 81% were born in Australia

Preliminary research for Sydney involved obtaining data from the ABS on the mean income, median income and unemployment of suburbs in Sydney. A regression model was specified

to examine socio-economic features that were statistically significant correlations with the number of days fished in saltwater per annum. Results that were significant for the total sample indicated that:

- Males fished more days than females;
- Married fishers fished less days than unmarried;
- Fishers educated above year 12 fished less days per annum than less well educated fishers;
- Sydney anglers fished more days than non-Sydney anglers;
- Non NSW resident licence holders fished less days than NSW residents;
- Age of angler, per capita income and being born in or out of Australia, were not significantly correlated with days fished.

Days fished by Sydney licence holders only are:

- significantly less in the suburbs with highest income;
- significantly less for suburbs where unemployment is highest;
- significantly less for married persons with families;
- significantly less for those with education beyond year 12 or equivalent.

The results confirm the wide range of socio-economic characteristics among Sydney's anglers. Additional research could be undertaken in this area.

#### *Trip expenditure*

The trip expenditure model showed that among all fishers in NSW and fishers in Sydney, expenditure per day is significantly:

- greater among fishers who fished more days;
- greater among fishers who spent more days away from home on trips;

In all NSW:

- Expenditure per day is significantly higher by fishers who travelled to NSW to fish from interstate.;

And in addition recreational fishing expenditure by Sydney residents is significantly:

- higher by fishers who reside in suburbs with highest average income;
- lower by fishers who reside in suburbs with highest unemployment;

These results are indicative of statistically significant differences, but should be interpreted with caution as only avidity and trip behaviour have been examined. The overall message is that recreational fishing is a socially diverse recreational activity and that the demography, social and motivational aspects merit further study.

#### **How can we improve management ?**

Good management of any sustainable resource involves increasing the economic value derived from the resource, through taking steps to alter current arrangements in ways that increase that value. Value can be expressed in both monetary and non-monetary terms such as increasing angler satisfaction with the fishing experience, or through angler expenditure on pursuing their sport. Examining the economic and socio-economic drivers of recreational fishing behaviour gives information useful for fisheries management and for management of the tourism sector.

For example, the current study shows that the information flow to fishers about issues such as RFHs is a key requirement of managing recreational fisheries. The initial use of RFHs by anglers was related to the information they had received and the study shows it is the expressed intention of an additional 38% of RFLHs to use RFHs. Further, it is likely that provision of information on fishing opportunities may enable harvest and survey information to increase angler satisfaction.

Adding value through management in this context might be in several forms. Information to anglers on RFHs may make fishing sites more accessible for anglers and their families and hence increase angler satisfaction. Conversely, an influx of new anglers to established sites may lead to a perception of site crowding and hence a reduction in the general angling satisfaction with that area. Investigating trip behaviour of Sydney residents and its economic importance to regional NSW was a prime motive for the current study.

*Can fisher trips to rural coastal NSW be increased?*

According to the survey, the implementation of RFHs will very likely increase the number of anglers traveling to towns in coastal NSW. This would undoubtedly add to the regional expenditure estimates presented in this report due to additional angling trips being undertaken. Alternatively existing anglers may actually spend more time in rural areas, with an increase in total expenditure in these regions. The study shows there are potential economic benefits for rural coastal communities in NSW which position themselves to benefit from saltwater recreational fishing tourism.

The potential community benefits available from all anglers are illustrated in this study by referring to Sydney-based anglers. The RFH experiment meets several of the key attributes desired by recreational fishers to travel to a coastal area: a clean environment and availability of legal sized fish in a designated area. Communities along the coast can market these attributes and can further provide information on the attractions of the region, facilities available for fishing, such as places to launch boats and clean fish.

The socio-economic evaluation of angler characteristics provides useful insights into the avidity of fishers and the daily expenditure of anglers. Daily expenditure on angling trips is positively correlated with income for Sydney fishers, though high income areas of Sydney may not produce anglers that fish the most days per annum.

We would expect the fishing related expenditure in coastal NSW to increase in 2003 in response to the formation of RFHs. The estimates of coastal expenditure by Sydney anglers of \$134.8m will likely be exceeded if anglers fulfill their stated intentions to use RFHs more extensively. This would enhance the economies of rural NSW, through anglers deciding to visit rural sites, as opposed to metropolitan areas. More traveling by fishers to these RFHs is likely. In the total national economy the net increase from RFHs may be marginally higher than before the formation of RFHs, but the main contribution of RFHs will be to regional economies, due to changes in travel expenditure patterns.

