THE NATIONAL RECREATIONAL FISHING SURVEY: THE NORTHERN TERRITORY

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EXECUTIVE SUMMARY

Recreational fishing has always been a popular pursuit of residents and visitors to the Northern Territory. Abundant fish stocks, accessible waterways and favourable weather conditions combine to provide a fishing experience unparalleled in Australia.

Commercial fishing and fishing tour operator activities are quantified through a reporting system attached to licence requirements. However, data on recreational fishing effort in the past, was imprecise and anecdotal at best. To make informed management decisions, there was an obvious need to identify the total amount of fish being caught, where they were being taken and by whom.

In 1995, the Northern Territory Government, through the Fisheries Group (NT Department of Business Industry and Resource Development) undertook a major survey to provide this vital 'big picture' information about recreational fishing in the Northern Territory, with a primary focus on total catch and effort assessment for the key species. The methodology used in the 1995 “Fishcount” survey was adapted for use for the first national recreational fishing survey (NRFS) in Australia.

The national recreational and indigenous fishing survey (NRIFS) was an initiative of the Commonwealth and State/Territory Governments and was funded by the Natural Heritage Trust, the Fisheries Research and Development Corporation and State and Territory fisheries agencies. This survey had three components, the NRFS, the indigenous fishing survey of northern Australia (IFSNA) and an overseas visitor fishing survey (OVFS).

While the survey database provides a large volume of information, this report presents a summary of the key findings and estimates from the NRFS: (Details of the ISFNA and the OVFS can be found in Henry and Lyle 2003 and Coleman 2004).

The primary focus of the NRFS was to collect nationally consistent and comparable data on catch, effort, participation rates, demographics, economic activity, attitudes and awareness in ‘non-commercial’ fishing. The NRFS also included indigenous fishing practices. So, for the first time information is available for all extractive users of aquatic resources in the NT. The information collected from Fishcount and the NRFS is compatible and will provide information on trends in the recreational sector over time, such as changes in catch, fishing effort, areas fished and expenditure.

Resident Participation and Profiles

- There are over 22,000 fishing ‘households’ in the NT.
- Almost 44,000 non-indigenous Northern Territory residents (32% of the non-indigenous population) go fishing in Australia annually.
- Over 40,000 non-indigenous Northern Territory residents (29% of the non-indigenous population) go fishing in the Northern Territory annually.

- Higher participation rates emerge among residents who live in the Darwin (37%) and coastal regions (44%), than those in the hinterland (5%); among males (37%) than females (20%); and in the younger age groups, ranging from 33% (20 to 34 years) down to 5% (65 years or more).

- Over 11,000 boats are owned by Northern Territory households, which equates to one boat per five households. About 70% of these boats have been used for recreational fishing, with just over half being used exclusively for fishing.

- Over 7% (2,882) of fishers are members of a fishing club and 2% (820) hold a recreational fishing licence for elsewhere in Australia.

Fishing Effort

- A total of 314,272 days are fished annually by recreational fishers within the NT, representing 1.9 million hours of fishing effort.

- Residents account for a majority of the effort (62% of days and hours) at an average of five days annually and between five and six hours per day. Visitors also fish over five hours per day.

- The 'dry season' (May-August) is more popular among residents and visitors (52% and 61% of hours fished, respectively) than the 'wet season' (January-April) (21% and 6%) and the 'build up' (September-December) (27% and 33% respectively).

- Barramundi is the most popular target species, accounting for almost half (42%) of all hours fished and visitors target barramundi to a greater extent (54% of visitor hours fished) than residents (35%).

- The Darwin Harbour area is the main fishing area, accounting for over a quarter (28%) of all hours fished, followed by the Mary River (11%), with all other regions below the 10% level.

Catch

- The total recreational catch is over 1.9 million aquatic organisms annually (i.e. harvested or released), comprising over 1.7 million fish and almost 200,000 non-fish (including mud crabs and shellfish) species. Of these 40% of fish and 70% of non-fish species are harvested.

- Tropical snappers represent the highest proportion (23%) of the total harvest of fish and 17% of the total catch, followed by barramundi (15% and 25%, respectively). Golden snapper account for almost half of the snapper harvest.

- All other species are at or below the 12% level of catch and harvest.

- Mudcrabs account for the highest proportion of the total harvest (60%) and the total catch (70%) of non-fish species. All others are at or below the 11% level of catch and harvest.

- Darwin Harbour accounts for 29% of the total catch, with all other areas at or below 11%.
- Resident fishers account for a clear majority (65%) of the total catch of all species.

Expenditure and Investment

- Over $34 million in total annual expenditure is directly attributable to recreational fishing within the Northern Territory, with residents accounting for a majority (over $26 million or 75%) and visitors close to $9 million (25%).
- The average resident recreational fisher spends $594 annually on recreational fishing.
- Three quarters (75%) of all expenditure on recreational fishing occurs in the Darwin area.

Awareness and Opinions

- The primary motivation for Northern Territory residents to go fishing is to be outdoors, followed by being able to relax and unwind.
- The majority of resident fishers (85%) are satisfied with the quality of the fishing experience within the Northern Territory.
- Low awareness levels emerge in terms of important fisheries legislation, such as size and possession limits for key species.
- However, almost universal support (96%) exists among recreational fishers for *"these kinds of regulations"*, with many respondents suggesting additional regulations, particularly for size and possession limits, when prompted.

CONTENTS

1 INTRODUCTION

1.1 Background

Fishing has long been regarded as an important recreational pursuit in the Northern Territory for both residents and visitors. Stocks of marine game and reef fish, along with the prized barramundi of the river systems, have provided the basis for the development of recreational fishing as a major industry in the Northern Territory.

Catch and effort data are essential pre-requisites for fisheries research and management. In the Northern Territory this information is regularly collected for the commercial components of fisheries and fishing tour operators (guided or charter fishing operations). However, for the recreational sector, this information was only collected in a limited way in the past, due to the complexity and comparatively high cost of data collection using conventional methods.

In 1995, the Fisheries Group conducted a recreational fishing survey (Fishcount; Coleman, 1998a, b) in the Northern Territory. The survey was designed to collect 'big-picture' information on recreational fishing in the Territory, principally, participation levels and profiling information for residents and visitors, catch and effort data for the main target species, economic assessments of investment and expenditure, and awareness of and opinions on recreational fisheries matters. The methodology, developed for the Fishcount survey by the Fisheries Group and Kewagama Research, was used as the basis for the methodology of the first Australia-wide National Survey of Recreational Fishing.

The national recreational and indigenous fishing survey (NRIFS) is a joint initiative of the Commonwealth and State/Territory Governments to obtain fisheries statistics to support the management of non-commercial fishing in Australia.

The survey was developed by a steering committee. A feasibility study was conducted in 1997/98 to select an appropriate survey method. It recommended a national telephone screening/diary survey with on-site field surveys and separate components for visiting international fishers and indigenous fishing activities throughout Northern Australia. A working group comprising specialist fisheries agency/consultant staff undertook final development of the survey in 1998/99. Funding for the development and implementation phase of the survey was provided by the Fisheries Research and Development Corporation, the Natural Heritage Trust and State/Territory Governments.

The NRIFS comprised three discrete survey phases, conducted (largely) in parallel over a 12-month period:

- The national recreational fishing survey (NRFS) – which was conducted with Australian residents
- The indigenous fishing survey of northern Australia (IFSNA) – which was conducted with a sample of aboriginal communities in coastal regions of northern Australia.

- Overseas visitor fishing survey (OVFS) – which was conducted as an exit survey at international airport terminals.

This report presents a summary of the survey methodology, key findings and estimates from the NRFS. (Details of the ISFNA and the OVFS can be found in Henry and Lyle 2003).

The NRFS was designed on experiences from other large-scale recreational fishing surveys and incorporated components which were developed specifically to address data quality issues (Lyle et al., 2002; Henry and Lyle, 2003). The survey was implemented in early 2000 as a series of concurrent state-wide surveys, conducted and managed in-house by each State and Territory fisheries agency, but co-ordinated nationally. Survey interviewers were specifically recruited and trained by project staff and were managed by the respective fisheries agencies.

1.2 Objectives

The primary focus of the NRFS was to collect nationally consistent and comparable data on catch, effort, participation rates, demographics, economic activity, attitudes and awareness in 'non-commercial' fishing. Within the Northern Territory, the specific objectives were to:

- determine participation rates among various population sub-groups (age and gender etc);
- determine boat ownership rates and collect information about the boats used for recreational fishing;
- quantify catch, effort and catch per unit effort for the main target fish and other species;
- collect information on expenditure on recreational fishing;
- establish awareness of, and attitudes towards, various issues concerning recreational fisheries management; and
- provide comparison with the information collected during the 1995 Fishcount Survey.

1.3 Notes to the Reader

- This report contains a summary of the methodology used for the National Recreational Fishing Survey. More detailed information can be obtained from Henry and Lyle (2003), Lyle et al. (2002) and the Survey Development Working Group (2000).
- A large amount of information has been collected about recreational fishing in the Territory during the NRFS. This report is a summary of the key findings and contains some disaggregation of the data relating to residents of, and visitors to, the NT. The database is considered as a 'working' database and is available through the Department of Business Industry and Resource Development for further analysis, reports and queries.

- It is important that the reader is familiar with key definitions and terms used in the document, which can be found in Section 2 and in the appendices.

- The results presented in this summary are largely in the form of expanded population estimates and relative percentages and mostly without commentary or interpretation. In some instances a zero result is presented within a table. This does not indicate that a particular event may never occur, but rather that this is a 'rare' event, which did not occur within the sampling scope of the survey. Also, due to rounding, some internal table cells may not add precisely to row or column totals.

- Before making any quantitative comparison with the information obtained in 1995 from the Fishcount survey, the minor changes in the survey methodology should be noted, particularly the calibration of non-response bias and sampling of 'visitors'.

1.4 Acknowledgements

The Northern Territory component of the NRFS has been successful. The contribution of the following is gratefully acknowledged:

- The interstate team, in particular Gary Henry, Jeff Murphy, Laurie West and Jeremy Lyle.

- Chris Uttley who was indispensable and had the huge job of data entry and office management. She was also attuned to the needs of the team, which proved invaluable.

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- Fisheries Group and Northern Territory Government staff for their support and assistance.

Finally, thanks to all the people of Australia who willingly cooperated and gave their time to the survey.

2 SURVEY METHODS AND KEY DEFINITIONS

2.1 Survey Overview

The National Recreational Fishing Survey collected a range of information about recreational fishing (including participation, catch and effort, expenditure) from a sample of Australian residents. The respondents were selected from a stratified random sampling of 'White Pages' telephone listings for Australia - a telephone survey of resident households.

The survey had three distinct phases: screening survey; diary survey; and wash-up/attitudinal survey.

- The first phase (the screening survey/initial interview), assessed participation in recreational fishing and obtained socio-demographic information about the household. Boat ownership was also established.

- The second (diary) phase, which lasted 12 months, collected information about recreational fishing activity and related expenditure by Australian residents identified in the initial interview as intending to fish. Fishing activity by respondents was recorded regardless of where in Australia the activity occurred. So, for example, information was recorded from Territorians fishing in Queensland and vice versa. Note: unlike conventional diary surveys, information was collected progressively during the period (by telephone) to maximise response and data quality.

- The third and final phase (the attitudinal interview), was conducted at the end of the diary phase to assess respondent awareness and opinions on a range of recreational fisheries issues.

Data quality issues were addressed through a series of calibration surveys to provide adjustments for non-response and to assess the extent of behavioural change (unexpected fishing) during the diary period. On-site (creel) surveys were also conducted to assess fish identification skills of recreational fishers, determine the size distribution of common species and provide independent verification of certain recreational fishing activities.

In the Territory, the initial surveys were conducted during April 2000, with the diary phase commencing in May 2000 and continuing to April 2001. The attitudinal surveys were conducted at the end of the diary phase in May 2001. A high response rate (82%) was achieved in the initial survey phase from a gross sample of 1,640 households. Of the respondents eligible for the diary survey, 92% agreed to take part. Among these, 84% completed the diary survey - resulting in a 'sample take' of 1,079 diarists.

Within the rest of the country, initial response rates varied between 78 and 86%, giving an overall response rate of 80%. Diary uptake and complete participation ranged between 81 and 90%, and 83 and 96%, respectively, giving a total diary uptake of 85% and participation of 94%. For further information on the survey methodology and national results see Henry (2003).

2.2 Scope and Key Definitions

2.2.1 Geographic scope

The geographic boundary for initial sampling incorporated the whole of the NT, including offshore islands (Figure 1). For sampling purposes however, this area has been divided into three zones (home regions) to ensure appropriate numbers were selected from each zone.

Darwin zone: comprising the metropolitan area of Darwin and surrounding rural areas.

Coastal zone: comprising the area within approximately 300 km of the coast and all islands.

Inland zone: comprising the inland remainder of the NT.

The zones mentioned above were for sampling procedures only. A more detailed regional system was used when collecting information on fishing activity (Figure 1 and Appendix 2, Table A1), that included oceanic waters along the Northern Territory coastline and adjacent islands. Inland areas were generally divided into basic river catchment areas. The detailed regional catchment system has been grouped into 14 fishing areas for the purposes of this report (Figures 2 and 3 and Appendix 2, Table A1). These fishing regions and fishing areas were the same as those used for the Fishcount survey.

The Territory was also divided into 10 economic zones to allow reporting of expenditure on a regional basis (Figure 4).

Visitor origins have been classified in terms of the other states of Australia (overseas visitors were included in the overseas visitor fishing survey and the results can be found in Henry and Lyle, 2003).

2.2.2 Households in scope

One category of dwelling was used for sampling, these were private dwellings with a home telephone number listed in the Telstra 'White Pages'.

One of the major differences between the Fishcount and the NRFS was the sampling procedure used to obtain information from visitors. As the NRFS was nation-wide, respondents were identified in each state. If they visited the Territory to fish, information about the fishing trip could be collected in their 'home' State. This meant the large scale sampling of non-private dwellings (hotels, motels, caravan parks) that occurred in the Fishcount survey was not required. However, it also meant that:

- Northern Territory residents who live in non-private dwellings were missed, unless they had a 'White Pages' phone listing;
- international visitors were not included in the NRFS;
- the sample of visitors in the Fishcount survey was benchmarked against Northern Territory Tourism data, whilst respondents in the NRFS were benchmarked against the Australian Bureau of Statistics (ABS) census data.

2.2.3 People in scope

The following is a summary of the key definitions for the survey, further details of which are contained in the appendices:

- ***residents*** were defined as having their usual place of residence in the NT.
- ***visitors*** were defined as having their usual place of residence elsewhere in Australia.
- three different ***age criteria*** were applied for various survey purposes, namely: (i) all ages (for total population purposes); (ii) those aged 5 years or more for eligible fishing activity; and (iii) those aged 15 years or more for attitudinal questioning.

2.2.4 Activities in scope

- For purposes of the survey, ***recreational fishing*** has been defined as including *"prawning, crabbing, spearfishing, or even collecting oysters or aquarium fish".* By design, commercial fishing activity and indigenous fishing were excluded.
- When the catch has not been separated into species groups**,** it has been defined as ***fish*** - including fin-fish, sharks and rays and ***non-fish*** - including shellfish, crabs and squid.
- Three terms/definitions have been applied in relation to catch information: (i) ***catch*** - all organisms captured whether harvested or released; (ii) ***harvest*** - the retained component of the catch; and (iii) ***released*** - the released component of the catch.

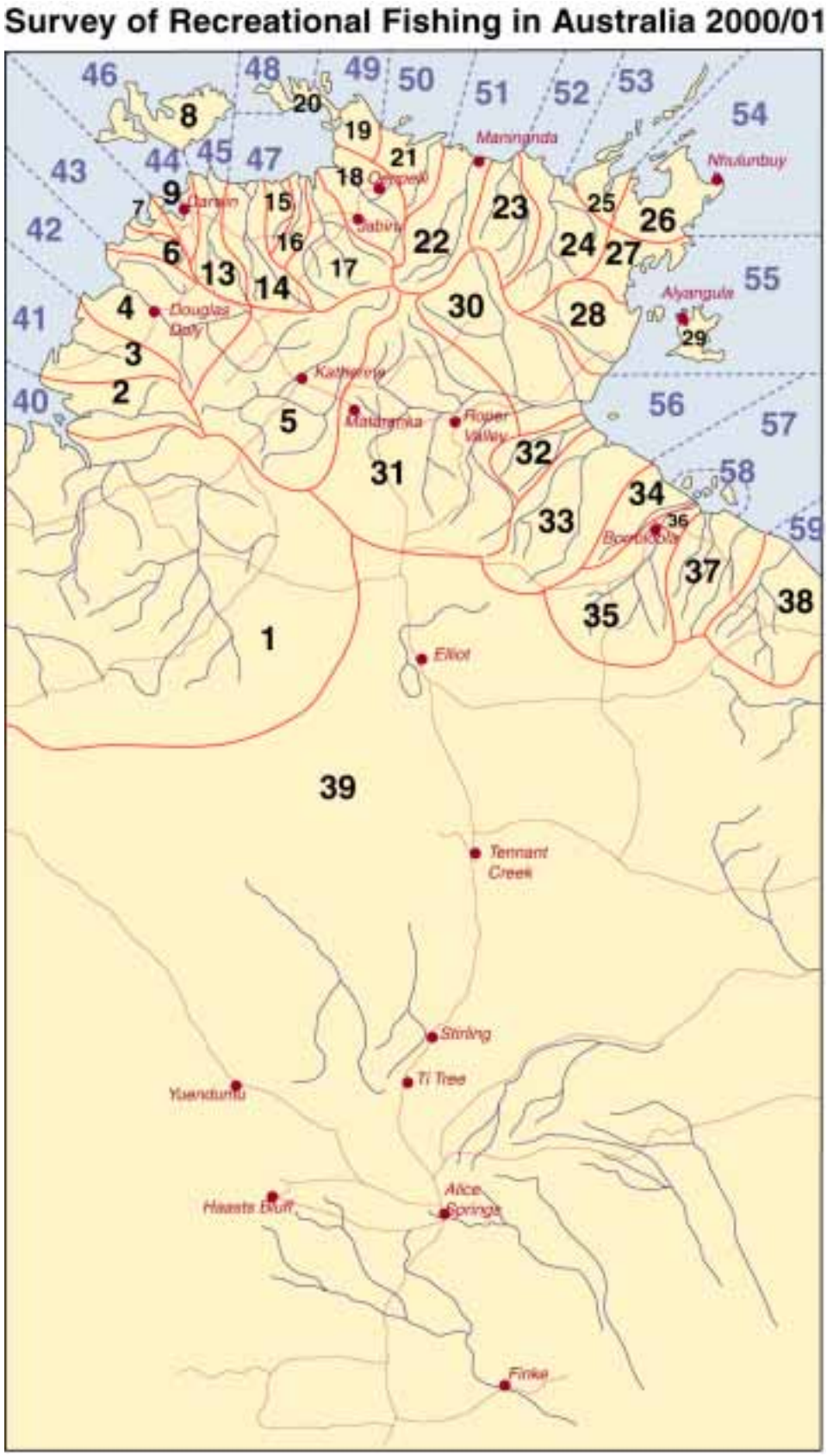

Figure 1. Map of the Northern Territory showing the fishing regions based on river catchments (see Appendix 2 Table A1)

