



Taihoru Nukurangi

**National marine diary survey of recreational fishing
from charter vessels, 1997–98**

Gavin James, Martin Unwin

**Final Research Report for
Ministry of Fisheries Research Project REC9703**

National Institute of Water and Atmospheric Research

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Final Research Report

Title: National Marine Diary Survey of Recreational fishing from Charter Vessels, 1997–98

Author: Gavin James, Martin Unwin

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2. **Contractor** NIWA
3. **Project Title** National survey of recreational fishing from charter boats
4. **Project code** REC9703
5. **Project Leader** Gavin James
6. **Duration of Project** 1/10/97 to 31/3/99
7. **Executive Summary**

Annual catches of fish and shellfish species taken by recreational fishers aboard marine charter boats, were estimated from a year-long voluntary diary survey in 1997–98, involving 85 charter-boat operators around New Zealand. Estimated numbers of fish landed are listed by species, QMS status, fishing method, area (QMA, Fishstock, recreational survey diary zone) and season, while estimated landings (tonnes) are provided by Fishstock for 16 QMS species. The survey also provided estimates of fishing effort (hours) by fishing method, area, and month, as well as the proportion of overseas anglers involved, and the percentage of each species released. The survey was run from 1 November 1997 to 31 October 1998.

Catch and effort estimates based on the survey data have been scaled upwards to represent the contribution from charter vessel operators who did not participate in the diary survey, and to allow for differential response rates between geographical regions, and for diarists who did not participate for the full 12 months. The scaling factors used (which range from 2.0 to 10.0) are the best that can be derived with the available data, but their accuracy is limited by a lack of quantitative data on the number of charter vessels operating during the survey period.

Numerically, snapper was the most important species landed (310 000 fish), followed by blue cod (250 000), and tarakihi (171 000). A total of 105 species (or species groupings) were recorded. While 25% of all fish and shellfish caught were released, the percentages varied greatly between species. Success rates for trips (based on species targeted which were caught) averaged 82%, but were much lower for big game (17%), and specifically marlin trips (5%).

The north east coast (QMA1) was the most important area with 75% of effort expended, followed by the Marlborough Sounds with 13%. Inshore lining was the most important

method (72% of total hours), followed by big game (15%), deepwater line (10%), extractive diving (3%), and other (<1%), although set net and potting effort was not measured. Seven percent of all fishers were overseas visitors, with the highest participation rates in northern north east New Zealand (14% in the North Cape/Bay of Islands).

The full report (containing Tables and Figures) to be submitted as a NIWA Technical Report is attached as Appendix A.

8. Objectives

8.1 Programme Objectives

1. To determine the catch and effort of recreational fishing activities from charter boats.
2. To characterise the charter boat industry for recreational fishing.

8.2 Objectives For 1997–98:

The three objectives for 1997–98 in the tender document were combined in the proposal into the single objective below to clarify the tasks involved and reporting requirements:

To estimate from a logbook survey the annual catch and effort of key species taken by charter boats by QMA area.

9. Methods

9.1 The Questionnaire

The programme developed by NIWA to survey recreational fishing from charter vessels was divided into two phases: a Questionnaire Survey, and a Diary Survey. The questionnaire survey was sent to 366 possible charter boat operators in early 1997, seeking basic information on the charter operation, including the operator's name and address, vessel size and name, number of anglers carried, and fishery type by general area fished and season. Replies were received from 62% of respondents, with 54% indicating they were actively fishing during 1996. Results from this questionnaire describing the main characteristics of the New Zealand marine recreational charter boat fleet and fishery in 1996–97 have been published (James, Unwin & Boustead 1997).

Information from the questionnaire was used to plan the second phase of the programme – a year-long diary survey to provide estimates of national fish catch and effort by recreational fishers using charter vessels, which was conducted from 1 November 1997 to 31 October 1998. The results of the diary survey constitute this report.

9.2 The Diary Survey

9.2.1 Diary Design

Following completion of the 1996–97 questionnaire survey, all 365 operators on the original mailing list (including 147 who had not replied to this survey, and reduced from 366 in the questionnaire report (James, Unwin & Boustead 1997) because one operator had duplicate company names) were sent a follow-up letter (Appendix 1). This invited them to keep records for the proposed diary survey, on a voluntary basis, during 1997–98. In the interim, a further 11 operators were added to the mailing list, bringing the total to 376. A total of 85 operators

eventually completed diaries, including 6 who were recruited by word of mouth after completion of the 1996–97 survey.