The management of recreational fishing licence holders to date has been generic, and the research suggests there is no compelling reason to change the generic approach. However the contribution of the report is to potentially identify sectors of the angling population that may be worthy of tourism development. For example, the socio-economic analysis shows that interstate anglers spend significantly higher amounts per day on fishing trips, even after travel

has been considered. Fishery managers and tourism operators may wish to target interstate anglers for fishing holidays to enhance economic benefits in regional NSW.

The next stage of research is to:

- appraise the expenditure of interstate and NSW anglers in towns on the north and south coasts of NSW. The current study provides a sound background for such a study.
- Measure actual angler visitations to RFHs and the satisfaction of anglers with their fishing experiences in these areas.

The study confirms that the desire of recreational fishers is to catch one or more legal sized fish through a satisfying recreational experience in a clean environment. Management needs to maintain and enhance fish availability to a level which encourages anglers to make more trips to the coastal regions of NSW, with subsequent revisits, bringing a stream of recurrent expenditure to coastal communities.

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## Appendix one: The survey

### The sample of recreational fishing licence holders

The sample was drawn from a database with a total population of 374,883 fishers. Of these, 4,190 entries consisted of corrupted data entries, leaving us with a useable database of 370,693. Another 179 consisted of fishers with overseas addresses, this leaves us with an edited database of 370,514 Australian fishers, as described in the table below.

Total database		374,883	100%
Less Ruined data	4,190	370,693	98.88%
Less Overseas	179	370,514	98.83%

Expanding the useable database up to account for the corrupted data, we find that buyers of NSW fishing licenses may be divided as follows:

State	Total	Adjusted	%
NSW (including ACT)	281,791	284,976	76.0%
Vic	61,295	61,988	16.5%
Qld	21,700	21,945	5.9%
SA	3,854	3,898	1.0%
WA	831	840	0.2%
NT	229	232	0.1%
Unknown (presumed Australian)	814	823	0.2%
Overseas	179	181	0.0%
<b>Grand Total</b>	<b>370,693</b>	<b>374,883</b>	<b>100.0%</b>

Since the Sydney population was deliberately oversampled compared to the non-Sydney population, different expansion factors were derived as shown below.

Area	Sample	Population	Percentage	Expansion Factor
Sydney	451	89,989	24%	199.53
Other	803	284,894	76%	354.79
Total	1,254	374,883	100%	

### Sydney Postcodes

The definition of Sydney used information from the Australian Bureau of Statistics in respect of postcodes. The definition for the study was that Sydney was from postcodes 2000-2240. This meant that several areas in the far west of Sydney were not included within Sydney<sup>12</sup>. The ABS actually use statistical local areas (SLAs) as opposed to postcodes. We discussed our definition of Sydney with ABS in ordering socio-economic information data for different Sydney postcodes and also with Roy Morgan research.

<sup>12</sup> For example Postcodes 2750-2770 cover part of the Penrith/ St Marys/ Mt Druitt areas and postcodes 2558-2570 cover part of the Campbelltown, Ingleburn, Minto, Narellan, Campden areas.

## The Survey Field Report

From the edited database of 370,514 Australian fishers 4,711 were randomly sampled for telephone interviews, which were conducted between 19<sup>th</sup> December 2002 and 20<sup>th</sup> January 2003. From this sample, 1,254 (27%) completed surveys were obtained.

Call Category	Total	Total
Complete	1,254	26.6%
Engaged, no reply, etc	1,174	24.9%
Terminate	878	18.6%
Had not fished/not fished in saltwater in NSW in last 12 months	648	13.8%
Refusal	553	11.7%
Appointments not fulfilled	204	4.3%
Grand Total	4,711	100.0%

	TOTAL	Sydney	non-Syd	Total	% Sydney	% non-Syd
Interviews	4,711	1,780	2,931	4,711	37.8%	62.2%
Complete	1,254	451	803	1,254	36.0%	64.0%

## Discussion of the field work report

The fieldwork commenced in mid December and immediately found that many shoppers in the pre Christmas led to low response rates. This was common across several fieldwork surveys being run by Roy Morgan research. Approximately 14% had not fished in the last 12 months. Given the data were using was licence records from July 2000-2001, this may be expected. A total of 25% were either engaged or no replies which may be due to people moving etc. Refusals to participate and unfulfilled appointments to complete the survey were 16%.

The levels of terminations of the interviews was 18% and this was investigated. Available name data was reviewed for correlations with ethnicity and hence language spoken at home. Other reasons may be length and depth of the survey. In this case the completed interviews may be consistent with a population with avid anglers. However the overall descriptive statistics do not support this as the mean number of fishing days is consistent with previous work of Pepperell (1996).

