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2000/01 Survey of Recreational Fishing in Tasmania

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Executive Summary

This study represents the first comprehensive assessment of recreational fishing in Tasmania. It provides baseline information about participation, catch and effort and expenditure, against which future trends can be assessed. It formed part of a coordinated national study that involved a screening survey (telephone) of households to ascertain demographic and fishing characteristics, and was followed by a diary survey during which fishing and related economic activity was monitored over a period of twelve months. Response rates across all facets of the study were very high, giving considerable confidence in the quality of the data.

In the twelve months prior to May 2000 an estimated 124,590 Tasmanian residents aged 5 years or older fished at least once, representing a participation rate of 29%. By region, highest participation rates occurred amongst residents of the Southern statistical division (38%), compared with between 27-30% for other regions. Recreational fishing was more popular amongst males, with a state-wide participation rate of 40%, compared with 19% for females. Participation rates varied with age, with 5-14 year olds having the highest rate of participation, although the greatest numbers of fishers were in the 30-44 age group.

In 2000, approximately 11% of Tasmanian households (almost 20,800) owned at least one boat used for recreational fishing, representing a total of over 23,000 vessels, with an estimated gross replacement value of $238 million. Vessels up to 16 m in length were reported but the majority were in the 4-5 m size range. Most of the recreational fleet was powered, with trailer boats the dominant group. The occurrence of electronic aids (echosounders and GPS units) on vessels was linked with increases in vessel size.

Information about fishing effort, catch and related economic activity of recreational fishers was monitored between May 2000 and April 2001. Local residents and interstate visitors expended an estimated 0.8 million fisher days of effort in Tasmania. The average number of days fished per fisher during the survey period was just over 6 days, with a median of three days. The distribution of effort between fishers was in practice highly skewed, with 20% of fishers accounting for 60% of the total effort.

Effort was also calculated in terms of fishing events and hours fished, with over 0.9 million events and 4.3 million fisher hours of effort expended in Tasmania during 2000/01. Line fishing was the primary activity undertaken by recreational fishers (86% events and 56% hours fished), followed by pot fishing (7% events and 30% hours), the use of gillnets (5% events and 12% of hours) and dive collection (3% events and 1% of hours). A range of other fishing methods was also reported, including the use of spears,

seine or bait nets, and hand collection but these were of minor importance by comparison.

Around three quarters of the fishing effort (events) occurred in saltwater, primarily in inshore coastal waters and to a lesser extent estuarine waters. In freshwater, effort was mainly concentrated in lakes as opposed to rivers. Overall, effort was distributed equally between boat and shore-based fishing but in freshwater and estuarine fisheries most effort was shore-based while boat-based effort dominated the inshore (and offshore) fisheries.

Recreational fishing effort was heaviest off the east coast (including the southeast), accounting for half of the total number of fishing events. The north coast attracted about 20% of total effort, with relatively low levels of effort reported from the west coast and Bass Strait islands. Approximately one quarter of the fishing effort occurred in inland waters, with slightly greater effort in the Central Plateau and Eastern regions compared with the Western region.

A wide variety of fish and shellfish species were caught by recreational fishers, including over 3.95 million finfish, just over half of which (2.1 million) were flathead (primarily sand flathead). Other finfish species or species groups of significance included Australian salmon, trout, mullet, cod and gurnards. Other key recreational species included squid (mainly calamary), rock lobster, and abalone.

Just over one third of all finfish captured were released or discarded. For some species such as flounder and striped trumpeter discard rates were low (<10%). On the other hand, discard rates were high (>60%) for species like gurnard and wrasse. Discard rates were low for squid but moderate for rock lobster.

The annual recreational harvest of flathead was estimated at 361 tonnes, almost six times larger than the commercial catch taken from state fishing waters. By weight, other species of importance included Australian salmon (111 tonnes), trout (147 tonnes), jackass morwong (44 tonnes), bastard trumpeter (43 tonnes), barracouta (55 tonnes), striped trumpeter (38 tonnes), rock lobster (73 tonnes) and abalone (52 tonnes).

Line fishing catches were dominated by flathead followed by Australian salmon, trout, cod and bream. The main species caught by gillnets were bastard trumpeter, mullet and jackass morwong. Mullet was the primary species taken by seine nets while flounder dominated the spear catch. The vast majority of the pot catch was rock lobster, while abalone and rock lobster were main dive caught species.

Trout dominated the finfish catches in freshwater, with redfin and blackfish of secondary importance in the lake fishery and eels and blackfish in the river fishery. Flathead and Australian salmon dominated estuarine and inshore coastal catches, with cod and bream of secondary importance in the estuarine and mullet and flounder in the coastal fisheries. Jackass morwong, tunas, striped trumpeter and gurnards were the main components of the offshore catch composition.

Regionally, about two thirds of the total finfish harvest was taken from the east (including southeast) coast. By species, this region was particularly important for catches of flathead, bream, bastard trumpeter and striped trumpeter, with the southeast especially significant for flounder, blue warehou and cod. Mullet were mainly taken off the north coast, with blue warehou and Australian salmon catches concentrated off the northwest coast. The west coast was also a relatively important region for Australian salmon, cod and bastard trumpeter. The southeast and, to a lesser extent,

central east coast regions were the main areas for calamary, rock lobster and abalone catches. Moderate quantities of lobster and abalone were also captured from the west coast. The inland trout fishery was concentrated in the lakes of the Central Plateau, especially Arthurs Lake and Great Lake, with catches from rivers of secondary importance.

Catches of many of the key species were most intense during summer and autumn (November to April). They included flathead, bream, mullet, trout, calamary, rock lobster and abalone. In addition to summer, there was a secondary peak in catches of Australian salmon and flounder during winter while striped trumpeter showed little evidence of a seasonal pattern in recreational catches. Cod was the only species group for which there was an obvious winter peak in catches.

Total expenditure attributable to recreational fishing in Tasmania during 2000/01 was estimated at $51.8 million but owing to the exclusion of certain expenditure items and non-coverage of expenditure by non-fishers, this represents a minimum estimate of the economic impact of recreational fishing. Boats/trailers (including purchase, maintenance, running costs, registration and insurance) represented the largest expenditure category at $20.9 million (40% of the total). Travel associated with fishing (primarily vehicle running costs) was the second highest expenditure category, accounting for about $15.7 million (30%). Clothing (including life jackets, wet weather gear) and accommodation were next in importance, about $4.3 million each, followed by fishing gear, at approximately $4.0 million, and fees/licences (primarily fishing licences) at $1.6 million.

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1. Introduction

With growing awareness of the significance of the recreational fishery in the early 1990's, a national policy for recreational fishing was developed in Australia. The policy was released in 1994 and endorsed the principle that "fisheries management decisions should be based on sound information including fish biology, fishing activity, catches and economic and social values of recreational fishing" (National Recreational Fisheries Working Group 1994). The policy recommended that a national survey of recreational fishing be undertaken once every five years. Recognition was also given to public concern over the then poor quality of data on recreational fishing.

Following extensive consultation and development phases, the Commonwealth, State and Territory fisheries agencies implemented the National Recreational Fishing Survey (NRFS) in early 2000. The principal objectives of the NRFS were to determine participation rates in recreational fishing, profile the demographic characteristics of recreational fishers; quantify recreational catch and effort; collect data on expenditure by the recreational fishing sector; and establish attitudes and awareness of recreational fishers to issues relevant to the fishery (Henry and Lyle 2003).

The survey established that over 3 million Australians, that is almost one in five persons aged 5 or older, participated in recreational fishing at least once in the 12 months prior to May 2000. Between May 2000 and April 2001 recreational fishers expended over 20 million fisher days of effort, harvesting 136 million aquatic animals, including 60 million finfish, 6 million crabs and lobsters, and almost 2 million cephalopods. Line fishing accounted for 85% of the fishing effort, followed by fishing with pots and traps (7%), hand collection methods (4%), fishing with nets (3%) and diving (1%). Annual expenditure attributed to recreational fishing-related activities was estimated at $1.8 billion.

In addition to nationally aggregated information, Henry and Lyle (2003) provided summary statistics each of the states and territories. For Tasmania it was established that the rate of recreational fishing participation was higher than the national average (29.5% compared with 19.5%), the average number of days fished per year by fishers was slightly higher than the national average (6.55 compared with 6.1 days) while the average annual expenditure per fisher[1] was lower than the national average ($416 compared with $552).

[1] Based on attributed expenditure on selected recreational fishing-related items (refer Henry and Lyle 2003).

Prior to the NRFS, only limited information was available about recreational fishing in Tasmania. In 1983 an Australian Bureau of Statistics (ABS) household survey provided some general statistics on recreational fishing but no estimates of catch or effort (ABS 1984). At that time about one third of all persons aged 15 or older were engaged in some form of recreational fishing activity. A more recent survey of home food production estimated home seafood 'production' for the year ending April 1992 at over 1000 tonnes for finfish (including trout), 60 tonnes for rock lobster and 25 tonnes for abalone (ABS 1994).

There have been several other attempts to gather information about the recreational fishery in Tasmania. A survey of recreational fishing in the Derwent Estuary conducted in 1984 provided some information about motivation, expenditure and catch rates, but gave no information on effort levels, total catch or catch composition (Winter 1985). Lyle (2000) conducted a comprehensive survey of licensed marine recreational fishing that provided catch and effort information for the recreational net, rock lobster and abalone fisheries between 1996 and 1998. There have also been several other surveys of the recreational rock lobster and abalone fisheries (Forward and Lyle 2002, Lyle and Morton 2004) and limited surveys of gamefish catch and effort (Smith 1994, Evans 1995, Morton and Lyle 2003). In terms of the inland trout fishery, catch and effort trends have been monitored over several years using mail survey methods (Davies 1995).

The purpose of the present report is to provide a more detailed synthesis of the NRFS dataset as it relates to the recreational fishery in Tasmania and should be read in association with the national survey (Henry and Lyle 2003) and national economic (Campbell and Murphy in press) reports.

2. Materials and Methods

A detailed description of the survey scope, design philosophy, methodology, and data analysis is provided in Henry and Lyle (2003) and summarised here.

2.1 Survey scope

The survey encompassed the private dwelling resident population of Australia, aged five years and older, and their recreational fishing activity. In this context recreational fishing was defined broadly as the capture or attempted capture of aquatic animals in Australian waters (freshwater, estuarine, marine) other than for commercial purposes and all recreational fishing techniques and harvesting activities were included. Selected economic activity related to recreational fishing (expenditure and selected investment) was also within scope.

2.2 Survey methodology

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 managed by the appropriate fisheries agency.

A multifaceted survey design was developed, the principal components being an initial screening survey followed by a 12-month diary survey.

2.2.1 Screening survey

The screening survey was a general population survey, conducted by telephone, on a randomly selected sample of Australian households. The electronic white pages directory provided the sample frame and the survey was conducted during March and April 2000. The demographic profile of all household residents (age and gender) and recent recreational fishing involvement of all residents aged 5 or older was established along with likelihood (expectation) of doing any recreational fishing in the 12-months following the interview. All persons (regardless of previous fishing history) expressing a positive expectation to go fishing were invited to participate in the diary phase. For persons identified as recreational fishers, socio-economic characteristics (education and labour force status) were also established. Household boat ownership and vessel details, including use for recreational fishing was also established for all households as part of the screening survey.

2.2.2 Diary survey

Diary respondents' fishing and fishing-related economic activity was monitored between May 2000 and April 2001. Survey interviewers maintained regular telephone contact with diarists throughout the diary period in order to collect and record details of any fishing or fishing related expenditure that had occurred since the last contact. The use of interviewers in this manner allowed for greater detail and reporting precision than could be achieved in a traditional self-administered diary,

with interviewers being able to immediately clarify any misunderstandings or apparent reporting errors. Therefore, data consistency and completeness was ensured.

The level of fishing activity by each respondent determined the frequency of interviewer contact but, as a general rule, respondents were contacted at least once a month, even if no fishing was planned. Thus any activity not recorded in the diary could still be collected over the telephone with minimal concern about recall bias influences. In effect, the survey was tailored to match the level of fishing activity of the individual respondent, reducing burden and enhancing data quality and response rates.

Respondents were only required to record basic information in their diaries, for example start and finish times, catch and release details by species and expenditure by item category. More detailed information regarding target species, fishing location, fishing method, fishing platform (boat/ shore category) and water body type (lake/ dam, freshwater river, estuary, coastal or offshore marine) were collected and recorded by survey interviewers during the regular telephone contact with diarists. For water body type, and specifically the delineation between marine and freshwater environments, respondent perception was ultimately relied upon, since a more objective assessment was regarded as impractical. Expenditure details collected during telephone interviews included the item, cost, date, region in which expenditure occurred and level of attribution of the expenditure to recreational fishing. Attribution was expressed in terms of the proportion (percentage) that the respondent considered the expenditure to be directly linked to the recreational fishing experience as opposed to other activities.

2.2.3 Calibration surveys

Data quality issues were addressed through a series of calibration surveys designed to provide adjustments for non-response and to assess the extent of behavioural change (unexpected fishing) during the diary period (refer Henry and Lyle 2003). Australian Bureau of Statistics (ABS) resident population information (June 2000) was used to benchmark survey data for coverage and representation and to provide the basis for expansion of data to 'population' estimates. 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.

2.3 Data analysis

Reference should be made to Henry and Lyle (2003) for a full account of process of data analysis. Unless otherwise indicated, parameter estimates provided in this report are based on expanded data, that is they have been scaled-up to represent the population rather than the sample from which they were derived.

All estimates have statistical uncertainty associated, a consequence of surveying a sub-sample rather that the entire population, and this uncertainty is expressed as standard errors. For the purpose of this report standard errors have only been calculated for state-wide estimates and it should be noted that as information is disaggregated (e.g. in space and time) the relative size of the standard errors (i.e. standard error as a fraction of the parameter estimate) will increase.

In presenting survey data, consideration has also been given to: a) the number of individual data records on which expanded estimates are based and b) the size of the expanded estimates themselves. Estimates based on very few data records or particularly low expanded estimates will be much less reliable than those involving a large quantity of survey information. As a general principle in this report only those parameter estimates that involved at least 25 diary records have been reported.

2.4 Regions

2.4.1 Sampling regions

Initial household selection (i.e. telephone number) for Tasmania was based on stratified random sample design using the four ABS Statistical Divisions (SD) as strata: Greater Hobart (referred hereafter as Hobart), Southern, Northern, and Mersey-Lyell (Fig. 1). In describing household and population characteristics data have been analysed at stratum (SD) and State levels.

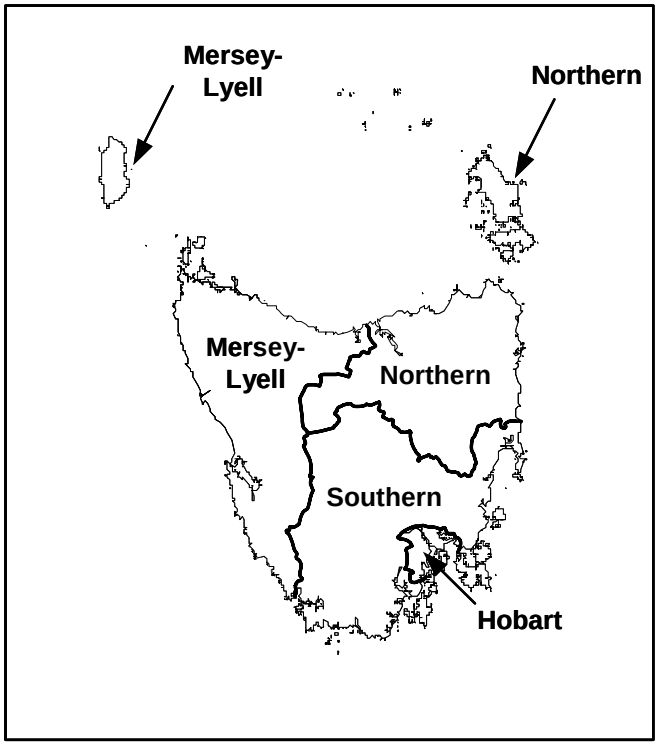

Fig. 1 Map of Tasmania showing ABS Statistical Divisions used for sample stratification.

2.4.2 Home regions

The concept of home region was applied to describe the region in which a fisher resided (determined from the initial sample selection) and was based on ABS statistical reporting regions (combination of SDs and Statistical Local Areas) (Fig. 2).

Note, the Southern SD was split into Huon and Midland-East regions while the offshore Bass Strait islands were split from the Northern and Mersey-Lyell SDs to create Launceston-North East Rural and West-North West Rural regions, respectively. Flinders and King Islands were combined to form the Bass Strait Island home region.

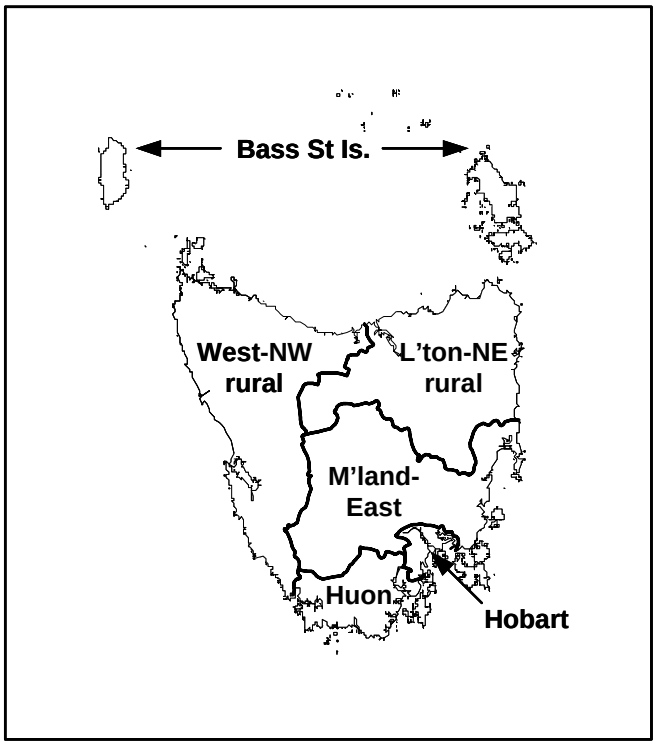

Fig. 2 Map of Tasmania showing regions used for reporting residency - Home Region - and economic activity - Economic Zone.

2.4.3 Fishing regions

Survey interviewers classified the location of each fishing activity into one of forty-nine fishing regions. However, for reporting purposes it has been necessary to collapse some regions to ensure that a minimum of 400 fishing events (i.e. raw unexpanded data) occurred in each reporting region. The combined Bass Strait Island (King and Flinders) region was the exception to this rule (with just 137 fishing events reported by diarists), but given the uniqueness and isolation of these island groups it was not considered appropriate to combine them with adjacent north coast regions. The fishing regions used for data reporting include inland, selected estuarine, and coastal regions as indicated in Fig. 3.

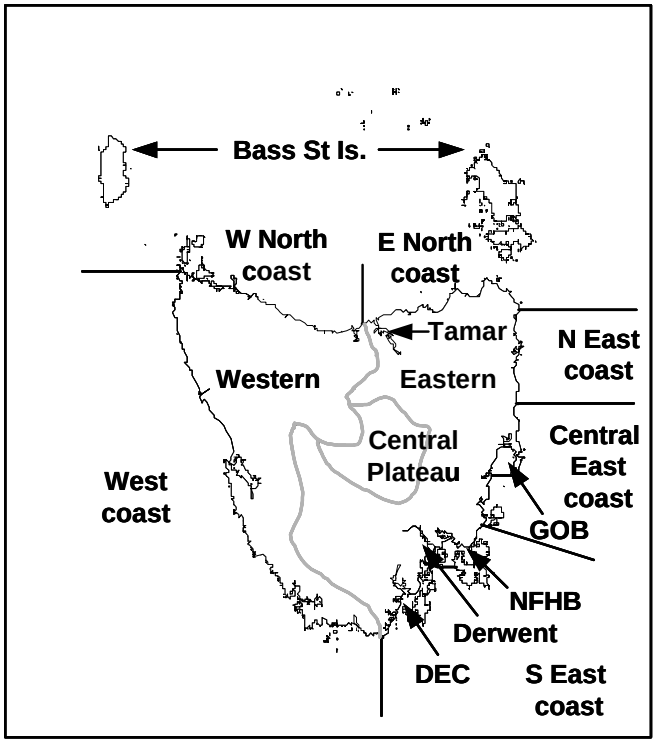

Fig. 3 Map of Tasmania showing analysis regions used for reporting fishing activities -Fishing Regions. GOB Great Oyster Bay; NFHB Norfolk & Frederick Henry Bays; DEC D'Entrecasteaux Channel.

2.4.4 Economic zones

The same regional boundaries as used to define home regions (Fig. 2) were applied when the reporting where fishing-related expenditure occurred. In order to distinguish between place of residence and location of expenditure the term Economic Zone has been adopted.

2.5 Fishing effort

Fishing information was collected on an 'event' basis, where an event was defined as a discrete fishing episode. Separate fishing events were recorded where there was a change in fishing region or water body type, target species and/or fishing method. In this way a day's fishing trip could comprise more than one event, for instance fishers commonly gather bait prior to fishing. Both the gathering of bait and the subsequent fishing were considered to be separate events since the effort expended in the capture of bait cannot be attributed to the capture of sport fish and vice versa. Similarly, the use of passive fishing gear, such as rock lobster pots or gillnets, whilst line fishing was recorded as separate fishing events. The delineation of fishing activity in this manner provided an ability to analyse effort (and catch) on the basis of fishing

method and target species/fishery. Furthermore, three measures of effort could be defined; namely fishing days (i.e. separate days in which some form of fishing was undertaken), fishing events, and hours fished.

It should be noted that person based effort has been calculated for this report. For methods such as line fishing this is clearly appropriate, but where shared or joint activities occurred, such as fishing with lobster pots or using graball nets, this can over estimate effort. For example, if three persons in a fishing party fished with pots (one or more pots) our analysis would indicate 3 person days of pot fishing, 3 person pot events and, on an hours fished basis, three times the pot soak time[2]. In this instance it would be more appropriate to analyse pot effort on the basis of the number of pots fished (i.e. per pot) when reporting method based effort (and method based catch rates).

2.6 Fishing methods

A variety of fishing/harvesting methods were used by diarists but for the purposes of analysis the following reporting categories have been defined: line fishing (using bait, lure/jig/fly, bait and lure/jig/fly, and set lines); pots (passive gear that includes lobster pots and traps), gillnets (graball and mullet nets); seine and bait nets (includes beach seine, dip nets, cast nets and bait nets); dive collection (includes spearfishing and hand collection on snorkel, scuba and hookah); spear (hand spearing from the surface); and other methods (including hand collection, pumps, spades).

2.7 Catch

Respondent perception was ultimately relied upon for catch identification, with respondents referred to a species identification booklet when uncertainties arose. Although excellent reporting precision can be achieved at the species level in some instances (confirmed through on-site surveys - Lyle and Campbell 1999; Lyle et al. 2002), species groupings were required where fishers could not reasonably delineate particular species, even using identification booklets. For example, icon species such as striped trumpeter were readily recognisable whereas identification to species level for flounder was less certain, even though flounders could be readily distinguished from other groups of fish.

For the purpose of high level reporting, catches have been grouped into seven categories according to taxonomy, primary method of capture and how they are utilised. The groups are finfish, small baitfish, crabs and lobsters, prawns and yabbies, cephalopods, other molluscs and other (miscellaneous) taxa. At the next level, organisms were arranged according to species or family groupings (e.g. bream, flathead, Australian salmon) to allow the reporting of catch data on the key species groups. Listing of taxa that comprise each of these groupings are provided in Appendix 1.

[2] Note: catch information was recorded on a person basis and where joint effort occurred the catch was attributed (split) between fishers in such a manner that multiple counting of the catch was avoided.

Catches personally taken by each diarist were reported as numbers of individuals kept or harvested and numbers released or discarded by species. These numbers were then expanded using estimates of fishing participation obtained from the screening survey to produce total catch numbers. In a small number of instances, respondents reported catches of small and generally abundant species (e.g. whitebait) in units of weight or volume. These catches were later converted to numbers using agreed number to weight or volume conversions[3].

2.8 Expenditure

In providing expenditure information, respondents identified the item or service provided, cost, when and where the expenditure occurred, the latter defined in terms of economic zones within or outside the respondent's state of residence. Apart from private vehicle travel, dollar values were collected for items or services. For practical reasons, distance travelled was employed for private vehicle travel and a rate of $0.50 per kilometre applied to cover vehicle running costs. Consequently, vehicle travel costs could not readily be defined in terms of where the 'expenditure' occurred.

Respondents were asked to provide an estimate of the proportion of their expenditure *associated* with fishing that they thought to be *attributable* to recreational fishing, as against any other activity incurred on the fishing trip or any other future use to be made of the item or service purchased. Attribution of expenditure thus related to the recreational choice and the use made of the expenditure item or service, as assessed by the respondent. This estimated value was then used as a proportional coefficient or weighting to provide an estimate of the amount of associated expenditure to be attributed to (or explained by the respondent's participation in) recreational fishing.

[3] These conversion factors were either assessed directly using field observation or 'best guess' estimates.

3. Sample and response profile

Table 1 provides a summary of the Tasmanian population as a June 2000 (based on ABS census data), sampling details and response profile relating to the initial screening survey. Since sampling was undertaken without replacement, that is if telephone numbers were disconnected or out of scope (non-private dwellings such as business numbers, fax numbers), there was some sample loss which effectively reduced the gross Tasmanian sample from 4022 to a net sample of 3392, of which 2755 households (81%) fully responded to the screening questionnaire. Response rates were consistent across all sampling strata. Overall, demographic profiling information was collected from 7190 persons aged 5 or older.

Table 1 Tasmanian private dwelling population (number of households), sample size, and response to the screening survey by stratum
Net sample- initial sample less sample loss

Stratum	Households	Initial sample	Net sample	Response	% Response
Hobart	77805	1480	1242	1015	81.7
Southern	13439	772	645	523	81.1
Northern	54409	885	752	599	79.7
Mersey-Lyell	43160	885	753	618	82.1
Total	188813	4022	3392	2755	81.2

Table 2 summarises response details as they related to the diary survey. Of those households identified at screening as having at least one resident with an intention to do some recreational fishing during the diary period (May 2000 to April 2001), 80% fully responded to the diary survey. Person based response rates were slightly lower (77%) since there were instances where some but not all fishers in a household completed the diary survey. In total 852 Tasmanian households and 1696 persons participated in the diary survey, with response rates very consistent across all strata.

Table 2 Response profile (household and person) to the diary survey by stratum

Stratum	Eligible Households	Diarist Households	% Response	Eligible persons	Diarists	% Response
Hobart	349	282	80.8	700	541	77.3
Southern	247	198	80.2	538	410	76.2
Northern	219	177	80.8	476	365	76.7
Mersey-Lyell	246	195	79.3	500	380	76.0
Total	1061	852	80.3	2214	1696	76.6

An alternative approach to defining the 'performance' of the diary survey is to compare the response rates based on initial diary acceptance. By comparing diary uptake (Table 3) and diary response with eligibility (Table 2) it is clear that most non-response to the diary survey occurred as an initial refusal to participate in the survey. Of those respondents who accepted the diary, over 95% fully participated for the full 12-month survey period.

Table 3 Diary uptake and response (household and person) by stratum

Stratum	Household diary uptake	Response	% Response	Person diary uptake	Response	% Response
Hobart	295	282	95.6	567	541	95.4
Southern	202	198	98.0	427	410	96.0
Northern	182	177	97.3	378	365	96.6
Mersey-Lyell	201	195	97.0	393	380	96.7
Total	880	852	96.8	1765	1696	96.1

By comparison with other general population telephone surveys and traditional mail-back diary studies, response rates achieved in this study are exceptionally high and represent an important indicator in terms of the overall performance of the survey instrument. However, as detailed in Henry and Lyle (2003), issues relating to non-response were explicitly investigated and adjustments have been made in determining weighting factors to address biases that arise from non-response.

4. Fisher characteristics

The following analyses are based on information derived from the screening survey of Tasmanian residents and are expanded, with non-response adjustment, to represent the resident private dwelling population of Tasmania.

4.1 Participation rates

Based on reported fishing activity in the 12 months prior to May 2000, an estimated 124,590 Tasmanian residents aged 5 or older fished at least once (Fig. 4A, Appendix 2). About 40% of fishers resided in the Hobart SD, 28% in the Northern, 21% in the Mersey-Lyell and 10% in the Southern SDs. The effective participation rate (proportion of the resident population) in recreational fishing for Tasmania was 29.3%, which was significantly higher than the national average of 19.5%. Regional participation rates were relatively consistent at 27-30% with the exception of the Southern SD, where 38% of the population engaged in some form of recreational fishing (Fig. 4B).

Household participation (i.e. at least one household member being a fisher) was also established, with 65,540 fisher households representing a household participation rate of 34.7%, ranging between 33.2% in the Northern SD to 44.4% in the Southern SD (Appendix 3).

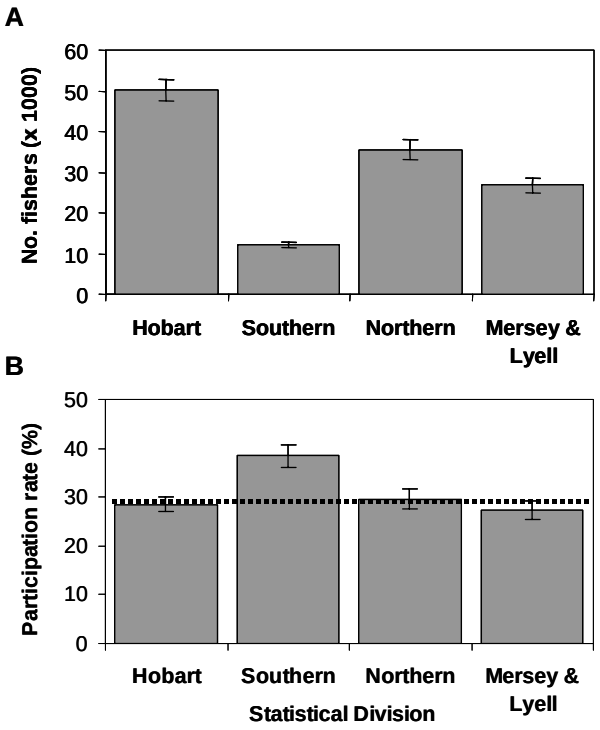

Fig. 4 Fishing participation in the 12 months prior to May 2000 by Statistical Division for persons aged 5 or older: A) Number of persons; and B) proportion of the resident population. Error bars represent one standard error and the dotted line represents the participation rate for Tasmania as a whole.

4.2 Age and gender

Recreational fishing was more popular amongst males, with 40% of the male and 18.9% of the female resident population in Tasmania aged 5 or older participating in recreational fishing in the 12 months prior to May 2000 (Appendix 4). By numbers, over twice as many males (83,526) than females (41,064) did some recreational fishing. The predominance of males involved in fishing, by number and proportion of population, was evident across all age groups (Fig. 5) and by statistical division (Appendix 4). Although the greatest numbers of fishers fell in the 30-44 years age group (23,332 males and 11,434 females), the highest participation rates occurred in the 5-14 years age group (51.4% for males and 32.1% for females or 42.0% overall). These underlying patterns of participation were consistent with those evident at a national scale (Henry and Lyle 2003).

The number of persons (both males and females) involved in fishing generally increased with age up until 30-44 years after which they declined quite markedly, such that by 75 years or older very few persons were involved in fishing (Fig 5A). Expressed as participation rates, however, there was a slight fall in the 15-29 years age group followed by an increase in the 30-44 age group and then a general decline there after such that by 60-74 years only 15% of persons were fishers and by 75 plus this had fallen to just 3% (Fig 5B, Appendix 4). This overall pattern was particularly influenced by the participation rates for males, with rates for females declining in each successive age group after 5-14 years.