Figure 2. Map of the Northern Territory showing the fishing areas (see Appendix 2 Table A1)

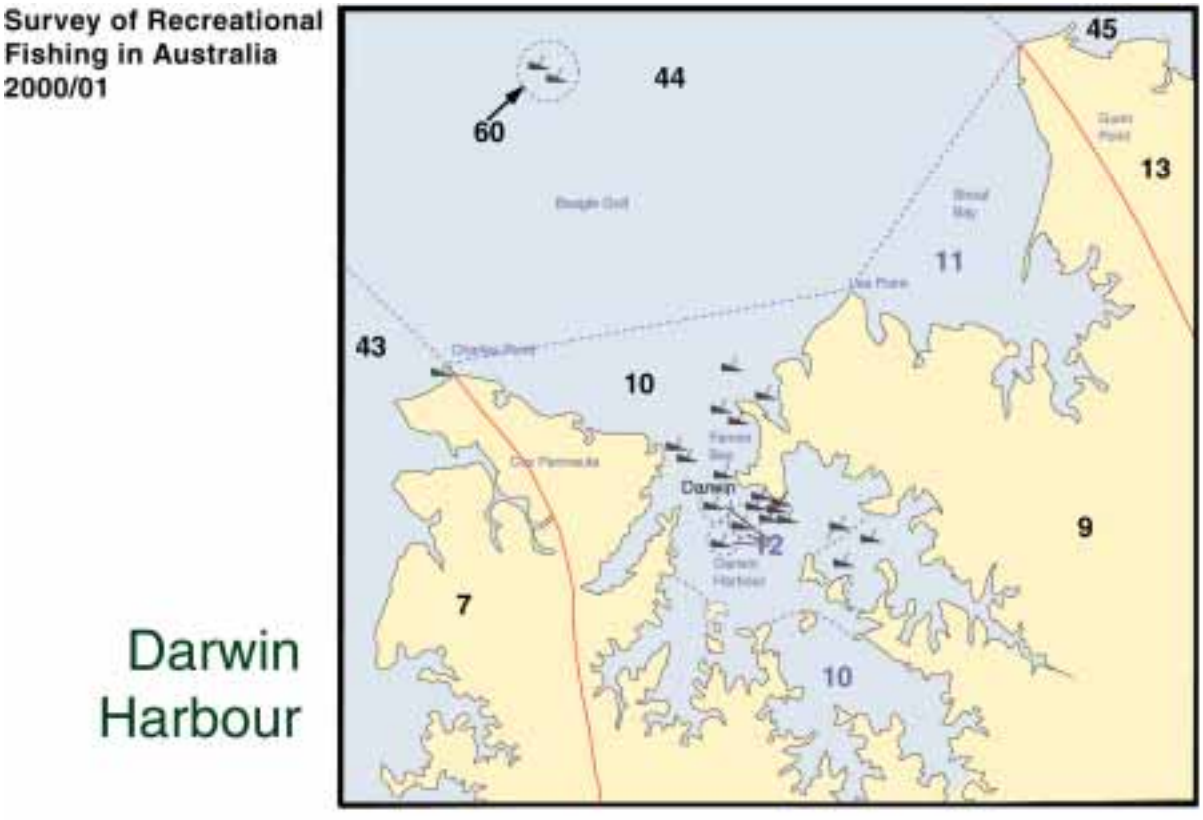

Figure 3. Map showing detail of the fishing regions in the Darwin Harbour area (see Appendix 2 Table A1)

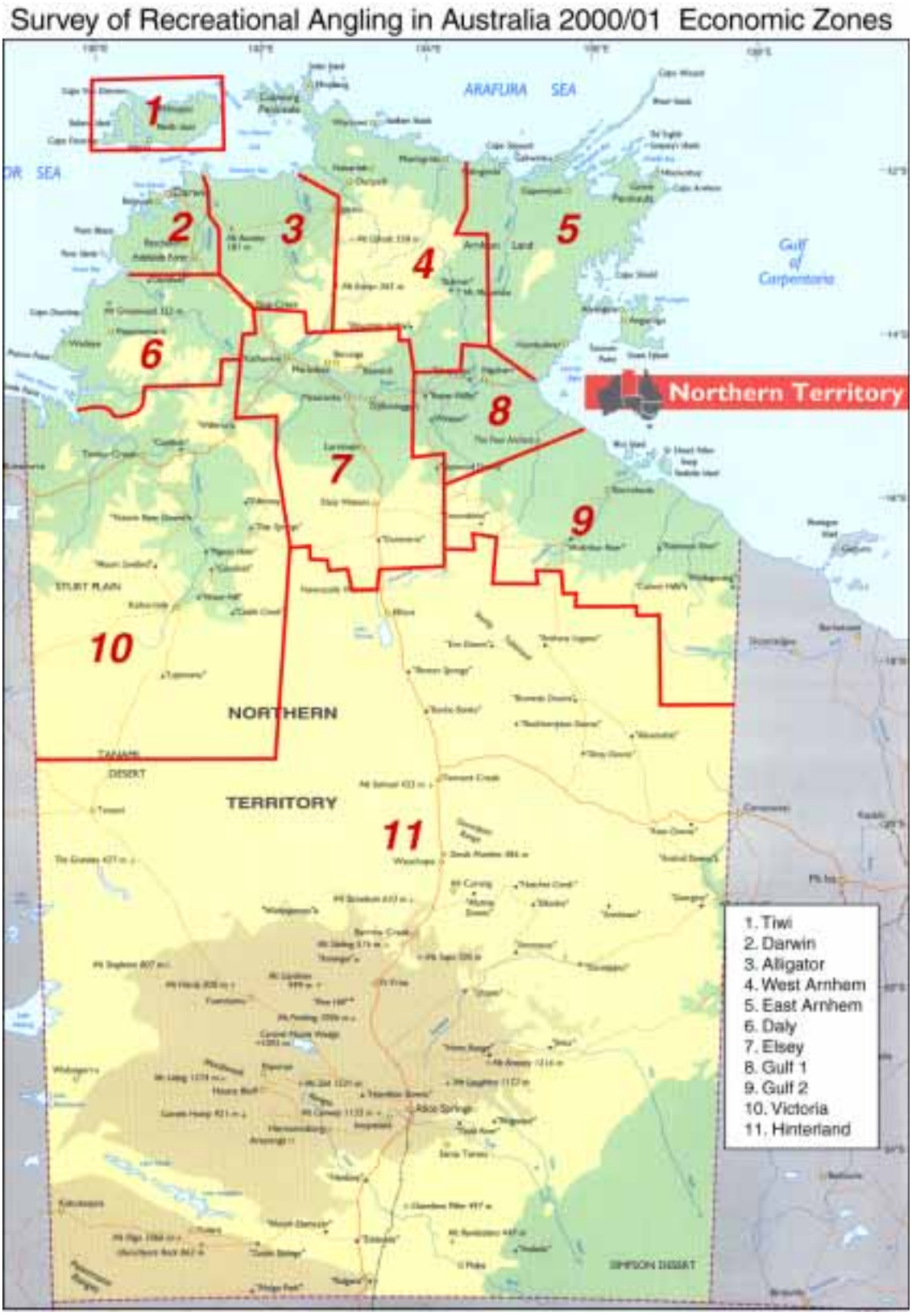

Figure 4. Map of the Northern Territory showing the economic zones (see Appendix 2 Table A2)

3 SURVEY METHODOLOGY

3.1 Survey Design

3.1.1 Three phase survey

The NRFS was conducted in three parts, in a similar way to the Fishcount survey:

- The initial (screening) interview: This part of the survey identified fishing households, collected basic demographic information and data about recent and proposed fishing activities. Vehicle and boat ownership details were also collected. The initial interviews were conducted by telephone for residents in April 2000.

- The diary survey: Respondents who intended to fish in the following 12 months were contacted regularly throughout the diary period by an interviewer (see Section 3.4 for follow-up of 'non-intending' respondents). During the regular contact with the respondent, the interviewer collected any information on fishing or expenditure activity that had occurred since the previous contact. Information on any 'interstate' fishing activity by respondents was also collected during these contacts. The respondent and interviewer planned the timing of contacts and in general the elapsed time was about two weeks. The frequency of contact was based on the level of fishing activity, with more avid recreational fishers being contacted more often. The diary period commenced on 1 May 2000 and finished at the end of April 2001.

- The attitudinal survey: The final part of the survey was at the end of the diary survey for recreational fishers aged 15 years or more. A fisher was selected randomly from each household and asked his/her attitude towards and awareness of fisheries issues. Respondents could also express their views and opinions on recreational fishing in the NT. Although certain questions were asked of respondents irrespective of the State/Territory in which they lived, the Northern Territory attitudinal survey was customised to investigate particular issues of relevance.

3.2 Sampling

The survey was based on general population sampling using single-stage cluster sampling (Thompson 1992). The initial sample was the household, with all fishers from the household included in the sample. The 'white pages' telephone directory was used as the sampling frame. The sample size for each State or Territory was calculated to provide consistency in the levels of precision for reporting of state and territory level estimates of participation, catch and effort.

The three geographic zones within the Northern Territory were chosen to account for variation in fishing participation rates within each of the zones. Stratification of the sampling within these three zones was required for sampling efficiency. The telephone numbers for inclusion in the study were chosen at random from a phone list sorted by postcode. There was no substitution of dwellings or respondents for either non-response or sample loss.

3.3 Field Procedures and Management

The Fisheries Group was responsible for the day-to-day management of the Northern Territory component of the survey and the analysis of the survey results.

Initially a comprehensive five-day interviewer-training course was conducted and all the interviewers were provided with a detailed Interviewer Manual. The list of telephone numbers to contact was issued to each interviewer, who had two weeks to complete the workload. Although the study was conducted on a voluntary basis, interviewers were instructed to 'politely persist' in convincing any respondents who wished to decline the survey of the importance of their inclusion and therefore minimise non-response bias. The number of refusals was extremely low and a total response rate of over 82% was achieved. Survey kits were mailed to respondents who agreed to participate in the diary survey.

3.4 Quality Control and Calibration

A rigorous approach to quality control has been applied to all phases of the survey, from design through to analysis and reporting. The need to ensure data quality was addressed in the design phase of the survey, with the wording and order of survey questions, together with the low respondent burden designed to minimise bias and other response errors. Thorough training and supervision of the interviewers, ensured interviewer reliability and integrity. Completed questionnaires were systematically checked and comprehensive computer editing checks for number range and logic were also undertaken.

The calibration work associated with the NRFS was an additional component that was different to the Fishcount survey. The calibration depended on four sources of information – non-response follow-up, unexpected fishing follow-up, on-site boat-ramp surveys and a supplementary economic survey (for details see Henry and Lyle 2003).

- Non-response follow-up - loss of respondents from non-response (i.e. refusals or non-contacts) in a survey has a potential to introduce bias if the non-response group is different to the responding group. During Fishcount, due to a high response rate (86%), it was assumed that non-response would not affect the estimates of participation. However during the NRFS, a non-response follow-up survey was conducted. It found a lower participation rate among the whole of the non-response group and a lower avidity rate among the fishers in the non-response group. An adjustment was made for non-response during data expansion. Non-response adjustment was not made during the expansion of data for the Fishcount survey, which would result in higher levels of participation.

- Unexpected fishing follow-up - a sample of households with respondents who were not intending to fish in the following 12 months were contacted at the end of the diary period to confirm that no fishing had taken place.

- On-site boat-ramp surveys - visits were conducted to boat ramps at times of high fishing activity, to assess fish identification skills of fishers and to monitor the size composition of the recreational harvest. Respondents only reported number of fish caught, so the on-site survey data could be

used to convert the number of fish caught to weight. This has been done for selected species (see Henry and Lyle, 2003).

- Supplementary economic survey – extra information on expenditure was obtained from each household for a two-month period during the diary phase.

3.5 Data Processing, Expansion and Analysis

3.5.1 Initial interview data

A total of 2,178 households were contacted throughout the NT. There was some sample loss due to business listings and disconnected numbers. From the total sample take there was some non-response due to non-contacts (5%), and refusal to take part (12%). However, a high response rate of 82% was achieved, resulting in a sample take of 1,351 households.

Expansion factors were applied to the sample to multiply the data up to the Northern Territory resident (aged five years or older) population basis. These factors were applied both for households and people for each home region.

3.5.2 Diary data

In total, 92% of resident recreational fishers eligible for the diary survey agreed to take part and 1079 (84%) completed the diary phase of the survey.

Using estimates of recreational fishing participation from the initial survey as a benchmark, expansion factors were applied to the sample to multiply the data up to the Northern Territory resident recreational fisher population basis. All data from the diary study, including estimates of fishing effort, catch and fishing-related expenditure, were expanded.

4 RECREATIONAL FISHING PARTICIPATION

The information in this section refers to the first phase of the survey, the initial screening interview for residents of Australia. Results are presented as expanded population estimates, with non-response adjustment, to represent the resident private dwelling population of the Northern Territory. Relative column percentages are also included and, where appropriate, additional information and definitions appear as introductory notes, footnotes to tables or as result summaries.

4.1 Participation

Active participation was assessed through a three-tier question sequence for respondents aged five years or older, to ensure all forms of recreational fishing were recorded.

In response to this question sequence, an estimated 32% (±1.5% se) of non-indigenous Northern Territory residents aged five years or over went fishing somewhere in Australia at least once in the 12 months prior to interview (Table 1). This translates to an estimated 43,932 ± 2,603 people.

Table 1. Active participation in recreational fishing in the Northern Territory in previous 12 months by home region, residents aged five years or more

		Darwin	Coastal	Hinterland	Total
fisher	No.	31,818	7,249	4,865	43,932
	%	37	45	13	32
non-fisher	No.	53,564	8755	32,967	95,286
	%	63	55	87	67
Total	**No.**	**85,409**	**16,046**	**37,764**	**139,218**
	%	**100**	**100**	**100**	**100**

A small proportion (2%) of Northern Territory residents only fished in another state and did not fish in the Territory at all (external fishers). These residents were more likely to live in the hinterland (7% of hinterland residents were external fishers).

An estimated 29% of non-indigenous Northern Territory residents aged five years or over went fishing at least once in the 12 months prior to interview within the Northern Territory (Table 2). Compared with previous surveys conducted in the Northern Territory (among residents who fished in the Northern Territory), these results show that although the overall number of fishers has remained similar, the participation rates have declined since 1995 (Coleman 1998b). The Fishcount survey conducted in 1995 found a participation rate of 35% (Coleman 1998b). Declining participation rates have also been observed in successive surveys in Queensland (Higgs and McInnes 2001), and reported from other parts of Australia and elsewhere (Kewagama 2002).

Although participation rates have declined since 1995, they still remain higher than any other State of Australia (Henry and Lyle, 2003). Despite the decrease in the actual participation rate due to

population increase, it is likely that the actual number of residents fishing in the Territory has stayed relatively stable.

The remainder of this section refers to disaggregation of participation for a range of socio-demographic variables for Northern Territory residents who fished within the Northern Territory.

4.1.1 Home region

The participation in recreational fishing within the Northern Territory for residents aged five years or older in each home region in the 12 months prior to interview is presented in Table 2.

Table 2. Participation in recreational fishing in the Northern Territory by home region, aged five years or more

		Darwin	Coastal	Hinterland	Total
fisher	No.	31,386	7,035	2,047	40,468
	%	37	44	5	29
non-fisher	No.	54,022	9,011	35,717	98,750
	%	63	56	95	71
Total	**No.**	**85,409**	**16,046**	**37,764**	**139,218**
	%	**100**	**100**	**100**	**100**

Substantially higher participation rates exist for residents of the Darwin (37%) and Coastal (44 %) regions, than for the hinterland region (5 %). Since 1995, the largest decline in the participation rate is seen in the coastal region (down from 52%).

4.1.2 Gender

The active participation in recreational fishing within the Northern Territory for residents aged five years or older in each home region in the 12 months prior to interview by gender is presented in Table 3.

Table 3. Participation in recreational fishing in the Northern Territory by gender and home region, residents aged five years or older

		Darwin		Coastal		Hinterland		Total	
		Male	Female	Male	Female	Male	Female	Male	Female
fisher	No.	21,801	9,585	4,678	2,357	1,523	524	28,002	12,466
	%	45	26	52	34	8	3	37	20
non-fisher	No.	26,158	27,865	4,363	4,648	17,659	18,058	48,179	50,571
	%	55	74	48	66	92	97	63	80
Total	**No.**	**47,959**	**37,450**	**9,041**	**7,005**	**19,181**	**18,583**	**76,181**	**50,571**
	%	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

A higher participation rate exists among males (37%) than in females (20%) and this trend is consistent across the home regions and Australia (Henry and Lyle 2003). However, the participation rate for females in the Northern Territory is almost double the national average.

Since 1995, the biggest decreases in participation (between 7 and 9%) are within the coastal male and female groups.

4.1.3 Age

The number of residents who actively participated in recreational fishing in the Northern Territory in the 12 months prior to interview by age group is presented in Table 4.

Table 4. Participation in recreational fishing in the Northern Territory in the previous 12 months by age group, residents aged five years or older

		5 – 19 yrs	20 – 34 yrs	35 – 49 yrs	50 – 64 yrs	65 + yrs	Total
fisher	No.	10,297	13,711	11,464	4,723	272	40,468
	%	31	33	29	25	5	29
non-fisher	No.	23,234	28,306	27,936	13,859	5415	98,750
	%	69	67	71	75	95	71
Total	**No.**	**33,532**	**42,017**	**39,400**	**18,582**	**5687**	**139,218**
	%	**100**	**100**	**100**	**100**	**100**	**100**

The participation rate in recreational fishing is similar in the younger age groups, 5-19, 20-34 and 35–49 being 31%, 33% and 29%, respectively. Over the age of 49 there is a substantial decrease in participation, falling to 5% in the 65+ age group. A similar trend is also observed across the different home regions. However, the high participation within the 20-34 year age group derives from a high participation within this group among people from the coastal home region.

Compared with other States, the Northern Territory has the highest participation rate for residents over 35 years old (35-49 and 50–64 yr old age group). However, the participation rate for 5-19 age group is the fourth highest, behind Tasmania, Western Australia and South Australia and for the 20 –34 age group the participation rate is second highest, behind Tasmania (Henry and Lyle 2003).