In order for diarists to be prepared to supply full and accurate records voluntarily, we sought and obtained assurances from the Ministry of Fisheries that only grouped information would be reported, thus ensuring that individual catch histories would not be transferred to the Ministry of Fisheries.

The format of the personalised diaries was developed in consultation with Ministry of Fisheries staff involved in recreational fisheries, and several charter boat operators. Appendix 2 contains copies of the diary introductory pages which include instructions, definitions and explanations of the various terms used: trips, fishing methods, hours fished, areas (see also Table 1) and diary zones (see also Fig. 1), species targeted, number of each species caught and released, and species identification codes, together with a trip record sheet already completed as an example. Every second trip record sheet was carbonised, permitting a duplicate copy to be made which was returned to NIWA; the original book could then be retained by the operator. It was emphasised that records should be sent in as soon as possible and at least every quarter, so that operators were eligible for the prizes being offered, and so that the data being provided could be checked. We also emphasised that returns should be provided for periods when no fishing was being undertaken. It was indicated that additional books were available on request.

A vital part of any voluntary diary scheme is regular communication with participants, and this was achieved primarily through the use of newsletters, sent out at least quarterly. These provided general information on progress with the survey, mentioned any problems that had arisen, and re-emphasised important matters. Copies of the 5 newsletters are attached as Appendix 3. Communication with operators was also made, when necessary, using telephone, fax and occasionally email. All diarists who had not sent in records for a 3-month period were contacted by telephone as a reminder, and to check if any assistance was required. To further publicise the diary survey, we had an article published in a magazine read by many charter boat operators (Ingram 1998). It is our intention to send all participants in the diary survey a copy of this report.

As an incentive for operators to participate, we organised a draw for three travel prize packages at the completion of the diary survey, with a total value of over \$5000. Each prize included return air travel for two persons; the first prize was to Australia, while the second and third were mystery weekends within New Zealand. Each diarist had one chance to participate in the draw for each 3-month period for which they sent in records. At the suggestion of one diarist, we also offered reduced rates for access to NIWA's sea surface temperature website.

9.2.2 Data analysis

9.2.2.1 Data checking and cleaning

The standard of the completed diary pages returned to NIWA was generally good, most of the 85 operators who participated having little difficulty coming to grips with our data capture requirements. Data were stored in a Microsoft™ Access database, providing linkages between records of catch and effort for individual vessels, and between return data for vessels and operators which had also participated in the 1996–97 postal survey. Routine data checks included validation of fields (such as hours per trip or trip date) for which only values within

a specified range were legal, and referential integrity checks on cross-linked fields such as species codes.

Approximately 10% of the completed pages showed evidence of some confusion over precisely what was meant by a “charter trip”, defined in the diary instructions as “...one fishing charter, with one group of fishers, using one fishing method, for at most one day ...”. In many instances these could be resolved quite simply, e.g. by splitting data for what was clearly a two or three day charter into appropriate daily units. More difficult situations arose when the species caught on a given trip were inconsistent with the fishing method used or the area of operation, such as (snapper during a big game trip, or hapuku by diving). In most such cases careful inspection of the data suggested that two or more “trips” had been inadvertently listed as one, such as a trip which involved extractive diving, or inshore line fishing (often for bait) as a small part of a big game trip. We resolved these cases using whatever data were available, such as other records for the same vessel in the same area, our own knowledge of species likely to be taken in each area, and (in some cases) follow up calls to the operator involved. Although some such errors are likely to have gone undetected, we believe that the number of records affected is small in relation to the full data set (roughly 20 000 catch records in 8 000 trips), and that any resulting errors in our estimates of catch and effort are negligible in relation to statistical and non-sampling errors.

9.2.2.2 Scaling from Survey to Total Estimates

The 85 operators who participated in this diary survey represented only a proportion of the total charter fleet. To estimate statistics such as total catch and total fishing effort from the survey records, the raw data must be scaled up to represent the contribution from charter operators who did not participate in the survey. Estimating the appropriate “expansion factor” – the number by which catch statistics for the diarists must be multiplied to yield estimates for the whole industry – requires answers to two related questions. First, how many charter vessel operations were operating in New Zealand during 1997–98? Second, to what extent were the operators who participated in the survey representative of the whole industry?