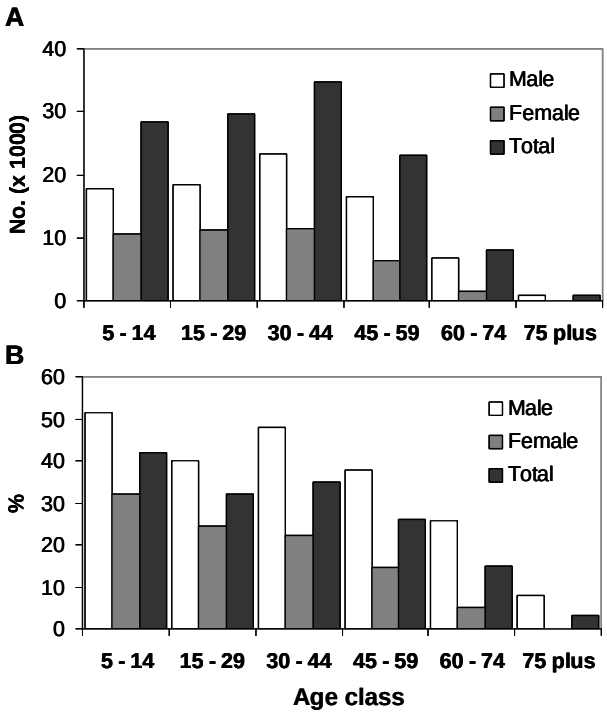

Fig. 5 Fishing participation in the 12 months prior to May 2000 by age class and gender by Tasmanian residents aged 5 or older: A) number of persons; and B) proportion (%) of the resident population.

4.3 Comparison with 1983

In October 1983 the ABS conducted a survey of about 2100 private dwelling households in Tasmania using face to face interviews to obtain information about fishing activities of all usual household residents aged 15 years or older (ABS 1984). The survey established that 107,031 Tasmanian residents fished at least once a year, representing a participation rate of 33.1%[4]. By contrast based on the present survey 96,180 persons 15 years or older, representing a participation rate of 26.9%, fished at least once a year in 2000 (refer Appendix 4). Thus, in absolute and relative terms there appears to have been a decline in recreational fishing participation in Tasmania between the early 1980s and the present time.

By gender, 48.7% of males aged 15 years and older (77,665 persons) fished at least one a year in 1983 compared with 37.7% (65,717 persons) in 2000. For females, the rates were 17.9% (29,366 persons) in 1983 and 16.6% (30,462 persons) in 2000.

[4] ABS document 3201.0 Population by Age and Sex, Australian States and Territories - Table 6. Estimated Resident Population By Single Year Of Age, Tasmania (December 2003).

The substantial fall in participation amongst males was clearly the underlying cause of the lower overall participation rate observed in 2000. While the reasons for this decline are unclear it does highlight the value of on-going assessments to establish trends and the need to identify key factors that influence recreational fishing participation. Of possible relevance to this observation has been the consistent and significant decline in recreational fishing participation rates in Queensland since the mid-1990s, with participation down from 28.1% in 1996 to 24.6% in 2001 (Higgs and McInnes 2003). Such information has application in future management planing and in the identification of potential changes in the socio-economic impacts of recreational fishing. Participation alone, however, does not adequately quantify impacts on the fisheries resources and thus there is a need to consider catch and effort information as well.

5. Boat ownership

The following analyses are based on information derived from the screening survey of Tasmanian residents and are expanded, with non-response adjustment, to represent the resident private dwelling population of Tasmania.

Of the 188,813 private dwelling households in Tasmania in 2000, an estimated 30,779 (16%) owned at least one vessel used for recreational purposes as at April 2000 (Appendix 5). Furthermore, 20,779 households (11%) owned boats that had been used for recreational fishing in the previous 12 months. The greatest number of boat owning households was in the Hobart SD, followed by Northern, Mersey-Lyell and Southern SDs (Fig. 6A). Proportionally, however, household boat ownership rates were highest in the Southern SD (25% overall and 17% for fishing boats), intermediate in the Hobart and Northern SDs and lowest in the Mersey-Lyell SD (11% overall and 9% for fishing boats) (Fig. 6B).

The total number of privately owned vessels (including jet skis, canoes, sailing boats, row boats and power craft) in Tasmania in 2000 was 39,739 boats, of which 23,111 (58%) were used for recreational fishing. Just under half (47% of all boats and 45% of boats used for recreational fishing) were owned by residents of the Hobart SD (Fig. 6C).

Recreational fishing boats were categorised according to length, primary storage location, propulsion mode, and presence of electronic equipment (Fig. 7, Appendix 5). Over 70% (16,312) were in the 4-5 m size range, although vessels up to 16 m in length were used for fishing (Fig. 7A). Vessels under 4 m comprised the next most common group (3685) and there were few vessels (642) larger than 10 m. Trailer boats accounted for 77% of the recreational fleet (17,799), with the bulk of the remainder stored on the shore or on moorings (Fig. 7B). Only a very small number of boats were classified as car-toppers. Almost 90% of recreational fishing vessels were powered (20,485), row/paddle and sail were of minor significance (Fig. 7C). Just over one third of all vessels (8165) had an echosounder while only 9% (2103) had a global positioning system (GPS) installed (Appendix 5). These electronic aids are generally used in the location of fish or fishing grounds in addition to navigation and their prevalence increased with vessel size such that about 60% of vessels 8 m or larger had echosounders (Fig. 7D) and about 50% had GPS (Fig. 7E).

The gross replacement value of the recreational fishing fleet was estimated at almost $238 million but based on the proportional usage for recreational fishing the fleet had an *attributed* value of $147 million (Appendix 5). Considering vessel size, the 4-5 m range accounted for $93 million (63%) of the attributed value whereas the small number of large vessels (> 10 m) had a disproportionately high value at $17 million (12%). Although relatively numerous, boats in the <4 m range were valued at just over $4 million (3% of total attributed value).

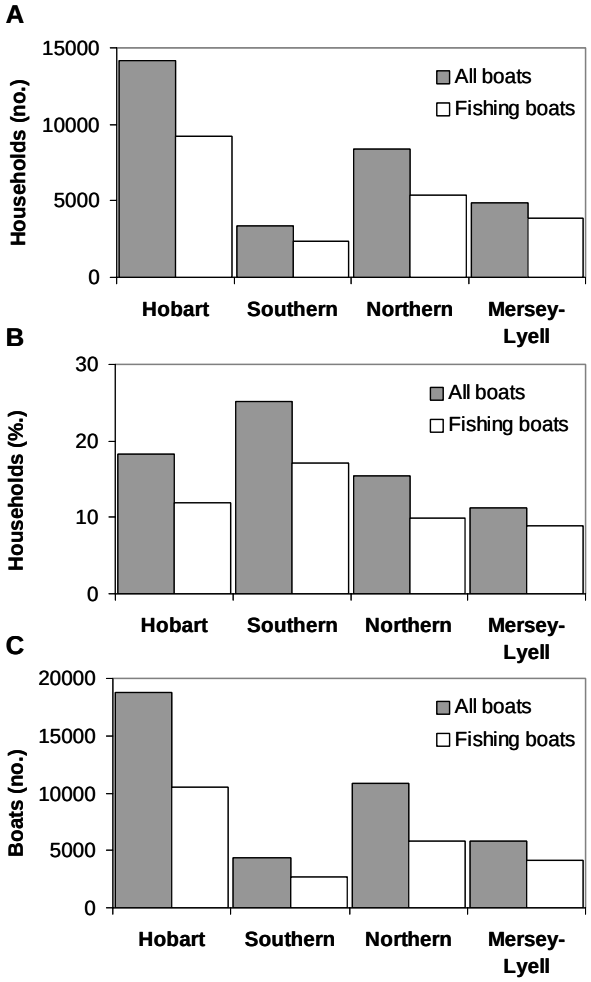

Fig. 6 Recreational boat ownership (all vessels and vessels used for recreational fishing) by Statistical Division in Tasmania, as at April 2000: A) number of boat owning households; B) boat owning households as a percentage of total households; and C) numbers of boats.

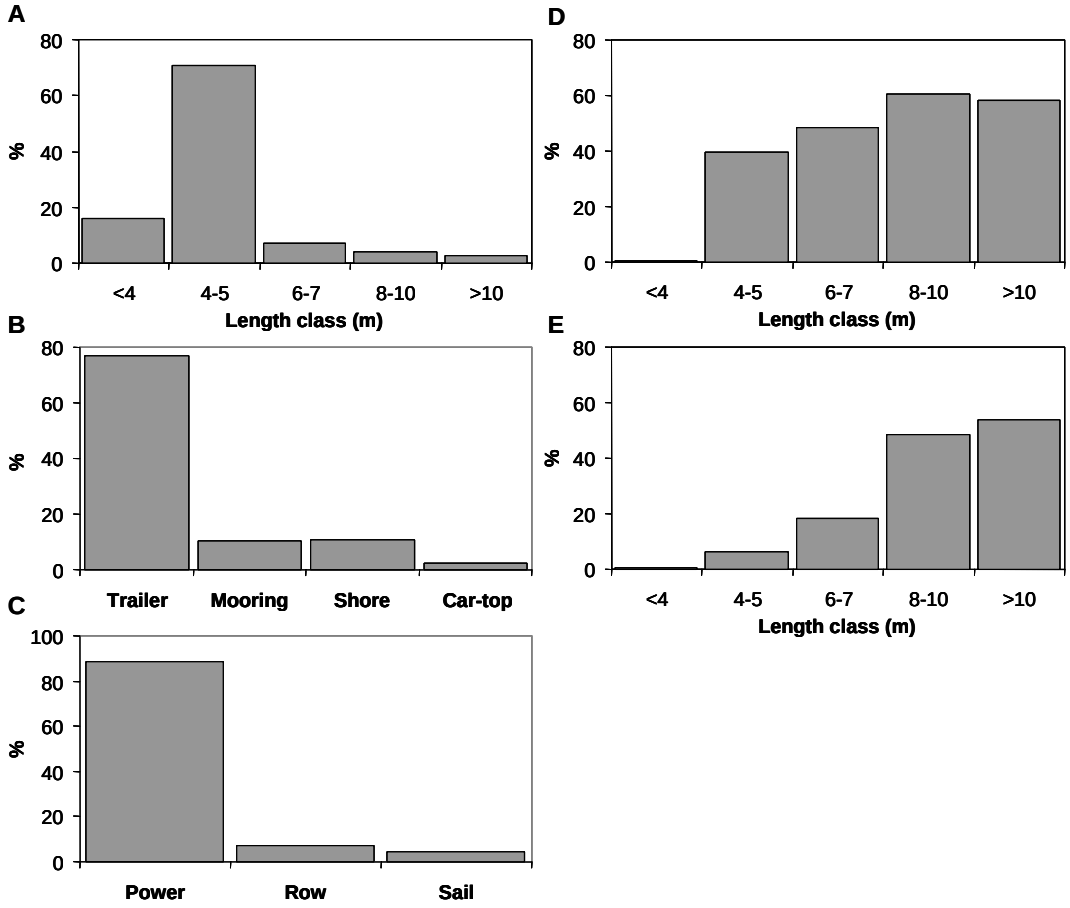

Fig. 7 Characteristics of boats used for recreational fishing in Tasmania, as at April 2000: A) Distribution (%) of vessels by length class; B) distribution (%)of vessels by primary storage location; C) distribution (%) by propulsion type; D) proportion (%)of vessels within each length class with echo sounders; and E) proportion (%) of vessels within each length class with GPS.

6. Fishing effort

Effort information was provided by fishers during the 12-month diary survey and has been presented as expanded estimates (based on participation rates obtained from the screening survey with appropriate non-response adjustments), and includes fishing activity by local and interstate fishers that was undertaken in Tasmania. Fishing effort is used to describe the pressure applied to a resource by fishers and to derive (with catch data) indices of resource abundance and fishing success. The response of fish populations to variations in fishing effort represents an important foundation for stock assessment.

For the purposes of this report only effort undertaken in Tasmania and its adjacent waters by local as well as interstate fishers has been considered. Overall, 132,527 Australian residents aged 5 or older fished in Tasmania between May 2000 and April 2001, representing a total of 816,402 fisher days of effort. Henry and Lyle (2003) established that 25,146 fisher days (3%) were the result of fishing by interstate residents. Conversely, Tasmania residents contributed 24,429 fisher days of effort in Australian states other than Tasmania, effectively cancelling out the impact of 'imported' fishing effort to the state.

In addition to fisher days, effort can be expressed in terms of fishing events and hours fished. Australian residents aged 5 or older expended an estimated 912,689 separate fishing events or 4,295,058 fisher hours of effort in Tasmania during 2000/01 (Appendix 6).

6.1 Days fished

Henry and Lyle (2003) noted that Tasmanians fished an average of 6.55 days per fisher during 2000/01. However, if only days fished in Tasmania (by locals and interstate visitors) are considered, then the average was somewhat lower, at 6.16 days per fisher.

In recreational fisheries, most fishers typically do relatively little fishing (and catch few fish) while, at the other extreme; relatively few fishers are very active and contribute disproportionately to the overall effort (and catch). The distribution of fishing effort is, therefore, characteristically skewed (Fig. 8). About two-thirds of all fishers (about 89,000 persons) fished for 5 or less days over the 12 month survey period (with the median being 3 days), while just 3% (about 4,000 persons) fished for more than 25 days (Fig. 8). The cumulative effect on effort was such that the 1-5 day fisher group accounted just over one quarter of the total effort while the 3% who fished more than 25 days contributed 20% of the effort.

The impact of individual fishers on total fishing effort was examined by ranking fishers based on annual fishing effort (days fished) and then calculating the effect of progressively adding a fisher's effort to the total (Fig. 9). From this relationship it was evident that 80% of fishers accounted for just 40% of the effort and conversely 20% of fishers accounted for 60% of the effort. This clearly highlights the potential for a relatively small proportion of the recreational fisher population to exert a substantial impact in terms of effort (and also catch), suggesting that minor shifts in

the dynamics of participation (based on activity levels) at the upper end of the fishery will have significant implications on effort (and catch) levels.

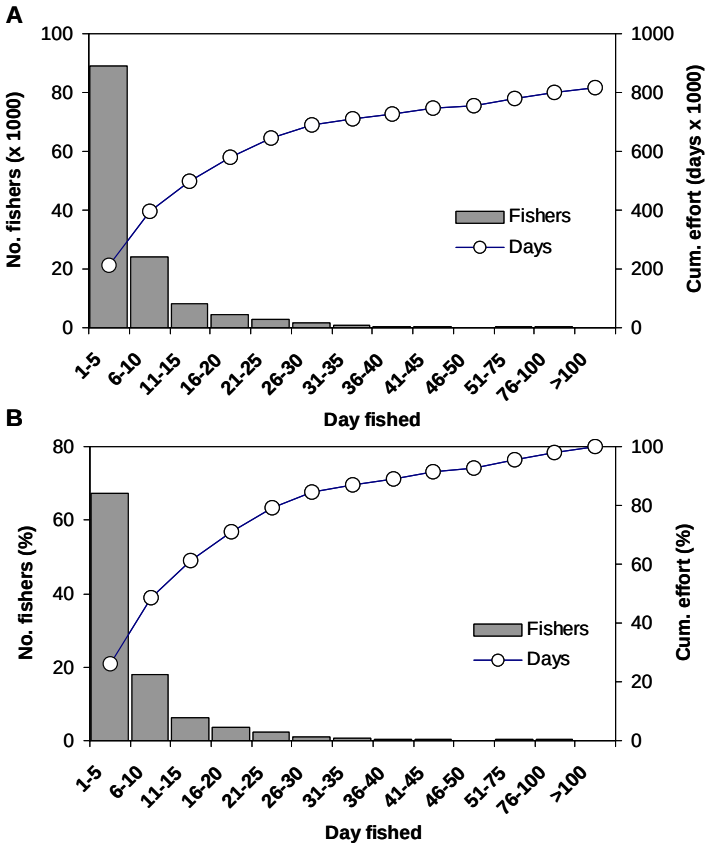

Fig. 8 Distribution of fishing effort by annual days fished for Australian residents aged 5 or older fishing in Tasmania during 2000/01 and the cumulative fishing effort: A) numbers of fishers and cumulative days fished; and B) proportion (%) of fishers and cumulated effort.

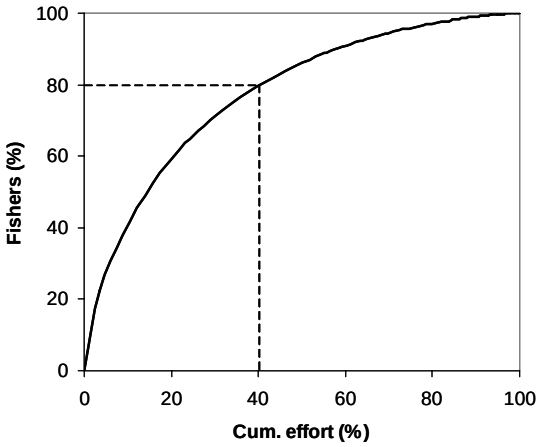

Fig. 9 Relationship between the number of fishers and their cumulative fishing effort (days fished) for Australian residents aged 5 or older who fished in Tasmania during 2000/01. Dotted lines indicate that 80% of the total number of fishers accounted for just 40% of the total days fished.

6.2 Fishing method and water body

Line fishing (including the use of bait, artificial lures and jigs, and set lines) represented the primary recreational fishing activity in Tasmania, accounting for 86% of all fishing events and 56% of the total fisher hours during 2000/01 (Fig. 10A, Appendix 6). Pot fishing was next in importance, 7% of events and 30% of the fisher hours; the greater significance of hours fished was due to long set durations for pots (averaging 21 hours compared with just over 3 hours per line fishing event). Gillnets accounted for about 5% of events and 12% of the fisher hours (reflecting set duration averaging almost 12 hours). Proportionally, the remaining fishing methods were of minor significance in terms of overall effort (but not necessarily in terms of catch of key species, refer Section 7).

An important feature of the Tasmanian fishery was the concentration of fishing effort in inshore coastal (52% events and 63% of fisher hours) and estuarine waters (21% events and 12% of fisher hours) (Fig. 10B, Appendix 7). Comparatively little fishing effort was directed in offshore (> 5km offshore) waters. Fishing activity in inland waters represented about one quarter of the total fishing events and 22% of the hours fished state-wide, with about twice the number of events and fishing time spent fishing lakes and dams compared with river fishing. Fishing in privately-owned waters accounted for just under 8% (11,942 events) of the effort expended in lakes or dams in Tasmania.

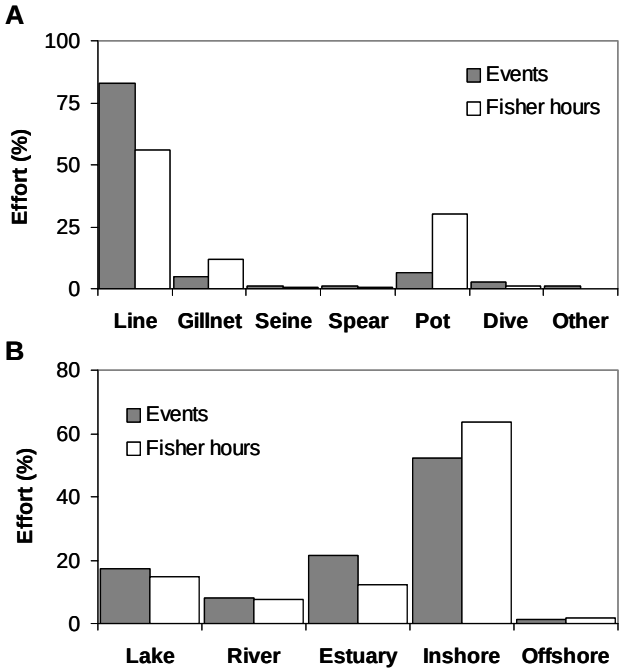

Fig. 10 Percentage of fishing effort (events and fisher hours) for Australian residents aged 5 or older who fished in Tasmania during 2000/01: A) effort by fishing method; and B) effort by water body type.

6.3 Fishing region

About half of the State's total fishing effort occurred off the east (including the southeast) coast (Fig. 11, Appendix 13). In the southeast, the D'Entrecasteaux Channel, Southern East, Derwent and Norfolk-Fredrick Henry Bay regions collectively accounted for 32% of the total effort. Off the east coast, the Central East (including Great Oyster Bay) attracted relatively higher levels of effort than the Eastern North region. Effort off the north coast was relatively evenly distributed between the western and eastern (including the Tamar) regions, representing 20% of the overall fishing effort. Comparatively low levels of activity were estimated for the West coast (4%) and the Bass Strait Islands (1%).

As noted previously, approximately one quarter of the total fishing effort (events) occurred in inland waters, with slightly greater effort in the Central Plateau and Eastern regions (9% each) compared with the Western region (6%).

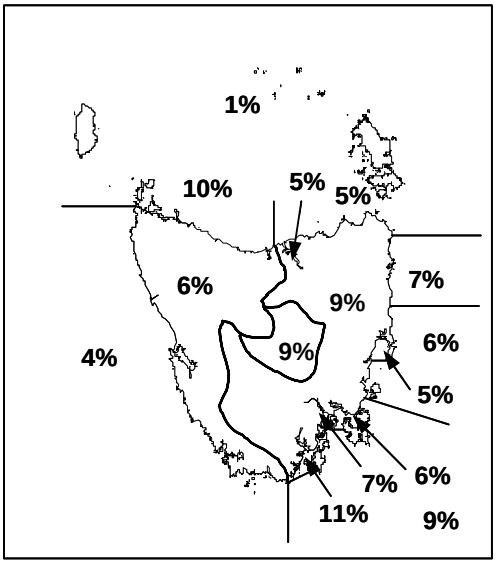

Fig. 11 Regional distribution (percentage) of fishing effort (events) for Australian residents aged 5 or older who fished in Tasmania during 2000/01.

6.4 Fishing platform

State-wide effort (events) was distributed approximately equally between boat and shore based fishing but there were differences in the relative proportions by water body type (Fig. 12, Appendix 8). River fishing was almost entirely conducted from the shore and shore-based fishing dominated in the lake and estuarine fisheries (by factors of 1.6 – 2.3 times). By contrast boat-based effort was about twice as prevalent as shore-based effort in the inshore fishery. Not unexpectedly, offshore fishing was exclusively boat based.

Shore fishing was split according to whether fishing occurred from jetties or wharves, other man made structures (e.g. bridges, dam walls, breakwaters) or from naturally occurring structures (e.g. river bank, beach, rocks) (Appendix 8). The majority of shore-based fishing occurred from natural structures; 80% overall, >90% for lakes and rivers, 68% for estuarine, and 75% for inshore coastal fishing. Jetties and wharves also represented significant access points for estuary (24%) and coastal (22%) fishing. Fishing from other man made structures was a comparatively minor activity (about 5% overall).

Fishing from hire and charter boat was flagged but overall the vast majority (99%) of all boat fishing effort in Tasmania occurred from privately owned vessels (Appendix 8).

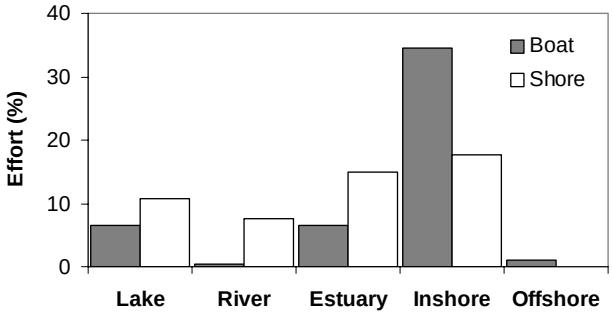

Fig. 12 Percentage of fishing effort (events) for Australian residents aged 5 or older who fished in Tasmania during 2000/01 by fishing platform and water body type.

7. Catch

Catch information was provided by fishers during the 12-month diary survey and has been presented as expanded estimates (based on participation rates obtained from the screening survey with appropriate non-response adjustments), and includes fishing activity by local and interstate fishers that was undertaken in Tasmania.

Recreational fishers in Tasmania harvested a diverse range of finfish, crustaceans, molluscs, and other taxa, a listing of species and their relative occurrence by fishing method is provided in Appendix 1. For the purposes of reporting and analysis, however, some species have been grouped (typically at the family level), recognising the fact that fishers could not reasonably be expected to delineate to species or where a particular species was rarely reported. For the purpose of higher level reporting, catches were grouped into seven categories according to taxonomy, primary method of capture and how they are utilised. The groups are finfish, small baitfish, crabs and lobsters, prawns and yabbies, cephalopods, other molluscs and other (miscellaneous) taxa. Listings of taxa that comprise each of these groupings are also provided in Appendix 1.

7.1 Total catch, harvest and release/discards

In recreational fisheries, catches can be split into retained or harvested and released or discarded components. The harvested portion may be used for a range of purposes including consumption or bait, whereas fish may be released because of regulation (e.g. size and/or bag limits), ethical reasons, undesirability of the species, and so on.

Over 13.1 million aquatic organisms were captured by recreational fishers in Tasmania during 2000/01, the dominant group based on numbers being small baitfish (8.7 million), principally whitebait. However, owing to their small sizes the contribution by weight was relatively low (Table 4).

Overall, an estimated 3.95 million finfish were caught in Tasmania by recreational fishers during 2000/01, over half of which (2.1 million) were flathead (Table 4). Other species of significance in order of descending importance based on catch (numbers) included Australian salmon (0.42 million or 11%), trout (0.27 million or 7%), mullet (0.14 million or 3%), cod (0.11 million or 3%), gurnard (0.10 million or 3%), wrasse (82,000 or 2%), bream (76,000 or 2%) and flounder (75,000 or 2%). While the bulk of the fish caught were saltwater species, freshwater species other than trout included redfin perch, river blackfish and eels (Appendix 1).

Furthermore, about 47,000 squid (mainly calamary), 0.17 million rock lobster, 0.11 million abalone and 0.16 million individuals of various other taxa, including oysters, mussels, other bivalves, and urchins were caught by recreational fishers.

In total 2.58 million finfish were retained, indicating that almost two-thirds of all finfish caught were harvested (Table 4). Flathead dominated the retained catch (1.38 million or 53%), followed by Australian salmon (0.31 million or 12%), trout (0.20 million or 8%), mullet (99,000 or 4%), flounder (71,000 or 3%), cod (67,000 or 3%), bream (45,000 or 2%), jackass morwong (37,000 or 1%), and gurnard (37,000 or 1%).

Amongst the other key taxa, about 44,000 squid, 87,000 rock lobster and 0.11 million abalone were harvested.

Overall, 1.37 million finfish were released or discarded, actual release rates varied depending upon species (Table 4). High release rates (> 60%) were reported for gurnard, wrasse, and gummy shark, moderate rates (31-60%) for flathead, cod, bream, silver trevally, leatherjacket, tunas, and redfin perch, intermediate rates (10-30%) for Australian salmon, trout, mullet, jack mackerel, jackass morwong, barracouta, bastard trumpeter, pike, eels, and blackfish, and low rates (<10%) for flounder, garfish, blue warehou, striped trumpeter, and Atlantic salmon (Table 5). Squids (arrow and calamary) also tended to have low release rates whereas rates were high for octopus. Almost half of the rock lobster caught were released whereas as almost all of the abalone collected were retained.

The reason for release was not solicited as part of the study but fish size (including adherence to size limits) was likely to be an important factor for species such as flathead, bream, Australian salmon and bastard trumpeter. Relatively high release or discard rates for wrasse, gurnard, cod, redfin perch, and leatherjacket may be influenced by the fact that these species are not generally held in high regard by many recreational fishers. The high discard rate for gummy shark may be linked to the influence of size and possession limits as well as the prohibition of taking sharks from certain waters. Comparatively high release rates for tunas presumably reflected the catch-and-release practice common amongst gamefishers.

Table 4 Estimated annual catch (total, kept and released numbers) and proportion released/discarded by key species for Tasmania during 2000/01, based on Australian residents aged 5 or older.

Species	Total	Kept	Released	% released
Flathead	2136033	1377350	758684	35.5
Australian salmon	422605	314221	108384	25.6
Trout	271469	200894	70575	26.0
Mullet	136295	99130	37165	27.3
Cod	107529	66829	40700	37.9
Gurnard	104279	36569	67710	64.9
Other finfish	93040	32758	60283	64.8
Wrasse	81985	22792	59194	72.2
Bream	76282	45396	30886	40.5
Flounder	75326	71160	4166	5.5
Silver trevally	49350	23770	25580	51.8
Leatherjackets	45269	20090	25179	55.6
Jack mackerel	43762	33571	10190	23.3
Jackass morwong	43063	37326	5738	13.3
Barracouta	39109	28287	10822	27.7
Bastard trumpeter	38677	34097	4579	11.8
Gummy shark	24477	7884	16594	67.8
Garfish	21567	19549	2018	9.4
Tuna	20126	12737	7389	36.7
Whiting	19937	12215	7723	38.7
Blue warehou	19244	18069	1175	6.1
Striped trumpeter	17956	17277	679	3.8
Redfin perch	17091	9367	7724	45.2
Atlantic salmon	14468	13689	779	5.4
Pike	11947	10481	1466	12.3
Eels	11428	8239	3189	27.9
Blackfish	9496	6711	2785	29.3
Total finfish	**3951812**	**2580457**	**1371355**	**34.7**
Arrow squid	6307	6269	38	0.6
Calamary	31851	30031	1820	5.7
Squid - unspec	8447	8138	309	3.7
Octopus	7407	<1000	6615	89.3
Abalone	110270	108495	1775	1.6
Rock lobster	166656	86976	79680	47.8
Small bait fish	**8671566**	**8496037**	**175529**	
Other taxa	**164885**	**150672**	**14213**	
Grand total	**13119200**	**11467867**	**1651334**	

Table 5 Summary table indicating groupings based on the proportion of the Tasmanian recreational catch for key species that was released or discarded by fishers during 2000/01.

Released → **Kept**

% released			
>60%	**31-60%**	**10-30%**	**<10%**
Octopus	Leatherjacket	Blackfish	Garfish
Wrasse	Silver trevally	Eels	Blue warehou
Gummy shark	Rock lobster	Barracouta	Calamary
Gurnard	Redfin perch	Mullet	Flounder
	Bream	Trout	Atlantic salmon
	Whiting	Australian salmon	Striped trumpeter
	Cod	Jack mackerel	Abalone
	Tuna	Jackass morwong	Arrow squid
	Flathead	Pike	
		Bastard trumpeter	

7.1.1 Harvest weights

Catch information reported during the diary survey was based on numbers rather than weight or size (length) since these latter parameters tend to be less reliably estimated when self-reported by recreational fishers. However, the weight of the recreational harvest is of particular interest to resource managers, scientists, the broader fishing community (commercial and recreational) and other stakeholder groups with an interest in the aquatic environment. Commercial production is generally reported in terms of weight and thus to permit comparisons between sectors it is desirable to report recreational harvest as weights.

It is possible to approximate recreational harvest weights for a given species by multiplying numbers caught by the average weight of an individual. However, achieving accuracy and precision in determining average weight for a species is complex because fish populations tend to exhibit structuring based on size (and age) over a range of temporal and spatial scales. There are also issues of gear selectivity, skill and personal ethics of individual fishers that will also affect the sizes of fish captured and retained. Ideally all of these factors should be taken into account when calculating average individual weight estimates. As this is rarely the case in large-scale studies, and was beyond the scope of the limited on-site surveys undertaken as part of this survey, the simple application of an average individual weight will introduce an additional degree of uncertainty to the harvest (weight) estimates. Furthermore, in some instances related species have been grouped together for reporting purposes, thereby confounding the notion of a simple average individual weight for all of the species in the group. *For these reasons it is necessary to view harvest weights for particular species or species groups as indicative rather than absolute point estimates of recreational fishery production.*

On-site creel surveys conducted during the present survey (Lyle et al. 2002), results of previous studies (Lyle and Campbell 1999) and information from alternative sources, such as commercial size composition information, have been used to approximate the average size of fish retained by recreational fishers (Table 6). Where

lengths were available, length/ weight relationships have been used to derive mean weights and these have been applied to harvest numbers to derive catch weights of the recreational catch (Table 6).

This survey has clearly established that, for a range of species, recreational catches were significant, with catches of flathead, Australian salmon and trout, each exceeding 100 tonnes. Overall, flathead not only dominated recreational catch numbers but by weight (360 tonnes) it was the most significant component of the harvest and exceeded the commercial flathead catch from Tasmanian waters by a factor of over 5 times.

The conversion of harvest numbers to weight had an impact on the relative importance of some species groups. Species for which consideration of weight resulted in marked increases in relative significance included barracouta (55 tonnes), jackass morwong (44 tonnes), tunas (45 tonnes), bastard trumpeter (43 tonnes). By contrast, weights resulted in reduced rankings for species such as mullet (27 tonnes), flounder (21 tonnes), jack mackerel (7 tonnes).