Since 1995, the biggest decreases in participation (around 10%) are within the 5 -19 and 65+ age group.

5 OTHER PROFILING INFORMATION - NORTHERN TERRITORY RESIDENTS

5.1 Introduction

The information contained in this Section refers to the first phase of the survey, the initial screening interview.

Information on club membership and ownership of interstate recreational fishing licences was based on information obtained from all residents, not just fishers.

Results are presented as expanded population estimates (based on ABS estimated resident population). Relative column percentages are also included and where appropriate, additional information and definitions appear as introductory notes, footnotes to tables or as result summaries.

5.2 Fishing Club Membership

An estimated 2% of all Northern Territory residents are members of a fishing club, with slightly higher levels of membership in Darwin and the coastal home region. (Table 5). Overall, the number and proportion of club members has increased since 1995. Most of this increase is due to increased membership in Darwin (from 1% in 1995 to 3% in 2000).

Table 5. Membership of fishing clubs, residents aged five years or more

		Darwin	Coastal	Hinterland	Total
club membership	No.	2,344	659	202	3,205
	%	3	4	1	2
no membership	No.	83,064	15,387	37,562	136,013
	%	97	96	99	98
Total	**No.**	**85,409**	**16,046**	**37,764**	**139,218**
	%	**100**	**100**	**100**	**100**

Among only recreational fishers (including those who only fished outside the Northern Territory), 7% are members of a fishing club (Table 6). The proportion of club membership is the same for all recreational fishers and those who have only fished in the Northern Territory. Again, the number and proportion of club members has increased since 1995. Most of this increase is due to increased membership in Darwin (from 1% in 1995 to 7% in 2000). The Northern Territory has the highest level of club membership for any state in Australia, almost double the national average of 4% (Henry and Lyle 2003).

Table 6. Membership of fishing clubs, resident fishers aged five years or more

		Darwin	Coastal	Hinterland	Total
club membership	No.	2,176	635	72	2,882
	%	7	9	1	7
no membership	No.	29,669	6,657	4,725	41,050
	%	93	91	99	93
Total	**No.**	**31,844**	**7,291**	**4,797**	**43,932**
	%	**100**	**100**	**100**	**100**

5.3 Ownership of Recreational Fishing Licences

Whilst recreational fishing licences are not required in the NT, all respondents were asked if they held a recreational fishing licence of any kind *"in any other state of Australia*"

Very low numbers (<1%) of Northern Territory residents held an interstate recreational fishing licence, with slightly higher levels of membership in Darwin and the coastal home region. Among all recreational fishers, the proportion of fishers holding a recreational fishing licence is 2%, which is consistent across the home regions (Table 7).

Table 7. Holders of recreational fishing licences, resident fishers aged five years or more

		Darwin	Coastal	Hinterland	Total
licence	No.	593	114	114	820
	%	2	2	2	2
no licence	No.	31,252	7,177	4,683	43,112
	%	98	98	98	98
Total	**No.**	**31,844**	**7,291**	**4,797**	**43,932**
	%	**100**	**100**	**100**	**100**

As would be expected, the proportion of fishers that hold a licence is higher among fishers who fished outside the Territory at some time in the previous 12 months (Table 8). The proportion of fishers who have fished outside the Territory and hold a licence is highest in the coastal region (7%) and lowest in the hinterland (3%).

Table 8. Holders of recreational fishing licences, external fishers aged five years or more

		Darwin	Coastal	Hinterland	Total
licence	No.	325	114	114	553
	%	5	7	3	5
no licence	No.	5,602	1,409	3,538	10,550
	%	95	93	97	95
Total	**No.**	**5,927**	**1,523**	**3,652**	**11,102**
	%	**100**	**100**	**100**	**100**

6 BOAT OWNERSHIP

All households were asked about boat ownership. Respondents were asked if anyone in the household owned a boat of any description. Information about boats was collected on a household basis and the boats were classified into three groups according to the main type of propulsion: power, sail or row-boats. Basic information about boats was also collected, including the type of boat, percentage use for recreational fishing and current market value.

6.1 Number and Type of Boats

The total number and types of boats owned by Northern Territory residents are presented in Table 9. These boats are not necessarily housed in the Northern Territory.

Table 9. Number of boats by type and home region, resident owned boats

		Darwin	Coastal	Hinterland	Total
power	No.	7,852	1,985	679	10,517
	%	91	93	83	91
sail	No.	275	22	0	297
	%	3	1	0	3
row	No.	522	133	140	796
	%	6	6	17	7
Total	**No.**	**8,649**	**2,141**	**820**	**11,610**
	%	**100**	**100**	**100**	**100**

In total, Northern Territory households own an estimated 11,610 boats. The majority of boats are powerboats (91%), with low numbers of sail and row-boats. Similar trends in boat ownership occur across the home regions. This translates to approximately one boat for every five resident households.

The number of boats owned by Northern Territory residents has not changed substantially since 1995.

The numbers of boats owned within each ‘boat’ household are given in Table 10. The total number of boats in the Northern Territory are owned within 9,668 separate households, with 26% of these households owning more than one boat. Similar trends occur across the home regions (Table 10).

Table 10. Number of boats per household by home region, resident households

		Darwin	Coastal	Hinterland	Total
one boat	No.	5,843	1,778	524	8,145
	%	83	92	78	84
two boats	No.	868	121	148	1,137
	%	12	6	22	12
three boats	No.	322	30	0	351
	%	5	2	0	14
four boats	No.	26	8	0	34
	%	<1	<1	0	<1
Total	**No.**	**7,059**	**1,937**	**672**	**9,668**
	%	**100**	**100**	**100**	**100**

6.2 Fishing Participation and Boat Ownership

Recreational fishing participation by boat ownership and for non-boat owners is presented in Tables 11 and 12, respectively.

Table 11. Participation in recreational fishing in the Northern Territory for boat owners by home region, residents aged 5 or more

		Darwin	Coastal	Hinterland	Total
recreational fisher	No.	13,873	3,568	292	17,733
	%	73	73	23	71
non-recreational fisher	No.	5,057	1,300	999	7,356
	%	27	27	77	29
Total	**No.**	**18,930**	**4,869**	**1,291**	**25,089**
	%	**100**	**100**	**100**	**100**

A boat owner is more likely to be a recreational fisher than a non-fisher. Among boat owners, the majority (71%) had fished in the 12 months prior to interview. Similar trends occurred among residents of the Darwin and Coastal regions. In the hinterland, boat owners are less likely to fish than in the other regions. However, boat ownership does increase the likelihood of the owner fishing (boat owners have a participation rate of 23% compared to 5% among all residents).

Similar rates of participation were observed among boat owners in 1995.

Table 12. Participation in recreational fishing in the Northern Territory for non-boat owners by home region, residents aged five years or more

		Darwin	Coastal	Hinterland	Total
recreational fisher	No.	17,514	3,437	1,755	22,706
	%	26	31	5	20
non-recreational fisher	No.	48,965	7,521	34,470	90,956
	%	74	69	95	80
Total	**No.**	**66,479**	**10,958**	**36,224**	**113,662**
	%	**100**	**100**	**100**	**100**

A non boat owner is less likely to be a recreational fisher. Among non-boat owners, only 20% had fished in the 12 months prior to interview. However, as these figures are similar to the overall participation rates found in the population, it would suggest that not owning a boat is less likely to affect the likelihood of someone fishing. Similar trends occurred across the home regions.

6.3 Boats and Recreational Fishing

Not all boats are used exclusively for recreational fishing purposes. The proportion of time a boat was used for recreational fishing in the 12 months prior to interview was assessed for all boats owned by residents aged 16 years or older (Table 13).

Table 13. Number of boats by use for recreational fishing and by type of boat, resident owned boats

		Power	Sail	Row	Total
no use	No.	2,262	212	653	3,127
	%	22	71	82	27
less than 50%	No.	231	40	29	299
	%	2	13	4	3
50% or more	No.	1,817	0	114	1,931
	%	17	0	14	17
100%	No.	6,208	45	0	6,253
	%	59	15	0	54
Total	**No.**	**10,517**	**297**	**796**	**11,610**
	%	**100**	**100**	**100**	**100**

Over 71% of all boats were used for recreational fishing at least half of the time. However, this reflects the large number of powerboats, of which, over 76% are used at least half of the time for fishing and 59% are used solely for recreational fishing. The situation is reversed for sailing boats, with only 15% being used at least half the time for recreational fishing and 71% not being used at all for fishing. These results are consistent with the findings from the 1995 Fishcount survey.

Further information was collected about boats that had been used for recreational fishing in the previous 12 months.

Table 14. Housing location by type of boat, resident owned boats used for recreational fishing in the previous 12 months

		Power	Sail	Row	Total
trailer	No.	6,695	45	0	6,740
	%	81	53	0	79
mooring/marina	No.	167	40	0	207
	%	2	47	0	2
car topper	No.	384	0	0	1,152
	%	5	0	0	5
shore-based	No.	1,009	0	143	1,152
	%	12	0	100	14
Total	**No.**	**8,255**	**85**	**143**	**8,483**
	%	**100**	**100**	**100**	**100**

The majority (79%) of boats that have been used for fishing by residents are kept on trailers (Table 14) and are likely to have an echo sounder (Table 15). Just over half (44%) of the boats used for recreational fishing had a GPS (global positioning system) (Table 16).

Table 15. Presence of echo sounder by type of boat, resident owned boats used for recreational fishing in the previous 12 months

		Power	Sail	Row	Total
echo sounder	No.	5,807	45	0	5,852
	%	70	53	0	69
no echo sounder	No.	2,448	40	143	2,631
	%	30	47	100	31
Total	**No.**	**8,255**	**85**	**143**	**8,483**
	%	**100**	**100**	**100**	**100**

Table 16. Presence of GPS by type of boat, resident owned boats used for recreational fishing in the previous 12 months

		Power	Sail	Row	Total
yes	No.	3,701	45	0	3,746
	%	45	53	0	44
no	No.	4,554	40	143	4,737
	%	55	47	100	56
Total	**No.**	**8,255**	**85**	**143**	**8,483**
	%	**100**	**100**	**100**	**100**

7 FISHING EFFORT

7.1 Introduction

The information contained in this section of the report was collected during the diary interview phase and refers to annual estimates of fishing effort in the Northern Territory by residents and interstate visitors between May 2000 and April 2001.

The information was collected on an 'event' basis to enable analysis of the data for different fishing activities. An event was defined as a separate fishing episode, so the time of an event could vary from 10 minutes for fishing for bait to 24 hours for mud crabbing. Separate events were also recorded within one fishing trip if there was a change in fishing region, sub-region, target, fishing methods or a break from fishing of more than six hours. Using this approach three measures of fishing effort can be defined - namely number of days, events or hours fished. The primary reporting base for effort used here is hours fished, which in the case of most fishing is fisher hours (line, net etc), but for other fishing e.g. mud crabbing, the effort measure is pot hours.

A regional system of river catchment and offshore regions was used when collecting fishing activity data (Figure 1). These regions have then been grouped into 14 fishing areas for general data analysis and reporting purposes (Figure 2). These fishing areas were also used for reporting the information from the 1995 Fishcount survey. A fishing sub-region was also recorded to further delineate fishing areas into lakes (dams or billabongs), rivers (freshwater), estuaries (marine), inshore (less than 5 km offshore) and offshore (further than 5 km offshore).

A total of 1,021 recreational fishing respondents included in the diary phase fished on a total of 2,066 days, providing a total of 12,987 recorded fishing hours which were used for data expansion. Results are presented as expanded population estimates (based on ABS estimated resident population and participation rates obtained from the initial survey).

7.2 Total Fishing Effort – Days, 'Events' and Hours

The total numbers of days fished by recreational fishers aged five years or older by 'season' are presented in Table 17. The total number of days includes any type of recreational fishing within the Northern Territory.

An estimated annual total of 308,387 fisher days are attributable to recreational fishing in the NT, with resident fishers accounting for a majority of this effort (195,273 days [63%]) (see Table 17). When season is considered, the 'dry season' emerges as more popular in terms of total days fished (54%) than the 'wet season' (16%) and the 'build up' (30%). Similar trends are seen in fishing activity throughout the year for both residents and visitors; however, visitors are far less likely to fish in the wet season (only 6% of visitor days fished).

Table 17. Total number of days fished annually by season and place of residence, recreational fishers aged five years or more

		Residents	Visitors	Total
wet (Jan-Apr)	No.	41,291	7,060	48,351
	%	21	6	16
dry (May-Aug)	No.	101,523	66,519	168,043
	%	52	59	54
build up (Sept - Dec)	No.	52,459	39,534	91,993
	%	27	35	30
Total	**No.**	**195,273**	**113,114**	**308,387**
	%	**100**	**100**	**100**

Compared with 1995, there has been a major reduction of over 100,000 days in fishing effort and a redistribution of fishing effort between the seasons. In 1995, the fishing effort was well distributed throughout the year, with slightly more activity in the dry season. In 2000 there was a marked drop in activity during the wet season and over half of the fishing activity occurred in the dry season.

The overall reduction in total fishing effort is attributable to a decrease of over 120,000 days by residents. Most of this reduction (50%) occurred during the wet season, followed by the build up (34%) and dry season (16%).

Visitors fished a similar number of days in 2000 as they did in 1995, but showed a decrease in fishing effort during the wet season, compensated by an increase in effort during the build up and dry season. The increase in visitor fishing effort during the dry season compensated for the decrease in resident fishing effort, producing a net overall increase of fishing effort in the dry season.

The total numbers of days fished by recreational fishers aged five years or older in each of the home regions by 'season' is presented in Table 18. The total number of days includes any type of recreational fishing within the Northern Territory.

Table 18. Total number of days fished annually by season by home region, resident recreational fishers aged five years or older

Season		Darwin	Coastal	Hinterland	Total
wet (Jan - Apr)	No.	32,192	6,611	2,488	41,291
	%	21	20	29	21
dry (May - Aug)	No.	82,561	17,574	1,388	101,523
	%	54	53	16	52
build up (Sept - Dec)	No.	38,615	9,078	4,766	52,459
	%	25	27	55	27
Total	**No.**	**153,368**	**33,263**	**8,642**	**195,273**

%	**100**	**100**	**100**	**100**

Residents fished on an estimated 195,273 days within the Northern Territory, with more days fished during the dry (52%) than during the other seasons. This trend is similar for Darwin and coastal residents, but not for hinterland residents where the number of days fished decreases during the dry season. The highest number of days fished in an individual month was recorded in May (27,938) and the lowest in February (5,843).

In comparison to 1995, the biggest decrease in days fished was among Darwin residents, who accounted for almost 56% of the overall decrease in fishing days.

7.2.1 Resident fishing effort – 'events' and hours

As discussed previously, three measurements of effort were obtained, - days, events and hours. Table 19 presents the links between these effort measures for residents.

Table 19. Total days, events and hours fished annually, resident recreational fishers aged five years or older

	Days		**Events**		**Hours**	
	total	**mean (per year)**	**total**	**mean (per day)**	**total**	**mean (per day)**
wet (Jan-Apr)	41,291	1.0	44,669	1.1	221,312	5.0
dry (May-Aug)	101,523	2.5	114,689	1.1	630,694	5.5
build up (Sept - Dec)	52,459	1.3	58,985	1.1	327,830	5.6
Total	**195,273**	**4.8**	**218,343**	**1.1**	**1,179,837**	**5.4**

Note: The means provided are per recreational fisher.

In total, the 195,273 fishing days give rise to 218,343 individual fishing events, which translates to 1,179,837 hours. On average, there is just over one fishing event per fishing day and a day's fishing will, on average, last between five and six hours.

Overall, resident recreational fishers fish around five days per year, which is similar for Darwin and coastal residents, whilst the average for hinterland recreational fishers is two days fished per year within the Northern Territory.

The number of fishing events per day is constant throughout the year, but the numbers of hours fished per day is higher during the dry and build up.

In comparison to 1995, the average number of days fished has decreased by three days. The number of events per day and the number of hours fished per day have stayed constant.

7.2.2 Resident fishing effort outside the Northern Territory – hours

A small proportion (2%) of Northern Territory residents only fished in another State and did not fish in the Territory (external fishers). Other Northern Territory residents fished both within the Territory and

elsewhere. Most external fishing effort was expended in Western Australia (43%), Queensland (22%) or South Australia (23%) (Table 20). External fishing comprised 5% of the total fishing effort expended by Northern Territory residents.

Table 20. Total hours fished annually outside the Northern Territory by state, residents aged five years or more

		NSW	Qld	SA	Tas	Vic	WA	Total
hours	No.	3,586	13,835	14,452	148	4,127	27,346	63,493
	%	6	22	23	<1	7	43	100

The coastal and hinterland residents account for most (80%) of the external fishing by all Northern Territory residents. However, different patterns of fishing location emerge between areas. Coastal residents are most likely to fish in Western Australia (87% of coastal residents' external fishing effort). Hinterland residents are most likely to fish in South Australia (50%) and Queensland (37%), whilst the external fishing effort by Darwin residents is reasonably well spread throughout the States, with the exception of Tasmania.

7.2.3 Visitor fishing effort – 'events' and hours

As discussed previously, three measurements of effort were obtained, - days, events and hours. Table 21 presents the links between these effort measures for visitors.

Table 21. Total days, events and hours fished annually, visitor recreational fishers aged five years or older

	Days	Events		Hours	
	total	total	mean (per day)	total	mean (per day)
wet (Jan-Apr)	7,060	7,354	1.0	43,013	5.8
dry (May-Aug)	66,519	76,930	1.2	401,180	5.2
build up (Sept - Dec)	39,534	42,758	1.1	207,790	4.9
Total	**113,114**	**127,041**	**1.1**	**651,983**	**5.1**

In total, the 113,114 visitor fishing days give rise to 127,041 individual fishing events that translates to 651,983 hours. Visiting fishers account for just over one fishing event per fishing day, at an average of 5.1 fishing hours per day. The number of fishing events per day is constant throughout the year, but the number of hours fished per day increases during the wet.

In comparison to 1995, although the number of days fished and the number of fishing events by visitors per day have stayed relatively constant, the number of hours fished per day has increased by just over one hour. The increased number of hours fished per day is seen in the wet and the dry.

Overall, this extra hour has increased the total number of hours fished by visitors by 300,000 hours (50%). Visitor fishing effort now accounts for 37% of the total fishing effort (hours) in the Northern Territory, up from 23% in 1995.

7.2.4 Visitor fishing effort by state of residence – hours

The total number of hours fished in the Northern Territory by visitors is presented by State of origin in Table 22.

Table 22. Total hours fished annually by place of residence, visitors aged five years or more

		NSW	Qld	SA	Tas	Vic	WA	ACT	Total
hours	No.	167,406	217,995	97,841	4,575	104,205	49,419	10,542	719,658
	%	26	33	15	1	16	8	2	100

Of the total fishing effort expended by visitors in the Northern Territory, the majority is by Queensland, New South Wales and Victorian residents (33%, 26% and 16%, respectively). The visitors from these three States contribute 75% of the visitor fishing effort.