Neither of these questions can be answered with complete certainty. The charter vessel industry is constantly changing, with new operators coming in and existing operators closing down, taking on new vessels, or shifting their base of operation. Consequently, the expansion factor (which for a simple random sample is simply the ratio of the total number of operators to the number of operators sampled) is not known exactly. In addition, the operators who participated in this diary survey are unlikely to have been a random subsample of the total. Of the 376 potential operators on the revised mailing list, 85 participants eventually completed diaries.

Because these individuals were volunteers, prepared to take on the additional task of maintaining a diary, their patterns of activity may have differed from those of their non-participating colleagues. Participation rates also varied between regions, and during the course of the 1997–98 survey; most diarists furnished returns for the full 12 month period (even for months during which they had not fished), but a few diarists dropped out at various times during the season. To address these biases we considered four possible sources of error in deriving appropriate expansion factors: variation in participation rates between regions; monthly variation in participation rates during the survey; variation in vessel length between participants and non-participants; and variation in fishing activity between participants and non-participants.

Regional variation: At the broadest level, we assumed that the charter fleet at the time of the 1997–98 survey numbered 376 vessels, representing one for each operator on the 1997–98 mailing list. Diary returns were obtained for 88 vessels (maintained by 85 operators), representing an average expansion factor of 4.27:1. In reality, the number of vessels per address is likely to have been slightly greater than one, so this figure is conservative. We then estimated expansion factors for 11 regions (corresponding to those used in the 1996–97 survey), based on the number of participating vessels within each region (Table 1). These expansion factors (E_{region}) ranged from 7.1 for the west coast of the North Island to 1.8 for Fiordland.

When applying these expansion factors, we took into account both the origin of each vessel (based on its home port) and the diary zone in which it was fishing. For example, zone 5 (Great Barrier) was fished by vessels operating out of Paihia (zone 2), Tutukaka and Bream Bay (zone 3), Tryphena (zone 5), Leigh (zone 6), Auckland (zone 7), Whitianga and Tairua (zone 10), and Tauranga (zone 11). Catch and effort estimates for zone 10 (and for all other zones) were therefore derived by summing expanded estimates for each contributing region as defined in Table 1.

Monthly variation: The instructions on the first page of each diary asked operators to return completed diary records every three months, or more often if completed sheets were available. At the end of each three month period, an attempt was made to contact all non-respondents and encourage them to forward their returns. Well over two thirds of the diarists kept records for the full twelve months, but response rates declined notably towards the end of this period, probably reflecting a loss of interest by the less committed diarists. To adjust for these individuals, we introduced a second level of expansion factors, specific to each region and quarter, which compensated for level of non-response (Table 2). These expansion factors (E_{quarter}) varied from 1 (100% response rate) to 2 (50% response rate), and averaged 1.22 (82% response rate). We then multiplied the regional and quarterly expansion factors to yield 44 distinct expansion factors ($E_{\text{region} \times \text{quarter}}$) ranging from 2.0 (area 11, all months) to 10.0 (area 4, all months except February to April).

Vessel length and fishing activity: To gauge the extent of biases arising from either of these two sources, we used data from the 1996–97 survey to compare vessel length and fishing activity for vessels operated by the 1997–98 diarists (75 and 71 vessels, respectively) with vessel length and fishing activity for all vessels recorded during the 1997–98 survey (207 and 197 vessels, respectively). This analysis suggested that vessels operated by the 1997–98 diarists were not significantly biased with respect to vessel length (Table 3), but that there was some tendency for diarists to be more active (in terms of number of fishing days per year) than non-diarists (Table 4). The diary scheme participation rate for 1996–97 respondents who fished for less than 50 days per year (15 out of 56, or 27%) was half that of the most active operators who fished for more than 200 days a year (14 out of 26, or 54%). Considered in isolation, this effect means that results derived from the 1997–98 diary scheme will tend to slightly overestimate total catch and effort in comparison to what would be expected had all 1996–97 respondents participated in the diary survey.

By analogy, one would also expect some non-response bias because respondents to the 1996–97 survey may have been more active than non-respondents from the original mailing list of 376 operators. However, anecdotal evidence suggests that charter fishing is steadily increasing in popularity, with many new operations coming into existence over the last few years, particularly in the South Island. This means that expansion factors based on a total charter fleet of 376 operators will tend to under-estimate catch and effort statistics, and will

tend to compensate for any non-response bias. In the absence of any data which would help to quantify either source of bias, we simply assumed that (a) with respect to vessel length and fishing activity the 88 vessels for which 1997–98 diary records were available constituted a simple random sample of the total charter fleet, and (b) that this fleet numbered 376 vessels. Neither assumption is likely to be correct, but the foregoing analysis suggests that any resulting errors will tend to cancel rather than reinforce.