The provision of harvest weights for selected species enabled comparison with commercial production levels and has relevance for stock assessment and management, including issues relating to resource sharing and allocation. Recreational catches were roughly equivalent to exceeded commercial production (i.e approximately 50% of the combined catch or greater) for species such as flathead, mullet, flounder, cod, jackass morwong, bastard trumpeter, striped trumpeter, barracouta, sliver trevally (Table 6). For other species, including Australian salmon, wrasse, garfish, whiting, rock lobster and abalone, the recreational catch comprised only a minor component of the total catch.

Table 6. Annual harvest (numbers), average weight and estimated harvest weight for key species taken by recreational fishers in Tasmania during 2000/01, based on Australian residents aged 5 or older, compared with commercial production in Tasmania. Commercial finfish catch data are based on General Fishing logbook returns, rock lobster and abalone catches reflect the Total Allowable Catch.

na not available; A based on limited data; B based on 1997-98 creel survey data; C based on average size taken by commercial fishers; D other data sources ulitised.

	Recreational					
Species	**Harvest (No.)**	**Av. weight (kg)**	**Estimated harvest (kg)**	**Commercial catch (kg)**	**Combined catch (kg)**	**% recreational**
Flathead	1377350	0.26	360866	63400	424266	85.1
Australian	314221	0.35	111234	485000	596234	18.7
Trout	200894	0.73[D]	146653	-		
Mullet	99130	0.27	26765	13700	40465	66.1
Flounder	71160	0.30[B]	21348	10500	31848	67.0
Cod	66829	0.47	31343	4000	35343	88.7
Bream	45396	0.64	29008	-		
Jackass morwong	37326	1.18	44157	13700	57857	76.3
Gurnard	36569	na	na	7800		
Bastard trumpeter	34097	1.27	43201	26200	69401	62.2
Jack mackerel	33571	0.2	6848	8600	15448	44.3
Other finfish	32758	na	na			
Barracouta	28287	1.93	54679	15100	69779	78.4
Silver trevally	23770	0.28[A]	6584	1600	8184	80.4
Wrasse	22792	0.59	13424	88400	101824	13.2
Leatherjackets	20090	0.44	8799	16700	25499	34.5
Garfish	19549	0.12[A]	2346	81400	83746	2.8
Blue warehou	18069	0.89	15991	36300	52291	30.6
Striped trumpeter	17277	2.20[B]	38009	49600	87609	43.4
Atlantic salmon	13689	na	na	-		
Tuna	12737	3.56[A]	45356	-		
Whiting	12215	0.11	1307	42500	43807	3.0
Pike	10481	na	na	12500		
Redfin perch	9367	0.25[D]	2342	-		
Eels	8239	na	na	-		
Gummy shark	7884	na	na			
Blackfish	6711	na	na	-		
Calamary	30031	0.6	18019	76600	94619	19.0
Abalone	108495	0.48[C]	52078	2730000	2782078	1.9
Rock lobster	86976	0.84[C]	73060	1502000	1575060	4.6

7.2 Harvest by method

Catch details by fishing method are provided in Appendix 6. Line fishing accounted for 88% of the finfish harvest (2.27 million), with a further 7% (0.17 million) taken by gillnets, 3% (74,000) by spear and almost 2% (47,000) by seine or bait nets. Catch composition varied markedly between methods, the key line-caught species by numbers being flathead, Australian salmon, trout, cod and bream, whereas for gillnets, bastard trumpeter, mullet, jackass morwong, leatherjacket, and jack mackerel dominated the catch (Fig. 13). Mullet, followed by Australian salmon and garfish, were the main species taken by seine nets, while flounder accounted for the majority of the catch taken by spear, with garfish and flathead of secondary importance.

The vast majority (> 90%) of the squid (arrow and calamary) catch was taken by line fishing while, not unexpectedly, rock lobster was the primary species taken in pots, and abalone and rock lobster were the main species taken by divers (Appendix 6). Small baitfish (whitebait) were taken almost exclusively by bait nets.

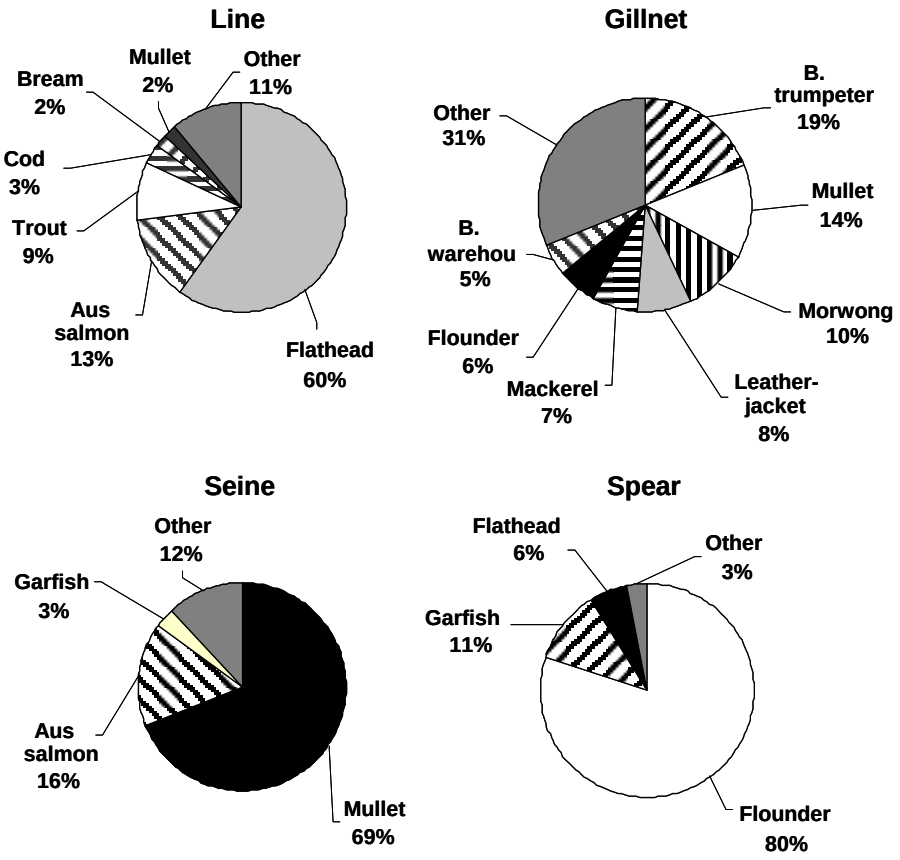

Fig. 13 Percentage composition of the recreational finfish catch (numbers harvested) by fishing method for Tasmania during 2000/01.

7.2.1 Line fishing

Line fishing activity was categorised as bait, lure/fly, or combination of bait and lure/fly fishing. The use of set lines was also identified, with recreational fishers permitted to use up to thirty hooks (typically baited) on a line, either set as a long line or drop line. Appendix 9 summarises harvest by the line fishing methods prevalent in Tasmania. For such species as flathead, cod, bream, mullet, silver trevally, jackass morwong, wrasse, striped trumpeter, whiting, blue warehou, Atlantic salmon, blackfish, garfish, and gummy shark the vast majority (>80%) of the catch was taken using bait. By contrast, trout, tuna, redfin perch, and calamary were primarily targeted using lures or flies. Bait and lure fishing were significant line capture techniques for species such as Australian salmon, barracouta, and pike.

Generally, in Australia there has been a growing awareness and acceptance of the use of lures, in particular soft plastics, for what have traditionally been bait capture species. Species for which this is particularly true include flathead and bream, and thus the extent to which this trend impacts on the Tasmanian fishery in the future may be assessed by reference to the baseline data provided by this survey.

7.3 Harvest by water body

Catch details by water body type are provided in Appendix 7. Overall, less than 10% of the catch of finfish was taken from freshwater, three-quarters of which was derived from lake fisheries and just one quarter from rivers and streams. Trout were the major (> 80%) catch in freshwater, with redfin perch and blackfish of secondary importance in lake fisheries and eels and blackfish in river fisheries (Fig. 14).

The majority (80%) of the saltwater catch of finfish was taken from inshore coastal waters, with catches from estuarine waters also relatively important (18%). Offshore catches were comparatively low. Flathead and Australian salmon dominated estuarine and inshore catches, collectively accounting for 60% of the estuarine and 76% of the inshore harvest. Other species of significance included cod, bream, mullet and flounder in the estuarine fishery, and mullet, flounder, bastard trumpeter and jack mackerel in the inshore waters fishery. Although relatively low, offshore catches included pelagic and demersal species, including various tuna species, jackass morwong, striped trumpeter, gurnard (mainly ocean perch) and flathead.

Squid were mainly captured in inshore waters with catches also taken from estuarine waters (Appendix 7). Rock lobster and abalone catches were effectively restricted to inshore coastal waters.

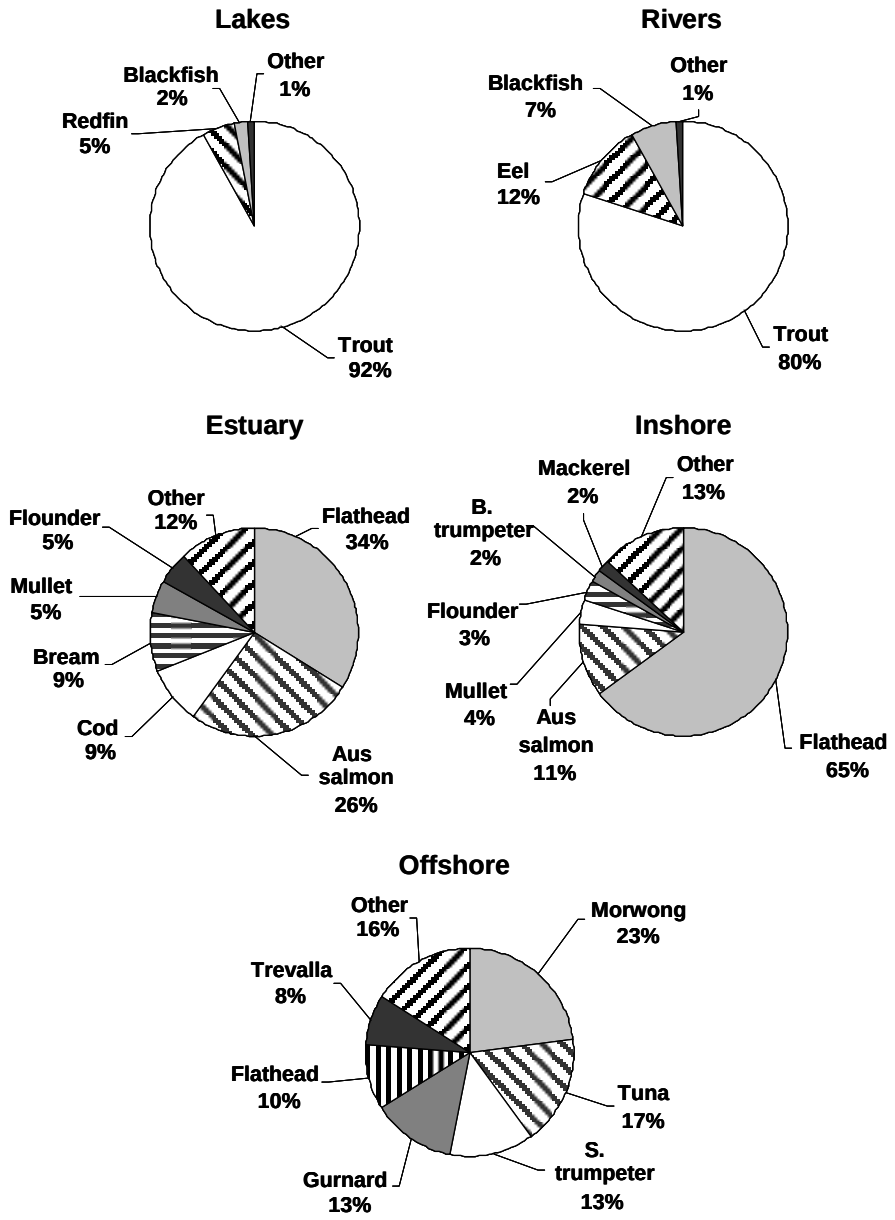

Fig. 14 Percentage composition of the recreational finfish catch (numbers harvested) by water body type for Tasmania during 2000/01.

7.4 Harvest by platform

The proportion of the harvest taken by boat as opposed to shore-based fishing varied considerably by species, no doubt influenced by the species distribution and fishing methods (Appendix 10). Overall, however, just over three quarters of the total finfish harvest (numbers) was taken by boat-based fishers.

Offshore species, e.g. tuna, striped trumpeter, were exclusively caught from boats (Table 7). Other finfish that were primarily captured by boat-based fishers (> 90%) included gurnard, bastard trumpeter and flathead while boat-based effort also produced the majority (70-90%) of the jackass morwong, pike, leatherjacket, barracouta, whiting, Atlantic salmon and cod catches. Boat fishers accounted for just over half (50-69%) of the wrasse, jack mackerel, Australian salmon, trout, blue warehou and gummy shark that were harvested. By contrast, the majority of the mullet, flounder, bream, silver trevally, garfish along with redfin perch, eels and blackfish were taken by shore-based fishers. Shore-based fishers also accounted for over half of the calamary catch. The vast majority of rock lobster were taken by boat-based fishers (potters and divers) whereas shore-based dive effort accounted for about one third of the abalone catch.

Table 7 Summary table indicating groupings based on the proportion of the Tasmanian recreational harvest of key species that was taken by boat-based fishers during 2000/01.

Shore → **Boat**

% boat-based				
<10%	**25-49%**	**50-69%**	**70-90%**	**>90%**
Redfin perch	Silver trevally	Abalone	Jackass morwong	Striped trumpeter
Eels	Calamary	Wrasse	Pike	Tuna
Blackfish	Garfish	Jack mackerel	Leatherjacket	Gurnard
	Flounder	Australian salmon	Barracouta	Bastard trumpeter
	Bream	Trout	Whiting	Rock lobster
	Mullet	Blue warehou	Atlantic salmon	Flathead
		Gummy shark	Cod	

7.5 Nil catches

Not all fishing effort resulted in a catch, whether retained or not, with overall success rates being a function of many factors including fishing method, water body type, fishing platform, species targeted, skill or experience of fishers, location and time of day, and season. In relation to the first three factors, survey data have been analysed according to the proportion of fishing events for which nothing was caught (kept or released). Overall, almost 31% (249,295 events) of the recreational fishing effort in Tasmania during 2000/01 resulted in no catch, with about one third of all line and pot fishing events yielding no catch (Fig. 15A). About 20% of gillnet and spear effort produced no catch while just under 10% of the dive and about 5% of the seine effort resulted in nil catches. By water body, about half of inland waters (lakes and rivers) fishing effort yielded no catch; success rates in salt water were higher, with just 31% of estuarine effort, 22% of inshore and 11% of offshore fishing effort resulting in no catch (Fig. 15B). This pattern across water body type was influence heavily by success rates for line fishing effort (Fig. 15C). When fishing platform was considered, it was evident that fishing success rates were substantially improved for boat-based compared with shore-based fishing (Fig. 15D). For instance, 28-31% of boat-based freshwater fishing effort using lines resulted in no catch compared with 54-59% of shore-based effort. In the saltwater fishery, just 10-17% of the boat fishing effort with lines produced no catch, this compared with 39% of the shore-based effort.

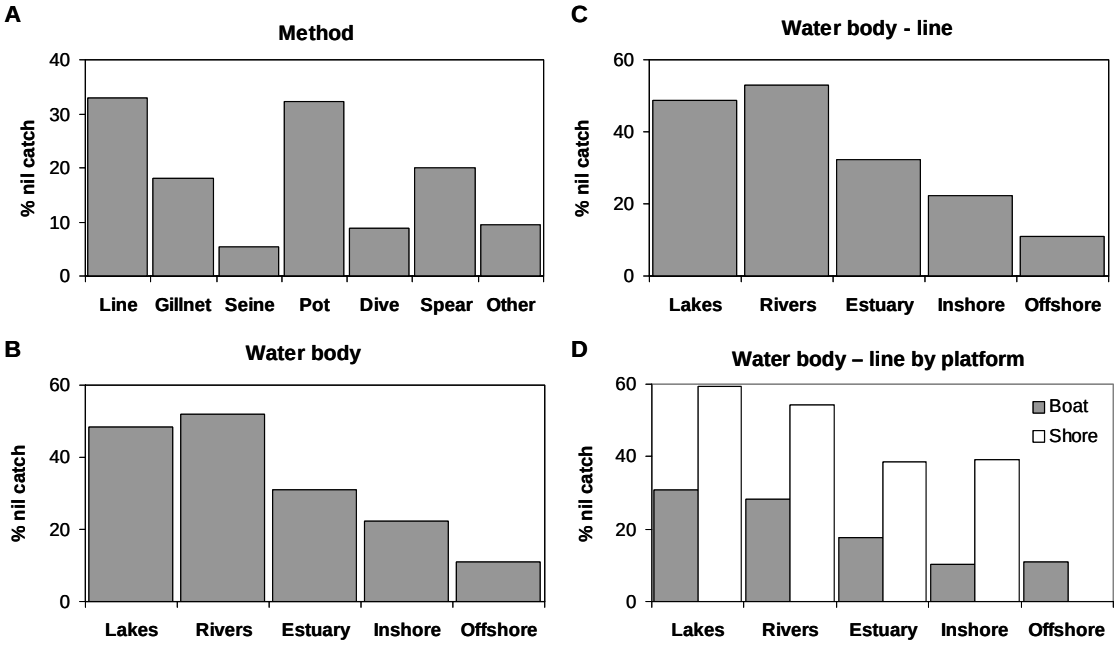

Fig. 15 Proportion of recreational fishing effort (events) that resulted in nil catches in Tasmania during 2000/01: A) proportion (%) of total events by fishing method; B) proportion (%) of total events by water body type; C) proportion (%) of line fishing events by water body type; and D) proportion (%) of total line fishing events by water body type and fishing platform.

8. Key species

In the following section, the fisheries for key species are described in terms of regional distribution of the catch (refer Appendix 11), numbers caught (Table 4), and catch by fishing platform (Appendix 10), method (Appendix 6 & 9), water body (Appendix 7) and season (Appendix 12). Catch information was provided by fishers during the 12-month diary survey and has been presented as expanded estimates (based on participation rates obtained from the screening survey with appropriate non-response adjustments), and includes fishing activity by local and interstate fishers that was undertaken in Tasmania.

8.1 Total finfish

Approximately 8% of the combined finfish harvest was derived from the inland fishing regions, half of which was taken from the Central Plateau (Fig. 16A). The combined regions on the east and south-east coasts accounted for two-thirds of the total harvest, with the Central East, Great Oyster Bay, Norfolk-Frederick Henry Bay, Southern East and D'Entrecasteaux Channel regions individually contributing at least 10% to the total harvest. The combined north coast regions (including Bass Strait Islands) accounted for about 19% and the West Coast just 5% of the State's recreational harvest of finfish. The bulk (65%) of the catch was retained (Fig. 16B), with boat based catches accounting for the majority (77%) of the retained catch (Fig. 16C). Finfish were harvested using a variety of fishing methods, the most significant being line fishing which produced 88% of the harvest numbers (Fig. 16D). Comparatively minor catches were taken by gillnet, seine (including bait nets), and by spear. The finfish harvest was concentrated in coastal inshore (73%) and estuarine (16%) waters, with comparatively low catches overall from inland and offshore waters (Fig. 16E). There was evidence for seasonality in catches, with catches rising in November-December to a distinct peak in January-February before declining slightly in March -April (Fig. 16F). The remaining six months (May-October) accounted for less than 30% of the annual production.

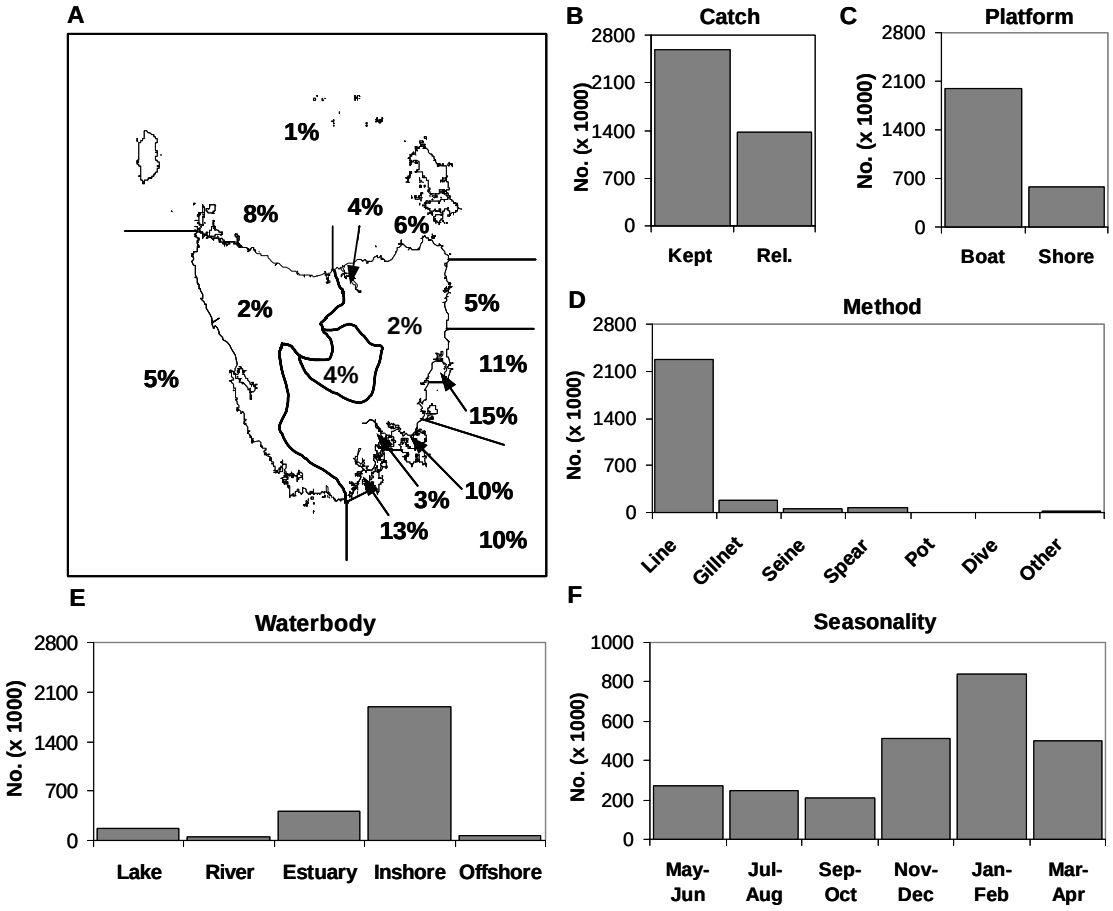

Fig. 16 Characteristics of the recreational catch of finfish (all species combined) in Tasmania during 2000/01: A) proportion (%) of the total harvest (numbers) by fishing region; B) total numbers kept and released; C) total harvest (numbers) by boat and shore based fishing activities; D) total harvest (numbers) by fishing method; E) total harvest (numbers) by water body fished; and F) seasonality in the harvest (numbers).

8.2 Flathead

Flathead were the dominant species group taken by recreational fishers in Tasmania, the vast majority (> 80%) of the catch being derived from the east and south-east coasts, with the Great Oyster Bay region alone accounting for about one quarter of the harvest (Fig. 17A). The D'Entrecasteaux Channel and Norfolk-Frederick Henry Bay regions were also significant (> 15%), and apart from the north coast, catches in other regions of the State were relatively low.

Sand flathead (*Platycephalus bassensis*) and tiger flathead (*Neoplatycephalus richardsoni*) are the dominant flathead species taken in Tasmanian waters (dusky flathead (*P. fuscus*) are occasionally reported from the north coast). About 10% of the flathead reported by survey respondents was not identified to species, of the remainder 94% were reported as sand flathead with just 6% being tiger flathead. If a similar ratio is applied to the non-specified flathead catch, then out of 1.38 million

flathead harvested by recreational fishers during 2000/01, about 1.30 million would have been sand flathead and approximately 77,000 tiger flathead. Around one third of all flathead caught were released or discarded (Fig. 17B). Boat based catches accounted for the vast majority (94%) of the retained catch (Fig. 17C), and virtually all of the catch was taken by line fishing (Fig. 17D), primarily fishing with bait, rather than lures. Flathead catches were concentrated in inshore coastal waters with relatively small catches also taken from estuarine and offshore waters (Fig. 17E). The flathead fishery was highly seasonal, with a strong peak in January-February and a distinct trough between July and October (Fig. 17F). The main fishing period between November and April accounted for over three quarters of the annual production.

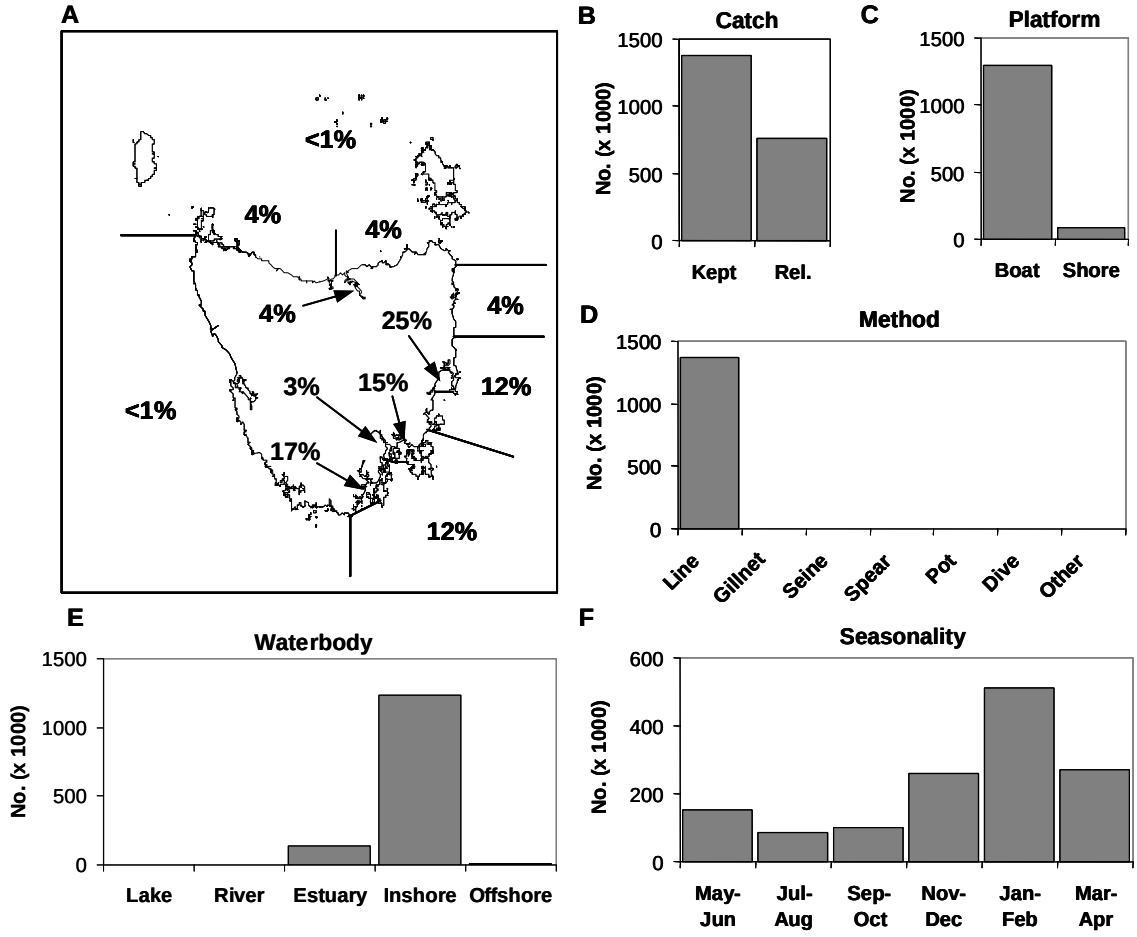

Fig. 17 Characteristics of the recreational catch of flathead in Tasmania during 2000/01: A) proportion (%) of the total harvest (numbers) by fishing region; B) total numbers kept and released; C) total harvest (numbers) by boat and shore based fishing activities; D) total harvest (numbers) by fishing method; E) total harvest (numbers) by water body fished; and F) seasonality in the harvest (numbers).

8.3 Australian salmon

The recreational fishery for Australian salmon (*Arripis trutta* and *A. truttaceus*) was concentrated off the West and Western North coasts of Tasmania, these regions accounting for about half of the total harvest (Fig. 18A). The Eastern North (including the Tamar) and Northern East regions, along with the Bass Strait Islands, were of secondary importance and collectively contributed a further 30% of the State's catch. Numerically, Australian salmon were the second most frequently caught finfish in Tasmania, with about one quarter of the total catch of 0.42 million fish released or discarded (Fig. 18B). In addition to boat-based catches, there was evidence of a substantial shore-based fishery for the species (Fig. 18C), with line fishing by far the major fishing method (Fig. 18D). In addition to bait fishing, lure fishing also represented an important capture method, with over one third of the harvest taken by lures. Catches were concentrated in inshore coastal and estuarine waters (Fig. 18E), with some evidence for winter (July-August) and summer (January-February) peaks in fishing activity (Fig. 18F).

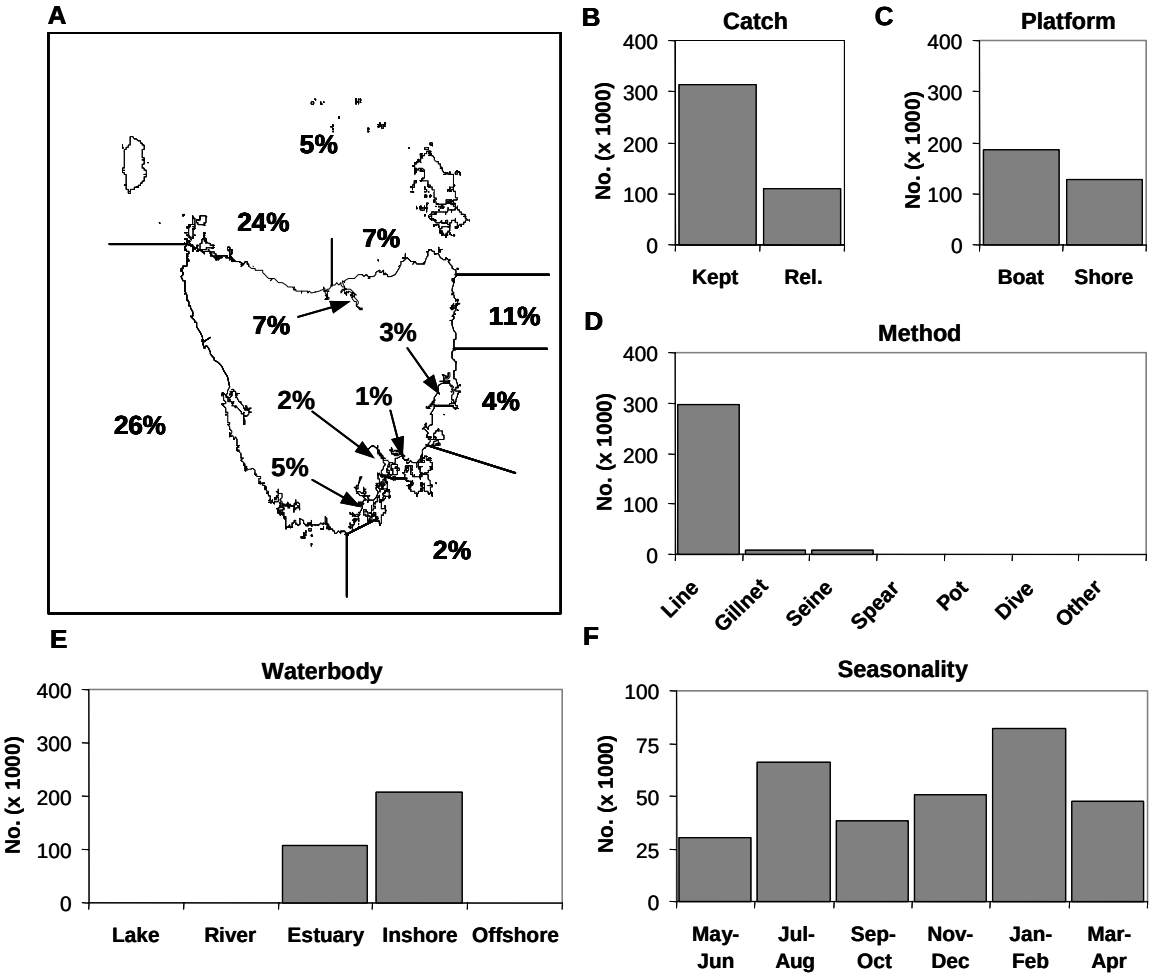

Fig. 18 Characteristics of the recreational catch of Australian salmon in Tasmania during 2000/01: A) proportion (%) of the total harvest (numbers) by fishing region; B) total numbers kept and released; C) total harvest (numbers) by boat and shore based fishing activities; D) total harvest (numbers) by fishing method; E) total harvest (numbers) by water body fished; and F) seasonality in the harvest (numbers).