7.3 Fishing Effort - Hours

All further analysis within this section is based on fishing effort within the Northern Territory in hours for both residents and visitors.

7.3.1 Hours fished by fishing area

The total fishing effort for each fishing area (see Figure 2) by place of residence is presented in Table 23.

Over a quarter of all recreational fishing effort in the Northern Territory (30% of hours fished) is attributable to the Darwin Harbour area. Of the remainder, the Mary River accounts for 11% of hours fished, with all other areas below the 10% level. When these results are analysed by place of origin, a similar pattern exists for Darwin residents but not for most areas for other Northern Territory residents and visitors. The major areas of fishing effort among coastal residents are close to the main population centres, including the Daly River (18% of coastal resident fishing effort), the Roper River (20%) and Nhulunbuy (18%). Hinterland residents mostly fished in Nhulunbuy (44% of hinterland resident effort), along the north coast (19%) and in the Darwin Harbour area (15%).

The main fishing locations for Darwin residents were less popular with visitors, except for Darwin Harbour, with the Roper River, and McArthur Rivers having the most visitor fishing effort (18% and 17% of visitor fishing effort, respectively).

Within each fishing area, the residents close to that area account for most of the fishing effort, the major exceptions being areas that have a large visitor component within the effort. Darwin residents

are responsible for most of the recreational fishing effort in Darwin Harbour (76%), the Adelaide River (88%), the Mary River (73%) and around the Cobourg Peninsula (88%). Coastal residents are responsible for most of the fishing effort in the Katherine (51%) and Nhulunbuy areas (31%) and the islands (61%). Hinterland residents are responsible for the entire resident fishing effort in the centre. Visitors have a major effect on the fishing effort in the McArthur (98%), the north coast (88%) and the Roper River (73%).

In comparison to 1995, there has been a major change in the patterns of fishing effort, particularly among Darwin residents. The proportion of fishing effort expended by Darwin residents in Darwin Harbour has dropped from 68% to 43%, with the effort being redistributed to areas around Darwin, namely the Mary River, the west coast (including Bynoe Harbour and Fog Bay), and the Adelaide and Daly Rivers. Fishing effort by visitors has also changed, with a substantial drop in fishing effort in Darwin Harbour (from 46% to 16%) and the Mary River (21 % to 7%), with increases in the more remote areas such as the Roper and McArthur Rivers. (Note: the changes observed in the distribution of visitor fishing effort may be partly due to the change in methodology between the NRFS and Fishcount).

Table 23. Hours fished annually by area and place of residence, recreational fishers aged five years or older

		Residents			Visitors	Total
		Darwin	Coastal	Hinterland		
Darwin area	No.	411,402	9,881	5,274	113,925	540,481
	%	76	2	1	21	100
Mary River	No.	151,539	4,479	0	51,030	207,048
	%	73	2	0	25	100
West Coast	No.	123,717	14,520	4,452	34,946	177,635
	%	70	8	3	20	100
Daly River	No.	109,054	35,377	1,119	23,480	169,030
	%	65	21	1	14	100
Roper River	No.	5,187	38,913	0	120,297	164,397
	%	3	24	0	73	100
Nhulunbuy	No.	4,351	35,493	15,864	60,581	116,289
	%	4	31	14	52	100
McArthur area	No.	920	964	0	113,746	115,629
	%	1	1	0	98	100
Alligator Rivers	No.	42,458	12,922	1,991	55,907	113,278
	%	37	11	2	49	100
Adelaide River	No.	65,515	1,386	0	7,783	74,684
	%	88	2	0	10	100
North Coast	No.	0	1,124	6,742	57,055	64,920
	%	0	2	10	88	100
Islands	No.	15,405	23,666	0	0	39,071
	%	39	61	0	0	100
Katherine area	No.	3,815	16,420	0	11,917	32,152
	%	12	51	0	37	100
Cobourg Peninsula	No.	13,332	1,753	0	0	15,085
	%	88	12	0	0	100
Centre	No.	0	0	803	1,316	2,120
	%	0	0	38	62	100
Total	**No.**	**946,696**	**196,896**	**36,245**	**651,983**	**183,1819**
	%	**50**	**10**	**2**	**38**	**100**

Note: Percentage of totals are given across the columns, i.e. the percentage of effort in each fishing area by place of residence.

7.3.2 Hours fished within fishing area – Darwin Harbour

Within the Darwin Harbour area, there are important fishing areas (Table 24). The actual harbour (within Charles and Lee Points see Figure 3) accounts for most (67%) of the fishing within the Darwin area. Fishing within the Harbour is important regardless of place of residence. Shoal Bay is only

important for Darwin residents, who account for 95% of the fishing effort in the Bay. Artificial reefs within the Darwin Harbour area (including the Fenton Patches artificial reef complex, Figure 3, region 60) are more important for visitors, who account for two thirds (66%) of the fishing effort on artificial reefs.

Table 24. Hours fished annually by area and place of residence, recreational fishers aged five years or older

		Residents			Visitors	Total
		Darwin	Coastal	Hinterland		
Within Harbour	No.	284,741	7,096	5,274	67,024	364,134
	%	69	72	100	59	67
Shoal Bay	No.	75,771	0	0	4,247	80,018
	%	18	0	0	4	15
Artificial Reefs	No.	11,502	339	0	23,055	34,896
	%	3	3	0	20	6
other areas	No.	39,388	2,446	0	19,599	61,433
	%	10	25	0	17	11
Total Darwin area	**No.**	**411,402**	**9,881**	**5,274**	**113,925**	**540,481**
	%	**100**	**100**	**100**	**100**	**100**

Note: Within harbour = saltwater fishing only

7.3.3 Hours fished within fishing area – west coast

Within the West Coast area, the Victoria River, Fog Bay and Bynoe Harbour are important fishing areas (Table 25). Fog Bay accounts for most (36%) of the fishing effort and is most important for Darwin residents. Darwin residents account for over 90% of the fishing effort in Fog Bay. Within the west coast, Bynoe Harbour is also an important fishing destination for Darwin residents, who account for over three-quarters of the fishing effort in this area. The Victoria River is important for Coastal and Hinterland residents and visitors. Although the Victoria River is less important for Darwin residents, they still account for over a third (38%) of the fishing effort in the River, with visitors accounting for another third.

Table 25. Hours fished annually by area and place of residence, recreational fishers aged five years or older

		Residents			Visitors	Total
		Darwin	Coastal	Hinterland		
Fog Bay	No.	58,479	276	1,151	3,539	63,445
	%	47	2	26	10	36
Bynoe Harbour	No.	26,294	3,445	0	4,683	34,422
	%	21	24	0	13	19
Victoria River	No.	21,060	9,565	3,301	21,279	55,205
	%	17	66	74	61	31
other areas	No.	17,884	1,234	0	5,444	24,562
	%	14	8	0	16	14
Total West Coast	**No.**	**123,717**	**14,520**	**4,452**	**34,946**	**177,635**
	%	**100**	**100**	**100**	**100**	**100**

Note: The Victoria River, Fog Bay and Bynoe Harbour do not include offshore areas but do include inland freshwater fishing.

7.3.4 Hours fished by fishing sub-area

The total fishing effort for each fishing sub-area (offshore, inshore, estuaries, rivers and lakes) by place of residence is presented in Table 26 and within each fishing area in Table 27.

Table 26. Hours fished annually by fishing sub-area and place of residence, recreational fishers aged five years or more

Fishing sub-area		Residents	Visitors	Total
offshore (> 5 km)	No.	89,505	27,113	116,618
	%	8	4	6
inshore (< 5 km)	No.	242,581	162,038	404,619
	%	21	25	22
estuary (marine)	No.	457,619	258,272	717,378
	%	39	40	39
river (fresh)	No.	377,782	177,060	554,841
	%	32	27	30
lake (or dam)	No.	12,350	27,501	39,851
	%	1	4	2
Total	**No.**	**1,179,837**	**651,983**	**1,831,819**
	%	**100**	**100**	**100**

Within all fishing areas, over half (61%) of all fishing effort occurs within the marine coastal area (inshore and estuaries). Only 6% of fishing effort occurs offshore, with the remaining 32% occurring in fresh water (rivers and lakes). Similar trends are seen for both residents and visitors, although visitors expend slightly more effort within the coastal marine environment.

The relative importance of each fishing sub-area within each fishing area is presented in Table 27. Freshwater fishing is particularly important in the Mary River, accounting for 80% of fishing effort and the Daly River area (70%) and the Alligator Rivers (68%). The marine coastal area accounts for the majority of the fishing effort along the North Coast (97%), in the Nhulunbuy area (96%), the Cobourg Peninsula (94%) and in Darwin Harbour (88%).

Among sub-regions, the Darwin Harbour area accounts for most of the fishing within the total offshore (36%) and marine coastal area (40%), whilst the Mary River accounts for most of the freshwater fishing activity (53%).

Table 27. Hours fished annually in each fishing area by sub-area, recreational fishers aged five years or older

Fishing Area		Offshore	Inshore	Estuary	River	Lake	Total
Darwin area	No.	42,415	151,496	322,465	21,017	2,989	540,481
	%	8	28	60	4	1	100
Mary River	No.	n/a	1,083	40,159	133,002	32,803	207,048
	%		1	19	64	16	100
West Coast	No.	14,178	58,324	64,945	40,187	0	177,635
	%	8	33	37	23	0	100
Daly River	No.	13,420	4,195	32,322	116,316	2,778	169,030
	%	8	2	19	69	2	100
Roper River	No.	115	4,549	57,005	102,728	0	164,397
	%	0	3	35	62	0	100
Nhulunbuy	No.	3,878	97,228	14,321	862	0	116,289
	%	3	84	12	1	0	100
McArthur area	No.	13,541	53,824	44,867	3,397	0	115,629
	%	12	47	39	3	0	100
Alligator Rivers	No.	n/a	1,571	34,636	76,603	469	113,278
	%		1	31	68	0	100
Adelaide River	No.	5,678	3,156	39,144	26,707	0	74,684
	%	8	4	52	36	0	100
North Coast	No.	265	858	63,235	562	0	64,920
	%	0	1	97	1	0	100
Islands	No.	22,141	14,138	2,793	0	0	39,071
	%	57	36	7	0	0	100
Katherine area	No.	n/a	n/a	n/a	32,152	0	32,152
	%				100	0	100
Cobourg Peninsula	No.	887	14,198	0	0	0	15,085
	%	6	94	0	0	0	100
Centre	No.	n/a	n/a	n/a	1,309	811	2,120
	%				62	38	
Total	**No.**	**116,618**	**404,619**	**717,378**	**55,481**	**39,851**	**1,831,819**
	%	**6**	**22**	**39**	**30**	**2**	**100**

Note: Percentages given in this table add across and not down, to give the percentage of hours fished in each sub-region for each fishing area.

7.3.5 Hours fished by fishing platform

The total fishing effort for each fishing platform by place of residence is presented in Table 28 and within each fishing area in Table 29.

Table 28. Hours fished annually by platform and place of residence, recreational fishers aged five years or more

Platform		Residents	Visitors	Total
boat	No.	933,440	454,644	1,388,084
	%	79	70	76
shore	No.	245,378	127,498	372,876
	%	21	20	20
both	No.	1,018	69,841	70,859
	%	<1	11	4
Total	**No.**	**1,179,837**	**651,983**	**1,831,819**
	%	**100**	**100**	**100**

Over three quarters (76%) of all recreational fishing effort is boat based and this is similar for residents and visitors. Most of the remaining effort is shore based with 4% of fishing effort occurring as a combination of boat and shore fishing within a single event. A higher proportion of combination boat and shore-based fishing occurs among visiting fishers (11% of effort) and substantially lower levels among residents (less than 1%).

Compared to 1995, there has been an increase in the proportion of boat fishing for both residents and visitors (up from 64% overall), however the largest change has been for visitors (up from 30%).

The majority of effort in most fishing areas is boat based (Table 29). In the Mary River, Alligator Rivers, north coast and the Cobourg Peninsula area boat fishing accounts for at least 93% of all fishing effort within each area. Only in the Katherine and Nhulunbuy areas does shore-based fishing account for a similar proportion of the fishing effort as boat based fishing. In the centre all fishing is shore-based. Only the Roper River has a significant amount of combined boat and shore-based fishing.

Compared to 1995, most areas have shown an increase in the amount of boat based fishing. The McArthur and Nhulunbuy areas are the only fishing regions to show a decrease in boat based fishing and a subsequent increase in shore based fishing. The Roper River has also shown a decrease in boat based fishing, but this has been compensated by an increase in combined boat and shore based fishing.

Table 29. Hours fished annually in each fishing area by platform, recreational fishers aged five years or older

Fishing Area		Boat	Shore	Both	Total
Darwin area	No.	430,901	108,628	953	540,481
	%	80	20	<1	100
Mary River	No.	191,548	15,499	0	207,048
	%	93	7	0	100
West Coast	No.	116,911	60,723	0	177,635
	%	66	34	0	100
Daly River	No.	119,208	49,822	0	169,030
	%	71	29	0	100
Roper River	No.	71,896	32,547	59,954	164,397
	%	44	20	36	100
Nhulunbuy	No.	72,366	43,923	0	116,289
	%	62	38	0	100
McArthur area	No.	98,903	6,839	9,887	115,629
	%	86	6	9	100
Alligator Rivers	No.	105,583	7,695	0	113,278
	%	93	7	0	100
Adelaide River	No.	60,646	14,038	0	74,684
	%	81	19	0	100
North Coast	No.	60,875	4,045	0	64,920
	%	94	6	0	100
Islands	No.	33,814	5,257	0	39,071
	%	87	13	0	100
Katherine area	No.	11,412	20,674	66	32,152
	%	35	64	<1	100
Cobourg Peninsula	No.	14,021	1,064	0	15,085
	%	93	7	0	100
Centre	No.	0	2,120	0	2,120
	%	0	100	0	
Total	**No.**	**1,388,084**	**372,876**	**70,859**	**1,831,819**
	%	**76**	**20**	**4**	**100**

Note: Percentages given in this table add across and not down, to give the percentage of hours fished by platform for each fishing area.

7.3.6 Hours fished by target fishery

The total fishing effort for each target fishery by place of residence is presented in Table 30. Although in the NFRS respondents were asked which species they were targeting, for reporting purposes these targets have been grouped to allow a comparison with the 1995 Fishcount data.

Table 30. Hours fished annually by target fishery and place of residence, recreational fishers aged five years or more

Target Fishery		Residents	Visitors	Total
barramundi	No.	414,555	374,172	788,726
	%	35	57	43
no specific target	No.	339,762	77,740	417,502
	%	29	12	23
reef fish	No.	115,424	58,630	174,054
	%	10	9	10
non-fish	No.	248,681	54,352	303,033
	%	21	8	17
game/sport fish	No.	56,477	82,835	139,313
	%	5	13	8
fishing for bait	No.	4,937	4,254	9,191
	%	<1	1	1
Total	**No.**	**1,179,837**	**651,983**	**1,831,819**
	%	**100**	**100**	**100**

Barramundi is the most popular target species, attracting 43% of the total recreational fishing effort and is especially popular among visiting fishers (57% of hours fished), compared to 35% for residents. Most of the remaining effort is fishing with no specified target (23%), reef fishing (12%) and fishing for organisms other than fish eg crabs or shellfish (17%).

In comparison to 1995, barramundi remains the most popular target. The most notable changes has been the decrease in reef fishing by both residents and visitors (down from 20% of the total effort) and the increase in game/sport fishing (up from less than 1%) and fishing for non-fish species (up from 1%).

As discussed earlier (Section 6.1), effort data were collected on an event basis. More than one event could occur per day, but each event only had one specific target type. Therefore, the mean duration for each targeted event can be ascertained. Fishing events with no specified target are shorter on average (4.1 hours) than all targeted fishing except fishing for bait (1.0 hours) and game/sport fishing (4.0). Fishing events for barramundi, and reef fish are similar (5.9 and 5.8 hours respectively), with 'non-fish' fishing events being the longest in duration (9.8 hours). Generally, fishing events by residents and visitors are similar for the same target species.

The total fishing effort for each target fishery by home region is presented in Table 31.

Table 31. Hours fished annually by target fishery by place of residence, recreational fishers aged five years or older

Target Fishery		Residents			Visitors	Total
		Darwin	Coastal	Hinterland		
barramundi	No.	350,329	55,351	8,874	374,172	788,726
	%	37	28	24	57	43
no specific target	No.	282,923	40,706	16,133	77,740	417,502
	%	30	21	45	12	23
reef fish	No.	89,413	19,970	6,041	58,630	174,054
	%	9	10	17	9	10
non fish	No.	182,319	61,281	5,081	54,352	303,033
	%	19	31	14	8	17
game/sport fish	No.	37,442	19,036	0	82,835	139,313
	%	4	10	0	13	8
fishing for bait	No.	4,271	551	115	4,254	9,191
	%	<1	<1	<1	1	1
Total	**No.**	**946,696**	**1,986,896**	**36,245**	**651,983**	**1,831,819**
	%	**100**	**100**	**100**	**100**	**100**

The overall trend for targeted effort is similar for residents of the Darwin region, but not for coastal and hinterland residents (Table 31). Hinterland residents fish with no specific target (45%) more often than they target barramundi (24%). Coastal residents are likely to fish for barramundi (28%) or no specific target (21%), with greatest effort (31%) directed at organisms other than fish. Overall the high level of fishing effort by residents for non-fish species reflects 'pot-hours', where pots can be left for 24 hours and one recreational fisher may have more than one pot.

In total, most of the fishing effort with no specific target (68%), 'non fish' (60%) and reef fish (51%) is attributable to residents in the Darwin area, but, in comparison, they provide less than half (44%) of the total effort targeting barramundi. This is similar to the targeted fishing activity in 1995.

7.3.7 Hours fished by fishing area and target fishery

The total fishing effort for each fishing area by target fishery is presented in Table 32.

The Darwin Harbour area is the most important region for all types of fishing except barramundi and game fishing. About half (50%, 54% and 51%, respectively) of the total 'non fish' fishing effort, fishing for bait and non-target fishing occurs in the Harbour area and over a third (39%) of reef fishing. Overall, fishing effort for barramundi is more widespread, but the largest proportion (25%) of barramundi effort occurs in the Mary River. The most fishing effort targeting game and sport fish occurs in the Nhulunbuy area (37%), with most of the remainder occurring in the Darwin Harbour area.