9.2.3 Data Reporting

All estimates of catch and most estimates of effort tabulated in this report are based on expanded data, as detailed in the previous section. We did not attempt to estimate total numbers of fishers because the survey emphasised fishing trips rather than individual fishers: simply adding the number of fishers for each trip would overestimate the number of individuals involved in multi-day charters, or charters where fishers used more than one fishing method. Catches are presented as total numbers of fish, and effort as total fisher-hours, i.e. a four hour charter trip taken by five fishers was counted as 20 fisher-hours. Effort associated with incidental methods such as potting and set-netting (for which “soak” hours were not usually supplied) was calculated as the number of trips, based on unexpanded data. All figures are rounded to the nearest whole number, although this is a matter of convenience rather than accuracy: given the uncertainties surrounding the various expansion factors, digits other than the most significant should be ignored.

Many varied cross-tabulations of the survey results are possible. To keep this report to a reasonable size we present a relatively limited set of tables, concentrating on cross-tabulations and groupings of data which capture the key results of the survey (such as effort by zone, catches by zone, catches of QMS species by Fishstock etc.). For readers seeking more detail we include a partially digested form of the data (as a Microsoft Excel workbook) from which readers can generate their own summaries. This summary file gives MFish users full access to any cross-tabulations they may require in the future, while at the same time preserving complete anonymity of individual respondents.

10. Results

10.1 The Replies

Approximately 2000 completed diary pages were returned to NIWA, representing 7941 fishing trips during the survey period by 50 421 fishers. Fishing activity (at least one trip by at least one vessel) was recorded in all zones except zone 8 (Firth of Thames); zone 16 (Wairarapa east coast from Cape Turnagain to Turakirae Head); zones 22 and 24 (Kaipara Harbour to Reef Point); zone 32 (Canterbury Bight between the Rakaia and Waitaki rivers); and zone 34 (south Otago from Tokomairiro River to Slope Point). A total of 20 341 catch records were provided, representing 105 species.

10.2 Fishing effort

Four methods – inshore line fishing, big game fishing, deepwater line fishing, and extractive diving – accounted for 95.9% of the charter trips recorded during the diary survey (Table 5). Other methods recorded included potting, set netting, scallop dredging, and very occasionally saltwater flyfishing.

For the four main fishing methods, estimated fishing effort by charter vessels from 1 November 1997 to 31 October 1998 totalled 1.12 million hours. The distribution of effort was strongly skewed (75% of total effort) towards zones 1 to 13 (QMA1), along the east coast of the North Island from North Cape to Cape Runaway (Fig. 1, Table 6), with a lesser concentration (13%) around the Marlborough Sounds (zones 26 – 28). Inshore line fishing was by far the most commonly used method, accounting for 72% of the total effort.

Effort varied significantly throughout the season (Table 7). This trend was most marked for big game fishing, over 70% of which was recorded over the three months from February to April 1998. Other fishing methods also showed a tendency for activity levels to drop off during winter, although the seasonal pattern was much less marked for extractive diving and inshore line fishing than for deepwater line fishing.

10.2.1 Characteristics of fishers

The number of fishers per charter trip averaged 6.5, and varied relatively little between fishing methods (Fig. 2). Big game charters tended to involve the smallest number of individuals (4.5 per trip), whereas inshore line trips involved the most (7.2 per trip). Fishing hours per day varied depending on the type of charter. Mean hours per day ranged from 1.5 for extractive diving to 6.5 for big game charters. Deepwater line fishing and inshore line fishing trips were of intermediate duration between these two values, averaging 3.7 hours and 4.4 hours, respectively.

Fishers of overseas origin accounted for 7.3% of the total fishers (Tables 8, 9). Overseas participation rates were similar (6.5% – 8.5%) for big game fishing (6.5%), deepwater lining (8.4%), and inshore lining (7.8%), but were substantially lower for extractive diving (2.2%). The highest participation rates tended to be associated with area and season of peak activity, in the Bay of Islands/Hauraki area during February and March. For zones 1 to 4 (North Cape to Bay of Islands), overseas fishers comprised 14% of the total (for all methods combined), and over 28% of those participating in deepwater line fishing charters.

Trip duration (defined as hours per day) varied substantially between fishing methods (Fig. 5). Diving trips were the shortest, seldom exceeding 2 hours in length, whereas big game trips averaged 6.5 hours per day. In practice, many big game trips (and some deepwater line trips) were multi-day charters lasting up to five days.