8.4 Trout

The importance of the Central Plateau to the trout fishery is clearly evident in Fig. 19A, this region producing well over half of the retained catch. Arthurs Lake alone was estimated to have accounted for about 39% of the State's harvest, with Great Lake contributing a further 9%. Western and Eastern regions each represented about 20% of the catch, with comparatively minor catches reported elsewhere. Out of a total catch of 0.27 million trout, about one quarter were released (Fig. 19B), the retained catch being taken almost equally between boat and shore based fishers (Fig. 19C). Overall, brown trout (*Salmo trutta*) dominated (almost 87%) the catch, with rainbow trout (*Oncoryhnchus mykiss*) comprising the bulk of the remainder (a small proportion were not distinguished to species by survey respondents). Trout were

taken almost exclusively by line fishing (Fig. 19D), with lures/flies the main (> 67%) gear used. The catch from lakes and dams was over 3.5 times greater than that from rivers, there were also minor quantities of trout taken from estuarine waters (Fig. 19E). Catches were consistently high between November and April but fell sharply during winter, corresponding to closure of parts of the fishery (Fig. 19F).

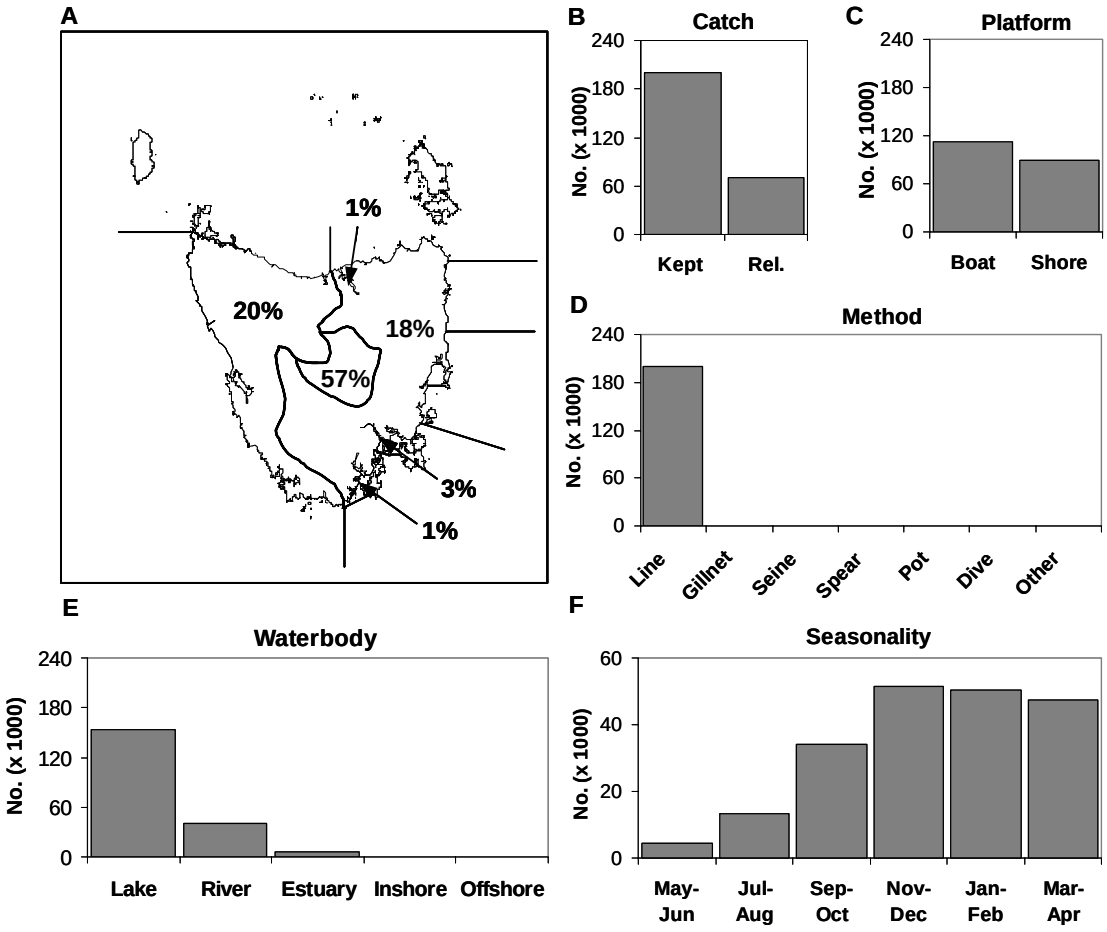

Fig. 19 Characteristics of the recreational catch of trout in Tasmania during 2000/01: A) proportion (%) of the total harvest (numbers) by fishing region; B) total numbers kept and released; C) total harvest (numbers) by boat and shore based fishing activities; D) total harvest (numbers) by fishing method; E) total harvest (numbers) by water body fished; and F) seasonality in the harvest (numbers).

8.5 Mullet

Yellow-eye mullet (*Aldrichetta forsteri*) and sea mullet (*Mugil cephalus*) occur in Tasmania waters, and although survey respondents did not distinguish between species, the former is known to dominate catches in Tasmania. Catches were concentrated off the north coast, in particular the Eastern North region (Fig. 20A). Apart from the D'Entrecasteaux Channel, catches from other regions were relatively minor. Just over one quarter of the catch was released (Fig. 20B) and shore-based fishers accounted for the majority (74%) of the harvest (Fig. 20C). Mullet were captured in more or less equal numbers by line, gillnet and seine fishing methods (Fig. 20D), mainly from inshore coastal and to a lesser extent estuarine waters (Fig. 20E). Catches varied markedly throughout the year, with a strong peak in November-December, preceded by minimum catch levels in September-October (Fig. 20F).

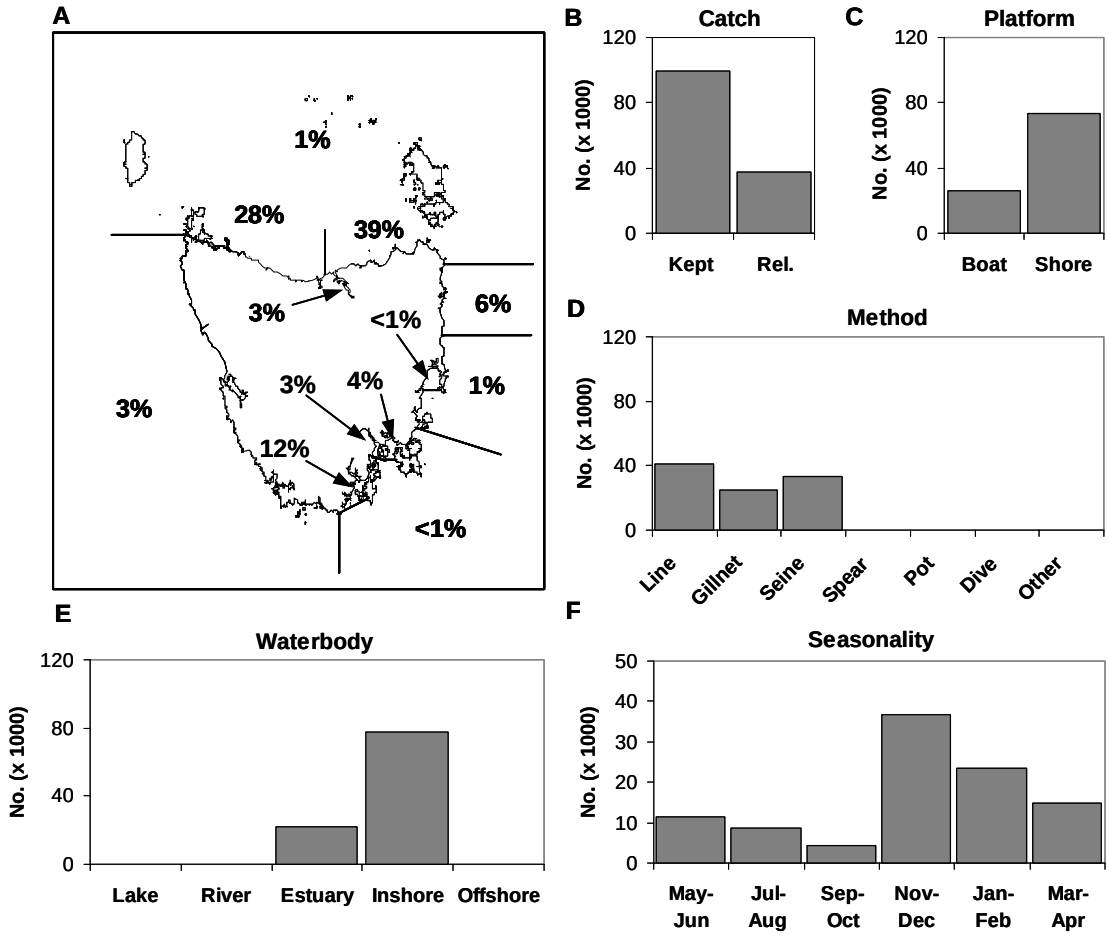

Fig. 20 Characteristics of the recreational catch of mullet in Tasmania during 2000/01: A) proportion (%) of the total harvest (numbers) by fishing region; B) total numbers kept and released; C) total harvest (numbers) by boat and shore based fishing activities; D) total harvest (numbers) by fishing method; E) total harvest (numbers) by water body fished; and F) seasonality in the harvest (numbers).

8.6 Flounder

Several species of flounder occur in Tasmanian waters, the most frequently caught being the greenback flounder (*Rhombosolea tapirina*), with the long-snouted flounder (*Ammotretis rostratus*) occasionally taken. Flounder were mainly caught in sheltered inshore waters, in particular from the D'Entrecasteaux Channel, Norfolk- Frederick Henry Bay, Tamar and West Coast (Macquarie Harbour) regions, collectively these areas accounted for almost 80% of the harvest (Fig. 21A). Only a very small proportion of the catch was released (Fig. 21B) and shore-based fishing produced the bulk of the harvest (Fig. 21C). Spearing was the main method of capture, followed by gillnets (Fig. 21D). As indicated above, flounder were caught exclusively in inshore coastal and estuarine waters (Fig, 21E). Catches exhibited a marked trough between September and December, a slight peak in January-February but were relatively consistent at other times of the year (Fig. 21F).

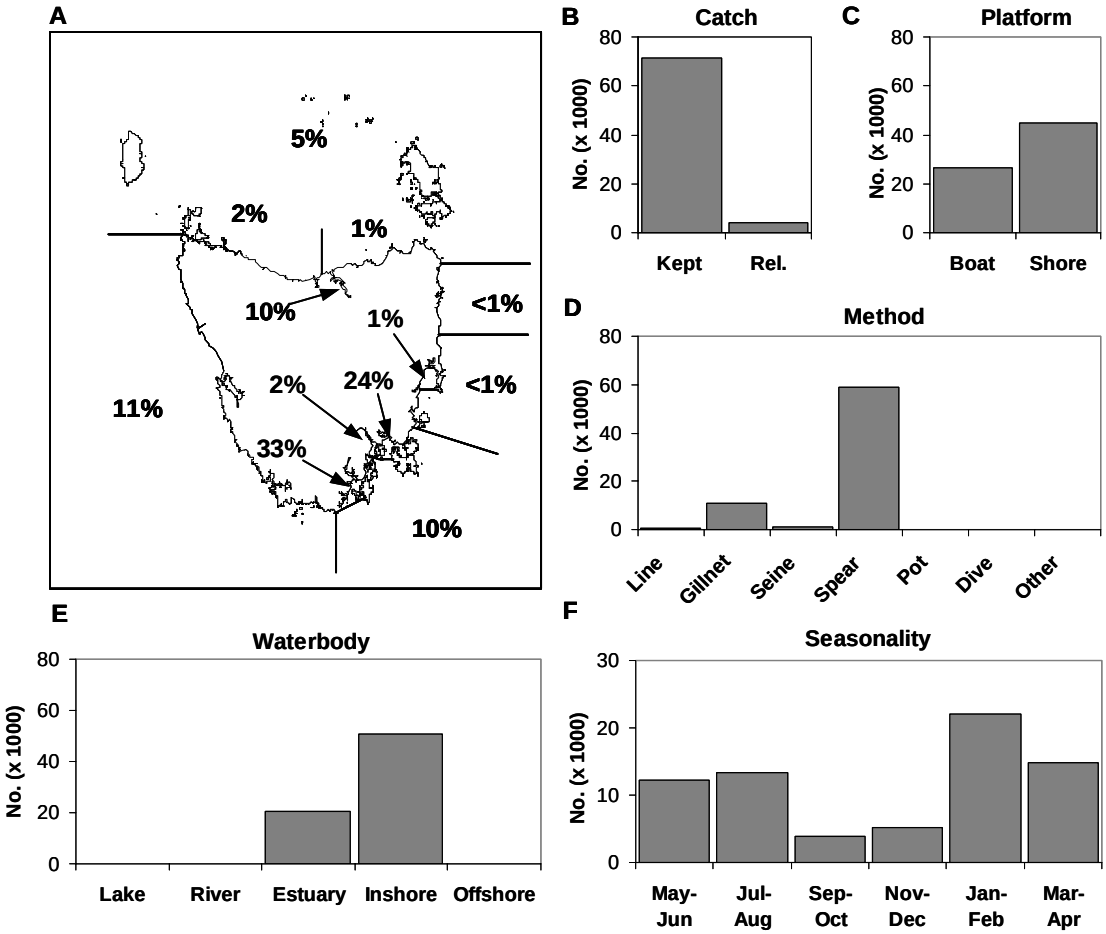

Fig. 21 Characteristics of the recreational catch of flounder in Tasmania during 2000/01: A) proportion (%) of the total harvest (numbers) by fishing region; B) total numbers kept and released; C) total harvest (numbers) by boat and shore based fishing activities; D) total harvest (numbers) by fishing method; E) total harvest (numbers) by water body fished; and F) seasonality in the harvest (numbers).

8.7 Cod

Recreational fishers in Tasmania catch several species of cod, the most commonly encountered species being the red cod (*Pseudophycis bachus*) and bearded cod (*P. barbata*). Key fishing regions for cod included the Tamar Estuary, West Coast (principally Macquarie Harbour), Norfolk-Frederick Henry Bay, and the D'Entrecasteaux Channel; collectively these regions accounted for over 70% of the total harvest (Fig. 22A). A relatively high proportion (38%) of the catch was released or discarded (Fig. 22B), with boat-based catches dominating (> 70%) (Fig. 22C). Line fishing, almost exclusively using bait, was the principal capture method, accounting for over 90% of the harvest (Fig. 22D). There was also a comparatively minor catch taken in gillnets. Over half of the catch was derived from estuarine fishing, the bulk of the remainder taken in inshore coastal waters along with a minor offshore catch (Fig. 22E). Cod catches peaked during winter (May-August) and were generally low at other times of the year (Fig. 22F).

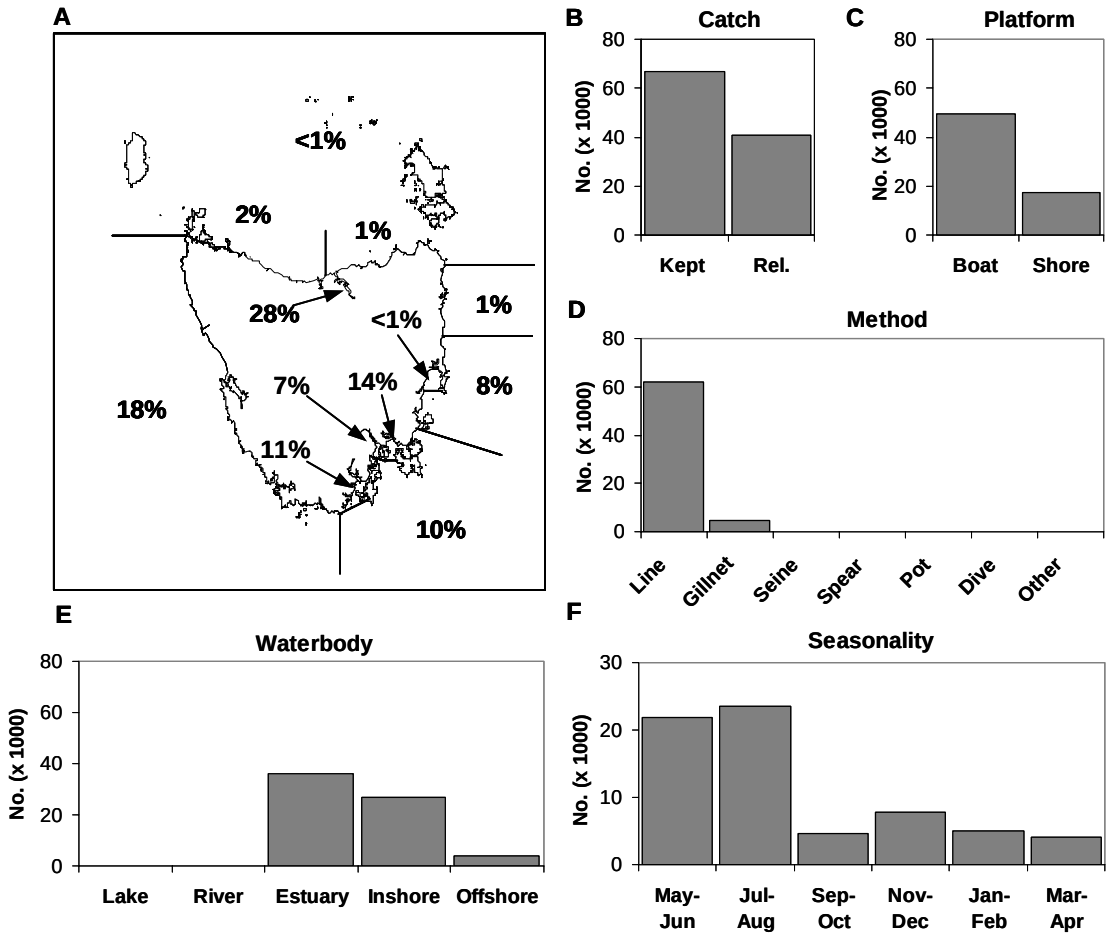

Fig. 22 Characteristics of the recreational catch of cod in Tasmania during 2000/01: A) proportion (%) of the total harvest (numbers) by fishing region; B) total numbers kept and released; C) total harvest (numbers) by boat and shore based fishing activities; D) total harvest (numbers) by fishing method; E) total harvest (numbers) by water body fished; and F) seasonality in the harvest (numbers).

8.8 Bream

Great Oyster Bay represented the most significant region for bream (*Acanthopagrus butcheri*), followed by the Derwent Estuary, Eastern North and Northern East coasts (Fig. 23A). Over 40% of the catch was released (Fig. 23B), with shore-based fishers taking most of the catch (Fig. 23C). Line fishing, almost exclusively using bait, along with a relatively small gillnet catch accounted for the vast majority of the bream harvest (Fig. 23D). Almost 80% of the catch was taken from estuarine waters, with the balance derived from inshore coastal waters (Fig. 23E). The fishery peaked during the summer months (November – February) with only small quantities of bream taken during winter and early spring (Fig. 23F).

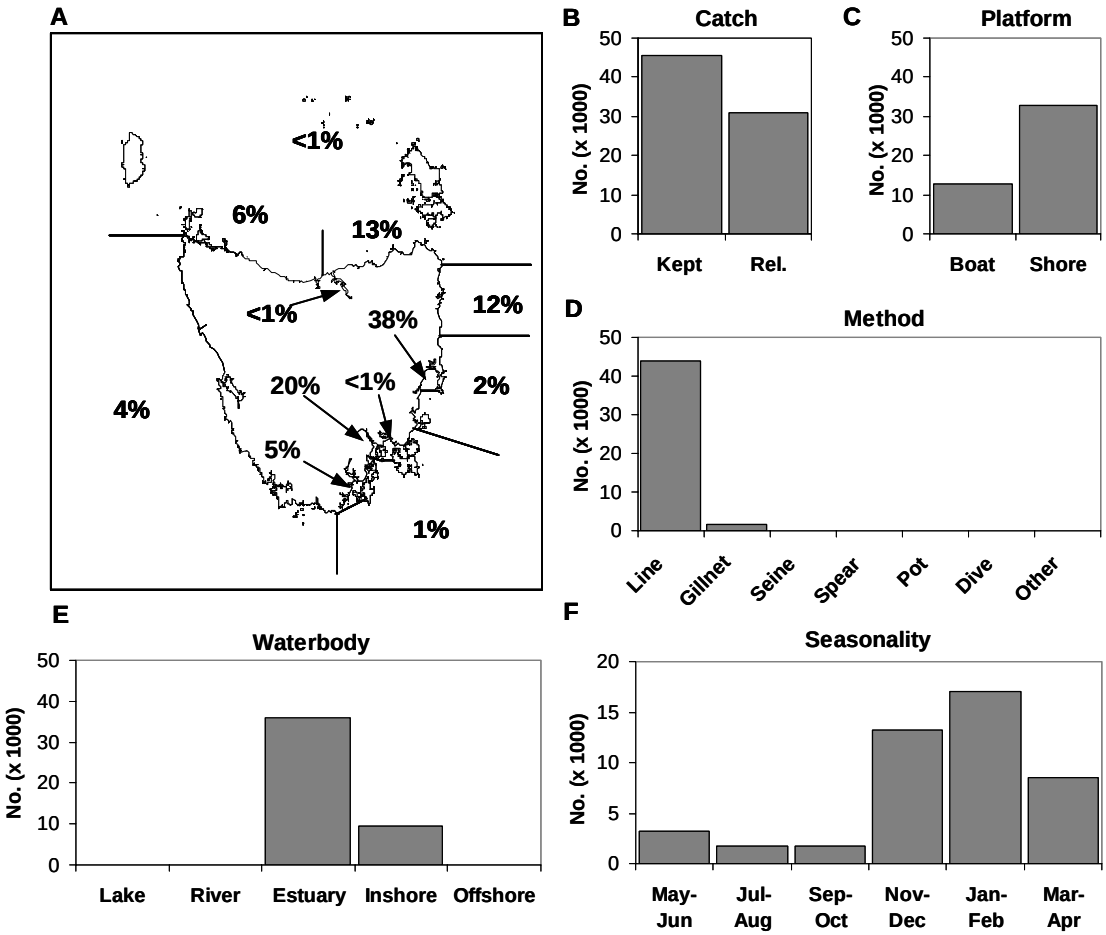

Fig. 23 Characteristics of the recreational catch of bream in Tasmania during 2000/01: A) proportion (%) of the total harvest (numbers) by fishing region; B) total numbers kept and released; C) total harvest (numbers) by boat and shore based fishing activities; D) total harvest (numbers) by fishing method; E) total harvest (numbers) by water body fished; and F) seasonality in the harvest (numbers).

8.9 Blue warehou

Blue warehou (*Seriolella brama*) catches were concentrated in the Western North coast and off the south-eastern Tasmania, including D'Entrecasteaux Channel and Norfolk-Frederick Henry Bay (Fig. 24A). Virtually all of the catch was retained (Fig. 24B), and was more or less equally distributed between boat and shore-based fishers (Fig. 24C). Both line fishing (exclusively using bait) and gillnets were significant capture methods for the species (Fig. 24D). The vast majority (> 80%) of the harvest was derived from inshore coastal waters, the catch from estuarine waters accounted for the bulk of the balance (Fig. 24E). Seasonality in the fishery was evident with peaks in late spring (November-December) and again in autumn (March-June) and very low catches taken during winter (Fig. 24F).

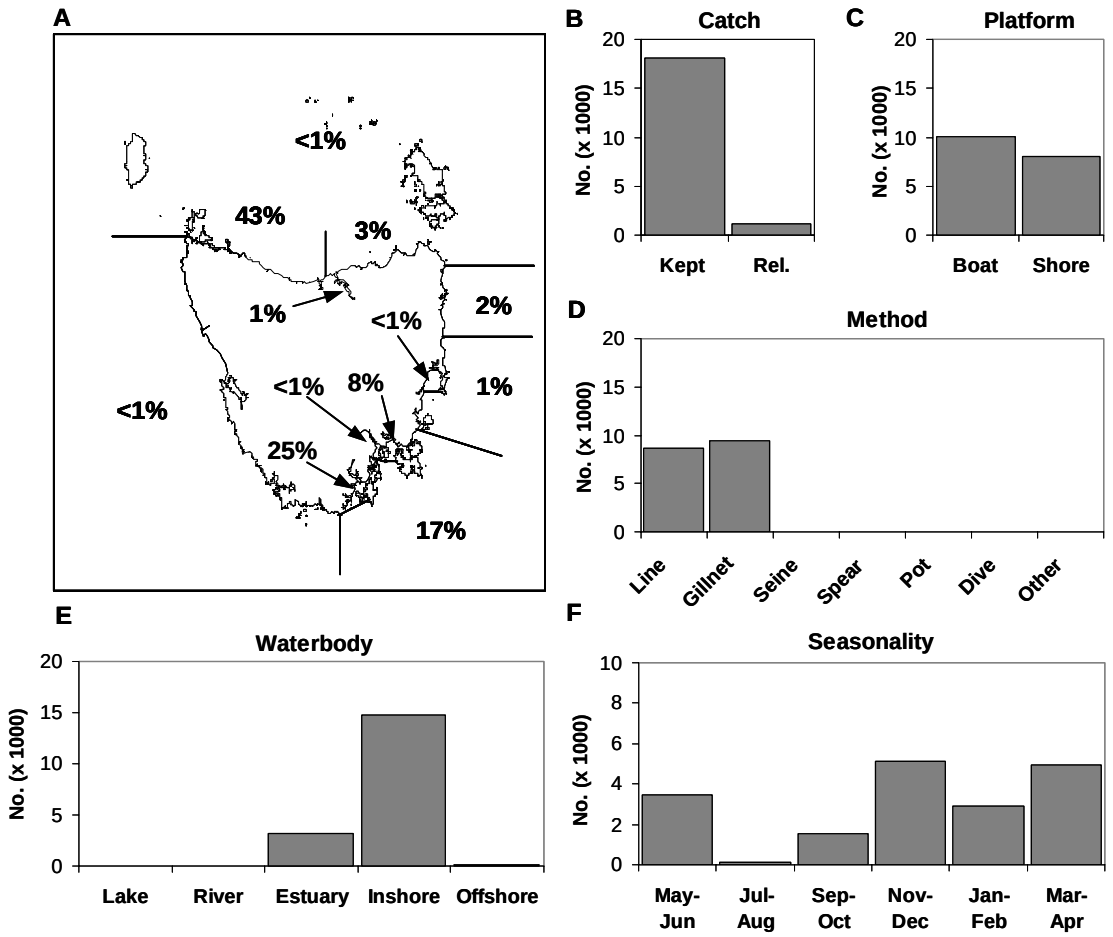

Fig. 24 Characteristics of the recreational catch of blue warehou in Tasmania during 2000/01: A) proportion (%) of the total harvest (numbers) by fishing region; B) total numbers kept and released; C) total harvest (numbers) by boat and shore based fishing activities; D) total harvest (numbers) by fishing method; E) total harvest (numbers) by water body fished; and F) seasonality in the harvest (numbers).

8.10 Bastard trumpeter

Over half of the bastard trumpeter (*Latridopsis forsteri*) catch was derived from the Southern East, D'Entrecasteaux Channel and Norfolk-Frederick Henry Bay regions (Fig 25A). Moderate catches were also taken off the West and Central East coasts. Only a small proportion (11%) of the catch was released or discarded (Fig. 25B), the vast majority being taken by boat fishers (Fig. 25C) using gillnets (Fig. 25D). Catches were taken almost exclusively from inshore coastal waters (Fig. 25E). There was a marked peak in catches during November-December followed by moderate catch levels through to April (Fig. 25F). Catches between May and August were consistently low.

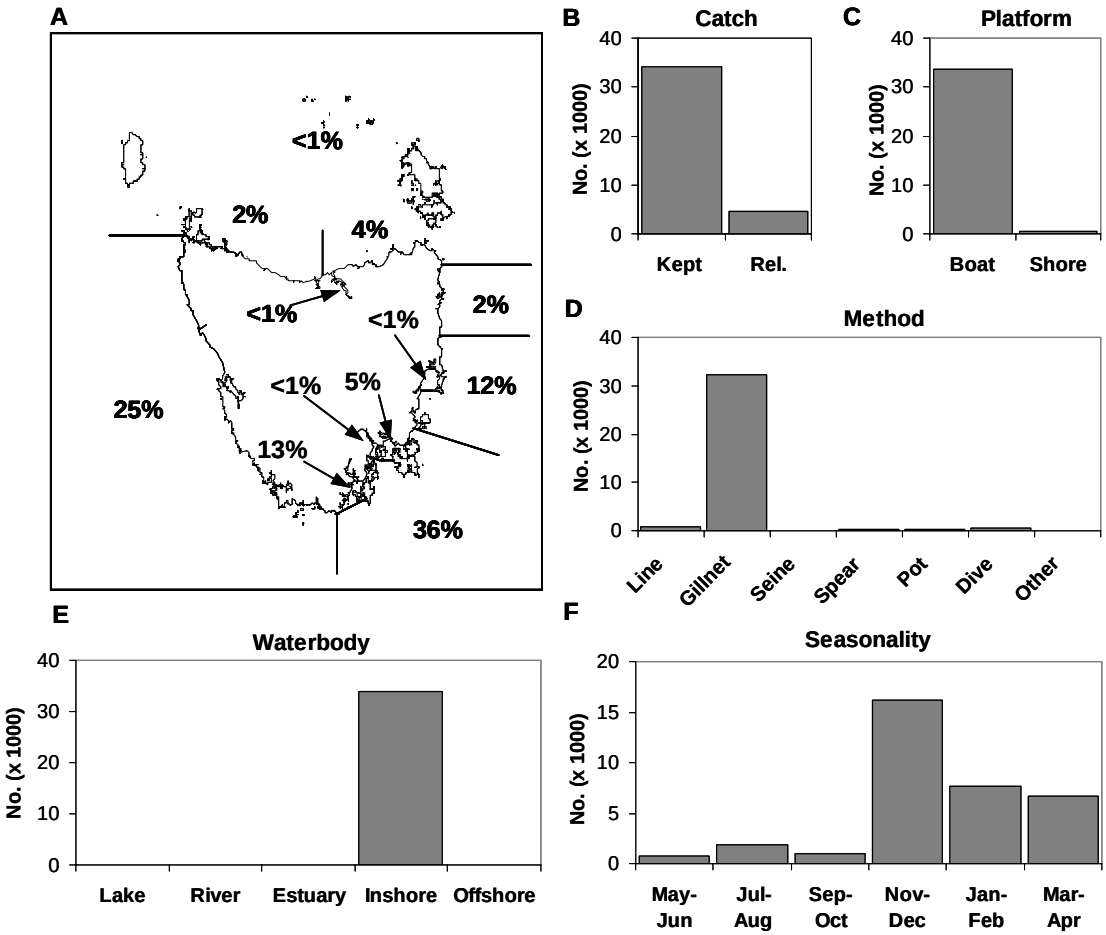

Fig. 25 Characteristics of the recreational catch of bastard trumpeter in Tasmania during 2000/01: A) proportion (%) of the total harvest (numbers) by fishing region; B) total numbers kept and released; C) total harvest (numbers) by boat and shore based fishing activities; D) total harvest (numbers) by fishing method; E) total harvest (numbers) by water body fished; and F) seasonality in the harvest (numbers).

8.11 Striped trumpeter

Regionally, striped trumpeter (*Latris lineata*) catches were concentrated off the Central East and Southern East coast regions, with limited catches from the north coast regions (apart from the Bass Strait Island region) and the West coast (Fig. 26A). Virtually all of the catch was retained (Fig. 26B), being taken exclusively by boat-based fishers (Fig. 26C). The dominant capture method was line fishing (the vast majority taken using bait) with the balance (about one quarter of the catch) taken by gillnets (Fig. 26D). Striped trumpeter catches were taken more or less equally between inshore and offshore waters (Fig. 26E) with slightly higher catches during the summer-autumn period (December-June) than at other times of the year (Fig. 26F).