Table 32. Hours fished annually by fishing area and target fishery, recreational fishers aged five years or older

		Barra-mundi	Game / sport fish	Reef fish	No specific target	Fishing for bait	Non fish	Total
Darwin area	No.	68,702	35,359	68,656	211,920	4,972	150,872	540,481
	%	9	25	39	51	54	50	30
Mary River	No.	193,582	0	2,734	7,747	0	2,986	207,048
	%	25	0	2	2	0	1	11
West Coast	No.	62,019	6,417	24,748	62,186	811	21,453	177,635
	%	8	5	14	15	9	7	10
Daly River	No.	101,205	1,732	7,800	20,104	250	37,940	169,030
	%	13	1	4	5	3	13	9
Roper River	No.	118,096	1,283	4,884	9,000	1,693	29,441	164,397
	%	15	1	3	2	18	10	9
Nhulunbuy	No.	3,018	65,789	13,515	29,742	287	3,938	116,289
	%	<1	47	7	7	3	1	6
McArthur area	No.	22,898	7,113	29,942	20,296	1,008	34,372	115,629
	%	3	5	17	5	11	11	6
Alligator Rivers	No.	104,368	1,378	1,765	5,682	0	86	113,278
	%	13	1	1	1	0	<1	6
Adelaide River	No.	39,208	6,496	5,474	13,824	79	9,603	74,684
	%	5	5	3	3	1	3	4
North Coast	No.	60,630	67	629	111	0	3,484	64,920
	%	8	<1	<1	<1	0	1	4
Islands	No.	1,442	5,851	10,637	20,062	61	1,018	39,071
	%	<1	4	6	5	1	<1	3
Katherine area	No.	13,558	3,136	0	8,396	29	7,033	32,152
	%	2	2	0	2	<1	2	2
Cobourg Peninsula	No.	0	4,694	3,271	6,313	0	807	15,085
	%	0	3	2	2	0	<1	1
Centre	No.	0	0	0	2,120	0	0	2,120
	%	0	0	0	1	0	0	<1
Total	**No.**	**788,726**	**139,313**	**174,054**	**417,502**	**9,191**	**302,903**	**1,831,819**
	%	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Compared to 1995 there has been no major change in the type of targeted fishing effort in each area, with the exception of the Darwin Harbour area. In the Darwin Harbour area, the amount of non-targeted fishing has decreased to about half of the effort seen in 1995, whilst the game and reef fishing effort has increased.

7.3.8 Hours fished by gear type

The total fishing effort for each gear type is presented in Table 33. Although respondents were asked in detail about the fishing gear they used for each event, for reporting purposes, fishing gear types have been grouped.

Table 33. Hours fished annually by gear type and place of residence, recreational fishers aged five years or more

Target Fishery		Residents	Visitors	Total
line	No.	926,364	608,018	1,534,382
	%	79	93	84
pot	No.	244,621	39,337	283,958
	%	21	6	15
net	No.	5,114	4,487	9,600
	%	<1	1	1
hand	No.	3,334	141	3,476
	%	<1	<1	<1
dive	No.	403	0	403
	%	<1	0	<1
Total	**No.**	**1,179,837**	**651,983**	**1,831,819**
	%	**100**	**100**	**100**

Fishing with lines and pots accounts for almost all (99%) of the recreational fishing effort in the Northern Territory. Residents use pots more frequently than visitors, reflecting the amount of fishing effort targeted at non-fish species.

Line fishing effort by bait and lure use by home region is presented in Table 34. Generally fishers use either bait or lures during a fishing event. Fishers use both lures and bait for only 10% of the total fishing effort using lines. Lure fishing is slightly more popular than bait fishing (49% of lure fishing effort compared with 41% bait). These trends are similar, regardless of place of residence.

Table 34. Hours fished annually by target fishery by place of residence, recreational fishers aged five years or older

Target Fishery		Residents			Visitors	Total
		Darwin	Coastal	Hinterland		
Lines - bait	No.	302,857	63,477	10,175	252,675	629,184
	%	40	47	33	42	41
Lines – lure/fly/jig	No.	389,559	49,200	13,961	302,399	755,119
	%	51	37	45	50	49
Both	No.	68,279	22,058	6,797	52,944	150,078
	%	9	16	22	9	10
Total	**No.**	**760,695**	**134,735**	**30,934**	**608,018**	**1,534,382**
	%	**100**	**100**	**100**	**100**	**100**

7.3.9 Hours fished by gear type and target fishery

The total fishing effort for each gear type by target fishery is presented in Table 35. As would be expected, line fishing is used when targeting barramundi, game/sport fish and reef fish. Non-targeted fishing is slightly more variable, but still mainly uses line fishing. When fishing for bait, fishers mainly use nets with some line fishing, whilst fishers for non-fish species generally use pots.

Table 35. Hours fished annually by gear type by target fishery, recreational fishers aged five years or older

		Barra-mundi	Game / sport fish	Reef fish	No specific target	Fishing for bait	Non fish	Total
line	No.	788,726	139,295	173,925	413,039	1,993	17,403	1,534,382
	%	100	100	100	99	22	9	84
pot	No.	0	0	0	2,176	0	281,782	283,958
	%	0	0	0	<1	0	93	16
net	No.	0	18	0	1,296	7,198	1,018	9,600
	%	0	<1	0	<1	78	<1	1
hand	No.	0	0	0	720	0	2,756	3,476
	%	0	0	0	<1	0	1	<1
dive	No.	0	0	59	270	0	74	403
	%	0	0	<1	<1	0	<1	<1
Total	**No.**	**788,726**	**139,313**	**174,054**	**417,502**	**9,191**	**302,903**	**1,831,819**
	%	**100**	**100**	**100**	**100**	**100**	**100**	**100**

8 CATCH

The information contained in this section refers to the second phase of the survey, the diary interview period for recreational fishers aged five years or older. The following catch information is based on the annual catch from May 2000 to April 2001. The catch information was also collected on an event basis as described for fishing effort (Section 6.1).

A regional system of river catchment and offshore regions was used when collecting fishing activity data (Figure 1, Appendix 2 Table A1). These regions have then been grouped into 14 fishing areas for data analysis and reporting (Figure 2, Appendix 2 Table A1). A fishing sub-region was also recorded to further delineate fishing areas into lakes (dams or billabongs), rivers (freshwater), estuaries (marine), inshore (less than 5 km) and offshore (greater than 5 km).

Throughout the diary survey, respondents were asked to record which part of their catch they retained (harvested) for any purpose and which they released. The harvest proportion is the proportion of the total catch that is retained (harvested). For practical purposes, only numbers of fish and aquatic organisms were used, so the following catch data refers to numbers of animals only.

During the diary phase of the survey, resident respondents caught over 25,000 individual specimens of 109 different identified species (see Appendix 2, Table A3) that were used for data expansion. Results are presented as expanded population estimates (based on ABS estimated resident population and participation rates obtained from the initial survey).

8.1 Total Catch

The total estimated number of fish and non-fish caught annually by recreational fishers aged five years or older is presented in Table 36. The total catch includes all released fish and non-fish.

Table 36. Total annual catch of aquatic organisms by place of residence, recreational fishers aged five years or older

		Residents	Visitors	Total
fish	No.	1,118,382	516,005	1,634,387
	%	88	93	89
non-fish	No.	157,326	37,831	195,156
	%	12	7	11
Total	**No.**	**1,275,708**	**553,836**	**1,829,543**
	%	**100**	**100**	**100**

An estimated 1,829,543 individual fish and aquatic organisms were caught by recreational fishers aged five years or older. Of the total, 1,634,387 (89%) were fish and 195,156 (11%) were non-fish. The proportion of fish/non fish was different for residents and visitors, as visitors caught proportionally more fish and less non-fish. Although the amount of fishing effort has decreased since 1995, the

overall catch has remained similar, with similar trends between catches of fish and non-fish for both residents and visitors.

The total estimated number of fish and non-fish caught annually by residents and visitors by place of residence is presented in Table 37.

Table 37. Total annual catch of aquatic organisms by place of residence, recreational fishers aged five years or older

		Residents			Visitors	Total
		Darwin	Coastal	Hinterland		
fish	No.	908,971	178,296	31,116	516,005	1,634,387
	%	56	11	2	32	100
non-fish	No.	127,866	27,773	1,686	37,831	195,156
	%	66	14	1	19	100
Total	**No.**	**1,036,837**	**206,069**	**32,802**	**553,836**	**1,829,543**
	%	**57**	**11**	**2**	**30**	**100**

NT residents are responsible for the majority (70%) of the total recreational catch and the fish (68%) and non-fish (81%) components. Darwin residents catch most of the resident catch (57% of the total), which is mainly due to the fish component of the catch.

The amount of the total catch which was harvested (retained) and released by place of residence is presented in Table 38.

Table 38. Total annual catch, harvest and release of aquatic organisms by place of origin, recreational fishers aged five years or older

		Residents		Visitors		Total	
		fish	non-fish	fish	non-fish	fish	non-fish
harvest	No.	474,868	104,418	209,984	33,304	684,852	137,722
	%	42	66	41	88	42	71
release	No.	643,514	52,908	306,021	4,527	949,535	57,435
	%	58	34	59	12	58	29
Total	**No.**	**1,118,382**	**157,326**	**516,005**	**37,831**	**1,634,387**	**195,156**
	%	**100**	**100**	**100**	**100**	**100**	**100**

Of the total catch by recreational fishers, less than half (45%) is harvested and 55% released. The harvest proportion is different for fish and non-fish, with a higher proportion of non-fish being harvested (71%), than fish (42%). Residents and visitors have different harvesting patterns, with visitors generally having slightly lower harvesting levels of fish (41%) but higher harvesting levels for non-fish (88%) compared to residents (42% and 66%, respectively).

Compared to 1995, the overall harvest level was similar but harvest levels are generally lower for residents and higher for visitors, particularly for the visitor harvest of non-fish species.

8.2 Total Catch by Species Groups

The total number of fish caught, harvested and released by species groups are presented in Table 39. The corresponding numbers of non-fish are presented in Table 40. Any species with a total harvest of less than 1000 individuals have been grouped as other fish or other non-fish.

In total, 109 different species or species groups were reported as being caught during the survey (Appendix 2, Table A3).

Almost half (45%) of the total number of fish caught were barramundi and snappers. As 53% of the tropical snappers are retained, this group provides 23% of the total harvest. However, although barramundi contribute most to the total catch, as the harvest proportion for barramundi is low (24%), barramundi contribute proportionately less (15%) to the total harvest. The total catch of catfish was the third highest, 7% of the total catch, but as the harvest proportion is extremely low (3%), catfish comprise only 1% of the total harvest.

Mackerels form an important component of the harvest of fish in the Northern Territory (by recreational and commercial fishermen). Within this group, three different species were listed for further identification. If the respondent could not identify the mackerel, it was listed as unidentified. Therefore the unidentified group of mackerel could not contain the listed species. Spanish mackerel accounts for the largest identified component of the mackerel catch (8,469 fish or 34%) and harvest (5,747 fish or 37%). However, almost half of the mackerel catch (11,630 fish) and harvest (6,403 fish) remained unidentified.

The highest total catch of non-fish species were mud crabs, 70% of the total non-fish catch and 60% of the total non-fish harvest. Yabbies, macrobrachium (freshwater prawns) and marine prawns contributed between 6 and 9% of the total non-fish catch and between 7 and 11% of the total non-fish harvest. All other species groups are at or below the 5% level (harvest or catch).

Within the total catch of fish and non-fish, snappers contribute 20%, barramundi 12%, and mudcrab 10%. Their contribution to the harvest is 17%, 23% and 7%, respectively.

When these results are analysed by place of residence, it emerges that resident fishers account for the largest proportion of the harvest (70%) as well as of the total catch (70%). Residents account for 85% of the snapper (lutjanid) harvest, 64% of the barramundi harvest and 82% of the mud crab harvest.

Harvest proportions ranged from 3 to 100%, but for fish were generally over 30% and for non-fish, over 60%. Only barramundi, catfish, tuna and sharks have harvest proportions of less than 30%. Catfish and sharks are not prized table species and the low retention of barramundi would generally reflect that the minimum size and personal possession limits are being observed and there is an increase in catch and release fishing.

Compared to 1995, snappers were also the main component of the harvest, but were also the main component of the catch. Although similar numbers of snappers were caught in both surveys, the harvest proportion was much lower in 2000. In 1995, barramundi were the second most important species in the catch and harvest. Although similar numbers of barramundi were harvested in the two surveys, a larger number was caught and released in 2000, making barramundi the main component of the 2000 catch. The incidence of mullet in the 2000 catch reflects the change in method to quantify bait species from Fishcount to the NRFS.

Table 39. Total estimated annual catch of fish by species group, recreational fishers aged five years or older

Species group	Total harvest	Proportion of total harvest (%)	Total released	Total catch	Proportion of total catch (%)	Harvest proportion (%)
snappers (lutjanids)	160,716	23	145,023	305,739	17	53
barramundi	100,423	15	316,663	417,086	26	24
mullet	84,933	12	4,708	89,641	5	95
threadfin salmon	36,899	5	7,654	44,553	3	83
grunters	21,836	3	22,708	44,544	3	49
bream	20,625	3	13,830	34,455	2	60
cod	19,924	3	42,043	61,966	4	32
trevally	17,988	3	37,174	55,162	3	33
jewfish	17,776	3	11,067	28,843	2	62
mackerels	15,407	2	9,827	25,233	2	61
tuskfish	14,789	2	5,658	20,477	1	72
emperors	12,195	2	21,522	33,716	2	36
barracuda	11,419	2	15,688	27,108	2	42
coral trout	9,939	1	11,255	21,194	1	47
sharks/rays	7,942	1	68,252	76,193	5	10
garfish	4,788	1	901	5,689	<1	84
catfish	3,624	1	123,125	126,748	7	3
whiting	2,069	<1	1,055	3,124	<1	66
flathead	1,467	<1	239	1,706	<1	86
tuna	1,396	<1	2,465	3,861	<1	36
small baitfish	76,306	11	6,700	83,007	5	92
other fish	42,389	6	81,977	124,366	8	34
Total	**684,853**	**100**	**949,535**	**1,634,387**	**100**	**42**

Table 40. Total estimated annual catch of non-fish by species group, recreational fishers aged five years or older

Species group	Total harvest	Proportion of total harvest (%)	Total released	Total catch	Proportion of total catch (%)	Harvest proportion (%)
mud crab	82,371	60	53,564	135,935	70	61
macrobrachium	15,424	11	1,571	16,994	9	91
yabbies/red claw	15,391	11	82	15,473	8	99
prawns	9,731	7	1,699	11,430	6	85
mussels	7,023	5	0	7,023	4	100
shells (other)	2,305	2	0	2,305	1	100
crabs (other)	1,561	1	519	2,080	1	75
oysters	1,176	1	0	1,176	1	100
other non-fish	2,739	2	0	2,739	1	100
Total	**137,722**	**100**	**57,435**	**195,156**	**100**	**71**

8.2.1 Catch by species - snappers

Tropical snappers (lutjanids) form the largest component of the total harvest of fish in the Northern Territory. Within this group, six different species were listed for further identification (see Table 41). If a snapper was caught that was not one of these six species, it was recorded as 'other' snapper. If the respondent could not identify the snapper, it was listed as unidentified. Therefore the unidentified group of snappers may contain the listed species. The composition of the snapper catch and harvest is presented in Table 41.

Table 41. Total estimated annual catch of snappers by species, recreational fishers aged five years or older

Species	Total harvest	Proportion of total snapper harvest (%)	Total released	Total catch	Proportion of total snapper catch (%)	Harvest proportion (%)
golden snapper	68,111	48	45,417	113,529	44	60
saddletail/red snapper	22,233	16	16,936	39,168	15	57
spanish flag/stripey	22,077	16	39,604	61,681	24	36
mangrove jack	19,914	14	9,589	29,503	11	67
red emperor	6,342	5	3,508	9,849	4	64
Russell's/moses	2,057	1	3,617	5,674	2	36
other snapper	0	0	37	37	<1	0
unidentified	19,982	14	26,315	46,298	18	43
Total	**140,734**	**100**	**118,708**	**259,442**	**100**	**54**

Golden snappers account for the largest component of the snapper catch (44%) and harvest (48%). In terms of species, golden snapper are probably the second most important individual species in the total Northern Territory recreational catch and harvest (mullet, as one of the important species groups, were not identified to species).

Golden snapper, mangrove jack and red emperor have the highest harvest levels, where at least 60% of the caught fish of these species are harvested.

8.3 Catch by Fishing Area

A summary of the total number of fish and aquatic organisms caught in each fishing area (see Figure 2) are presented in Table 42.

Table 42. Total annual catch in each fishing area, recreational fishers aged five years or older

Fishing Area		Fish	Non-fish	Total
Darwin area	No.	448,264	116,473	564,737
	%	25	60	31
Mary River	No.	110,050	1,662	111,712
	%	6	1	7
West Coast	No.	197,582	12,465	210,047
	%	11	6	11
Daly River	No.	117,749	20,810	138,559
	%	7	11	8
Roper River	No.	92,038	4,467	96,504
	%	5	2	5
Nhulunbuy	No.	147,814	7,725	155,539
	%	8	4	9
McArthur area	No.	76,265	15,944	92,210
	%	4	8	5
Alligator Rivers	No.	115,891	162	116,052
	%	7	<1	6
Adelaide River	No.	131,204	3,783	134,987
	%	7	2	7
North Coast	No.	79,064	337	79,401
	%	5	<1	4
Islands	No.	95,673	41	95,714
	%	5	<1	5
Katherine area	No.	13,229	10,878	24,107
	%	<1	6	1
Cobourg Peninsula	No.	4,536	410	4,946
	%	<1	<1	<1
Centre	No.	5,027	0	5,027
	%	<1	<1	<1
Total	**No.**	**1,634,387**	**195,156**	**1,829,543**
	%	**100**	**100**	**100**

Not surprisingly, as Darwin Harbour accounts for 28% of the total fishing effort, Darwin Harbour supplies 29% of the total catch (Table 42). The total catch from Darwin Harbour is at least more than

double the catch from any of the other fishing areas. Each of these other areas produce between 1% and 11% of the total catch.

8.4 Catch of Key Species Groups by Fishing Area

Details of catch by species groups for each fishing area follow in Tables 43 to 56 without commentary. Harvest proportions for each species group in each area is also included. The letter given in parenthesis e.g. (A) refers to the fishing area key (Figure 2, Appendix 2, Table A1).