## **Appendix two: Investigations into characteristics of those who use and do use recreational fishing havens.**

### **Who fishes fishing havens?**

The data available for all fishers were regressed in a LOGIT regression model to investigate the characteristics of those fishers who did not indicate they were very likely, fairly likely (ie not very likely, not at all likely, and can't say). The model used a dependent 1,0 variable, where 1 was very likely and fairly likely use of RFHs and 0 was other categories. A series of independent variables were used to seek significant explanatory variables (days fished in Saltwater, days fished in Freshwater, sex, age, married (number of children was highly correlated with Married and was omitted), level of education, born in Australia or overseas, traveling distance to last fishing trip, postcode in NSW or otherwise).

The following results were statistically significant showing that recreational fishing havens are more likely to be used by:

- Fishers who fish more saltwater days per annum;
- Fishers who fish less freshwater;
- Married fishers with children;
- Fishers educated above year 12;
- Fishers born in Australia;
- Fishers living at a location near to a RFH;
- Fishers living in NSW.

Details of the model results can be obtained from the author. While these variable are statistically significant, they may not be sizeable in effect.

The complexity of this issue can be seen in the App. Table 1 and is illustrated by the following:

- An area such as the Gold Coast is outside NSW and yet has high very likely use of RFHs;
- Areas such as Warringah and Chatswood have probably well educated fishers, born in Australia, but appear to have high levels of fishers not likely to use RFHs.

This is the first attempt to study use of RFHs and socio-economic characteristics of recreational fishers in NSW. It may well be the subject of further study and methodological refinement in the future.

**App. Table 1: The attitude to use of RFHs by RFLHs from different postal areas within and without NSW.**

BSP Name (AP)	Not very Likely	Fairly Likely	Very Likely
<b>BANKSTOWN</b>	<b>30%</b>	<b>32%</b>	<b>38%</b>
<b>BONDI</b>	<b>37%</b>	<b>20%</b>	<b>43%</b>
<b>CAMPBELLTOWN</b>	<b>27%</b>	<b>24%</b>	<b>49%</b>
<b>CHATSWOOD</b>	<b>57%</b>	<b>36%</b>	<b>7%</b>
<b>LEICHHARDT</b>	<b>27%</b>	<b>36%</b>	<b>36%</b>
<b>PARRAMATTA</b>	<b>37%</b>	<b>26%</b>	<b>37%</b>
<b>PENRITH</b>	<b>37%</b>	<b>29%</b>	<b>35%</b>
<b>PYMBLE</b>	<b>33%</b>	<b>33%</b>	<b>33%</b>
<b>RICHMOND</b>	<b>42%</b>	<b>27%</b>	<b>31%</b>
<b>ST GEORGE</b>	<b>21%</b>	<b>38%</b>	<b>42%</b>
<b>SYDNEY STREETS</b>	<b>0%</b>	<b>50%</b>	<b>50%</b>
<b>WARRINGAH</b>	<b>55%</b>	<b>25%</b>	<b>20%</b>
<b>NSW NORTH COAST</b>	<b>31%</b>	<b>32%</b>	<b>37%</b>
<b>GOSFORD</b>	<b>42%</b>	<b>41%</b>	<b>17%</b>
<b>HUNTER</b>	<b>27%</b>	<b>36%</b>	<b>37%</b>
<b>ILLAWARRA</b>	<b>38%</b>	<b>30%</b>	<b>32%</b>
<b>NEW CNTRY WEST</b>	<b>37%</b>	<b>27%</b>	<b>36%</b>
<b>CANBERRA</b>	<b>33%</b>	<b>29%</b>	<b>38%</b>
<b>Qld Total</b>	<b>40%</b>	<b>30%</b>	<b>30%</b>
<b>TOOWOOMBA SE CNR</b>	<b>35%</b>	<b>29%</b>	<b>35%</b>
<b>GOLD COAST</b>	<b>33%</b>	<b>17%</b>	<b>50%</b>
<b>Vic Total</b>	<b>45%</b>	<b>27%</b>	<b>28%</b>
<b>VIC FAR COUNTRY</b>	<b>33%</b>	<b>33%</b>	<b>33%</b>
<b>SA Total</b>	<b>75%</b>	<b>25%</b>	<b>0%</b>
<b>WA Total</b>	<b>100%</b>	<b>0%</b>	<b>0%</b>
<b>Grand Total</b>	<b>35%</b>	<b>30%</b>	<b>34%</b>