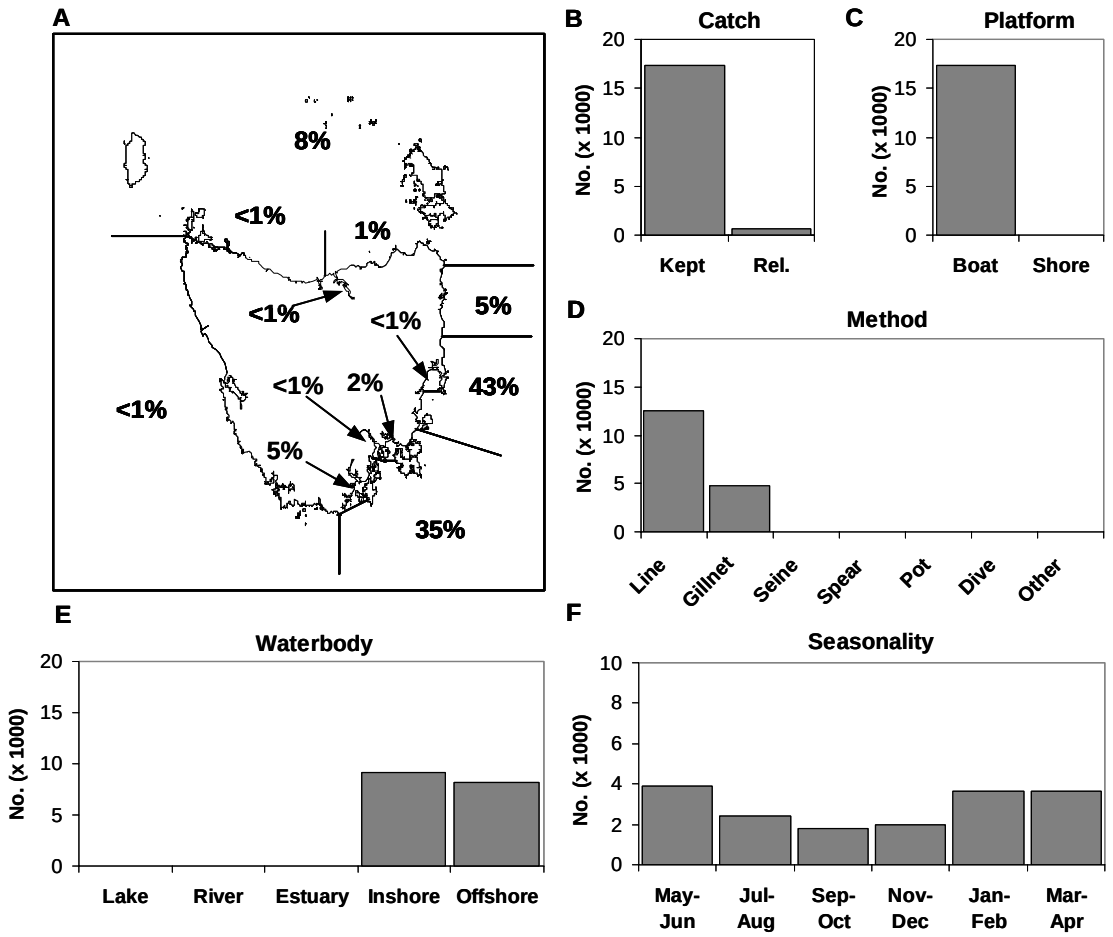

Fig. 26 Characteristics of the recreational catch of striped trumpeter in Tasmania during 2000/01: A) proportion (%) of the total harvest (numbers) by fishing region; B) total numbers kept and released; C) total harvest (numbers) by boat and shore based fishing activities; D) total harvest (numbers) by fishing method; E) total harvest (numbers) by water body fished; and F) seasonality in the harvest (numbers).

8.12 Southern calamary

Over half of the southern calamary (*Sepioteuthis australis*) catch was taken from south-eastern Tasmania, including the D'Entrecasteaux Channel and Norfolk-Frederick Henry Bay regions (Fig. 27A). Moderate catches were also taken off the Central East, Great Oyster Bay and the Eastern North and Tamar regions. The vast majority of the catch was retained (Fig. 27B), with shore-based fishers accounting for slightly more of the catch than boat-based fishers (Fig. 27C). Line fishing (primarily using lures/jigs) represented the main capture method but there were also relatively minor seine and spear catches (Fig. 27D). Most of the calamary were caught in inshore coastal waters, with small quantities reported from estuarine areas (Fig. 27E). Catches were concentrated over the summer-autumn period (December-April), relatively low numbers were taken at other times of the year (Fig. 27F).

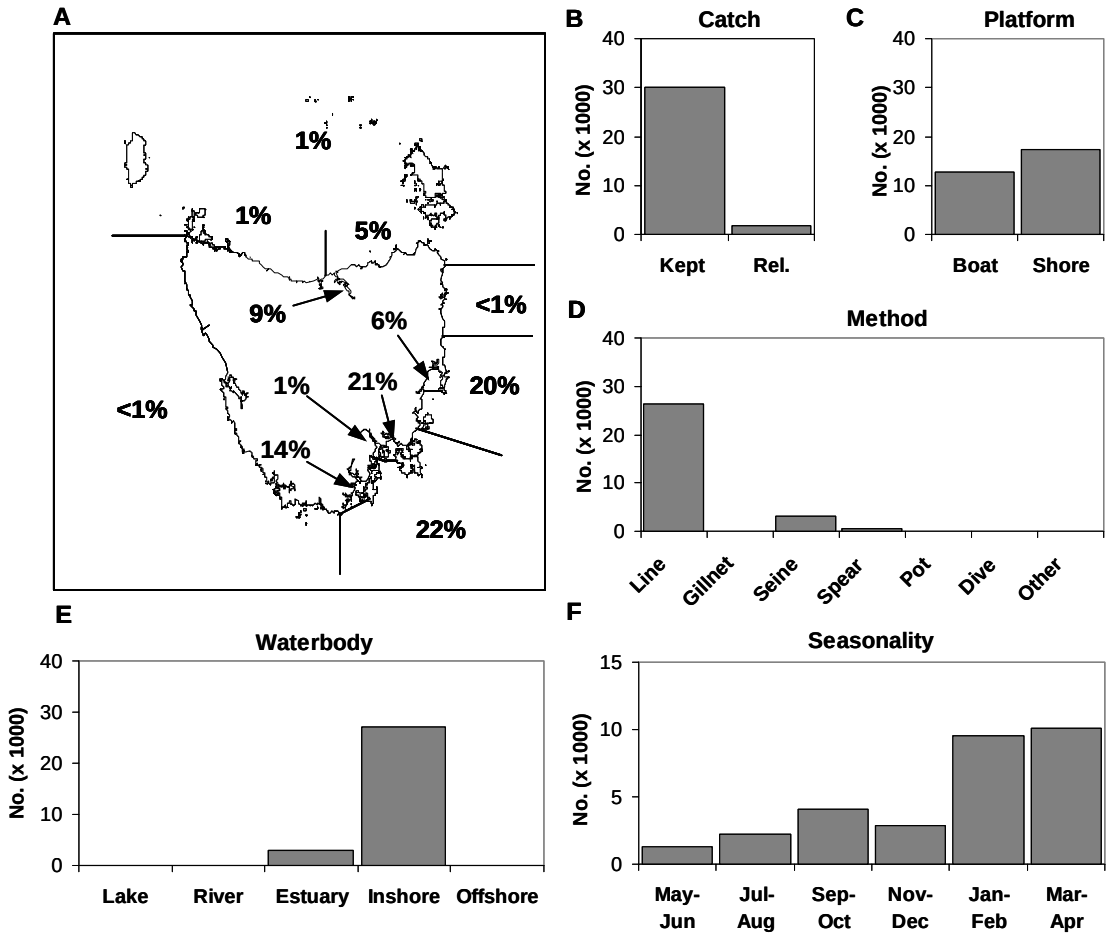

Fig. 27 Characteristics of the recreational catch of southern calamary in Tasmania during 2000/01: A) proportion (%) of the total harvest (numbers) by fishing region; B) total numbers kept and released; C) total harvest (numbers) by boat and shore based fishing activities; D) total harvest (numbers) by fishing method; E) total harvest (numbers) by water body fished; and F) seasonality in the harvest (numbers).

8.13 Rock lobster

Catches of rock lobster (*Jasus edwardsii*) from regions in south-eastern Tasmania accounted for almost half of the State's total, with the combined Central East, Great Oyster Bay and Northern East coast regions contributing a further third of the total harvest (Fig. 28A). Approximately half of the lobsters caught were released (Fig. 28B) and boat-based fishers took the vast majority of the harvest (Fig. 28C). Lobster pots accounted for about 60% of the catch with dive collection also significant (Fig. 28D). Virtually all of the catch was taken from inshore coastal waters (Fig. 28E), primarily between November and April, with a marked peak immediately following the opening of the fishing season in November (Fig. 28F). The impact of the rock lobster fishery closure during September and October was clearly apparent.

The characterisation of the recreational lobster fishery based on fishing region, method and seasonality in this study is consistent with that reported for targeted surveys of lobster licence-holders (Lyle 2000; Forward and Lyle 2002; Lyle and Morton 2004). Forward and Lyle's (2002) estimate of the rock lobster harvest for the period November 2000 to August 2001 of 128,374 lobster (95% confidence limits 109,519-148,266) was higher than estimated here (86,976 lobsters). Although the survey periods did not fully overlap both surveys did cover the periods of greatest catches between November 2000 and April 2001, and if confidence limits around these estimates are compared, the upper 95% confidence limit for the present survey[5] (110,196) overlapped the lower limit (109,519) estimated by Forward and Lyle (2002). Despite some fundamental differences between surveys (general population survey verses a licensed-fisher survey), the underlying consistency in results for rock lobster represents a significant observation pertaining to the efficacy of the present survey, in as much as it has been able to describe the dynamics of a relatively minor activity[6].

[5] Calculated as the estimate plus 1.96xse (refer Appendix 6).

[6] The rock lobster fishery represents only a minor component of the overall recreational fishery in Tasmania – for instance compare with line fishing effort and catch levels.

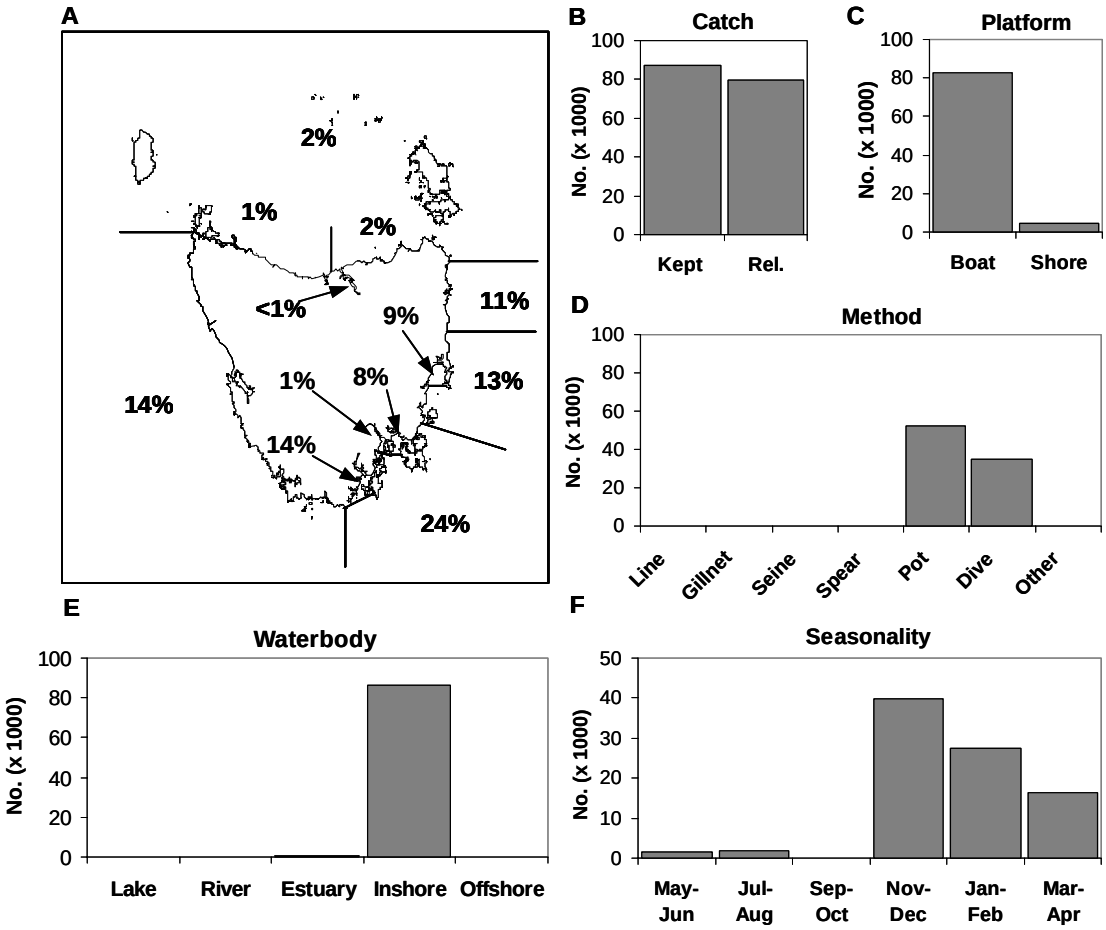

Fig. 28 Characteristics of the recreational catch of rock lobster in Tasmania during 2000/01: A) proportion (%) of the total harvest (numbers) by fishing region; B) total numbers kept and released; C) total harvest (numbers) by boat and shore based fishing activities; D) total harvest (numbers) by fishing method; E) total harvest (numbers) by water body fished; and F) seasonality in the harvest (numbers).

8.14 Abalone

Catches of abalone were largely concentrated off south-eastern Tasmania (especially the Southern East and D'Entrecasteaux Channel regions), with moderate catches also taken from the Central East and West Coast regions (Fig. 29A). Only minor catches were reported from the north coast (including the Bass Strait Islands), and since greenlip abalone (*Haliotis laevigata*) tend to be restricted to this region, it is clear that blacklip abalone (*H. rubra*) dominated the catch. Virtually all of the catch was retained (Fig. 29B), taken by a combination of boat and shore-based divers (Fig. 29C&D) operating in inshore coastal waters (Fig. 29E). Catches were highest during the summer autumn period, with a marked peak in January-February (Fig. 29F). Winter and early spring catches were low.

The spatial and temporal characterisation of the abalone fishery is consistent with that described in directed surveys of recreational licence-holders (Lyle 2000; Lyle and Morton 2004).

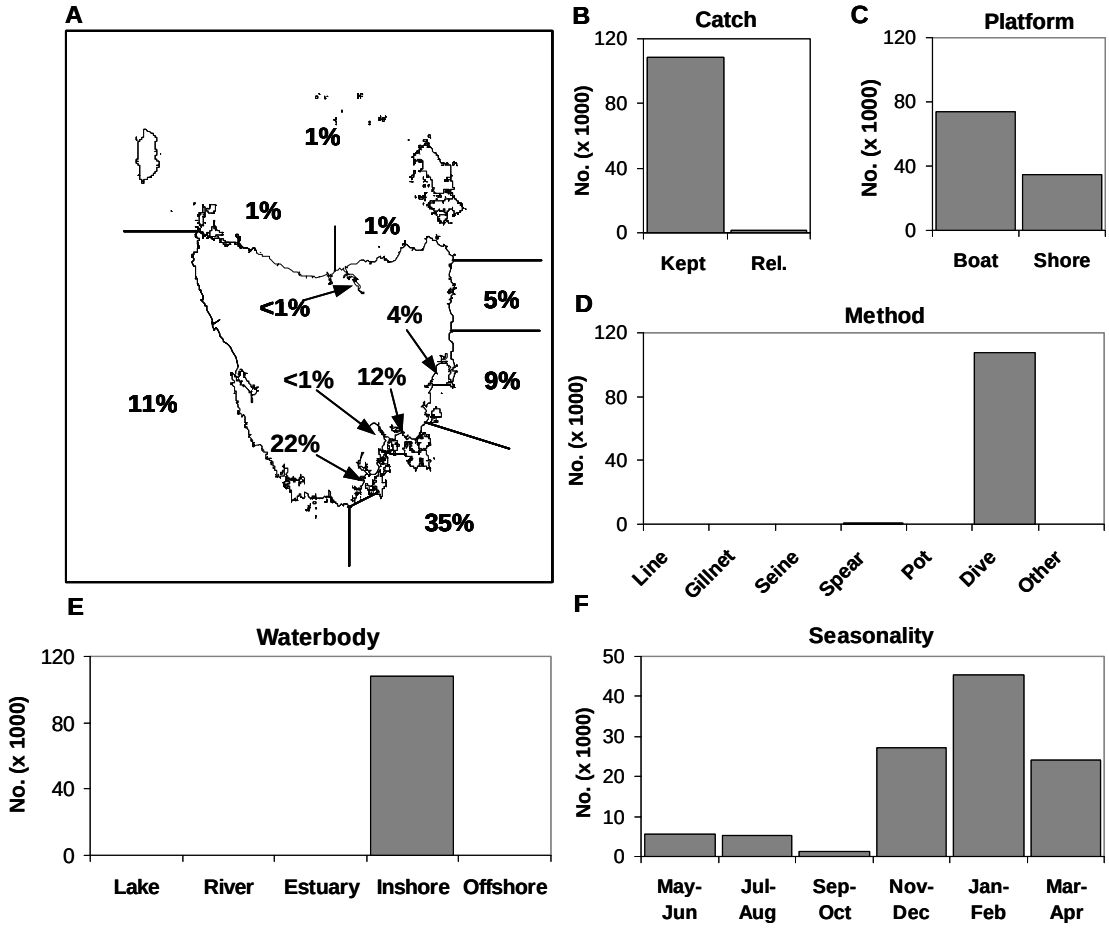

Fig. 29 Characteristics of the recreational catch of abalone in Tasmania during 2000/01: A) proportion (%) of the total harvest (numbers) by fishing region; B) total numbers kept and released; C) total harvest (numbers) by boat and shore based fishing activities; D) total harvest (numbers) by fishing method; E) total harvest (numbers) by water body fished; and F) seasonality in the harvest (numbers).

9. Regional Fisheries

In this section, catch and effort are considered in the context where the fishing activities occurred (fishing regions). Catch and effort information was provided by fishers during the 12-month diary survey and has been presented as expanded estimates (based on participation rates obtained from the screening survey with appropriate non-response adjustments), and includes fishing activity by local and interstate fishers that was undertaken in Tasmania. All references to fishing region relate to those regions depicted in Fig. 3 while home regions relate to the region in which fishers resided and is based on Fig. 2. For more detailed information refer to Appendices 11, 13-15.

9.1 Inland fishery

Tasmania's inland fishery can be divided into three main regions, Western, Central Plateau and Eastern, and in each instance trout dominated finfish catches; over 70% of catch numbers in the Western and Eastern regions and 99% in the Central Plateau. In the Western region the balance of the catch was comprised mainly of blackfish, eels and bream while in the Eastern region redfin perch, eels and blackfish were of secondary importance (Appendix 11). The vast majority of the fishing effort in each of the regions was attributed to line fishing (Appendix 13).

Fishing effort in the Western region was primarily derived from West-NW Rural and Launceston-NE Rural residents (Fig. 30A), i.e. primarily persons residing within or within close proximity to the region. Lake fishing accounted for just over half of the effort with river fishing also significant (Fig. 30B). In both instances, shore-based fishing comprised the bulk of the fishing effort.

The source of fishing activity in the Central Plateau was more evenly distributed between residents from West-NW Rural, Launceston-NE Rural and Hobart areas (Fig. 30C). The importance of the lake fisheries (including Arthurs and Great Lake) in this region was clearly evident, with an even split between boat and shore-based effort (Fig. 30D).

Launceston-NE Rural and Hobart residents accounted for the bulk of the fishing effort in the Eastern region (Fig. 30E), with slightly more effort in rivers than in the lake fisheries (Fig. 30F). Shore-based fishing dominated in both water body types.

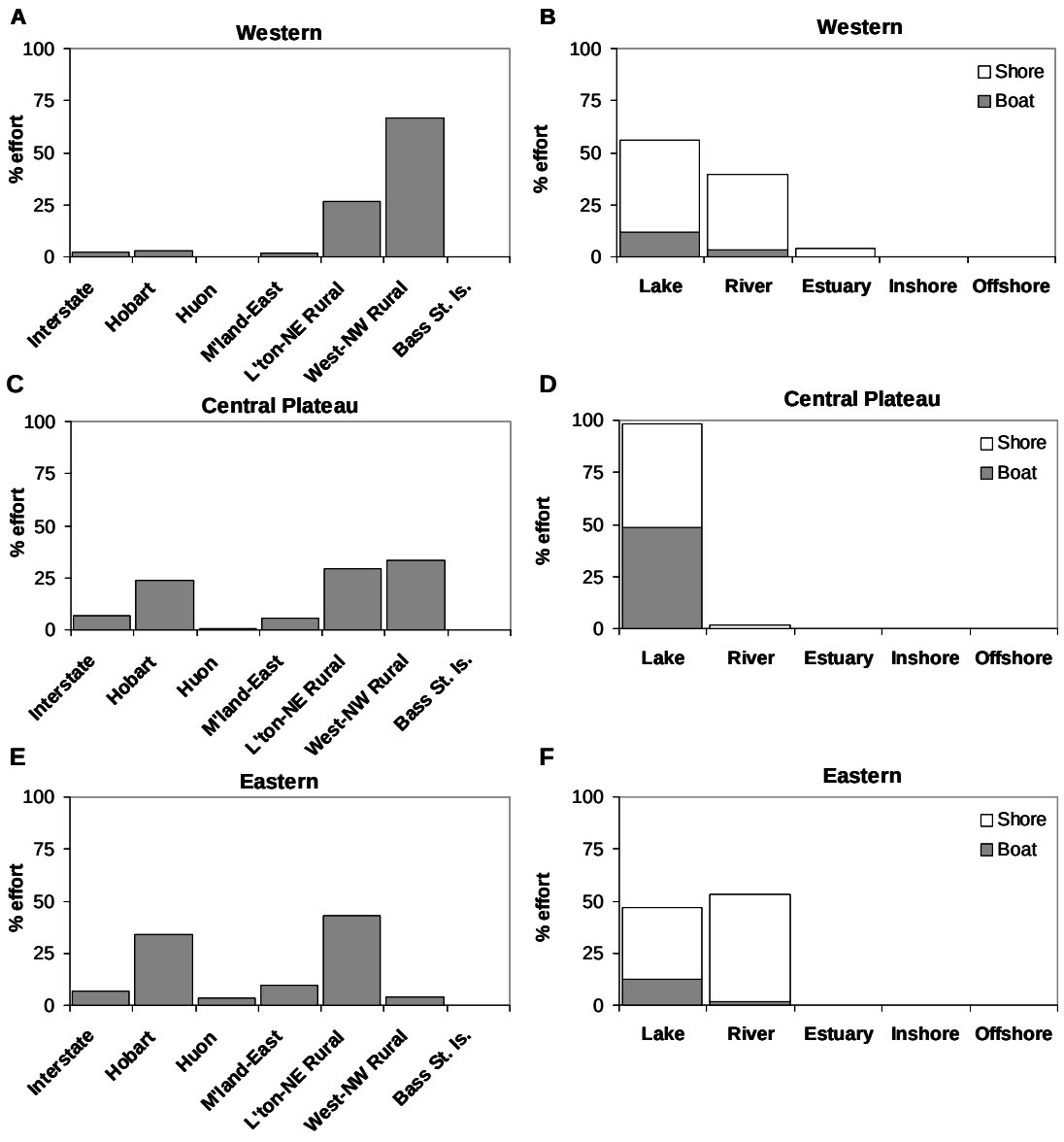

Fig. 30 Characteristics of the inland regions recreational fishery, based on fishing activity during 2000/01: A) proportion (%) of the fishing effort (events) for the Western region based on the region of residence of fishers; B) proportion (%) of the fishing effort (events) for the Western region expended by water body and fishing platform; C) proportion (%) of the fishing effort (events) for the Central Plateau region based on the region of residence of fishers; D) proportion (%) of the fishing effort (events) for the Central Plateau region expended by water body and fishing platform; E) proportion (%) of the fishing effort (events) for the Eastern region based on the region of residence of fishers; and F) proportion (%) of the fishing effort (events) for the Eastern region expended by water body and fishing platform.

9.2 Western North Coast

Line fishing accounted for the vast majority of the fishing effort in the Western North Coast fishery (Fig. 31A), with about two thirds of the effort directed in inshore coastal waters, primarily by shore-based fishers (Fig. 31B). The balance of the effort occurred in estuarine waters, again dominated by shore-based fishing. Local fishers (resident in the West-NW Rural region) contributed the majority of the fishing effort, there was comparatively limited activity from persons from outside of the general region (Fig. 31C). Key species captured included Australian salmon, followed by flathead, mullet, barracouta and blue warehou (Fig. 31D).

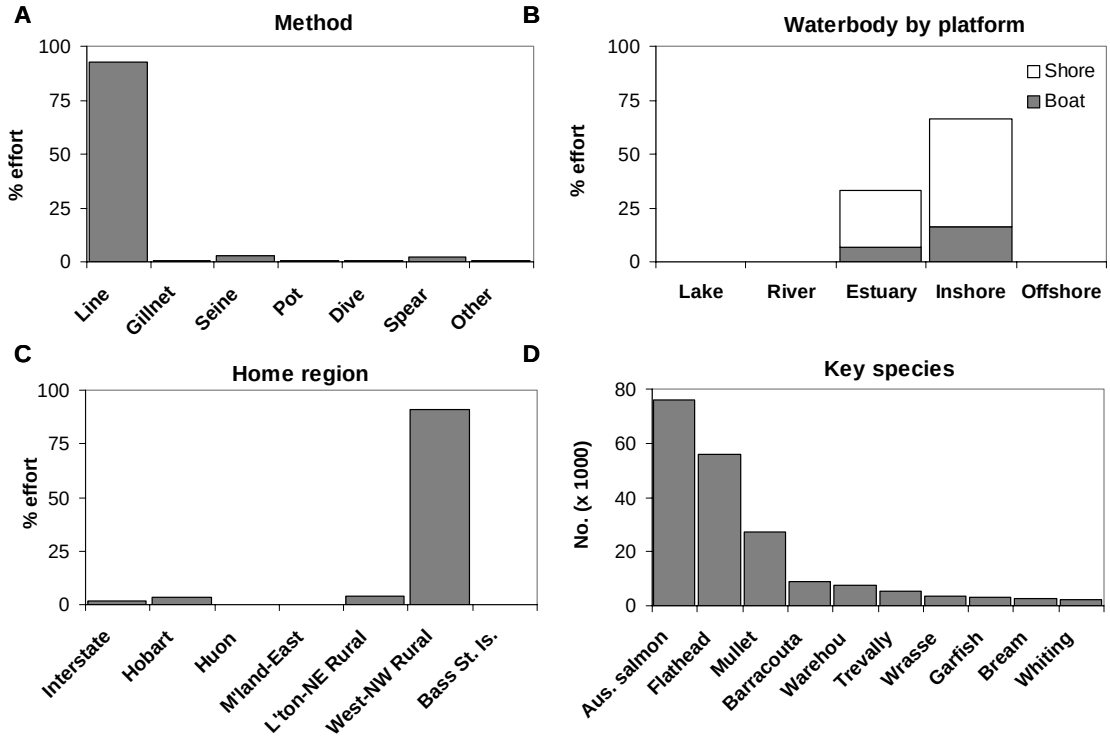

Fig. 31 Characteristics of the recreational fishery in the West North Coast region, based on fishing activity during 2000/01: A) proportion (%) of the fishing effort (events) by fishing method; B) proportion (%) of the fishing effort (events) expended by water body and fishing platform; C) proportion of the fishing effort (events) based on the region of residence of fishers; and D) harvest (numbers) for the key species.

9.3 Eastern North Coast

While line fishing was the major fishing activity in the Eastern North Coast region, gillnets, beach seines and pots were of some minor significance (Fig. 32A). Effort was largely directed in inshore coastal waters, with shore-based fishing activity slightly more prevalent than boat-based fishing effort (Fig. 32B). Fishing in estuarine waters was relatively insignificant. Locally based fishers (Launceston-NE Rural) accounted for about three quarters of the total effort while residents of the West-NW Rural region contributed the bulk of the remainder (Fig. 32C). Flathead were the most numerous species caught, followed by mullet, Australian salmon and bream (Fig. 32D).

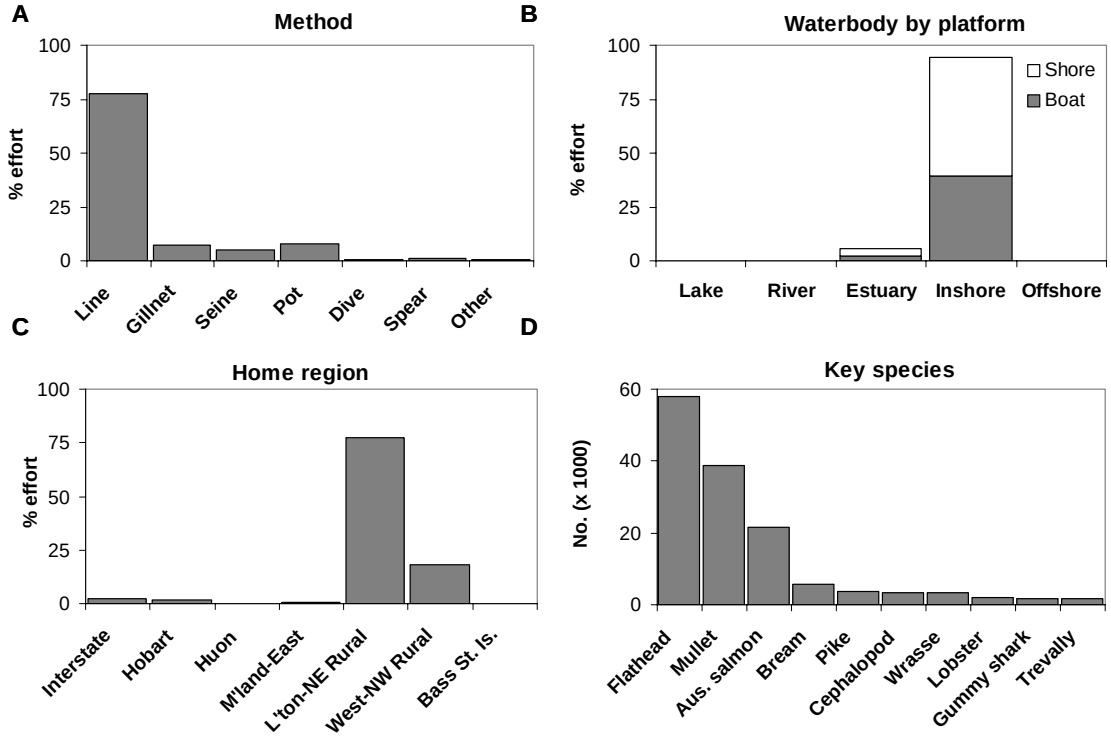

Fig. 32 Characteristics of the recreational fishery in the East North Coast region, based on fishing activity during 2000/01: A) proportion (%) of the fishing effort (events) by fishing method; B) proportion (%) of the fishing effort (events) expended by water body and fishing platform; C) proportion of the fishing effort (events) based on the region of residence of fishers; and D) harvest (numbers) for the key species.

9.4 Tamar Estuary

Effort in the Tamar Estuary was almost entirely attributable line fishing, with a small amount spear fishing activity (Fig. 33A). Not unexpectedly effort was primarily directed in estuarine waters, with shore-based fishing slightly more important than boat-based activity (Fig. 33B). Residents of the surrounding region (Launceston-NE Rural) accounted for the vast majority of the fishing activity (Fig. 33C), with flathead followed by Australian salmon, cod and flounder dominating the harvest (Fig. 33D).