Table 43. Total annual catch on the **West Coast** (A), recreational fishers aged five years or older

		Harvest	Released	Total catch	Harvest proportion
snappers	No. %	29,599 27	35,692 35	65,292 31	45
mullet	No. %	15,875 15	802 1	16,678 8	95
barramundi	No. %	13,049 12	29,728 29	42,777 20	31
small baitfish	No. %	90,65 8	880 1	9,945 5	91
mud crab	No. %	5,823 5	6,278 6	12,101 6	48
cod	No. %	5,247 5	4,364 4	9,611 5	55
tuskfish	No. %	4,208 4	41 <1	4,249 2	99
jewfish	No. %	4,127 4	225 <1	4,352 2	95
threadfin salmon	No. %	3,492 3	809 1	4,301 2	81
grunters	No. %	2,064 2	887 1	2,951 1	70
mackerel	No. %	1,560 1	1,321 1	2,881 1	54
sharks/rays	No. %	1,506 1	7,532 7	9,039 4	17
emperors	No. %	1,278 1	0 0	1,278 1	100
bream	No. %	1,056 1	1,641 2	2,697 1	39
other	No. %	10,629 10	11,265 11	21,895 10	49
Total	**No. %**	**108,580 100**	**101,467 100**	**210,047 100**	**52**

Table 44. Total annual catch in the **Daly area** (B), recreational fishers aged five years or older

		Harvest	Released	Total catch	Harvest proportion
barramundi	No.	13,425	55,185	68,609	20
	%	24	68	50	
yabbies	No.	7,314	67	7,381	99
	%	13	<1	5	
macrobrachium	No.	7,000	0	7,000	100
	%	12	0	5	
snapper	No.	6,562	3,691	10,254	64
	%	12	5	7	
mussels	No.	6,429	0	6,429	100
	%	11	0	5	
threadfin salmon	No.	3,838	1,039	4,876	79
	%	7	1	4	
mullet	No.	3,121	0	3,121	100
	%	5	0	2	
small baitfish	No.	1,934	0	1,934	100
	%	3	0	1	
emperors	No.	1,433	0	1,433	100
	%	3	0	1	
grunters	No.	1,075	1,500	2,575	42
	%	2	2	2	
cod	No.	1,000	2,356	3,356	30
	%	2	3	2	
other	No.	3,832	17,759	21,591	18
	%	7	22	16	
Total	**No.**	**56,964**	**81,595**	**138,559**	**41**
	%	**100**	**100**	**100**	

Table 45. Total annual catch in the **Katherine area** (C), recreational fishers aged five years or older

		Harvest	Released	Total catch	Harvest proportion
macrobrachium	No.	8,162	2,139	10,301	79
	%	58	21	43	
barramundi	No.	1,928	3,083	5,011	38
	%	14	31	21	
other	No.	3,937	4,858	8,795	45
	%	28	48	36	
Total	**No.**	**14,028**	**10,080**	**24,107**	**58**
	%	**100**	**100**	**100**	

Table 46. Total annual catch in **Darwin Harbour** (D), recreational fishers aged five years or older

		Harvest	Released	Total catch	Harvest proportion
snappers	No. %	78,084 24	60,941 25	139,026 25	56
mud crabs	No. %	61,906 19	41,509 17	103,415 18	60
small baitfish	No. %	50,910 16	2,524 1	53,434 9	95
mullet	No. %	18,851 6	3,753 2	22,604 4	83
barramundi	No. %	13,428 4	14,537 6	27,965 5	48
threadfin salmon	No. %	12,263 4	1,396 1	13,659 2	90
bream	No. %	12,086 4	4,250 2	16,336 3	74
trevally	No. %	9,952 3	1,487 1	11,440 2	87
cod	No. %	9,009 3	19,842 8	28,851 5	31
yabbies/red claw	No. %	6,631 2	15 <1	6,646 1	100
grunters	No. %	6,157 2	3,425 1	9,582 2	64
tuskfish	No. %	6,094 2	2,361 1	8,455 1	72
garfish	No. %	4,788 1	901 <1	5,689 1	84
jewfish	No. %	4,552 1	3,026 1	7,578 1	60
sharks/rays	No. %	3,648 1	24,333 10	27,981 5	13
whiting	No. %	1,255 <1	987 <1	2,241 <1	56
prawns	No. %	1,047 <1	1,131 <1	2,178 <1	48
other	No. %	20,984 7	55,673 23	77,656 14	27
Total	**No. %**	**321,646 100**	**243,091 100**	**564,737 100**	**57**

Table 47. Total annual catch in the **Adelaide River** (E), recreational fishers aged five years or older

		Harvest	Released	Total catch	Harvest proportion
threadfin salmon	No.	6,530	1,188	7,718	85
	%	20	1	6	
barramundi	No.	5,324	13,624	18,948	28
	%	16	13	14	
snappers	No.	4,955	6,601	11,556	43
	%	15	7	9	
jewfish	No.	3,267	5,854	9,121	36
	%	10	6	7	
grunters	No.	2,618	6,484	9,102	29
	%	8	6	7	
mud crab	No.	2,395	1,374	3,769	64
	%	7	1	3	
small baitfish	No.	1,309	0	1,309	100
	%	4	0	1	
cod	No.	1,097	685	1,785	62
	%	3	1	1	
other species	No.	5,968	65,713	71,681	8
	%	19	65	53	
Total	**No.**	**33,464**	**101,523**	**134,987**	**25**
	%	**100**	**100**	**100**	

Table 48. Total annual catch in the **Mary River** (F), recreational fishers aged five years or older

		Harvest	Released	Total catch	Harvest proportion
barramundi	No.	18,060	52,829	70,889	25
	%	69	62	63	
jewfish	No.	2,375	293	2,669	89
	%	9	<1	2	
threadfin salmon	No.	1,000	293	1,293	77
	%	4	<1	1	
other species	No.	4,727	32,134	36,862	13
	%	18	38	33	
Total	**No.**	**26,162**	**85,550**	**111,712**	**23**
	%	**100**	**100**	**100**	

Table 49. Total annual catch in the **Alligator Rivers** (G), recreational fishers aged five years or older

		Harvest	Released	Total catch	Harvest proportion
barramundi	No.	15,855	79,346	95,201	17
	%	71	85	82	
snappers	No.	5,075	3,292	8,367	61
	%	23	4	7	
other	No.	1,332	11,153	12,485	11
	%	6	12	11	
Total	**No.**	**22,262**	**93,791**	**116,052**	**19**
	%	**100**	**100**	**100**	

Table 50. Total annual catch in the **Cobourg Peninsula area** (H), recreational fishers aged five years or older

		Harvest	Released	Total catch	Harvest proportion
trevally	No.	493	474	968	51
	%	31	14	20	
snappers	No.	374	237	611	61
	%	23	7	12	
mud crab	No.	277	133	410	68
	%	17	4	8	
other	No.	463	2,495	2,958	16
	%	29	75	60	
Total	**No.**	**1,607**	**3,339**	**4,946**	**32**
	%	**100**	**100**	**100**	

Table 51. Total annual catch along the **North Coast** (I), recreational fishers aged five years or older

		Harvest	Released	Total catch	Harvest proportion
barramundi	No.	7,137	53,762	60,899	12
	%	61	79	77	
mackerel	No.	11	88	99	11
	%	<1	<1	<1	
snappers	No.	2,505	815	3,320	75
	%	21	<1	4	
threadfin salmon	No.	1,375	408	1,783	77
	%	12	1	2	
other species	No.	713	12,588	13,301	5
	%	6	19	17	
Total	**No.**	**11,740**	**67,661**	**79,402**	**15**
	%	**100**	**100**	**100**	

Table 52. Total annual catch in the **Nhulunbuy area** (J), recreational fishers aged five years or older

		Harvest	Released	Total catch	Harvest proportion
mackerels	No	11,348	4,615	15,963	71
	%	16	6	10	
snappers (lutjanids)	No	10,678	12,131	22,809	47
	%	15	15	15	
barracuda	No	10,096	11,893	21,989	46
	%	14	14	14	
mullet	No	6,650	0	6,650	100
	%	9	0	4	
coral trout	No	4,596	179	4,775	96
	%	6	<1	3	
trevally	No	3,972	11,042	15,013	26
	%	5	13	10	
bream	No	3,020	3,120	6,141	49
	%	4	4	4	
mud crab	No	2,790	841	3,631	77
	%	4	1	2	
small baitfish	No	2,734	133	2,867	95
	%	4	<1	2	
tuskfish	No	2,563	2,618	5,181	49
	%	4	3	3	
shells (other)	No	2,001	0	2,001	100
	%	3	0	1	
oysters	No	1,176	0	1,176	100
	%	2	0	1	
cod	No	1,052	6,194	7,246	15
	%	1	7	5	
other	No	9,860	30,237	40,097	25
	%	14	36	26	
Total	**No**	**72,536**	**83,003**	**155,539**	**47**
	%	**100**	**100**	**100**	

Table 53. Total annual catch in the **Roper area** (K), recreational fishers aged five years or older

		Harvest	Released	Total catch	Harvest proportion
mullet	No.	34,186	0	34,186	100
	%	43	0	35	
grunters	No.	8,400	2199	10,599	79
	%	11	13	11	
barramundi	No.	8,377	7,927	16,304	51
	%	11	46	17	
small baitfish	No.	7,908	1,064	8,973	88
	%	10	6	9	
threadfin salmon	No.	5,540	49	5,589	99
	%	7	<1	6	
snappers	No.	4,994	848	5,843	85
	%	6	5	6	
bream	No.	2,481	874	3,355	74
	%	3	5	3	
mud crab	No.	2,011	792	2,802	72
	%	3	5	3	
macrobrachium	No.	1,559	0	1,559	100
	%	2	0	2	
other	No.	3,820	3,475	7,295	52
	%	5	20	8	
Total	**No.**	**79,276**	**17,228**	**96,504**	**82**
	%	**100**	**100**	**100**	

Table 54. Total annual catch in the **McArthur River area** (L), recreational fishers aged five years or older

		Harvest	Released	Total catch	Harvest proportion
mud crab	No.	6,433	2,623	9,056	71
	%	15	5	10	
prawns	No.	6,250	0	6,250	100
	%	15	0	7	
snappers	No.	5,191	7,88	5,979	87
	%	15	2	6	
mullet	No.	5,000	0	5,000	100
	%	12	0	5	
barramundi	No.	2,872	3,838	6,710	43
	%	7	8	7	
threadfin salmon	No.	2,678	2,473	5,151	52
	%	6	5	6	
small baitfish	No.	2,083	505	2,589	80
	%	5	1	3	
coral trout	No.	1,778	2,136	3,914	45
	%	4	4	4	
catfish	No.	1,437	14,185	15,622	9
	%	3	28	17	
cod	No.	1,174	3,218	4,393	27
	%	3	6	5	
emperors	No.	1,005	7,547	8,552	12
	%	2	15	9	
other	No.	6,394	12,599	18,994	34
	%	15	25	21	
Total	**No.**	**42,296**	**49,914**	**92,210**	**46**
	%	**100**	**100**	**100**	

Table 55. Total annual catch in the **Islands area** (M), recreational fishers aged five years or older

		Harvest	Released	Total catch	Harvest proportion
snappers (lutjanids)	No.	9,668	18,846	28,514	34
	%	31	29	30	
emperors (lethrinids)	No.	6,733	2,875	9,608	70
	%	22	4	10	
coral trout	No.	2,456	7,237	9,693	25
	%	8	11	10	
other	No.	12,059	35,839	47,898	25
	%	39	55	50	
Total	**No.**	**30,916**	**64,798**	**95,714**	**32**
	%	**100**	**100**	**100**	

Table 56. Total annual catch in the **Centre** (N), recreational fishers aged five years or older

		Harvest	Released	Total catch	Harvest proportion
fish	No.	1,096	3,931	5,027	22
	%	100	100	100	
Total	**No.**	**1,096**	**3,931**	**5,027**	**22**
	%	**100**	**100**	**100**	

8.5 Catch by Target Fishery

A summary of the total number of fish and aquatic organisms caught, harvested and released during targeted fishing are presented in Table 57. Harvest proportions (percentage kept) in each area are also included.

Table 57. Total catch of aquatic organisms by target fishery, recreational fishers aged five years or older

Target		Harvest	Released	Total catch	Harvest proportion
barramundi	No.	143,125	404,426	547,551	27
	%	17	40	30	
no specific target	No.	249,818	254,175	503,993	50
	%	30	25	28	
reef	No.	145,927	212,529	358,456	34
	%	18	21	20	
non fish	No.	122,541	55,892	178,433	69
	%	15	6	10	
game/sport	No.	61,718	77,686	139,403	44
	%	8	8	8	
fishing for bait	No.	99,444	2,263	101,707	98
	%	12	<1	6	
Total	**No.**	**822,573**	**1,006,970**	**1,829,543**	**43**
	%	**100**	**100**	**100**	

Barramundi fishing emerges as a dominant activity, accounting for 30% of the total catch but only 17% of the harvest. Reef fishing and 'non-target' fishing account for lesser proportions (28% and 20% respectively) of the total catch, but non-targeted fishing accounts for 30% of the harvest, given the higher harvest proportion.

The catch during fishing for bait was recorded differently in 1995, never the less, the only major change from 1995 is the proportion of the catch obtained from targeted reef fishing. In 1995, 38% of the total catch was obtained from reef fishing, compared to 20% in 2000.

Details of catch by species groups for each targeting category follow in Tables 58 to 63. Any species group with less than 1,000 harvested individuals for each target group has been grouped as other.

Table 58. Total catch, harvest and release by species groups during targeted **barramundi** fishing, recreational fishers aged five years or older

		Harvest	Released	Total	Harvest proportion
barramundi	No.	84,915	294,041	378,956	22
	%	57	73	69	
snappers	No.	12,050	5,377	17,427	69
	%	8	1	3	
threadfin salmon	No.	11,226	1,390	12,616	89
	%	8	<1	2	
grunters	No.	6,030	7,356	13,386	45
	%	4	2	2	
mullet	No.	4,836	974	5,809	83
	%	3	<1	1	
bream	No.	3,630	2,279	5,908	61
	%	3	1	1	
jewfish	No.	2,885	675	3,560	81
	%	2	<1	1	
cod	No.	2,015	5,762	7,777	26
	%	1	1	1	
sharks/rays	No.	1,341	5,263	6,604	20
	%	1	1	1	
tuskfish	No.	1,077	63	1,140	94
	%	1			
perch	No.	1,033	0	1,033	100
	%	1			
catfish	No.	1,006	39,901	40,907	2
	%	1	9	7	
other	No.	11,083	41,295	52,379	21
	%	8	11	10	
Total	**No.**	**143,125**	**404,426**	**547,551**	**26**
	%	**100**	**100**	**100**	

Table 59. Total catch, harvest and release by species groups during **'non-specific'** target fishing, recreational fishers aged five years or older

		Harvest	Released	Total	Harvest proportion
snappers	No. %	61,734 25	61,338 24	123,072 24	50
small baitfish	No. %	41,748 17	3,428 1	45,176 9	92
mullet	No. %	14,147 6	2,762 1	16,909 3	84
trevally	No. %	13,086 5	9,849 4	22,935 5	57
barramundi	No. %	13,060 5	18,306 7	31,367 6	42
threadfin salmon	No. %	12,329 5	2,523 1	14,853 3	83
cod	No. %	11,503 5	24,469 10	35,972 7	32
grunters	No. %	11,439 5	8,636 3	20,075 4	57
bream	No. %	7,998 3	2,564 1	10,562 2	76
emperors	No. %	6,926 3	1,258 <1	8,183 2	85
tuskfish	No. %	6,858 3	979 <1	7,837 2	88
jewfish	No. %	4,767 2	6,160 2	10,927 2	44
garfish	No. %	4,743 2	436 <1	5,179 1	92
mud crab	No. %	3,394 1	1,349 1	4,742 1	72
mackerel	No. %	3,383 1	3,094 1	6,477 1	52
sharks/rays	No. %	3174 1	36,400 14	39,574 8	8
coral trout	No. %	2,946 1	7,554 3	10,500 2	28
prawns	No. %	2,434 1	568 <1	3,002 1	81
barracuda	No. %	2,059 1	1559 1	3,618 1	57
whiting	No. %	1,399 1	30 <1	1,429 <1	98
other	No. %	20,691 8	60,912 24	81,603 16	25
Total	**No. %**	**249,818 100**	**254,175 100**	**503,993 100**	**50**

Table 60. Total catch, harvest and release by species groups during targeted **reef fishing**, recreational fishers aged five years or older

		Harvest	Released	Total	Harvest proportion
snappers	No.	82,694	75,127	157,821	52
	%	57	35	44	
jewfish	No.	9,739	4,117	13,857	70
	%	7	2	4	
threadfin salmon	No.	9,095	3,333	12,428	73
	%	6	1	3	
emperors	No.	4,772	20,149	24,920	19
	%	3	7	5	
cod	No.	4,746	8,091	12,836	37
	%	3	3	3	
tuskfish	No.	4,468	2,113	6,581	68
	%	3	1	1	
bream	No.	4,161	2,697	6,858	61
	%	3	1	2	
coral trout	No.	3,465	2,726	6,191	56
	%	2	1	1	
grunters	No.	3,213	5,176	8,388	38
	%	2	2	2	
sharks/rays	No.	2,002	17,428	19,430	10
	%	1	6	4	
barramundi	No.	1,899	2,976	4,875	39
	%	1	7	5	
trevally	No.	1,756	9,993	11,749	15
	%	1	3	3	
mackerels	No.	1588	276	1863	85
	%	1	<1	<1	
mullet	No.	1461	0	1461	100
	%	1	0	<1	
catfish	No.	1,437	46,160	47,598	3
	%	1	22	13	
mud crabs	No.	1,024	938	1,962	52
	%	1	<1	<1	
other	No.	8,407	11,230	19,637	43
	%	8	11	10	
Total	**No.**	**145,927**	**212,529**	**358,456**	**41**
	%	**100**	**100**	**100**	

Table 61. Total catch, harvest and release by species groups during fishing for **organisms other than fish**, recreational fishers aged five years or older

		Harvest	Released	Total	Harvest proportion
mud crabs	No.	77,041	51,046	128,087	60
	%	63	91	72	
yabbies	No.	15,255	15	15,270	100
	%	12	<1	9	
macrobrachium	No.	14,769	1,571	16,340	90
	%	12	3	9	
mussels	No.	6,429	0	6,429	100
	%	5	0	4	
small baitfish	No.	2,046	0	2,046	100
	%	2	0	1	
oysters	No.	1,176	0	1,176	100
	%	1	0	1	
other shells	No.	1,832	0	1,832	100
	%	1	0	1	
other	No.	3,993	3,259	7,252	55
	%	3	6	4	
Total	**No.**	**122,541**	**55,892**	**178,433**	**69**
	%	**100**	**100**	**100**	

Table 62. Total catch, harvest and release by species groups during targeted **sport/game** fishing, recreational fishers aged five years or older

		Harvest	Released	Total	Harvest proportion
mackerel	No.	10,437	6,407	16,844	62
	%	17	8	12	
barracuda	No.	8,847	12,371	21,217	42
	%	14	16	15	
bream	No.	4,837	5,801	10,637	45
	%	8	7	8	
threadfin salmon	No.	4,249	408	4,657	91
	%	7	1	3	
small abitfish	No.	3,855	2,076	5,931	65
	%	6	3	4	
snappers	No.	3,611	3,181	6,792	53
	%	6	4	5	
coral trout	No.	3,528	861	4,389	80
	%	6	1	3	
tuskfish	No.	2,386	2,503	4,889	49
	%	4	3	4	
trevally	No.	2,385	6,636	9,021	26
	%	4	9	6	
mullet	No.	2,234	0	2,234	100
	%	4	0	2	
cod	No.	1,531	3,341	4,872	31
	%	2	4	3	
sharks/rays	No.	1,426	9,099	10,525	14
	%	2	12	8	
tuna	No.	1,017	2,312	3,329	31
	%	2	3	2	
other	No.	11,376	22,691	34,066	33
	%	18	29	24	
Total	**No.**	**61,718**	**77,686**	**139,403**	**44**
	%	**100**	**100**	**100**	

Targeted barramundi fishing accounts for 87% of all the barramundi caught in the Northern Territory by recreational fishers aged five years or older. However, barramundi only account for over half of the total catch (66%), and the harvest (57%) during targeted barramundi fishing (Table 58). A variety of

species are caught during barramundi fishing, however they each comprise less than 8% of the harvest.