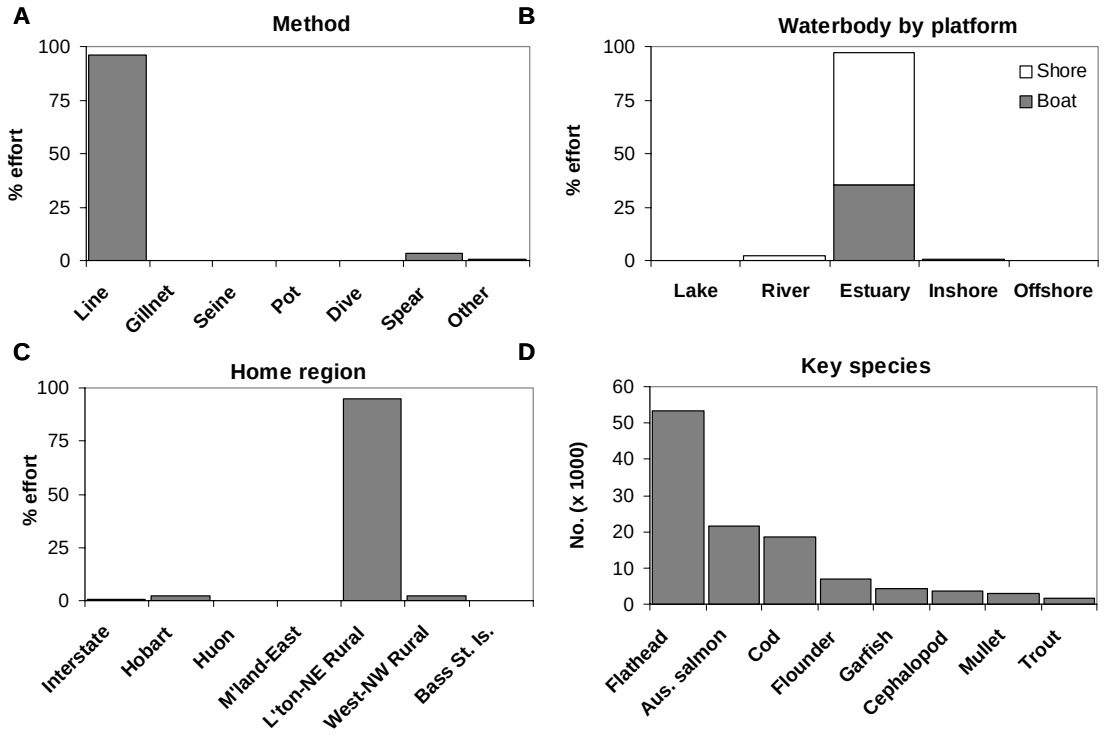

Fig. 33 Characteristics of the recreational fishery in the Tamar Estuary, based on fishing activity during 2000/01: A) proportion (%) of the fishing effort (events) by fishing method; B) proportion (%) of the fishing effort (events) expended by water body and fishing platform; C) proportion of the fishing effort (events) based on the region of residence of fishers; and D) harvest (numbers) for the key species.

9.5 Northern East Coast

Line fishing followed by pot fishing represented the most significant activities in the Northern East Coast region, although a variety of other activities (gillnetting, beach seining, dive collection) were also actively pursued by fishers but at relatively low levels (Fig. 34A). Fishing effort was mainly directed in inshore coastal waters but estuarine fishing was also of some significance (Fig. 34B). St Helens represents an important centre for gamefishing and offshore charter operations and this was refected in the occurrence of some offshore fishing activity. Boat-based fishing was more prevalent than shore-based activity across each of the water body types. About three quarters of the fishing effort was derived from residents of the adjacent area (Launceston-NE Rural) but there was some evidence for fishers travelling from other areas, including West-NW Rural and Hobart (Fig. 34C). Flathead, Australian salmon and rock lobster were the three most frequently harvested species but the influence of the offshore recreational fishery was also apparent with tuna (various species) and blue eye trevalla being identified amongst the top ten species harvested (Fig. 34D).

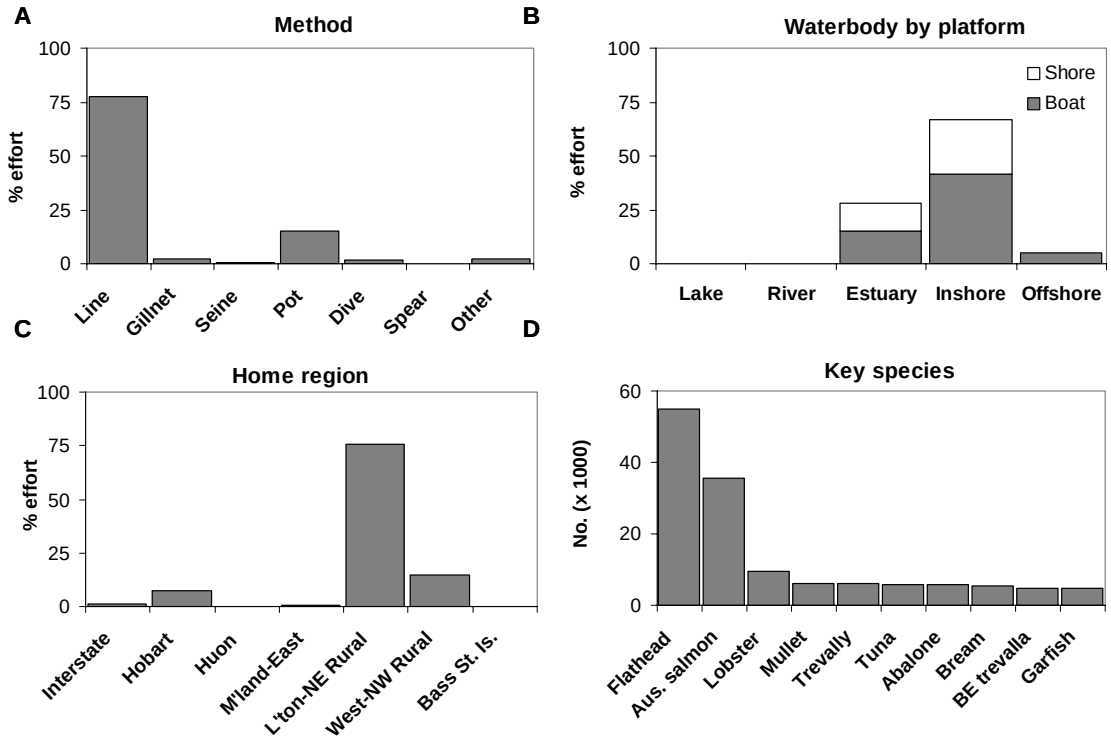

Fig. 34 Characteristics of the recreational fishery in the North East Coast region, based on fishing activity during 2000/01: A) proportion (%) of the fishing effort (events) by fishing method; B) proportion (%) of the fishing effort (events) expended by water body and fishing platform; C) proportion of the fishing effort (events) based on the region of residence of fishers; and D) harvest (numbers) for the key species.

9.6 Central East Coast

In addition to line fishing effort, methods of importance in the Central East Coast region included pots, gillnet and dive collection (Fig. 35A). The vast majority of the effort occurred in inshore coastal waters and was primarily boat-based (Fig. 35B). There was very limited estuarine and offshore fishing activity reported in the region. Hobart residents contributed over half of the total effort, indicating the impact and importance of fishers travelling from outside the general region. Residents from the surrounding areas (Midland-East and Launceston-NE Rural) accounted for the bulk of the remaining effort (Fig. 35C). Flathead were by far the dominant species harvested, followed by jackass morwong and jack mackerel (Fig. 35D).

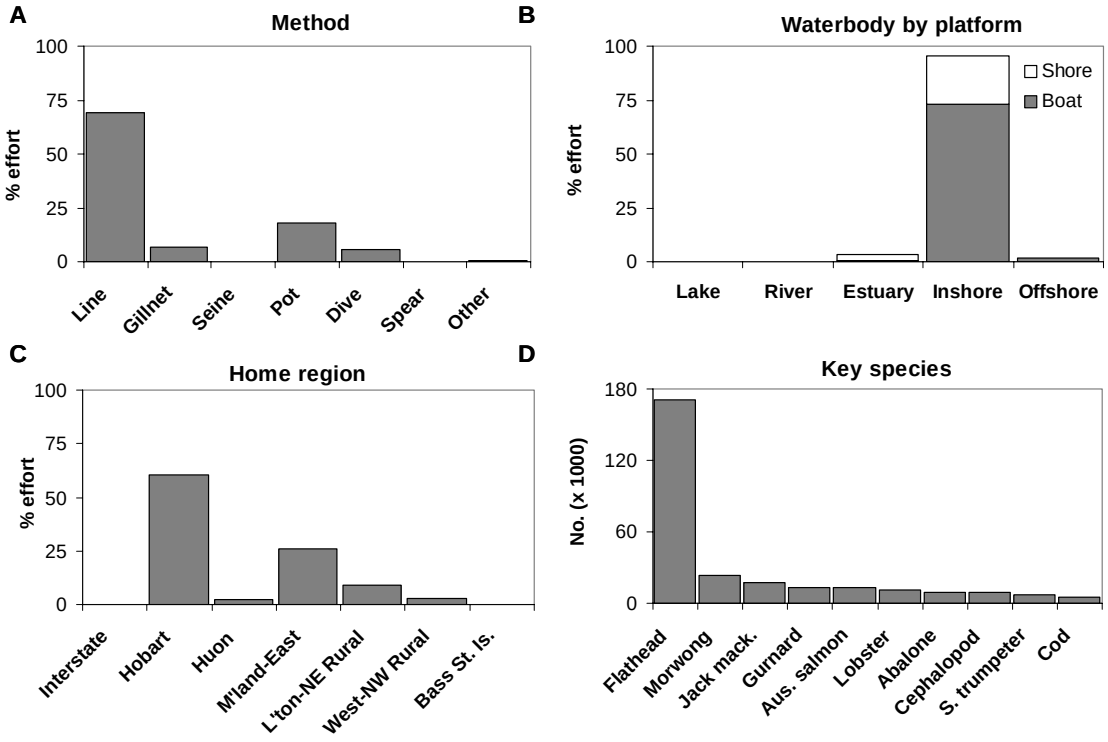

Fig. 35 Characteristics of the recreational fishery in the Central East Coast region, based on fishing activity during 2000/01: A) proportion (%) of the fishing effort (events) by fishing method; B) proportion (%) of the fishing effort (events) expended by water body and fishing platform; C) proportion of the fishing effort (events) based on the region of residence of fishers; and D) harvest (numbers) for the key species.

9.7 Great Oyster Bay

Great Oyster Bay is effectively a sub-region within the Central East Coast and shared some general fishery characteristics, including the relative mix of fishing methods (Fig. 36A). There was, however, proportionally more fishing effort directed in estuarine waters (mainly shore-based) (Fig. 36B) along with some differences in catch composition, notably bream being the second most frequently harvested species after flathead (Fig. 36D). In contrast to the Central East Coast, was the fact that effort was more or less evenly distributed between residents from Launceston-NE Rural, Hobart, West-NW Rural and Midland-East regions, again indicating the importance of visiting fishers to the region (Fig. 36C).

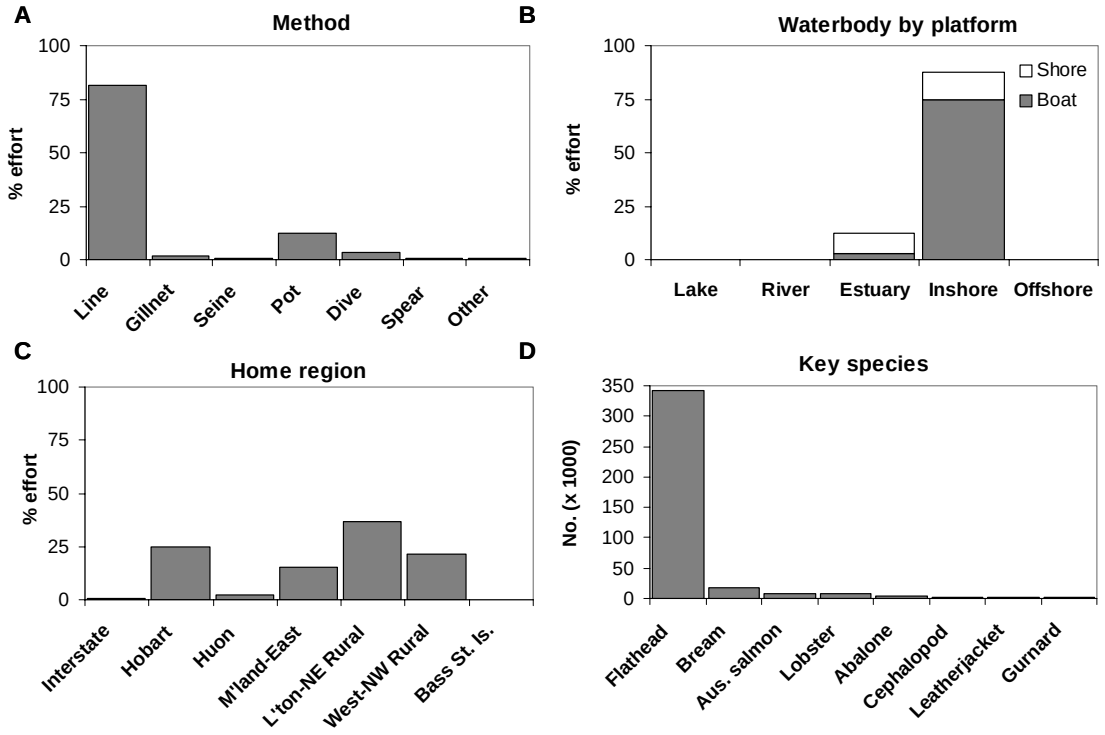

Fig. 36 Characteristics of the recreational fishery in Great Oyster Bay, based on fishing activity during 2000/01: A) proportion (%) of the fishing effort (events) by fishing method; B) proportion (%) of the fishing effort (events) expended by water body and fishing platform; C) proportion of the fishing effort (events) based on the region of residence of fishers; and D) harvest (numbers) for the key species.

9.8 Southern East Coast

Only about half of the total effort in the Southern East Coast region was attributable to line fishing; pot, gillnets, and dive methods were of secondary importance (Fig. 37A). The vast majority of the fishing activity was directed in the inshore coastal region, primarily fishing from boats (Fig. 37B). Offshore fishing also featured in the fishery, with the Tasman Peninsula an important centre for gamefishing and offshore charter operations. Hobart residents accounted for about three quarters of the total effort, with Midland-East the bulk of the balance (Fig. 37C). In addition to flathead, abalone and rock lobsters were the main species captured (Fig. 37D). Species typically caught by gillnet such as bastard trumpeter also featured amongst the top ten species, as did tuna (various species), the main target of the offshore gamefish fishery.

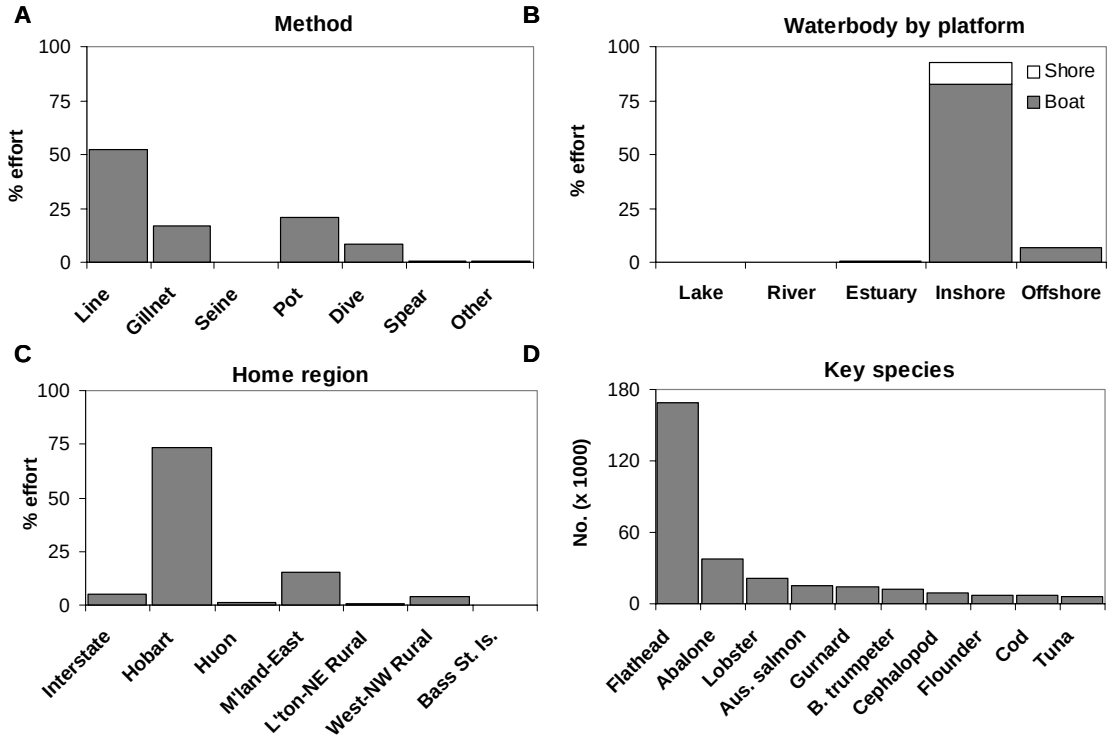

Fig. 37 Characteristics of the recreational fishery in the Southern East Coast region, based on fishing activity during 2000/01: A) proportion (%) of the fishing effort (events) by fishing method; B) proportion (%) of the fishing effort (events) expended by water body and fishing platform; C) proportion of the fishing effort (events) based on the region of residence of fishers; and D) harvest (numbers) for the key species.

9.9 Norfolk-Frederick Henry Bay

Norfolk and Frederick Henry Bays provide relatively sheltered waters, supporting a range of fishing opportunities, with line fishing the primary activity (Fig. 38A). The use of gillnets, pots, dive and spear collection methods were also undertaken in the region but at comparatively low levels. Boat fishing in inshore coastal waters accounted for the bulk of the recreational fishing activity (Fig. 38B), with locally based fishers (Hobart) contributing the vast majority of the fishing effort (Fig. 38C). Flathead represented the primary catch, followed by flounder and abalone (Fig. 38D).

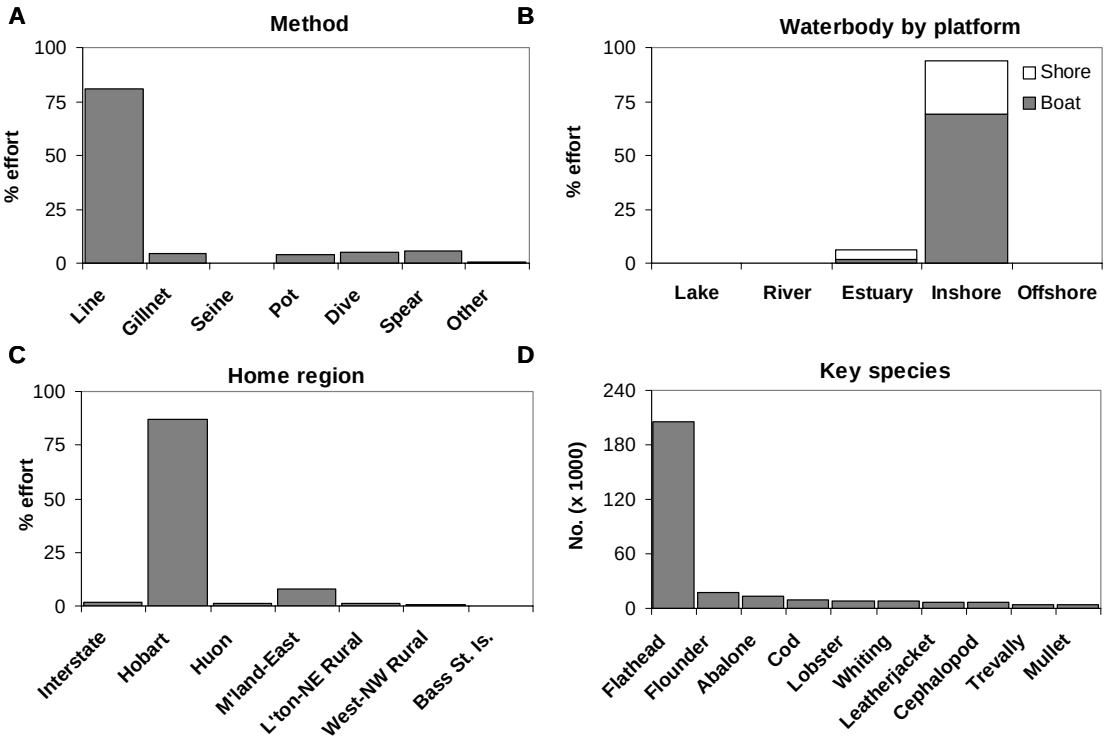

Fig. 38 Characteristics of the recreational fishery in Norfolk and Frederick Henry Bays, based on fishing activity during 2000/01: A) proportion (%) of the fishing effort (events) by fishing method; B) proportion (%) of the fishing effort (events) expended by water body and fishing platform; C) proportion of the fishing effort (events) based on the region of residence of fishers; and D) harvest (numbers) for the key species.

9.10 Derwent Estuary

Line fishing was by far the most important fishing activity in the Derwent (Fig. 39A), with shore-based fishing more prevalent than boat fishing (Fig. 39B). There was also a small amount of river and inshore (around the mouth of the estuary) fishing. Hobart residents accounted for the vast majority of the effort (Fig. 39C), with flathead the most commonly caught species (Fig. 39D). Bream, trout and Australian salmon were of secondary importance in the overall catch.

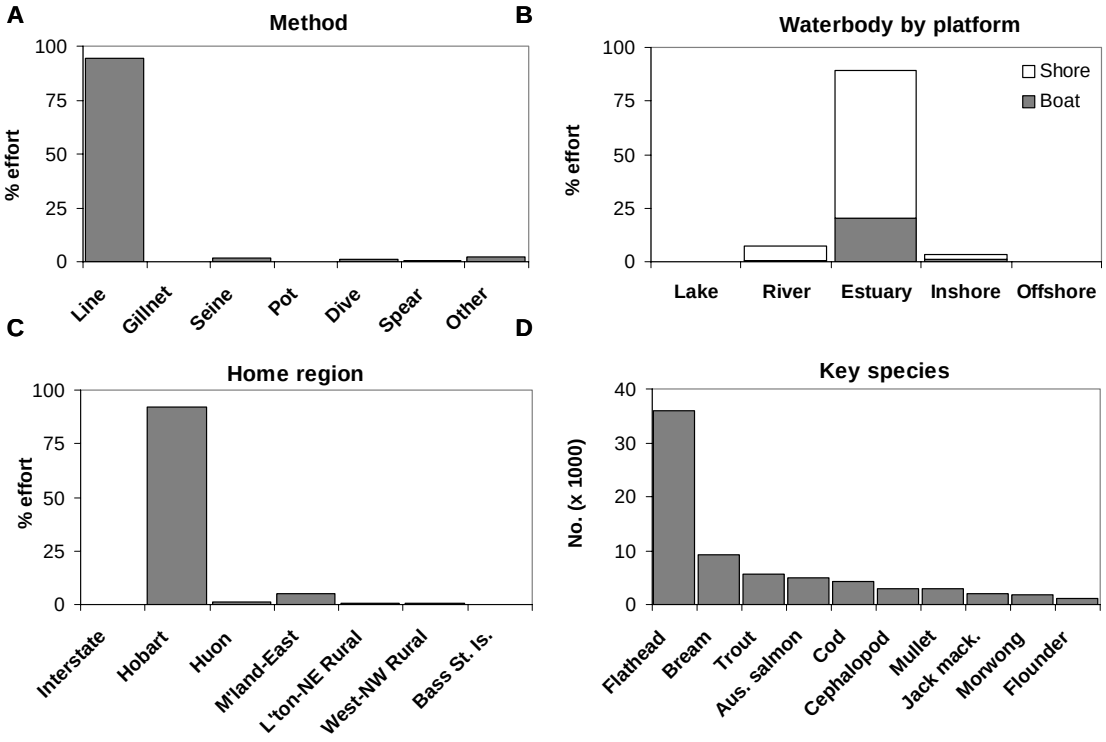

Fig. 39 Characteristics of the recreational fishery in the Derwent Estuary, based on fishing activity during 2000/01: A) proportion (%) of the fishing effort (events) by fishing method; B) proportion (%) of the fishing effort (events) expended by water body and fishing platform; C) proportion of the fishing effort (events) based on the region of residence of fishers; and D) harvest (numbers) for the key species.

9.11 D'Entrecasteaux Channel

In addition to line fishing, comparatively minor levels of gillnet, pot, dive and spear effort were conducted in the D'Entrecasteaux Channel (Fig. 40A). Boat fishing accounted for most of the effort in the inshore waters whereas shore-based fishing was slightly more important to the estuarine fishery (Fig. 40B). The vast majority of the effort was attributed to Hobart and Huon residents, indicating limited impact from fishers residing outside of the general area surrounding the Channel (Fig. 40C). Overall, flathead dominated the catch with abalone and flounder of secondary importance (Fig. 40D). Atlantic salmon, escapees from aquaculture cages, also featured amongst the top ten species captured.

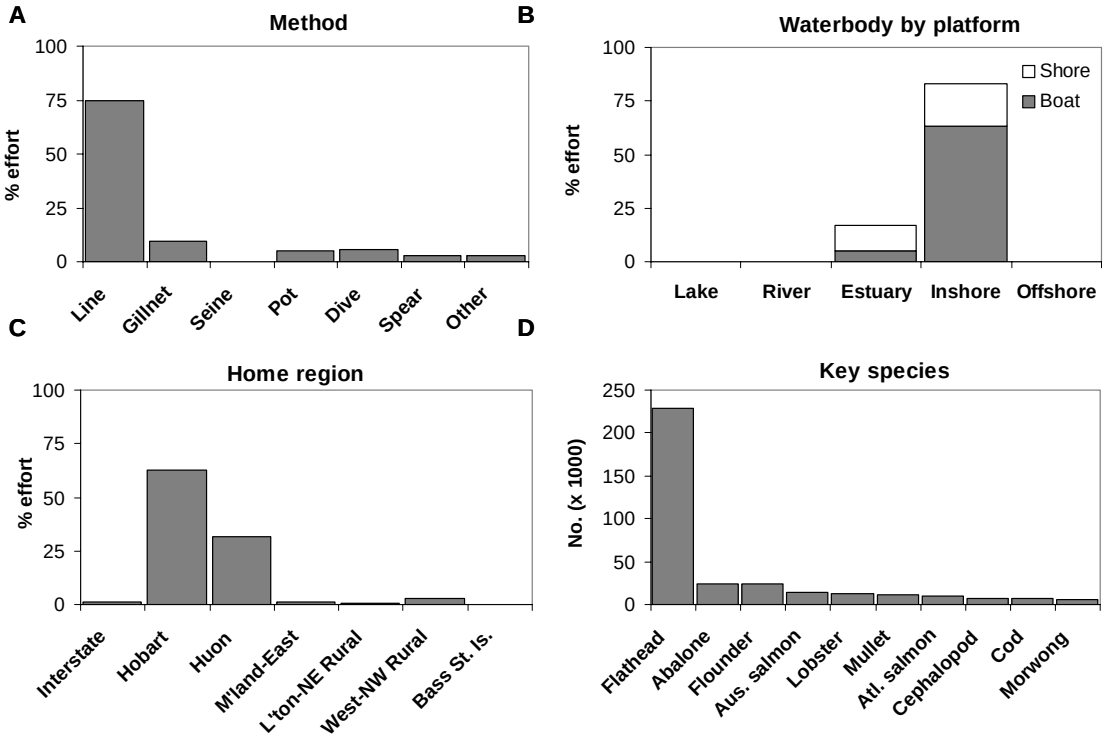

Fig. 40 Characteristics of the recreational fishery in the D'Entrecasteaux Channel, based on fishing activity during 2000/01: A) proportion (%) of the fishing effort (events) by fishing method; B) proportion (%) of the fishing effort (events) expended by water body and fishing platform; C) proportion of the fishing effort (events) based on the region of residence of fishers; and D) harvest (numbers) for the key species.

9.12 West Coast

Line fishing accounted for just over half of the total effort off the West Coast, usage of gillnets, pots and dive methods was also relatively common in the region (Fig. 41A). Most of the fishing activity occurred in inshore coastal waters, but estuarine fishing (mainly in Macquarie Harbour) was also significant (Fig. 41B). Effort was distributed more or less equally between boat and shore-based fishing activity in estuarine waters whereas boat fishing was more prevalent in the inshore fishery. While most of the West Coast effort was the result of fishers residing in the adjacent areas (West-NW Rural), there was also a minor contribution from interstate fishers and Hobart residents (Fig. 41C). Australian salmon were the main species caught, followed by rock lobster, cod and abalone (Fig. 41D).

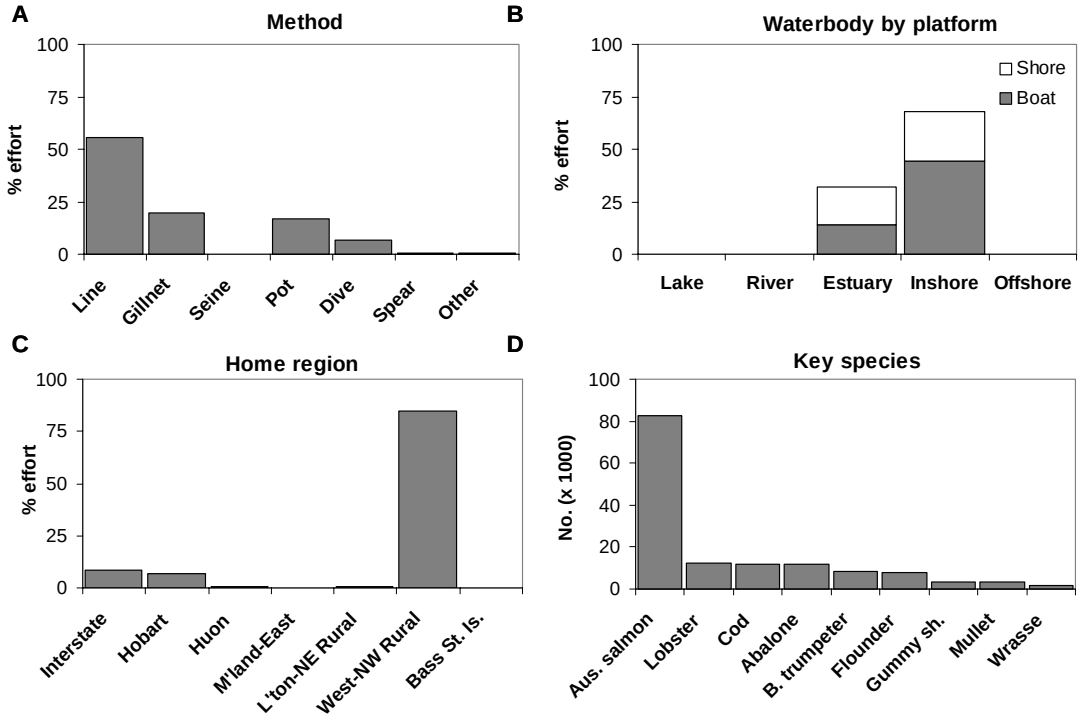

Fig. 41 Characteristics of the recreational fishery in the West Coast region, based on fishing activity during 2000/01: A) proportion (%) of the fishing effort (events) by fishing method; B) proportion (%) of the fishing effort (events) expended by water body and fishing platform; C) proportion of the fishing effort (events) based on the region of residence of fishers; and D) harvest (numbers) for the key species.

9.13 Bass Strait Islands

By comparison with the other regions, the fishery in the Bass Strait Islands was relatively small, due to the combined impact of a small population base and isolation from the Tasmanian mainland. As such the quantity of information available from the survey was limited and may not be fully representative of the fishery in the region. The available information, however, indicated that line fishing, followed by the use of pots, were the main methods used (Fig. 42A) and that overall shore-based fishing was more significant than boat fishing, with most effort expended in inshore coastal waters (Fig. 42B). Locally based fishers (Bass Strait Islands) accounted for just over half of the total fishing effort, indicating the importance and potential impacts visitors from both Tasmania and interstate (Fig. 42C). Australian salmon represented the main catch, followed by flounder, flathead and blue mackerel (Fig. 42D).

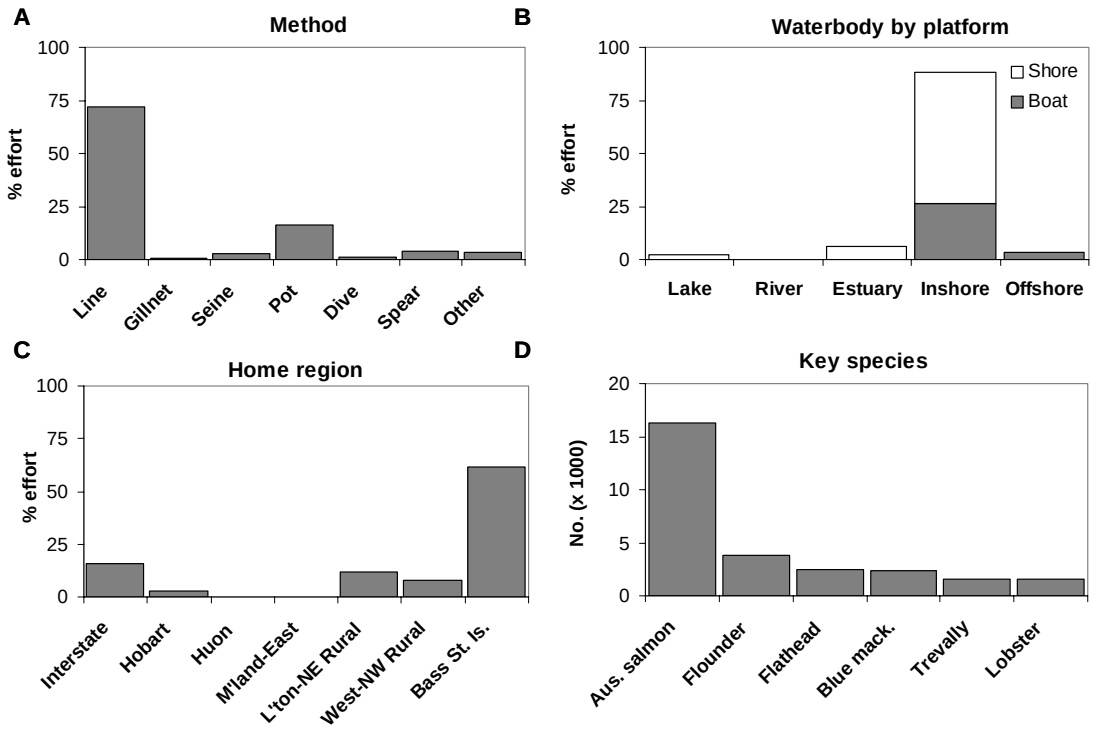

Fig. 42 Characteristics of the recreational fishery in the Bass Strait Islands, based on fishing activity during 2000/01: A) proportion (%) of the fishing effort (events) by fishing method; B) proportion (%) of the fishing effort (events) expended by water body and fishing platform; C) proportion of the fishing effort (events) based on the region of residence of fishers; and D) harvest (numbers) for the key species.

10. Expenditure

Expenditure information was collected during the diary survey for a wide range of items and services related to recreational fishing activity but for the purpose of analysis they have been grouped into ten major categories (Table 8). Significantly, some items have been excluded from the economic analysis, they include food and drink, motor vehicle purchases, real estate purchases and communication costs (telephone, postage and internet).

All expenditure is reported as attributable expenditure as per the definition provided in Section 2.8.

10.1 Expenditure by Tasmanians

Total expenditure attributable to recreational fishing by Tasmanians during 2000/01 was estimated at $51.8 million (Table 8), representing 2.8% of the national total of over $1.8 billion (Henry and Lyle 2003). Owing to the exclusion of certain expenditure items (refer above) and non-coverage of non-fishers who also make purchases of fishing related goods and services (e.g. as gifts), these figures represent minimum estimates of the economic impacts of recreational fishing.

Boats/trailers (including purchase, maintenance, running costs, registration and insurance) represented the largest expenditure category, $20.9 million (40% of the total). Travel associated with fishing (primarily vehicle running costs) was the second highest expenditure category accounting for about $15.7 million (30%). Clothing (including life jackets, wet weather gear) was next in importance at $4.2 million (8%), followed by fishing gear and accommodation, approximately $4.0 million each, and $1.6 million in fees/licences (primarily fishing licences).

Table 8 Estimated annual attributed expenditure ($) by item category by recreational fishers aged 5 or older.
se is standard error

Item category	Expenditure BY Tasmanians: Total	Expenditure IN Tasmania: BY Tasmanians	BY interstate visitors	Total
Boat and Trailer	**$20,883,824**	$20,696,992	$1,722	**$20,698,713**
Travel	**$15,730,756**	$15,295,200	$167,067	**$15,462,267**
Clothing	**$4,244,406**	$4,243,093	$126,530	**$4,369,623**
Accommodation	**$3,962,103**	$3,873,215	$432,472	**$4,305,687**
Fishing Gear	**$4,053,237**	$3,915,965	$79,891	**$3,995,856**
Fees, Licences	**$1,597,855**	$1,586,889	$63,866	**$1,650,755**
Dive Gear	**$532,337**	$529,554	-	**$529,554**
Bait, Burley, Ice	**$363,703**	$316,277	$28,442	**$344,719**
Boat Hire, Charter	**$290,239**	$192,553	$73,167	**$265,720**
Others	**$175,997**	$175,997	-	**$175,997**
TOTAL	**$51,834,458**	**$50,825,735**	**$973,157**	**$51,798,892**
se	*4,966,010*			

10.2 Expenditure in Tasmania

Not all fishing related expenditure by Tasmanians occurred within Tasmania, just over $1million occurred interstate, resulting in an estimated annual expenditure by locals in Tasmania of $50.8 million (Table 8). The contribution by interstate fishers in Tasmania was roughly $1 million (mainly accommodation, travel and clothing) and effectively balanced the 'exported' expenditure, giving a total fishing related expenditure in Tasmania of $51.8 million for 2000/01.

10.3 Regional expenditure

In order to examine regional economic impacts, expenditure information (excluding the travel component based on private vehicle travel and derived from kilometres travelled) has been analysed based on where the fishers resided (home region) and where the expenditure occurred (economic zone). Home region and economic zone boundaries are indicated in Fig. 2, noting that fishers residing outside of Tasmania have been assigned "interstate" as their home region.

Regional expenditure data are provided in Appendix 16 and are summarised in Fig. 43 by economic zone based on where (home region) the expenditure inputs were derived. In the Hobart, Launceston-NE Rural and West-NW Rural regions the vast majority (>90%) of the economic activity attributable to fishing was derived from fishers who resided within the region. That is, within in the context of each of these zones, the impact of imported economic activity was relatively small. By contrast, in the Huon and Midland-East regions expenditure by local residents accounted for only about 60% of the total; Hobart residents accounted for about one third and 14% of the expenditure in the Huon and Midland-East economic zones, respectively. The former was no doubt associated with Hobart residents fishing in the D'Entrecasteaux and Southern East Coast regions (refer sections 9.8 & 9.9). The proportionally high level of imported expenditure into the Midland-East economic zone was largely due to the fishing activities of Hobart, Launceston-NE Rural and West-NW Rural residents in the Central Plateau, Central East and Great Oyster Bay fishing regions (refer sections 9.1, 9.6 & 9.7). Overall, however, the economic analysis demonstrated that the bulk of the economic activity within each of the economic zones was due to fishers who resided within the zone.

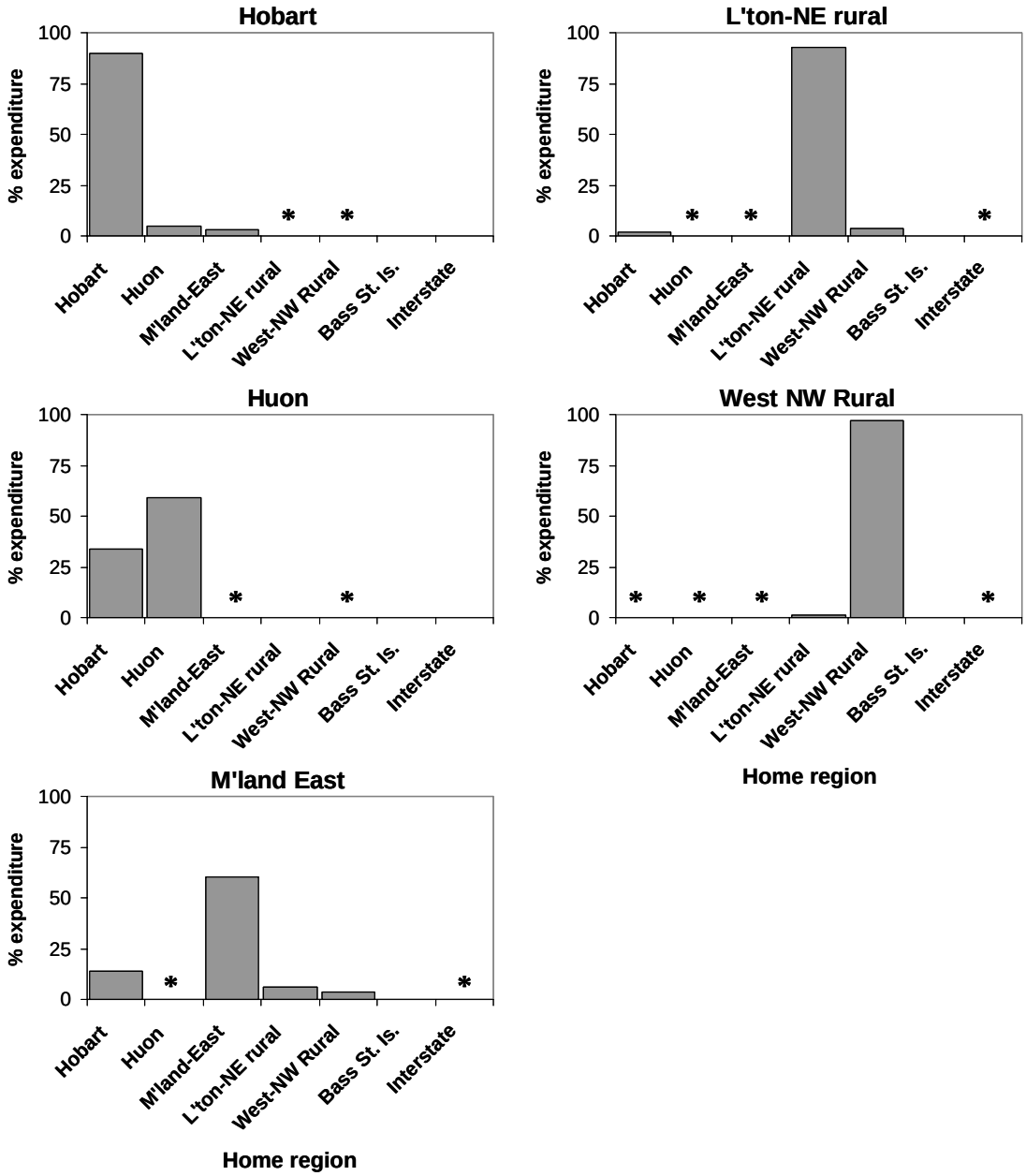

Fig. 43 Attributed expenditure (% of regional total excluding private vehicle travel costs) based on fishers home region * data not shown, less than 30 data records

11. Summary and Conclusions

This study represents the first comprehensive assessment of recreational fishing in Tasmania. It provides baseline information about participation, catch and effort and expenditure against which future trends can be assessed. It formed part of a coordinated national study which involved a screening survey (telephone) of households (in Tasmania over 2700 households responded) to ascertain demographic and fishing characteristics, and was followed by a diary survey (involving over 850 Tasmanian households and almost 1700 fishers) during which fishing and related economic activity was monitored over a period of twelve months. Response rates across all facets of the study were very high, giving considerable confidence in the quality of the data.

In the twelve months prior to May 2000 an estimated 124,590 Tasmanian residents aged 5 years or older fished at least once, representing a participation rate of 29%. By region, highest participation rates occurred amongst residents of the Southern statistical division (38%), compared with between 27-30% for other regions. Recreational fishing was more popular amongst males, with a state-wide participation rate of 40%, compared with 19% for females. Participation rates varied with age, with 5-14 year olds having the highest rate of participation although the greatest numbers of fishers were in the 30-44 age group.

The only reliable previous estimate of fishing participation in Tasmania was for 1983 and indicated that 33% of Tasmanians aged 15 years or older fished at least once. When present survey data are constrained to include only persons 15 years or older, the current participation rate became 27%, suggesting a decline in participation over the past couple of decades. The primary reason for the decline has been a marked fall in participation amongst males.

In 2000, approximately 11% of Tasmanian households (almost 20,800) owned at least one boat used for recreational fishing, representing a total of over 23,000 vessels, with an estimated gross replacement value of $238 million. The basic characteristics of the Tasmanian recreational fishing fleet (vessel sizes, storage location, mode of propulsion and electronic aids) were consistent with those for the other states (Henry and Lyle 2003). Vessels up to 16 m in length were reported but the majority were in the 4-5 m size range, most were powered and were trailer boats. The prevalence of electronic aids on recreational vessels in Tasmania was slightly lower than national levels (35% compared with 45% for echosounders, and 9% compared with 19% for GPS). The occurrence of electronic aids increased with vessel size such that about 60% of vessels 8 m or larger had echosounders and 50% had GPS units. These electronic aids have implications for increased efficiency through the location/detection of fish and fishing grounds and information on ownership rates may potentially represent an important indicator of changes in effective effort in the recreational fishery.

Information about fishing effort, catch and related economic activity of recreational fishers was monitored between May 2000 and April 2001. Local residents and interstate visitors expended an estimated 0.8 million fisher days of effort in Tasmania. Interstate visitors accounted for just over 25,000 fisher days of effort (3% of the total), with local residents contributing more or less equivalent levels of fishing effort in other Australian states. In this regard 'exported' fishing effort was roughly balanced by 'imported' effort in Tasmania. By contrast, New South Wales, Queensland, Western Australia and the Northern Territory were net importers of fishing effort (i.e. interstate visitors contributed more fisher days of effort to the state than were expended by residents fishing outside of their home state), while Victoria and the ACT were net exporters of effort (Henry and Lyle 2003).

The average number of days fished per fisher in Tasmania over the survey period was just over 6 days, with a median of three days. The distribution of effort between fishers was in practice highly skewed, with 20% of fishers accounting for 60% of the total effort.

Effort was also calculated in terms of fishing events and hours fished, with over 0.9 million events and 4.3 million fisher hours of effort expended in Tasmania during 2000/01. Line fishing was the primary activity undertaken by recreational fishers (86% events and 56% hours fished), followed by pot fishing (7% events and 30% hours), the use of gillnets (5% events and 12% of hours) and dive collection (3% events and 1% of hours). The use of gillnets (graball and mullet net), fishing for rock lobster (pot, dive and ring) and abalone (dive) are licensed activities in Tasmania and during 2000/01 about 18,000 rock lobster, 10,800 gillnet (graball and mullet net), and 7400 abalone licences were issued. A range of other fishing methods were also reported, including the use of spears, seine or bait nets and hand collection but these were of minor importance by comparison.

In each of other Australian states and territories, line fishing was also the dominant recreational fishing method, accounting for 77% (Queensland and Western Australia) to over 90% (New South Wales, Victoria and ACT) of all fishing events (Henry and Lyle 2003). Pots and traps (for lobsters and/or crabs) were also significant recreational fishing methods in New South Wales, Western Australia, South Australia, Queensland and the Northern Territory. Recreational use of gillnets is effectively restricted by regulation to Tasmania and Western Australia, although in several states the use of cast nets, drag or seine nets and push nets (to collect bait or prawns) were popular activities (in particular New South Wales, Victoria, Queensland, and Western Australia). Dive collection, in particular for lobsters and abalone, were relatively common practices in Western Australia, South Australia and Victoria as well as Tasmania. In New South Wales, Queensland and South Australia the use of pumps, rakes or spades for a range of species were also of some significance.

Around three quarters of the fishing effort (events) in Tasmania occurred in saltwater, primarily in inshore coastal waters and to a lesser extent estuarine waters. In freshwater, effort was mainly concentrated in lakes as opposed to rivers. Overall, effort was distributed equally between boat and shore-based fishing but in freshwater and estuarine fisheries most effort was shore-based while boat-based effort dominated the inshore (and offshore) fisheries. Elsewhere in Australia, recreational fishing effort was heaviest in the inshore coastal zone of Queensland, South Australia and Western Australia, whereas in New South Wales, Victoria and the Northern Territory estuarine fisheries attracted the greatest level of effort (Henry and Lyle 2003).

A wide variety of fish and shellfish species were caught by recreational fishers during 2000/01, including over 3.95 million finfish, just over half of which (2.1 million) were flathead (primarily sand flathead). Other finfish species or species groups of significance included Australian salmon (0.4 million), trout (0.27 million, mainly brown trout), mullet (0.1 million), cod (0.1 million) and gurnards (0.1 million).

Just over one third of all finfish captured were released or discarded; with low rates of release (<10%) for species such as garfish, blue warehou, flounder, Atlantic salmon and striped trumpeter, intermediate rates (10-30%) for Australian salmon, trout, mullet, jack mackerel, jackass morwong, barracouta, bastard trumpeter, pike, eels, and blackfish, moderate rates (31-60%) for flathead, cod, bream, silver trevally, leatherjacket, tunas, and redfin perch, and high rates (>60%) for gurnard, wrasse, and gummy shark. Reasons for release were not solicited but influence of regulations (size and bag limits), desirability (for consumption), and ethical considerations were likely to have played varying roles in determining whether fish were released or not.

Recreational fishers also caught about 47,000 squid (mainly calamary), 0.17 million rock lobster, 0.11 million abalone and 0.16 million individuals of various other taxa, including oysters, mussels, other bivalves, urchins, and urchins were caught by recreational fishers. Amongst these taxa, rates of release were low for squid and moderate for rock lobster.

Numerically, the most abundant group captured by recreational fishers were small baitfish (8.7 million, principally whitebait), however, owing to their extremely small size the contribution by weight was low.

By applying average weights it was possible to approximate harvest weights and compare recreational and commercial production. The annual recreational harvest of flathead was estimated at 361 tonnes, almost six times larger than the commercial catch from state fishing waters. By weight, other species of importance included Australian salmon (111 tonnes), trout (147 tonnes), jackass morwong (44 tonnes), bastard trumpeter (43 tonnes), barracouta (55 tonnes), striped trumpeter (38 tonnes), rock lobster (73 tonnes) and abalone (52 tonnes). Furthermore, recreational catches of mullet, flounder, cod, jackass morwong, bastard trumpeter, striped trumpeter, barracouta, and silver trevally were higher or roughly equivalent to the commercial take. By contrast, for Australian salmon, wrasse, garfish, whiting, rock lobster and abalone the recreational catch represent only a minor component of the total harvest.

Catch composition was influenced by many factors, including fishing method. The line fish harvest was dominated by flathead (60% of numbers), followed by Australian salmon (13%), trout (9%), cod (3%), bream (2%) and mullet (2%) whereas the main gillnet caught species were bastard trumpeter (19%), mullet (14%), jackass morwong (10%), leatherjacket (8%), jack mackerel (7%), flounder (8%) and blue warehou (5%). In an earlier survey of gillnet fishing, Lyle (2000) reported substantially higher recreational gillnet catches of blue warehou (29% numbers, equivalent to 116 tonnes in 1997), such that this species dominated the gillnet catch at the time and bastard trumpeter was of secondary importance (15%). Such marked differences can be linked directly to inter-annual variability in the availability of blue warehou. For instance, commercial catches of blue warehou in 1997 were four times higher than in 2000/01 (Lyle et al. 2004). Mullet were the main species taken by seine nets (69%) while flounder dominated the spear catch (80%). The vast majority of the catch taken in pots was rock lobster, while abalone and rock lobster were main species taken by divers.

Trout dominated the finfish catches in freshwater (>80%), with redfin and blackfish of secondary importance in the lake fishery and eels and blackfish in the river fishery. Flathead and Australian salmon dominated estuarine and inshore coastal catches (collectively >60%), with cod and bream of secondary importance in the estuary and mullet and flounder in the inshore coastal fisheries. Jackass morwong, tunas, striped trumpeter and gurnards were the main components of the offshore catch composition.

Catch and effort data were examined in detail considering aspects of the fisheries for key species (catches based on region, method, platform, water body and seasonality) and characteristics of the regional fisheries (effort by method, water body, where fishers resided and catch composition).

Regionally, about two thirds of the total finfish harvest was taken from the east coast of Tasmania. Based on the major species, the east coast (including the southeast) was a particularly important region for flathead, bream, bastard and striped trumpeter, while the southeast was particularly significant for flounder, blue warehou and cod. Mullet catches were concentrated off the north coast, with the northwest coast significant for blue warehou and Australian salmon. Catches of Australian salmon, cod and bastard trumpeter were also relatively important from the west coast. The southeast and, to a lesser extent, central east coast regions were the main areas for recreational catches of southern calamary, rock lobster and abalone. Moderate quantities of lobster and abalone were also captured from the west coast. The inland trout fishery was concentrated in the lakes of the Central Plateau, especially Arthurs Lake and Great Lake, with catches from rivers of secondary importance.

Catches of many of the key species were concentrated during summer and autumn (November to April), they included flathead, bream, mullet, trout, bastard trumpeter, blue warehou, calamary, rock lobster and abalone. In addition to summer, there was a secondary peak in Australian salmon and flounder catches during winter while striped trumpeter showed little evidence for a seasonal pattern in catches. Cod was the only species for which catches peaked during winter.

Line fishing represented the primary capture method for many species, including flathead, Australian salmon, trout, cod, bream, striped trumpeter and calamary. Recreational fishers targeted blue warehou with lines and gillnets, mullet with a combination of line, gillnet and seine methods, bastard trumpeter more or less exclusively with gillnets, and flounder using spears and to a lesser extent gillnets. Rock lobster were harvested principally using pots and dive collection and abalone were targeted by divers.

Although the inland fishery was focussed on trout, in the Eastern and Western regions it was primarily a shore-based fishery with effort distributed relatively equally between lakes and rivers, while in the Central Plateau region it was a largely a lake fishery, with relatively even boat and shore-based effort.

Saltwater fishing effort off the north coast was primarily directed in inshore coastal waters, mainly as shore-based activity. Australian salmon, flathead and mullet represented the top three species taken, though Australian salmon dominated in the Western North while flathead in the Eastern North regions. The fishery in the Tamar was also mainly shore-based, with flathead followed by Australian salmon and cod the most numerous species harvested. Although information was limited for the Bass Strait Islands, data suggested that the bulk of the effort was directed at inshore coastal waters, was mainly shore-based, with Australian salmon, flounder and flathead representing the top three species caught.

Several regions were defined for analysis along the east coast. In the Northern East, effort was heaviest in inshore coastal waters and was mainly boat-based, though there was also some estuarine and offshore fishing, with flathead, Australian salmon and rock lobster comprising the main species harvested. Effort in the Central East and adjacent Great Oyster Bay regions was directed mainly at inshore coastal waters by boat-based fishers, with some estuarine fishing in the Great Oyster Bay region. Flathead dominated catches in both regions, with jackass morwong and jack mackerel next in importance in the Central East and bream and Australian salmon in Great Oyster Bay. In the Southern East region, effort was primarily boat-based and mostly conducted in inshore coastal waters with some offshore fishing. Top three species harvested included flathead, abalone and rock lobster. There were underlying similarities in the Norfolk-Frederick Henry Bay and D'Entrecasteaux fisheries, both were primarily undertaken in inshore coastal waters mainly by boat-based effort and the top three species in both regions were flathead, abalone and flounder. In the neighbouring Derwent, most of the effort was shore-based with flathead, bream and trout the main catch.

Off the West Coast, effort was distributed between estuarine and inshore coastal waters, with slightly greater boat-based effort. Australian salmon, rock lobster and cod dominated catches.

In each of the regional fisheries line fishing represented the dominant fishing activity. Gillnets, pots and dive methods were of secondary importance particularly off the east and west coasts, seine fishing featured in the Western North and Bass Strait Island regions while spear fishing was a relatively common activity in the Western North, Tamar, Norfolk-Frederick Henry Bay, D'Entrecasteaux Channel and West Coast regions.

Generally fishers residing in areas adjacent to the fishing regions accounted for the greatest portion of the fishing effort, though there was evidence for fishers travelling outside of their general regions to fish. For instance, about one quarter of the effort in both the Eastern North and Northern East regions was derived from residents of the West-NW Rural home region. Hobart residents accounted for over half of the effort in the Central East while residents from Hobart, Launceston-NE Rural and West-NW Rural regions collectively accounted for over 80% of the total effort in the Great Oyster Bay region. Interstate fishers and visitors from the Tasmanian mainland collectively contributed around 40% of the fishing activity in the Bass Strait Islands.

Total expenditure attributable to recreational fishing in Tasmania during 2000/01 was estimated at $51.8 million, but owing to the exclusion of certain expenditure items and non-coverage of expenditure by non-fishers, this represents a minimum estimate of the economic impact of recreational fishing. Not all fishing related expenditure by Tasmanians occurred within Tasmania, just over $1million occurred interstate but this was roughly balanced by the expenditure of interstate fishers in Tasmania (mainly accommodation, travel and clothing).

Boats/trailers (including purchase, maintenance, running costs, registration and insurance) represented the largest expenditure category at $20.9 million (40% of the total). Travel associated with fishing (primarily vehicle running costs) was the second highest expenditure category accounting for about $15.7 million (30%). Clothing (including life jackets, wet weather gear) and accommodation was next in importance at $4.3 million each, followed by fishing gear, approximately $4.0 million, and fees/licences (primarily fishing licences) at $1.6 million.

In the Hobart, Launceston-NE Rural and West-NW Rural regions the vast majority (>90%) of the economic activity attributable to fishing was derived from fishers who resided within each region. That is, within in the context of each of these zones, the impact of ‘imported’ economic activity was relatively small. By contrast, in the Huon and Midland-East regions expenditure by local residents accounted for only about 60% of the total; indicating the importance of expenditure . Overall, however, the economic analysis demonstrated that the bulk of the economic activity within each of the economic zones was due to fishers who resided within the zone.

Clearly, given the level of regional heterogeneity in the recreational fishery, it is important for management and stock assessment to understand the dynamics of the fishery at the appropriate regional scales. This survey represents a significant step towards achieving this and as such provides an important benchmark against which future developments in the fishery can be evaluated.

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References

ABS (1984). Household fish consumption and non-commercial fishing activities, Tasmania. Australian Bureau of Statistics, Hobart.

ABS (1994) Home food production of selected food stuffs, Australia, year ended April 1992. Australian Bureau of Statistics. *Cat. No. 7110.1*.

Campbell, D. and Murphy, J.J. (in press) The 2000-01 national recreational fishing survey economic report. Australian Government Department of Agriculture, Fisheries and Forestry, Canberra.

Davies, P.E. (1995) Mail surveys of Tasmanian inland water recreational fisheries: preliminary results and sources of error. Pp120-130. In Hancock, DA (ed.) *Recreational fishing: what's the catch?* Australian Society for Fish Biology Workshop Proceedings, Canberra 30-31 August 1994. Australian Society for Fish Biology, Canberra.

Evans, B.S. (1995) Tasmanian tuna charter fishery – update, season 1994. Department of Primary Industry and Fisheries, Tasmania.

Forward, J and Lyle, J.M (2002) A survey of the 2000/01 Tasmanian recreational rock lobster fishery and options for future assessment. Tasmanian Aquaculture and Fisheries Institute Final Report to the Marine Recreational Fishery Council, 36p

Henry, G.W. and Lyle, J.M. (2003) The national recreational and indigenous fishing survey. Final Report to the Fisheries Research and Development Corporation, Project 99/158. NSW Fisheries Final Report Series No. 40, 188p.

Higgs, J.B. and McInnes, K.L. (2003) 2001 biennial recreational fishing survey of Queensland residents. Queensland Department of Primary Industries, Brisbane, 91p.

Lyle, J.M. (2000) Assessment of the licensed recreational fishery of Tasmania (Phase 2). Final report to Fisheries Research and Development Corporation, Project 1996/161, 102p.

Lyle, J.M. and Campbell, D.A. (1999) Species and size composition of recreational catches with particular reference to licensed fishing methods. Tasmanian Aquaculture and Fisheries Institute Final Report to Marine Recreational Fishery Advisory Committee, 46p.

Lyle, J.M., Forward, J. and Morton. A. (2002) Species and size composition of recreational catches based on 2000/2001 creel surveys. Tasmanian Aquaculture and Fisheries Institute Internal Report, 29p.

Lyle, J.M. and Morton, A.J. (2004) Survey of the 2002/03 Tasmanian recreational rock lobster and abalone fisheries. Tasmanian Aquaculture and Fisheries Institute, Technical Report No. 22, 33p.

Lyle, J.M., Ziegler, P.E., Haddon, M., Tracey, S.R. and Burch, P. (2004) Tasmanian scalefish fishery – 2003. Tasmanian Aquaculture and Fisheries Institute Fishery Assessment Report, 89p.

National Recreational Fisheries Working Group (1994) *Recreational Fishing in Australia: A National Policy*. Department of Primary Industries and Energy, Canberra, 25p.

Morton, A.J. and Lyle, J.M. (2003) Preliminary assessment of the recreational gamefish fishery in Tasmania, with particular reference to southern blue tuna. Tasmanian Aquaculture and Fisheries Institute, Technical Report No. 21, 30p.

Smith, J.T. (1994) Charter fishing for tuna in Tasmania. Department of Primary Industry and Fisheries. Recreational Fishing Report No. 1, 26pp.

Winter, O.N. (1985) The Derwent Estuary recreational fishing survey, Research Report No. 1. Urban Fringe Recreation Programme Environmental Report No. 8, 80p.