As would be expected, a greater variety of species was caught during fishing for no specific target and the total catch spread more evenly between the species groups (Table 59). Snapper are the largest component of the total catch (24%) and harvest (25%). Snappers caught during non-target fishing comprise 40% of the total snapper catch and 38% of the total snapper harvest.

Targeted reef fishing accounts for half (52%) of the total Northern Territory snapper (lutjanid) catch and half of the snapper harvest. Snappers are the largest component (54%) of the harvest from this target fishery (Table 60), with all other species at or below 6% of the harvest. Jewfish and threadfin salmon are important minor species. Emperors are an important species group in terms of catch, but they have a low harvest rate.

Mud crabs are the largest component of the total catch from 'non-fish' targeting, comprising 72% of the catch from this target fishery and 63% of the harvest (Table 61). The crabs caught during non-fish targeting account for 94% of the total Northern Territory mud crab catch and of the harvest.

Mackerel account for 12% of the catch and 17% of the harvest during game (Table 63). A quarter (24%) of the total mackerel catch and about half (50%) of the mackerel harvest comes from game fishing, most of the remainder of the catch is divided between reef (39%) and barramundi fishing (28%) and fishing for no specific target (9%).

Table 63. Total catch, harvest and release by species groups (of listed species) during **fishing for bait**, recreational fishers aged five years or older

		Harvest	Released	Total	Harvest proportion
mullet	No.	62,255	972	63,227	98
	%	63	43	62	
small baitfish	No.	28,054	638	28,692	98
	%	28	28	28	
prawns	No.	7,297	0	7,297	100
	%	7	0	7	
other	No.	1,838	653	2,491	74
	%	2	29	2	
Total	**No.**	**99,444**	**2,263**	**101,707**	**98**
	%	**100**	**100**	**100**	

By design, the catch reported for the 'fishing for bait' category was quantified and identified as one of the species groups listed (see Appendix 2, Table A3) or was recorded as small baitfish if the catch could not be identified. Mullet, garfish, herring, whiting, yabbies and macrobrachium were among the 'listed' species groups as being taken during fishing for bait. Mullet comprised the highest proportion

(63%) of the harvest, with small baitfish comprising 28% of the harvest. The total harvest proportion of these species during fishing for bait was 98% (Table 62).

9 CATCH, HARVEST AND RELEASE RATES

The information contained in this section refers to the second phase of the survey, the diary interview period for recreational fishers aged five years or older.

Catch per unit effort (cpue), harvest per unit effort (hpue) and release per unit effort (rpue) are defined as follows: cpue - total numbers caught per hour, hpue – total numbers harvested per hour and rpue – total numbers released per hour for fish and non fish. The effort measure used to calculate total catch, harvest and release rates was all appropriate effort i.e. all line effort for fish and non-fish effort for non-fish species.

Note: Any quantitative comparisons of catch rates with the information obtained from Fishcount (Coleman 1998b) should be treated with caution due to the natural high variation in catch rates and the factors which affect these catch rates.

9.1 Total Catch, Harvest and Release Rates

A summary of the total catch and harvest within the Northern Territory, per resident recreational fisher aged five years or older is given in Table 64. Note: some of the equivalent information for visitors is unavailable due to the survey design.

Table 64. Number of fish and non-fish caught per year, resident recreational fishers aged five years or older

		Residents	
		fish/year	**non-fish/year**
harvest	No.	12	3
release	No.	16	1
Total	**No.**	**28**	**4**

On average a resident recreational fisher catches approximately 28 fish and four non-fish per year, of which, 12 fish and three non-fish are harvested. This translates to a catch of approximately six fish and one non-fish per day of fishing. Visitors catch approximately five fish and less than a half non-fish per day of fishing.

The catch and harvest rates for residents and visitors are similar to the catch and harvest rates observed in 1995.

The total catch rates for fish and non-fish species by residents and visitors are presented in Table 65.

Table 65. Total catch rates for fish and non fish (number per hour), recreational fishers aged five years or older

	Residents	Visitors	Total
fish	1.2	0.9	1.1
non-fish	0.6	0.7	0.6
total	**1.1**	**0.8**	**1.0**

The total catch rate (cpue) of all aquatic (fish and non-fish) organisms in the NT is 1.0 organisms/hour, with higher catch rates emerging for fish compared to non-fish (Table 65). Residents have a higher catch rate of fish than visitors (1.2 and 0.9 fish/hour respectively) but similar catch rates in terms of non-fish species.

Table 66. Catch, harvest and release rates for fish and non fish (number per hour), recreational fishers aged five years or older

	Residents		Visitors		Total	
	Fish	**Non-fish**	**Fish**	**Non-fish**	**Fish**	**Non-fish**
hpue	0.51	0.42	0.35	0.61	0.45	0.45
rpue	0.69	0.21	0.51	0.08	0.62	0.19
cpue	1.20	0.63	0.86	0.70	1.07	0.64

Although overall harvest rates for fish and non-fish are similar, catch and release rates are higher for fish than non fish. The overall harvest is approximately one fish and one non-fish per two hours of fishing.

Visitors catch and release fewer fish per hour than residents and although overall catch rates of non-fish are similar for residents and visitors, visitors have a higher harvest rate and much lower release rate.

9.2 Catch, Harvest and Release Rates by Fishing Area

Total catch rates (cpue) for fish and non-fish for each fishing area are presented in Table 67.

The highest overall catch rates occur in the Centre and the Islands, with catch rates of over two fish/non-fish per hour, which is influenced by the highest catch rates for fish (of over two fish per hour). The lowest catch rates for fish occur in the Cobourg Peninsula and Katherine areas. Areas with high catch rates for non-fish species are the Alligator Rivers and the Nhulunbuy area. The areas with the lowest catch rates for non-fish species are the Islands and the Roper River areas.

Compared to 1995, major reductions occurred in the catch rates of non-fish species in the Nhulunbuy and north coast areas. This is probably influenced by the high harvest of shellfish observed in these areas in 1995.

Table 67. Total catch rates for fish and non fish (number per hour) for each fishing area, recreational fishers aged five years or older

	Fish	Non-fish	Total
Darwin area	1.15	0.77	1.04
Mary River	0.54	0.56	0.54
West Coast	1.27	0.58	1.18
Daly River	0.9	0.55	0.82
Roper River	0.68	0.15	0.59
Nhulunbuy	1.32	1.96	1.34
McArthur area	0.94	0.46	0.8
Alligator Rivers	1.02	1.88	1.02
Adelaide River	2.02	0.39	1.81
North Coast	1.29	0.10	1.22
Islands	2.51	0.04	2.45
Katherine area	0.53	1.55	0.75
Cobourg Peninsula	0.32	0.51	0.33
Centre	2.37	n/a	2.37
Total	**1.07**	**0.64**	**1.00**

9.3 Catch, Harvest and Release Rates by Target Fishery

A summary of total cpue, hpue and rpue for all aquatic organisms for target fishing by resident recreational fishers aged five years or older are presented in Table 68.

Table 68. Total cpue, hpue and rpue (number per hour) for all aquatic organisms by target fishery, recreational fishers aged five years or older

	hpue	rpue	cpue
barramundi	0.18	0.51	0.69
game/sport fish	0.44	0.56	1.00
reef fish	0.84	1.22	2.06
no specific target	0.60	0.61	1.21
non fish	0.40	0.18	0.59
fishing for bait	10.82	0.25	11.07
Total	**0.45**	**0.55**	**1.00**

Except for bait fishing, reef fishing has the highest catch rate of the targeted fisheries (2.06 fish/hour) and fishing for non-fish species the lowest (0.59 organisms/hour) (Table 68). Bait fishing has the

highest harvest rate (approximately 11 organisms per hour) followed by reef fishing (about one fish per hour). Barramundi fishing has the lowest harvest rate of one fish every five hours.

Details of catch rates by species groups for each target fishery follow, in Tables 69 to 74.

Table 69. Cpue, hpue and rpue (number per hour) for barramundi and other species during targeted **barramundi fishing**, recreational fishers aged five years or older

	hpue	**rpue**	**cpue**
barramundi	0.11	0.37	0.48
all other species	0.07	0.14	0.21
Total	**0.18**	**0.51**	**0.69**

Table 70. Cpue, hpue and rpue (number per hour) by species during targeted **game fishing**, recreational fishers aged five years or older

	hpue	**rpue**	**cpue**
mackerel	0.07	0.05	0.12
barracuda	0.06	0.09	0.15
threadfin salmon	0.03	<0.01	0.03
trevally	0.02	0.05	0.06
tuna	0.01	0.02	0.02
all other species	0.25	0.36	0.61
Total	**0.44**	**0.56**	**1.00**

Table 71. Cpue, hpue and rpue (number per hour) by species during targeted **reef fishing**, recreational fishers aged five years or older

	hpue	**rpue**	**cpue**
snappers	0.48	0.43	0.91
jewfish	0.06	0.02	0.08
threadfin salmon	0.05	0.02	0.07
emperors	0.03	0.12	0.14
cod	0.03	0.05	0.07
all other species	0.20	0.58	0.78
Total	**0.84**	**1.22**	**2.06**

Table 72. Cpue, hpue and rpue (number per hour) by species during **non target fishing**, recreational fishers aged five years or older

	hpue	rpue	cpue
snappers	0.15	0.15	0.29
mullet	0.03	0.01	0.04
trevally	0.03	0.02	0.05
barramundi	0.03	0.04	0.08
threadfin salmon	0.03	0.01	0.04
mackerel	0.01	0.01	0.02
all other species	0.32	0.37	0.69
Total	**0.60**	**0.61**	**1.21**

Table 73. Cpue, hpue and rpue (number per hour) by species during fishing for species **other than fish**, recreational fishers aged five years or older

	hpue	rpue	cpue
mud crab	0.25	0.17	0.42
yabbies	0.05	<0.01	0.05
macrobrachium	0.05	0.01	0.05
all other species	0.05	0.01	0.06
Total	**0.40**	**0.18**	**0.59**

Table 74. Cpue, hpue and rpue (number per hour) by species during fishing for **bait**, recreational fishers aged five years or older

	hpue	rpue	cpue
mullet	6.77	0.11	6.88
small baitfish	3.05	0.07	3.12
prawns (marine)	0.79	<0.01	0.79
all other species	0.20	0.07	0.27
Total	**10.82**	**0.25**	**11.07**

10 EXPENDITURE

10.1 Introduction

Information on direct expenditure was collected from resident fishers aged five years or older during the second phase of the survey, during the diary interviews. Respondents were also asked where the expenditure occurred and each expenditure event was allocated an economic zone, either in the Northern Territory (Figure 4) or interstate (expenditure outside of Australia was not included). Only expenditure related to vehicle fuel was not allocated an economic zone.

Results are presented as expanded population estimates (based on ABS estimated resident population and participation rates obtained from the initial survey).

10.2 Expenditure

All expenditure related to recreational fishing personally incurred by the respondent was recorded during the diary survey. Such expenditure could either be directly associated with a fishing event or occur as an ‘expenditure only’ event. In this way, any expenditure related to recreational fishing was obtained even if a recreational fisher did not actively fish during the diary phase of the survey. Note: by design, the study did not attempt to assess the economic 'value' of the recreational fishery and it is recognised that expenditure information (although an important measure of economic activity) equates to the 'cost of inputs', in terms of any such valuation.

Direct expenditure was obtained for several categories. When an expense was incurred, the proportion of this amount directly attributable to fishing was also ascertained e.g. if a boat outing included fishing and water-skiing, only that proportion of the fuel and costs directly attributable to fishing was recorded.

10.3 Direct Expenditure within the Northern Territory

Both residents of and visitors to the Territory incurred direct expenditure on recreational fishing within the Northern Territory. Expenditure by residents and visitors by expenditure category is presented in Table 75.

Table 75. Total expenditure per year within the Northern Territory by expenditure category, recreational fishers aged five years or older

	Residents ($)	Visitors($)	Total ($)
boat - capital	10,426,166	9,393	10,435,559
car – daily running costs and fuel	5,590,590	16,553	5,607,143
boat - hire/charter	954,592	4,215,135	5,169,727
accommodation	220,363	3,289,762	3,510,125
boat/trailer - maintenance	3,027,117	11,689	3,038,806
boat - fuel	1,693,812	451,918	2,145,729
tackle – capital and maintenance	1,314,538	140,985	1,455,523
fees (clubs, licence, access etc)	918,528	40,044	958,571
tackle - terminal (eg hooks and line)	588,276	74,912	663,188
camping equipment	499,009	20,434	519,443
bait	354,172	132,249	486,421
other travel (within the NT)	248,321	218,232	466,553
clothing	121,183	3,373	124,556
car - capital	47,613	43,782	91,395
ice	83,115	1,384	84,499
books/magazines	16,842	5,093	21,935
diving - equipment/air refills etc	1,548	0	1,548
other	96,836	34,820	131,655
Total	**26,105,784**	**8,674,938**	**34,780,721**

Total annual expenditure, **directly** attributable to recreational fishing in the NT is estimated at almost $35 million. Resident fishers account for a substantial majority ($26 million or 75%) of the total expenditure. Overall, capital expenditure on boats was the highest expenditure category, with over $10 million being spent, representing 30% of the total net expenditure and 40% of the total expenditure by residents. Daily running costs for vehicles were the second highest expenditure category overall and for residents. Overall, the most expensive aspect of recreational fishing for residents is buying, maintaining and running boats, which is over half (62%) of their yearly expenditure at over $16 million. The patterns of expenditure by residents were similar across the home regions. The highest level of expenditure for visitors was on boat hire and charter (49%) followed by accommodation (38%).

The average resident recreational fisher spends $594 per year within the Northern Territory directly on recreational fishing.

In 1995 capital expenditure on boats and daily running costs of vehicles were also the highest expenditure categories, however boat capital did not include expenditure on new boats (in 1995 this was included as capital investment in boats). The average resident fisher spent $460 per year on

recreational fishing in 1995, within the Northern Territory, however this did not include some expenditure categories, such as accommodation.

10.3.1 Regional direct expenditure within the Northern Territory

The direct expenditure on recreational fishing by residents and visitors within each economic zone is presented in Table 76 (see Figure 4). The Darwin region accounts for the majority (75%) of the direct expenditure. However expenditure in the east and west Arnhem zones is significant, particularly by visitors.

Table 76. Total expenditure per year by economic zones, recreational fishers aged five years or older

		Residents ($)	**Visitors($)**	**Total ($)**
Darwin region (Y1)	No.	17,400,503	4,416,901	21,817,403
	%	85	51	75
West Arnhem (Y4)	No.	38,681	2,950,832	2,989,514
	%	<1	34	10
East Arnhem (Y5)	No.	1,680,687	275,478	1,956,165
	%	8	3	7
Arnhem H'way (Y3)	No.	497,051	399,741	896,791
	%	2	5	3
Katherine (Y7)	No.	656,378	40,732	697,110
	%	3	<1	2
McArthur Coast (Y8)	No.	29,085	413,349	438,734
	%	<1	5	2
Douglas – Daly (Y6)	No.	104,420	63,605	168,025
	%	1	1	1
Tmber Creek West (Y9)	No.	67,273	81,251	148,525
	%	<	1	1
Center (Y10)	No.	79,953	0	79,953
	%	<1	<1	<1
Tiwi (Y2)	No.	22,086	0	22,086
	%	<1	0	<1
Total	**No.**	**20,576,117**	**8,641,889**	**29,214,306**
	%	**100**	**100**	**100**

10.4 Direct Expenditure Outside the Northern Territory

Residents of the Territory also incurred direct expenditure on recreational fishing within other states of Australia (expenditure outside Australia was not included in the survey). External expenditure by residents by expenditure category is presented in table 66.

Total annual expenditure, by Northern Territory residents in other states of Australia, **directly** attributable to recreational fishing is estimated at almost half a million dollars. Overall, capital expenditure and maintenance of fishing tackle was the highest expenditure category, with over $150,000 being spent, representing 36% of the total external expenditure.

Table 77. Total expenditure per year by expenditure category, recreational fishers aged five years or older

	Residents ($)
tackle – capital and maintenance	157,630
boat - capital	63,601
boat - fuel	55,268
tackle - terminal (eg hooks and line)	45,748
boat hire	37,755
camp	22,839
fees	22,233
bait	13,275
accommodation	10,456
books	4,464
boat m	1,923
car c	1,038
ice	771
dive	190
Total	**437,191**

11 AWARENESS AND OPINIONS

11.1 Introduction

The information contained in this section of the report was collected at the end of the diary phase for residents, to ensure that the educational effects of certain questions (e.g. enhanced awareness of size and possession limits) did not influence the behaviour of respondents during the diary phase. A diarist (aged 15 or more) was selected randomly from each household and asked a series of questions to assess opinions on a range of fishing related issues.

Results are presented as expanded population estimates (based on ABS estimated resident population).

11.2 Motivation for Fishing

As the first question in this phase of the survey, respondents were questioned about their motivations to go fishing. They were asked to rate eight factors according to their importance.

Table 78. Importance of factors, recreational fishers aged 16 years or older

Motivation		Very	quite	Not very	Not at all	unsure
relax or unwind	%	63	31	5	1	0
to be outdoors	%	65	31	3	0	0
solitude	%	16	28	36	20	1
time with family	%	31	30	29	10	0
time with friends	%	24	52	21	3	0
fishing competitions	%	1	5	22	72	1
sport of catching fish	%	29	45	17	8	1
catch fish for food	%	20	29	31	20	1
Total	**%**	**31**	**31**	**20**	**17**	**0**

The most important factors were to ‘relax and unwind’ and to be outdoors. Both of these factors were important to at least 94% of respondents. The least important motivation for fishing was fishing competitions, only being important to 6% of respondents. These results were similar to fishers in the rest of Australia (Henry and Lyle 2003)

Respondents were then asked their primary reason for fishing. The primary reason for most residents to go fishing is to be outdoors (32%), followed by relaxing and unwinding (28%) (Table 79). This result differed quite significantly for fishers in other states of Australia (Henry and Lyle 2003). In other States the primary reason for fishing was to relax and unwind, followed by fishing for sport. Overall, being outdoors ranked fourth as the primary reason to go fishing, with most States ranking it at least third.

Table 79. Primary reason for fishing, recreational fishers aged 15 years or older

Motivation		Residents	National
relax or unwind	%	28	37
to be outdoors	%	32	13
solitude	%	4	2
time with family	%	11	15
time with friends	%	10	5
fishing competitions	%	0	0
sport of catching fish	%	9	18
catch fish for food	%	2	8
Total	**%**	**100**	**100**

11.3 Satisfaction of Fishing

Respondents were asked how satisfied they were with "*the overall quality of fishing* " they had done in the previous 12 months. Fishers were generally satisfied with the quality of fishing, with 29% stating they were very satisfied (Table 80).

Table 80. Satisfaction of fishing, recreational fishers aged 15 years or older

		Very	quite	Not very	Not at all	unsure
Satisfaction	%	29	56	13	0	2

Fishers who were dissatisfied with the fishing were asked why they were dissatisfied. The majority of these respondents indicated that they were dissatisfied because they had not caught a fish/enough fish (Table 81).

Table 81. Primary reason for dissatisfaction of fishing, dissatisfied resident recreational fishers aged 15 years or older

Reason		
no fish	%	73
conditions	%	3
quality	%	8
personal skill	%	5
environment	%	3
crowded	%	5
time	%	5
Total	**%**	**100**

11.4 Awareness of Fisheries Legislation

Awareness of various fisheries legislation was assessed through a series of questions, the results to which are presented in Table 82.

Table 82. Awareness of legislation by resident recreational fishers aged 15 years or older

		Full awareness	General awareness	No awareness
barramundi size limit	%	56	24	20
barramundi possession limit	%	52	25	23
mud crab size limits	%	36	34	31
mud crab possession limit	%	31	28	41
jewfish possession limit	%	24	25	52
overall possession limit	%	20	26	54
Mary River closure (seasonal)	%	36	21	43
Daly River closure (seasonal)	%	23	28	49

The only regulations well known amongst resident recreational fishers were the barramundi minimum size and possession limits, with 80% and 77%, respectively, of resident recreational fishers being at least generally aware of the regulation. About half of the fishers knew the actual barramundi size and possession limits. About half of the fishers had an awareness of the other regulations but only around 30% of fishers knew the regulation (full awareness). The regulation with the least awareness was the overall general possession limit, with 54% of fishers having no awareness of the regulation at all.

Compared to 1995, there has been an increase in the general awareness of the seasonal closures on the Daly and Mary Rivers and the size and possession limits for mud crabs (the jewfish and general possession limit were introduced in 1996 and 1997, respectively).

11.5 Attitude to Fisheries Legislation

Immediately following the questions on awareness of fisheries legislation, recreational fishers aged 16 years or older were asked, as a measure of public support for recreational fisheries legislation, *"in general, do you think…….are a good idea or not?"*.

Almost universal support exists for fisheries legislation generally, with 96% of resident recreational fishers in favour of size and possession limits and seasonal closures (Table 83).

Table 83. Attitude to fisheries legislation recreational fishers aged 15 years or older

		Size limits	Possession limits	Closures
in favour	%	96	96	96
not in favour	%	2	1	1
unsure	%	2	3	3

Total	**%**	**100**	**100**	**100**

11.6 General Possession Limit

All respondents who were aware of the general possession limit were asked further questions. All respondents who were aware of this limit (46% of all respondents) agreed with a general possession limit.

Table 84. Attitude to fisheries legislation recreational fishers aged 16 or older

as is	%	57
higher	%	1
lower	%	42
Total	**%**	**100**

All respondents who believed the (30 fish) general possession limit should be lower thought it should be 20 fish or less, with 39% of respondents stating it should be 10 fish or less (Table 84). (Note: since the survey was conducted the general possession limit has been changed. It remains at 30 fish, but this number now includes the individual possession limits for managed finfish species).

11.7 Recreational Fishing Licence

The level of support for the introduction of a general recreational fishing licence (…….. *along the lines of those in Victoria and New South Wales, where children and pensioners are exempt and revenue is used directly in research and improvement of recreational fishing*) was assessed for resident recreational fishers aged 15 years or older.

Slightly less than half of resident fishers aged 15 or more did not support the introduction of a general fishing licence (Table 85). About equal numbers of fishers in the coastal and hinterland regions did and did not support the introduction of a licence, however, in the Darwin region, a larger number of fishers did not support a licence. There is also a large number of fishers who are undecided about the issue, particularly in the hinterland region.

Table 85. Support for a general recreational fishing licence by resident recreational fishers aged 15 years or older

		Darwin	Coastal	Hinterland	Total
support	%	34	42	38	36
no support	%	52	42	36	48
unsure	%	14	16	27	16
Total	**%**	**100**	**100**	**100**	**100**

11.8 Sources of Information

Respondents were asked if they were aware of the ongoing program of public discussion and consultation on fisheries related issues. In the previous 12 months to the survey, focus was on the management of golden snapper and the recreational use of drag nets. Only 23% of respondents were aware of the public discussion process (72% unaware and 5% unsure). Respondents who were aware of the process were then asked how they had heard about it. The percentages given in Table 86 represent the number of recreational fishers who acknowledged a particular method.

The majority of respondents who were aware of the discussion and consultation process obtained their information from the print media and television (60%).

Table 86. Sources of information on discussion process, recreational fishers aged 16 years or older

		Main source	2nd source
other print media	%	36	7
television	%	24	5
government displays/shows	%	9	
fishing magazines	%	8	6
radio.	%	6	14
other fishers	%	5	3
government brochures/publications	%	2	
tackle shop	%	1	
clubs/associations	%	1	
government. internet/website	%		1
unsure	%	7	5
no second source		n/a	53

11.9 Other Comments

All respondents were also given the opportunity (without specific prompting) to raise any issues, concerns or suggestions concerning recreational fishing, environmental aspects of fishing and the survey.

11.9.1 Fishing issues

The comments made concerning recreational fishing issues fell into seven broad categories

Table 87. Number of fishing issues raised by category, recreational fishers aged 16 years or older

Issue		
more fisheries legislation	%	26
more enforcement	%	18
commercial fishing issues	%	17
access/facilities issues	%	11
licence issues	%	11
education issues	%	9
positive comments	%	6
others	%	3
Total	**%**	**100**

More fisheries legislation (26% of all comments)

Most of the suggestions for increased controls were specific rather than general, and centred around size and possession limits. A new theme of comments involved a requirement for boat registration/licences. All comments regarding the fisheries legislation suggested additional/increasing controls.

"A maximum size limit intro for Barra - 1 metre max".

"Bag limit for Jew Fish could be reduced to 2 per person"

"Boats in the NT should be registered and licensed."

"Reduce overall possession limits to 15 fish per person - to promote breeding and preserve stocks"

More enforcement (18% of all comments)

Most of the comments were general, suggesting more police and increased enforcement. Other comments suggested policing of specific issues.

"More policing and on spot fines"

"Police boat ramps"

"Potential for more policing and inspection of improper fishing practises"

Commercial fishing issues (17% of all comments)

Most of the comments concerned limiting commercial fishing or fishing tour operators either generally or in specific areas or localities.

"Limit number of crab pots for commercial fishers"

"Fishing tour operator licences should be restricted"

"Commercial fishing should not take place within 5 km of the NT coastline"

Access/facilities issues (11% of all comments)

Most comments were about improving general access into fishing spots and the provision of more and improved boat ramps

"Should be more and better boat ramps."

"Improve access to fishing ramps, fishing locations and road"

"Keep areas open as much as possible for all"

Licence issues (11% of all comments)

Most comments were against the introduction of a licence and were probably in response to the earlier questioning in the survey.

Education issues (9% of all comments)

Most comments tended to be about better general education and fisheries controls and legislation, but some were more specific about certain issues.

"More promotion of fishing regulations of specific areas e.g. signs etc including web site"

"Educational programs to change attitudes of some fishers who disregard rules and regulations and behave irresponsibly."

"Make information on bag limits more readily available - pamphlets - ramp signage etc."

Positive comments (6% of all comments)

"Fishing good in NT overall"

"Generally NT is lucky - good fishing available for all".

"Believes that AFANT and Fisheries and Government doing a good job for recreational fishers"

Other comments (3% of all comments)

Other comments varied across a wide range of issues, some comments by individuals were,

"More funding being put into recreational fishing research in the NT".

"Closed water systems getting crowded – e.g. Corroboree especially with party barges etc - have boat size restrictions"

11.9.2 Environmental issues

Most of the comments raised the issue of litter and marine debris, development and destruction of mangroves, either generally or at specific locations (Table 88).

"Destruction of mangroves."

"Leave Harbour undisturbed"

other comments by individuals included,

"Old nets washed up on beaches - loss of sea turtles"

"Concerned about mangrove loss for redevelopment"

"River banks becoming eroded as boats become more numerous and bigger in size."

Table 88. Number of environmental issues raised by category, recreational fishers aged 15 years or older

Issue		
development	%	39
litter	%	36
marine debris	%	8
pollution	%	7
erosion	%	5
weeds	%	5
Total	**%**	**100**

11.9.3 Survey issues

Most (93%) of the comments were positive and supportive of the survey being conducted, with the remainder containing suggestions about the survey methodology.

"Very good idea - otherwise would not have participated."

"Survey good idea if results going to used for the improvement of recreational fishing for the future."

"Been a pleasure to participate"

11.9.4 Other comments

Other comments varied across a wide range of issues, some comments by individuals were,

"Crocodile numbers are getting out of hand."

"Cost of equipment is very high. Too high for most people."

"Only wish there was more fishing in Alice Springs"

12 REFERENCES

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APPENDIX 1 – SURVEY DEFINITIONS

A. People 'in' the survey

Respondent - any person in the survey aged five years or more. An age criterion of five years old was applied in terms of personal fishing activity, on the basis of independent fishing capability (i.e. without constant parental supervision) and 15 years old in terms of independent attitudes to recreational fishing.

Residents – people who normally live in the Northern Territory.

Visitors - people who normally reside outside of the NT. They were included in the survey from their State of origin and any fishing activity by visitors in the Northern Territory was included.

Diary survey eligibility - any residents who were intending to fish within the next 12 months or visitors who had fished or were going to fish during their stay in the Territory were included in the longitudinal survey.

B. Fishing Definitions

(i) Recreational fishing - includes *"prawning, crabbing, spearfishing, or even gathering oysters or aquarium fish".* Any commercial fishing activity and indigenous fishing are excluded.

(ii) Target fishery

The target refers to the type of fishing done or species fished for. Although respondents were asked which specific species they were targeting, for reporting purposes, targeting groups were used.

Barramundi - all fishing specifically for barramundi.

Game or sportfish - all fishing for pelagic type gamefish such as mackerel, tuna and sailfish. This category does not include barramundi or any freshwater species.

Reef fish - all fishing that occurs over a reef or rocky bar where 'reef fish' are commonly caught. Species targeted include coral trout, golden snapper and jewfish.

Fishing for bait - all fishing activities where the primary purpose was to catch bait.

Not fish - any fishing or gathering that targets organisms other than fish i.e. mud crabs, prawns, oysters, etc (this should not be confused with non-fish – see catch terminology).

No specific target - includes all other kinds of fishing activity.

(iii) Effort

Fishing effort – two measures of fishing effort have been used:

Days fished – any day on which recreational fishing activity occurred.

Hours fished – actual hours spent recreational fishing, excluding major breaks of more than 10 minutes

(iv) Catch

Fish - all fish including fin-fish, sharks and rays.

Non-fish - all non-fish including shellfish, crabs and squid.

Catch - the total number of organisms caught.

Harvest - the total number of organisms retained or kept from the catch.

Release - the number of organisms from the catch released and returned to the water.

APPENDIX 2

Table A1. Fishing areas for data analysis purposes (from Figure 3)

Code	Fishing area	Code	Fishing regions
A	West Coast	1	Victoria River
		2	Fitzmaurice River
		3	Moyle River
		6	Finiss River
		7	Bynoe Harbour
		40	
		41	
		43	
B	Daly River	4	Daly River
		42	Perron Islands
		63	
C	Katherine area	5	Katherine
D	Darwin Harbour area	8	Tiwi Islands
		9	Inland Darwin area
		10	Arms and Harbour
		11	Shoal Bay
		12	Artificial reefs
		44	Fenton Patches
		46	
		60	Marchart complex
		61	Manton Dam
E	Adelaide River	13	Adelaide River
		45	Vernon Islands
F	Mary River	14	Mary River
		62	Shady Camp
G	Alligator Rivers	15	Wildman River
		16	West Alligator River
		17	South Alligator River
		18	East Alligator river
H	Cobourg Peninsula,	19	
		20	
		47	Chambers Bay
		48	
		49	
I	North Coast	21	Goomadeer River
		22	Liverpool/Mann Rivers
		23	Blyth River
		24	Goyder River
		25	Woolen/Habgood Rivers
		50	Croker Island
		51	

Code	Fishing area	Code	Fishing regions
		52	
		53	English Company Islands
J	Nhulunbuy area	26	Nhulunbuy area
		54	
K	Roper area	27	Walker River
		28	Rose River
		30	Roper River (Roper Bar)
		31	Roper River (Mataranka)
		32	Towns River
		33	Limmen Bight/Cox Rivers
		37	Wearyan/Robinson Rivers
		38	Calvert River
		56	
		59	
L	McArthur area	34	Rosie/Bing Bong Creeks
		35	McArthur River
		36	McArthur River
		57	
		58	Sir Edward Pellew Islands
M	Islands	29	Groote Eylandt
		55	
N	Centre	39	

Table A2. Economic zones

Code	Economic zone
Y1	Darwin region
Y2	Tiwi
Y3	Arnhem H'way
Y4	West Arnhem
Y5	East Arnhem
Y6	Douglas – Daly
Y7	Katherine
Y8	McArthur Coast
Y9	Tmber Creek West
Y10	Center

Table A3. Species/groups of fish and aquatic organisms reported during the survey

High level grouping	Low level grouping	Common name
Cephalopods	Squid/cuttlefish	Squid - unspecified
Crabs and Lobsters	Blue swimmer crab	Crab - blue swimmer/sand
	Crabs (other)	Crab - unspecified
	Lobsters	Lobster - tropical/ornate
	Lobsters	Lobster - unspecified
	Mud crab	Crab - mud
Finfish	Australian bass/perch	Cod - freshwater
	Australian bass/perch	Perch freshwater - unspecified
	Barramundi	Barramundi
	Bream	Bream - black/northern/pikey/marine
	Bream	Bream - unspecified
	Catfish	Catfish - freshwater
	Catfish	Catfish - saltwater/eel-tailed
	Catfish	Catfish - saltwater/fork-tailed
	Catfish	Catfish - unspecified
	Cod (various)	Cod - other
	Cod (various)	Cod - unspecified
	Coral trout	Coral trout - unspecified
	Coral trout	Coronation trout
	Dart	Dart/ swallowtail
	Eels	Eel - other
	Eels	Eel - unspecified
	Emperors	Emperor - grass sweetlip
	Emperors	Emperor – grass/tricky
	Emperors	Emperor - other
	Emperors	Emperor - red throat/sweetlip
	Emperors	Emperor - spangled
	Emperors	Emperor - unspecified
	Flathead	Flathead - unspecified
	Garfish	Garfish - unspecified
	Grunters/trumpeters	Grunter - sooty
	Grunters/trumpeters	Perch - spangled/spangled grunter
	Grunters/trumpeters	Trumpeter - grunters/javelin fish
	Mackerels	Mackerel - broad barred
	Mackerels	Mackerel - narrow barred/Spanish
	Mackerels	Mackerel - spotted
	Mackerels	Mackerel - unspecified
	Mullet	Mullet - unspecified
	Mulloway/jewfish	Jewfish - other
	Mulloway/jewfish	Jewfish - unspecified
	Mulloway/jewfish	Jewfish/spotted croaker/spotted jew/black jew
	Other	Archer fish
	Other	Bass - sand

High level grouping	Low level grouping	Common name
	Other	Bony bream
	Other	Clown fish
	Other	Cobia/black kingfish
	Other	Finfish - ID unknown
	Other	Fish - other
	Other	Fusilier
	Other	Long Tom
	Other	Marlin - unspecified
	Other	Moonfish/batfish
	Other	Queenfish
	Other	Rainbow fish
	Other	Remora
	Other	Sailfish - indo pacific
	Other	Saratoga
	Other	Sweetlips - painted/slatey bream
	Other	Tarpon/ox-eye herring
	Other	Toads/pufferfish/boxfish/blowfish
	Pike	Barracuda/ striped sea pike
	Red emperor	Emperor - red
	Rock-cod/gropers	Cod - estuary/ greasy
	Sea perch/snappers	Nannygai/ redfish/scarlet sea perch
	Sea perch/snappers	Snapper - golden/fingermark
	Sea perch/snappers	Snapper - mangrove jack
	Sea perch/snappers	Snapper - other
	Sea perch/snappers	Snapper - red/redfish/scarlet perch/saddle
	Sea perch/snappers	Snapper – Russel's/Moses' perch/fingermark
	Sea perch/snappers	Snapper - stripey sea perch/Spanish flag
	Sea perch/snappers	Snapper - unspecified
	Sharks/rays	Rays/skates - unspecified
	Threadfin salmon	Salmon - blue
	Threadfin salmon	Salmon - northern threadfin/bluenose
	Threadfin salmon	Salmon - unspecified -Nth
	Trevally	Trevally - giant/ turrum
	Trevally	Trevally - golden
	Trevally	Trevally - unspecified
	Tuna	Tuna - unspecified
	Whiting	Whiting -unspecified
	Wrasse/tuskfish/gropers	Tuskfish/parrotfish - unspecified
	Wrasse/tuskfish/gropers	Wrasse - unspecified
	Other	Non-fish - other
Molluscs (shells)	Bivalves (other)	Clams - unspec.
	Bivalves (other)	Cockles - unspecified
	Mussels	Mussels - unspec.
	Other	Shells - unspecified
	Oysters	Oysters

High level grouping	Low level grouping	Common name
	Pippi/cockle	Pippi
Prawns and yabbies	Crayfish (freshwater)	Red claw
	Crayfish (freshwater)	Yabbies
	Macrobrachium/cherabin	Macrobrachium/cherabin
	Prawns (saltwater)	Prawns
Small baitfish	Herring/pilchards	Herring - other
	Herring/pilchards	Herring - unspecified
	Herring/pilchards	Pilchard
	Small baitfish	Small baitfish