Appendix 1 Species groupings and scientific names of organisms reported by recreational fishers in Tasmania during 2000/01.
Capture methods and relative harvest are indicated.+ less than 1000; ++ 1000-50000 individuals; > 50000 individuals

Species group	Species	Scientific name	Line	Gillnet	Seine/ bait net	Pot	Dive	Spear	Other
Finfish									
Australian salmon	Australian salmon	*Arripis trutta & A. truttaceus*	+++	++	++			+	
Barracouta	Barracouta	*Thyrsites atun*	++	+					
Blackfish	Blackfish	*Gadopsis marmoratus*	++						
Blue warehou	Blue warehou	*Seriolella brama*	++	++					
Bream	Bream	*Acanthopagrus butcheri*	++	++	+			+	
Cod	Cod	Moridae	+++	++		+			
Eels	Conger eel	*Conger* spp.	+			+			
	Eel - unspec.	Anguillidae	++	+	+			+	
Flathead	Dusky flathead	*Platycephalus fuscus*	+						
	Sand flathead	*Platycephalus bassensis*	+++	++	+			++	
	Tiger flathead	*Neoplatycephalus richardsoni*	+++					+	
	Flathead - unspec.	Platycephalidae	+++	+	+			++	
Flounder	Flounder	Pleuronectidae	+	++	++			+++	
Garfish	Garfish	*Hyporhamphus melanochir*	++	+	++			++	++
Gummy shark	Gummy shark	*Mustelus antarcticus*	++	++					
Gurnard	Gurnard	Triglidae & Scorpaenidae	++	++					
	Ocean perch	*Helicolenus* spp.	+						
Jack mackerel	Jack mackerel	*Trachus declivis*	++	++	+	+		+	
Jackass morwong	Jackass morwong	*Nemadactylus macropterus*	++	++				+	
Leatherjacket	Leatherjacket	Monacanthidae	++	++			+	+	
Mullet	Mullet	Mugilidae	++	++	++			+	
Pike	Long-finned pike	*Dinolestes lewini*	++	+					
	Short-finned pike	*Sphyreana novaehollandiae*	++						
		Perca fluviatilis							

Appendix 1 continued

Species group	Species	Scientific name	Line	Gillnet	Seine/ bait net	Pot	Dive	Spear	Other
Silver trevally	Silver trevally	*Pseudocaranx dentex*	++	++				+	
Bastard trumpeter	Bastard trumpeter	*Latridopsis forsteri*	+	++		+	+	+	
Striped trumpeter	Striped trumpeter	*Latris lineata*	++	++					
Atlantic salmon	Atlantic salmon	*Salmo salar*	++	++					
Trout	Brown trout	*Salmo trutta*	+++	+					
	Rainbow trout	*Oncoryhnchus mykiss*	++	+					
	Trout - unspec.	Salmonidae	++	+			+		
Tuna	Albacore	*Thunnus alalunga*	++						
	Skipjack tuna	*Katsuwonis pelamis*	+						
	Southern bluefin tuna	*Thunnus maccoyii*	+						
	Yellowfin tuna	*Thunnus albacares*	+						
Whiting	Whiting	Sillaginidae	++		+			+	
Wrasse	Wrasse	Labridae	++	++			+	+	+
Other finfish	Blue eye trevalla	*Hyperoglyphe antarctica*	++						
	Blue mackerel	*Scomber australasicus*	++						
	Boarfish	Pentacerotidae	+	+					
	Carp	*Cyprinus carpio*	+						
	Dory	Zeidae	+	+					
	Porcupine fish	*Diodon nicthemerus*						+	
	Hapuku	*Polyprion* spp.	+						
	Kingfish	*Seriola lalandi*	++						
	Latchet	*Pterygotrigla polyommata*	+						
	Ling	*Genypterus* spp.	+	+					
	Luderick	*Girella tricuspidata*	++	+					

Appendix 1 continued

Species group	Species	Scientific name	Line	Gillnet	Seine/ bait net	Pot	Dive	Spear	Other
Other finfish	Magpie perch	*Cheilodactylus nigripes*		+					
	Banded morwong	*Cheilodactylus spectabilis*	+	+		+			
	Dusky morwong	*Dactylophora nigricans*		+					
	Pink snapper	*Pagrus auratus*	+						
	Freshwater flathead	*Pseudophritis urvillii*	+						
	Stargazer	Uranoscopidae	+						
	Sweep	*Scorpis* spp.	+						
	Tailor	*Pomatomus saltatrix*	+	+					
	Tench	*Tinca tinca*	+						
	Toadfish	Several families	+		+		+	+	
	Spotted warehou	*Seriolella punctata*	+						
	Elephant shark	*Callorinchus milii*	+	+					
	Rays/skates	Several families	+	+	+	+			
	Blue shark	*Prionace glauca*	+						
	Draughtboard shark	*Cephaloscyllium laticeps*		+		+			
	Mako shark	*Isurus oxyrinchus*	+						
	Port jackson shark	*Heterodontus portusjacksoni*	+	+		+			
	Saw shark	*Pristiophorus* spp.	+	+					
	School shark	*Galeorhinus galeus*	+	+					
	Seven gill shark	*Notorynchus cepedianus*	+						
	Spurdog shark	Squalus & Centrophorus	+	+					
	Wobbegong shark	*Orectolobus* spp.		+		+			
	Shark - unspec.	Several families	+	+					

Appendix 1 continued

Species group	Species	Scientific name	Line	Gillnet	Seine/ bait net	Pot	Dive	Spear	Other
Small baitfish									
Small baitfish	Small baitfish	Several families			+++	++			
Whitebait	Whitebait	*Lavettia* & *Galaxias* spp.			+++				
Cephalopods									
Arrow squid	Arrow squid	*Nototodarus gouldi*	++	+				+	
Calamary	Calamary	*Sepioteuthis australis*	++		++			+	
Octopus	Octopus	*Octopus* spp.	+			+	+	+	+
Crabs & Lobsters									
Crab - blue swimmer	Crab - blue swimmer	*Portunus pelagicus*			+				
Crab - unspec.	Crab	Brachyura	+	+	+	+	+	+	++
Lobster - other	Lobster - freshwater	Palinuridae	+						
Rock lobster	Rock lobster	*Jasus edwardsii*	+	+		+++	++		+
Prawns & yabbies									
Prawns	Prawns	Penaeidea			++				
Yabbies	Yabbies	*Cherax* spp.	++						
Molluscs (shelled)									
Abalone	Abalone	Haliotidae		+			+++	+	+
Mussels	Mussels	*Mytilus edulis*							+++
Oysters	Oysters	Ostreidae & Pteriidae							++
Shells - other	Shells - various	Mollusca					++		++
Surf clams	Surf clams	*Dosinia* spp.							++
Miscellaneous taxa									
Cunjuvoi	Cunjuvoi	*Pyura stolonifera*							+
Sea urchins	Sea urchins	Echinoidea		+			+		

Appendix 2 Estimated number of persons and proportion of the Tasmanian resident population aged 5 or older who fished recreationally in the 12 months prior to May 2000.

se is standard error, rse is relative standard error.

	Sample	Recreational fishers			Participation rate	
Statistical Division	**stratum**	**Number**	**se**	**rse**	**(%)**	**se**
Hobart	42	50,105	*2,680*	*5.3*	28.5	*1.5*
Southern	43	12,125	*720*	*5.9*	38.4	*2.3*
Northern	44	35,554	*2,496*	*7.0*	29.6	*2.1*
Mersey & Lyell	45	26,807	*1,823*	*6.8*	27.3	*1.9*
Total		**124,590**	***4,154***	*3.3*	**29.3**	***1.0***

Appendix 3 Estimated number of Tasmanian households and the proportion of private dwelling households that contained persons who fished recreationally in the 12 months prior to May 2000.

se is standard error, rse is relative standard error.

	Sample	Fisher households			Proportion of private dwelling households	
Statistical Division	**stratum**	**Number**	**se**	**rse**	**(%)**	**se**
Hobart	42	26,249	*1,152*	*4.4*	33.7	*1.5*
Southern	43	5,963	*292*	*4.9*	44.4	*2.2*
Northern	44	18,079	*1,050*	*5.8*	33.2	*1.9*
Mersey & Lyell	45	15,250	*829*	*5.4*	35.3	*1.9*
Total Tasmania		**65,540**	***1,789***	***2.7***	**34.7**	***0.9***

Appendix 4 Estimated number of persons and proportion of the Tasmanian resident population aged 5 or older by age and gender who fished recreationally in the 12 months prior to May 2000.

		Males			Females			Total		
Statistical Division	**Age class**	**Popn**	**Fishers**	**% fishers**	**Popn**	**Fishers**	**% fishers**	**Popn**	**Fishers**	**% fishers**
Hobart										
	5 to 14	13756	7173	52.1	13388	4497	33.6	27144	11670	43.0
	15 to 29	20071	7199	35.9	20151	4791	23.8	40222	11990	29.8
	30 to 44	19738	9071	46.0	21635	4398	20.3	41373	13469	32.6
	45 to 59	17741	7082	39.9	18371	2894	15.8	36112	9976	27.6
	60 to 74	9843	2247	22.8	11118	532	4.8	20961	2780	13.3
	75 plus	4049	220	5.4	6259	0		10307	220	2.1
	Total	**85199**	**32993**	**38.7**	**90921**	**17112**	**18.8**	**176120**	**50105**	**28.4**
Southern										
	5 to 14	2815	1785	63.4	2556	1017	39.8	5371	2802	52.2
	15 to 29	2963	1520	51.3	2736	686	25.1	5699	2207	38.7
	30 to 44	3817	2130	55.8	3833	1288	33.6	7650	3418	44.7
	45 to 59	3650	1713	46.9	3377	990	29.3	7027	2703	38.5
	60 to 74	2348	694	29.5	2019	211	10.5	4367	905	20.7
	75 plus	678	90	13.2	825	0		1503	90	6.0
	Total	**16271**	**7932**	**48.7**	**15346**	**4193**	**27.3**	**31617**	**12125**	**38.3**
Northern										
	5 to 14	9619	4932	51.3	9105	3208	35.2	18724	8140	43.5
	15 to 29	12863	5630	43.8	12982	3945	30.4	25845	9575	37.0
	30 to 44	13656	6706	49.1	14111	3355	23.8	27766	10062	36.2
	45 to 59	12265	3875	31.6	12427	1382	11.1	24692	5257	21.3
	60 to 74	7652	1887	24.7	8024	423	5.3	15676	2310	14.7
	75 plus	2937	211	7.2	4344	0		7281	211	2.9
	Total	**58993**	**23240**	**39.4**	**60992**	**12313**	**20.2**	**119985**	**35554**	**29.6**
Mersey & Lyell	5 to 14	8456	3919	46.4	7942	1878	23.7	16398	5798	35.4
	15 to 29	10050	4012	39.9	10034	1782	17.8	20083	5794	28.8
	30 to 44	11388	5425	47.6	11792	2394	20.3	23180	7819	33.7
	45 to 59	10161	3905	38.4	10062	1170	11.6	20222	5076	25.1
	60 to 74	6241	1854	29.7	6451	222	3.4	12692	2076	16.4
	75 plus	2209	245	11.1	3286	0		5495	245	4.5
	Total	**48505**	**19361**	**39.9**	**49566**	**7446**	**15.0**	**98071**	**26807**	**27.3**
Tasmania										
	5 to 14	34647	17809	51.4	32991	10601	32.1	67638	28410	42.0
	15 to 29	45947	18362	40.0	45903	11203	24.4	91850	29565	32.2
	30 to 44	48599	23332	48.0	51370	11434	22.3	99969	34767	34.8
	45 to 59	43817	16576	37.8	44236	6436	14.5	88054	23012	26.1
	60 to 74	26084	6681	25.6	27612	1389	5.0	53696	8070	15.0
	75 plus	9873	766	7.8	14713	0	0	24586	766	3.1
	Total	**208968**	**83526**	**40.0**	**216825**	**41064**	**18.9**	**425793**	**124590**	**29.3**

Appendix 5 Characteristics of recreational boats owned by Tasmania residents and used for fishing (number of vessels unless otherwise indicated)

Estimated values of less than 500 vessels shown as <500

	Length class (m)					
	<4	**4-5**	**6-7**	**8-10**	**>10**	**Total**
Primary propulsion						
Row/paddle	1074	510				**1584**
Sail	<500	<500	<500	<500	<500	**1042**
Power	2604	15773	1297	<500	<500	**20485**
Primary storage location						
Trailer	1841	14712	1152	<500	<500	**17799**
Mooring	<500	<500	<500	817	606	**2328**
Car-top	<500	<500				*
Shore	1408	1094				**2503**
Electronic equipment						
Sounder	<500	6464	776	529	<500	**8165**
No sounder	3664	9848	820	<500	<500	**14946**
GPS	<500	1024	<500	<500	<500	**2103**
No GPS	3664	15289	1306	<500	<500	**21008**
Total vessels	**3685**	**16312**	**1596**	**876**	**642**	**23111**
Replacement value ($M)						
Attributed	4.3	93.1	19.5	12.5	17.4	**146.8**
Gross	4.7	109.8	28.1	38.3	56.8	**237.8**

Appendix 6 Annual recreational effort (events and fisher hours) and harvest (numbers) of key species by fishing method for Tasmania during 2000/01, based on Australian residents aged 5 or older.

se standard error; * denotes fewer than 25 diary records involved; values of less than 1000 shown as <1000

	Line	Gillnet	Seine/ bait net	Pot	Dive	Spear	Other	Total	*se*
Fishing effort									
Events (no.)	757527	42319	9109	60376	24040	11136	8181	**912689**	
se	*23740*	*4200*		*5488*				***39494***	
Fisher hours	2409720	502581	18530	1294628	37032	23406	9162	**4295058**	
Harvest (nos)									
Flathead	1368829	4014				*		**1377350**	***153964***
Australian salmon	297566	8782	7795			*		**314221**	***80639***
Trout	200510	*			*			**200894**	***25725***
Mullet	41226	24772	32943			*		**99130**	***28337***
Flounder	*	10793	1050			59042		**71160**	***12336***
Cod	62008	4681		*				**66829**	***17008***
Bream	43761	*	*			*		**45396**	***10283***
Jackass morwong	18797	18396				*		**37326**	***22913***
Gurnard	34297	2272						**36569**	***11814***
Bastard	*	32351		*	*	*		**34097**	
Jack mackerel	20563	*	*	*		*		**33571**	***18487***
Other finfish	17268	5187	*	*	*	*	9891	**32758**	
Barracouta	28256	*						**28287**	***5852***
Silver trevally	19213	4469				*		**23770**	***3746***
Wrasse	13415	8923			*	*		**22792**	***4741***
Leatherjackets	5926	13362			*	*		**20090**	***5930***
Garfish	*	*	*			7892	1537	**19549**	***3208***
Blue warehou	8611	9458						**18069**	
Striped trumpeter	12552	*						**17277**	
Atlantic salmon	7488	6201						**13689**	
Tuna	12737							**12737**	***5382***
Whiting	11766		*			*		**12215**	***2552***
Pike	10367	*						**10481**	***2322***
Redfin perch	9367							**9367**	***6692***
Eels	7867		*	*		*		**8239**	***1749***
Gummy shark	6214	1669						**7884**	
Blackfish	6711							**6711**	
Total finfish	**2271915**	**174520**	**47511**	**<1000**	**<1000**	**73744**	**11428**	**2580457**	***188898***
Arrow squid	6181	*				*		**6269**	
Calamary	26336		3065			*		**30031**	
Squid - unspec	7989	*	*			*		**8138**	
Rock lobster				52270	34626		*	**86976**	***11847***
Abalone		*			107757	*	*	**108495**	***20525***
Small baitfish			**8494904**	*****				**8496037**	***5347204***
Other taxa	**2255**	**1124**	**9687**	*****	**6808**	*****	**130576**	**150672**	
Total	**2314949**	**175796**	**8555195**	**54216**	**150106**	**75396**	**142209**	**11467867**	

Appendix 7 Annual recreational effort (events and fisher hours) and harvest (numbers) of key species by water body type for Tasmania during 2000/01 based on Australian residents aged 5 or older.

* denotes fewer than 25 diary records involved; values of less than 1000 shown as <1000

Species group	Lake/ dam	River	Estuary	Inshore	Offshore	Total
Fishing effort						
Events (no.)	156944	74194	195028	476442	10081	**912689**
se	*14026*	*8261*	*12389*	*25232*	*7491*	***39494***
Fisher hours	638198	327190	533323	2729327	67019	**4295058**
Harvest (nos)						
Flathead			140144	1231367	*	**1377350**
Australian salmon			107546	206150	*	**314221**
Trout	154141	40615	5549	*		**200894**
Mullet			21919	77211		**99130**
Flounder			20522	50638		**71160**
Cod			35956	26994	*	**66829**
Bream			35876	9520		**45396**
Jackass morwong			*	19499	*	**37326**
Gurnard			<1000	28274	*	**36569**
Bastard trumpeter			*	33906	*	**34097**
Jack mackerel			4702	28869		**33571**
Other finfish	*	*	2524	23689	*	**32759**
Barracouta			5170	20573	*	**28287**
Silver trevally			11398	10564	1808	**23770**
Wrasse			1654	21112	*	**22792**
Leatherjackets			*	18507	*	**20090**
Garfish			*	13112		**19549**
Blue warehou			*	14798	*	**18069**
Striped trumpeter				9111	8165	**17277**
Atlantic salmon	*	*	2703	10587		**13689**
Tuna				*	10269	**12737**
Whiting			*	11344		**12215**
Pike			*	9006		**10481**
Redfin perch	9116	*				**9367**
Eels	*	5908	*	*		**8239**
Gummy shark			<1000	7176	*	**7884**
Blackfish	*	3441				**6711**
Total finfish	**168129**	**50559**	**414004**	**1886318**	**61447**	**2580457**
Arrow squid			*	3545		**6269**
Calamary			*	27026		**30031**
Squid - unspec			*	7203		**8138**
Abalone			*	108161		**108495**
Rock lobster			*	86206	*	**86976**
Small bait fish	**3037**	**2992609**	**5498170**	**2222**		**8496037**
Other taxa	**1422**	<1000	**71197**	**78053**	<1000	**150672**
Total	**172588**	**3043167**	**5991139**	**2204318**	**56655**	**11467867**

Appendix 8 Annual recreational boat and shore-based effort (fishing events) by water body type for Tasmania during 2000/01 based on Australian residents aged 5 or older.

* denotes fewer than 25 diary records involved

	Lake/dam	River	Estuary	Inshore	Offshore	Total
Boat						
Private	59107	4266	58354	312181	9036	442944
Hire/charter	*		*	*	*	4770
Total boat	**59384**	**4266**	**59165**	**314511**	**10389**	**447714**
Shore						
Jetty/wharf	*	*	32076	36238	-	69495
Other man made structure	8203	*	11352	4500	-	24446
Natural shore	89169	68543	92381	120942	-	371034
Total shore	**97559**	**69928**	**135808**	**161680**	**-**	**464975**
% boat	**37.8**	**5.7**	**30.3**	**66.0**	**100.0**	**49.0**
Grand total	**156944**	**74194**	**194973**	**476190**	**10389**	**912689**

Appendix 9 Recreational line fishing harvest (numbers) of key species for Tasmania during 2000/01, including proportion of the harvest taken by bait or lure/fly fishing methods, based on Australian residents aged 5 or older.

* denotes fewer than 25 diary records involved

	Total	Bait	Lure/fly	Bait & lure/fly	Set-line	% bait only	% lure/fly only
Flathead	1368829	1183939	39046	142953	*	86.7	2.9
Australian salmon	297566	138391	107786	51183	*	46.6	36.2
Trout	200510	48286	134894	17330		24.1	67.3
Cod	62008	58919	*	*	*	96.2	2.2
Bream	43761	41807	*	*		95.5	0.3
Mullet	41226	37614	*	3227		91.2	0.9
Gurnard	34297	27058	*	4365	*	83.0	4.3
Barracouta	28256	12160	8641	7455		43.0	30.6
Jack mackerel	20563	15836	*	*		77.0	4.2
Silver trevally	19213	16727	*	*		87.1	0.2
Jackass morwong	18797	15777	*	*	*	86.9	0.9
Other finfish	18349	17154	*	*	*	93.5	1.6
Wrasse	13415	12643	*	*		94.2	1.9
Tuna	12737	*	10953	*		2.0	86.0
Striped trumpeter	12552	10237	*	*	*	93.1	0.8
Whiting	11766	10399	*	*		88.4	0.4
Pike	10367	4291	*	*		41.4	29.2
Redfin perch	9367	1033	8334	*		11.0	89.0
Blue warehou	8611	8611				100.0	0.0
Eels	7867	5803	*	*		73.8	6.7
Atlantic salmon	7488	6931	*	*		92.6	4.4
Blackfish	6711	6084	*	*		90.6	5.8
Gummy shark	6214	4719	*	*	*	92.7	3.2
Leatherjackets	5926	4677	*	*		78.9	0.0
Garfish	5517	5446	*	*		98.7	1.3
Total finfish	**2271915**	**1694798**	**319301**	**248960**	**8856**	**75.0**	**14.1**
Arrow squid	6181	*	*	*		86.9	12.3
Calamary	26336	*	18613	5257		9.4	70.7
Squid - unspec	7989	*	*	*		39.5	19.0

Appendix 10 Annual recreational harvest (numbers) of key species by fishing platform for Tasmania during 2000/01, based on Australian residents aged 5 or older.

* denotes fewer than 25 diary records involved; values of less than 1000 shown as <1000

	Total	Boat	Shore	% boat
Flathead	1377350	1290968	86382	93.7
Australian salmon	314221	186100	128121	59.2
Trout	200894	112209	88684	55.9
Mullet	99130	26093	73036	26.3
Flounder	71160	26396	44764	37.1
Cod	66829	49364	17464	73.9
Bream	45396	12634	32762	27.8
Jackass morwong	37326	33365	*	89.4
Gurnard	36569	36381	<1000	99.5
Bastard trumpeter	34097	33605	*	98.6
Jack mackerel	33571	21181	12391	63.1
Other finfish	32758	18751	14006	57.2
Barracouta	28287	22635	5653	80.0
Silver trevally	23770	11226	12545	47.2
Wrasse	22792	14468	8324	63.5
Leatherjackets	20090	16710	3380	83.2
Garfish	19549	*	*	38.7
Blue warehou	18069	10041	8028	55.6
Striped trumpeter	17277	17277		100
Atlantic salmon	13689	10309	3380	75.3
Tuna	12737	12737		100
Whiting	12215	9357	*	76.6
Pike	10481	9340	*	89.1
Redfin perch	9367	*	8505	9.2
Eels	8239	*	7637	7.3
Gummy shark	7884	3956	3928	50.2
Blackfish	6711	*	6489	3.3
Total finfish	**2580457**	**1994345**	**586112**	**77.3**
Arrow squid	6269	*	*	49.0
Calamary	30031	12818	17213	42.7
Squid - unspec	8138	5519	*	67.8
Abalone	108495	73664	34830	67.9
Rock lobster	86976	82480	4496	94.8
Small baitfish	**8496037**		**8496037**	**0**
Other taxa	**150672**	**2991**	**147681**	**15.0**
Total	**11467085**	**2174837**	**9292249**	**19.0**

Appendix 11 Annual recreational effort (events and fisher hours) and harvest (numbers) of key species by fishing region for Tasmania during 2000/01, based on Australian residents aged 5 or older.

* denotes fewer than 25 diary records involved; values of less than 1000 shown as <1000

	Western	Central Plateau	Eastern	Western North Coast	Eastern North Coast	Tamar	Northern East Coast	Central East Coast	Great Oyster Bay	Southern East Coast	Norfolk-Frederick Henry Bay	Derwent	D'Entre-casteaux Channel	West Coast	Bass St Ils
Effort															
Events	58527	86703	82669	93839	41292	45783	68235	54117	43796	78931	50567	62153	98681	36504	10891
Fisher-hours	185553	378560	388467	252241	219206	121886	424808	343775	231595	687732	192860	146543	375697	277588	68547
Harvest															
Flathead	*		*	55686	57983	53380	55022	170718	342001	169004	204704	36017	228602	*	*
Australian salmon	*			75909	21534	21561	35555	13315	8514	15486	3021	4846	14718	82611	*
Trout	40121	114543	36228	*	*	*		*	*	*	*	5582	1933	*	*
Mullet	*			27325	38609	2931	6079	*	*	*	*	*	11493	*	*
Flounder				*	*	*	*	*	*	7056	16935	*	23652	*	*
Cod	*			1629	*	18554	*	5290	*	6794	9252	4361	7140	11665	*
Bream	*			*	*		5552	*	17432	*	*	9215	*	*	*
Jackass morwong				*	*	*	*	23471	*	*	*	*	5122	*	*
Gurnard				1789	*	*	*	13614	1574	14094	2089	*	1753	*	*
Bastard trumpeter				*	*		*	*	*	12352	*		4496	8490	
Jack mackerel				*		*	*	17780	*	*	*	*	3335		*
Barracouta				8827	*	*	*	5009	*	*	*	*	2997	*	*
Silver trevally				5392	*	*	6038	*	*	*	*	*	*		*
Wrasse			*	3719	3247	*	<1000	3949	*	1235	*	v	5099	*	*
Leatherjackets				*	*		*	1137	1743	4545	7059	*	2077		

Appendix 11 continued.

	Western	Central Plateau	Eastern	Western North Coast	Eastern North Coast	Tamar	Northern East Coast	Central East Coast	Great Oyster Bay	Southern East Coast	Norfolk-Frederick Henry Bay	Derwent	D'Entre-casteaux Channel	West Coast	Bass St Ils
Blue warehou				*	*	*	*	*		*	*		*		
Striped trumpeter					*		*	7455		*	*		*		*
Atlantic salmon			*							*		*	10143	*	
Tuna					*		5815	*		6438					
Whiting				*	*		*		*	*	7341	*	*		*
Redfin perch	*	*	8961									0			
Eels	3006	*	*	*	*	*	*	*	*	*		*	*	*	
Gummy shark				*	*	*	*	*	*	*	*	*	<1000	3347	*
Blackfish	3781	*	*									*			
Total finfish	**51748**	**115630**	**50511**	**218299**	**144163**	**113499**	**139509**	**271044**	**378822**	**268053**	**268195**	**70652**	**333813**	**124427**	**32092**
Calamary				*	*	*		*	*	*	*	*	*		*
Abalone				*	*		*	*	*	38017	*	*	23826	*	*
Rock lobster				*	2130		9416	11264	8014	20903	7392	*	12523	12160	1552
All taxa	**304641**	**116197**	**52341**	**567111**	**151519**	**120147**	**162101**	**307792**	**405751**	**336334**	**296201**	**179344**	**427631**	**154769**	**40207**

Appendix 12 Recreational harvest (numbers) of key species by bimonthly periods for Tasmania during 2000/01, based on Australian residents aged 5 or older.

* denotes fewer than 25 diary records involved; values of less than 1000 shown as <1000

	May-Jun	Jul-Aug	Sep-Oct	Nov-Dec	Jan-Feb	Mar-Apr	Total
Flathead	150914	85973	99804	258349	511966	270343	1377350
Australian salmon	29972	65916	38214	50858	81914	47347	314221
Trout	4599	13259	34197	51312	50287	47239	200894
Mullet	11267	8615	*	36843	23304	14670	99130
Flounder	12169	13245	*	5105	21978	14733	71160
Cod	21838	23610	4647	7757	4983	3994	66829
Bream	3216	*	*	13162	17018	8457	45396
Jackass morwong	*	*	*	4900	10784	*	37326
Gurnard	1941	5320	2955	5718	13714	6920	36569
Bastard trumpeter	*	*	*	16197	7657	*	34097
Jack mackerel	*	*	*	*	11667	11839	33571
Barracouta	5745	*	*	5661	10655	5517	28287
Silver trevally	*	*	*	4147	6663	3986	23770
Wrasse	1179	2317	<1000	8526	6160	4128	22792
Leatherjacket	*	*	*	2597	11989	3337	20090
Blue warehou	*	*	*	*	*	*	18069
Striped trumpeter	*	*	*	*	*	*	17277
Atlantic salmon	*	*	*	4201	*	*	13689
Tuna	*	*	*	*	*	7557	12737
Whiting	*	*	*	*	3741	*	12215
Finfish Total	**271638**	**245840**	**208690**	**514282**	**839474**	**500534**	**2580457**
Calamary	*	*	*	*	9499	10077	30031
Abalone	*	*	*	27075	45295	24183	108495
Rock lobster	1431	*	0	39953	27569	16229	86976

Appendix 13 Annual recreational effort (events) by fishing method and region for Tasmania during 2000/01, based on Australian residents aged 5 or older.
* denotes fewer than 25 diary records involved

		Western	Central Plateau	Eastern	Western North Coast	Eastern North Coast	Tamar	Northern East Coast	Central East Coast	Great Oyster Bay	Southern East Coast	Norfolk-Frederick Henry Bay	Derwent	D'Entre-casteaux Channel	West Coast	Bass St Isl.
Line	No.	56548	86703	82599	86811	32068	44050	52988	37270	35722	41402	40852	58661	73823	20227	7802
	%	96.6	100	99.9	92.5	77.7	96.2	77.7	68.9	81.6	52.5	80.8	94.4	74.8	55.4	71.6
Gillnet	No.				*	3115		1688	3522	*	13413	2250	*	9419	7139	*
	%				0.8	7.5		2.5	6.5	2.0	17.0	4.4	0.2	9.5	19.6	0.4
Net	No.	*		*	2627	2089		*	*	*	*	*	*	*		*
	%	3.4		0.1	2.8	5.1		0.5	0.2	0.3	0.2	0.2	1.9	0.1		3.0
Pot	No.				*	3218		10441	9673	5309	16412	1936	*	4828	6224	1785
	%				0.5	7.8		15.3	17.9	12.1	20.8	3.8	0.2	4.9	17.1	16.4
Dive	No.				*	*	*	*	3018	*	6606	*	*	5319	2490	*
	%				0.4	0.6	0.2	1.8	5.6	3.3	8.4	4.9	1.1	5.4	6.8	0.9
Spear	No.				*	*	*	*	*	*	*	2790	*	2573	*	*
	%				2.3	0.9	3.2	0.2	0.2	0.4	0.7	5.5	0.3	2.6	0.4	4.1
Other	No.				*	*	*	*	*	*	*	*	*	2639	*	*
	%				0.7	0.4	0.4	2.2	0.8	0.5	0.5	0.3	2.0	2.7	0.7	3.5
Total	**No.**	**58527**	**86703**	**82669**	**93839**	**41292**	**45783**	**68235**	**54117**	**43796**	**78931**	**50567**	**62153**	**98681**	**36504**	**10891**
	%	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Appendix 14 Annual recreational effort (events) by water body type and fishing region for Tasmania during 2000/01, based on Australian residents aged 5 or older.

* denotes fewer than 25 diary records involved

Water body type		Western	Central Plateau	Eastern	Western North Coast	Eastern North Coast	Tamar	Northern East Coast	Central East Coast	Great Oyster Bay	Southern East Coast	Norfolk-Frederick Henry	Derwent	D'Entre-casteaux Channel	West coast	Bass St Isl.
Lakes/Dams	No.	32799	85336	38585												*
	%	56.0	98.4	46.7												2.0
Rivers	No.	23298	*	43996									4574			*
	%	39.8	1.5	53.2			2.1						7.4			0.2
Estuarine	No.	*			31345	*	44545	19312	1700	5348	*	3120	55371	16816	11636	*
	%	4.2			33.4	5.5	97.3	28.3	3.1	12.2	0.5	6.2	89.1	17.0	31.9	6.1
Inshore	No.				62239	38913	*	45496	51628	38448	73233	47352	*	81866	24813	9604
	%				66.3	94.2	0.6	66.7	95.4	87.8	92.8	93.6	3.6	83.0	68.0	88.2
Offshore	No.				*	*		3426	*		5292	*			*	*
	%				0.3	0.2		5.0	1.5		6.7	0.2			0.2	3.5
Total	**No.**	**58527**	**86703**	**82669**	**93839**	**41292**	**45783**	**68235**	**54117**	**43796**	**78931**	**50567**	**62153**	**98681**	**36504**	**10891**
	%	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Appendix 15 Annual recreational effort (events) by fishing region and based on fishers home region for Tasmania during 2000/01, based on Australian residents aged 5 or older.

* denotes fewer than 25 diary records involved

Home region		Western	Central Plateau	Eastern	Western North Coast	Eastern North Coast	Tamar	Northern East Coast	Central East Coast	Great Oyster Bay	Southern East coast	Norfolk-Frederick Henry	Derwent	D'Entre-casteaux Channel	West coast	Bass St Isl.
Hobart	No.	*	20779	27845	2962	*	*	4963	32667	10774	58004	44111	57373	61922	*	*
	%	2.7	24.0	33.7	3.2	1.7	2.3	7.3	60.4	24.6	73.5	87.2	92.3	62.7	6.5	2.7
Huon	No.	*	*	2702	*			*	1169	907	940	*	*	31456	*	*
	%	0.2	0.6	3.3	0.1			0.1	2.2	2.1	1.2	1.0	1.1	31.9	0.3	0.2
M'land East	No.	*	4802	8062	*	*	*	*	13924	6637	12130	4059	3273	<1000		
	%	1.5	5.5	9.8	0.3	0.4	0.1	0.8	25.7	15.2	15.4	8.0	5.3	1.0		
L'ton-NE	No.	15686	25698	35266	3801	32034	43369	51738	4766	15967	*	*	*	*	*	*
	%	26.8	29.6	42.7	4.1	77.6	94.7	75.8	8.8	36.5	0.5	1.0	0.5	0.7	0.3	11.7
West-NW	No.	39070	28927	3197	85199	7519	*	10044	*	9298	3264	*	*	2735	30863	*
	%	66.8	33.4	3.9	90.8	18.2	2.1	14.7	2.9	21.2	4.1	0.8	0.6	2.8	84.5	8.1
Bass St Is	No.															6725
	%															61.7
Interstate	No.	*	6003	5596	*	*	*	*		*	*	*	*	*	3033	*
	%	2.0	6.9	6.8	1.6	2.1	0.8	1.3		0.5	5.3	1.9	0.2	0.9	8.3	15.6
Total	**No.**	**58527**	**86703**	**82669**	**93839**	**41292**	**45783**	**68235**	**54117**	**43796**	**78931**	**50567**	**62153**	**98681**	**36504**	**10891**
	%	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Appendix 16 Total annual expenditure ($) in Tasmania during 2000/01 attributed to recreational fishing (excludes private vehicle travel along with food and drink, motor vehicle and real estate purchases and communication costs) by economic zone and based on the home region of the recreational fisher.

* denotes fewer than 25 diary records involved.

	Economic zone						
Home region	**Hobart**	**Huon**	**M'land-East**	**L'ton-NE rural**	**West-NW Rural**	**Bass St**	**Total**
Hobart	14,054,689	257,800	421,903	195,999	*		**14,973,562**
Huon	756,421	451,635	*	*	*		**1,212,997**
M'land-East	514,754	*	1,849,185	*	*		**2,412,699**
L'ton-NE rural	*		187,400	8,738,225	100,093	*	**9,113,458**
West-NW Rural	*	*	105,818	345,490	8,232,440	*	**8,943,555**
Bass St						*	*****
Interstate	*		*	*	*	*	**973,157**
Total	**15,686,515**	**767,757**	**3,054,676**	**9,434,163**	**8,505,462**	**210,558**	**37,659,131**