10.3 Species targeted and successful trips

Of the 7941 trips recorded by diarists, information on target species was available for 7643 (96.3%) trips. A total of 54 species were listed at least once, although within each fishing method the most popular target species seldom numbered more than two or three (Table 10). Key target species were marlins and tuna (for big game charters); hapuku/bass and kingfish (for deepwater line charters); rock lobster (for extractive diving charters); and snapper and blue cod (for inshore line charters).

To characterise the fishing success rate for each target species, we adopted the definition (given by Bradford et al. 1998) that a successful trip was any charter during which at least one individual of the specified target species was caught. Success rates averaged 82%, and were usually high (over 80%) for fishing methods other than big game. By contrast, the success rate for big game trips averaged 17%, and was only 5% (31 successes out of 630 trips) for marlins (predominantly striped marlin, although respondents did not always specify a single species).

10.4 Total Catches

Estimated catches for all 105 species taken during the survey are listed in Table 11, expressed both as the total catch (including fish caught and released), and the total harvest (including only fish caught and kept). Catches of individual species ranged from 455 000 snapper (of which 310 000 were kept) to single figure estimates (invariably based on isolated catches of a single individual) for 16 minor species such as stargazer, elephant fish, and turbot. For most of the remaining tables in this report we concentrate on 32 species, comprising QMS species for which the estimated catch exceeded 1000 individuals (18 species), plus a further 14 non-QMS species of particular significance to the charter fishing industry. These included all species with an estimated catch of over 2000 individuals, together with spiny dogfish (estimated catch 1253 fish), yellowfin tuna (estimated catch 1130 fish), and butterfly or greenbone (estimated catch 521 fish).

10.4.1 Catches of the main species

Estimated numbers of the 32 main species landed (i.e. caught and killed), are listed in Table 12 by fishing method. The top 11 species were all QMS species, with snapper the most important, followed by blue cod, tarakihi, scallops, jack mackerel, sea perch, dredge oysters, rock lobster, trevally, hapuku/bass, and barracouta. As expected, snapper, blue cod and tarakihi were predominantly taken by inshore lining, with small numbers by deepwater lining. Of those species taken in large numbers by "other" methods, scallops were taken by extractive diving and scallop dredging, rock lobster by extractive diving and potting, and butterfly/greenbone and tarakihi by set netting.

Table 13 lists the numbers of the main species landed by Quota Management Area. Snapper are mostly taken in QMA1, blue cod in QMA's 3, 5, and 7, and tarakihi in QMA's 1 and 7. Fully 75% of fish species are taken most commonly in QMA1, the exceptions being blue cod, sea perch, hapuku & bass, trumpeter, red cod, spiny dogfish, and butterfly (or greenbone).

The estimated numbers of the main species landed are listed in Table 14 by annual quarter. For the most important three species, landings were spread over the year, with peak catches of snapper and blue cod in February – April, and of tarakihi in November – January. Migratory species such as the tunas were noticeably absent during cooler periods.

To aid fisheries managers we have listed in Table 15 the estimated number of fish landed by Fishstock (as defined in Anon. 1998), for all QMS species recorded. For 16 species for which data on mean green weights (by Fishstock) are readily available (Bradford 1998c), these estimates are also tabulated as tonnages (Table 16). Similar tonnage estimates could be made for any species for which adequate data on mean green weights are available elsewhere in the literature, or become available in the future. In Table 17 we provide estimates of the number of fish landed by QMA and the 40 zones used in the diary survey (see Appendix 2), for eight species considered of particular importance.

11. Conclusions

Estimates of the numbers of fish landed, as determined from this survey, were compared with those derived by Bradford (1998d) from data supplied by the very small number of diarists using charter boats (3.3% of trips) in the National Marine Recreational Fishing Survey in 1996. Although the ranking of species importance is broadly similar in both reports, the estimates obtained from this survey were usually markedly higher, often by a factor of

between 2 and 3. For the three most important species snapper, blue cod and tarakihi, the factors were similar at 2.4, 2.8 and 2.3 respectively. For a small number of species such as kahawai and rock lobster, estimates from the two sources were similar, while for a few others e.g. sea perch and jack mackerel, estimates from this survey were about 10 –15 times greater.

This diary survey provided vastly more information on which to base estimates of fish catch than was available to Bradford in the earlier survey; in fact it was largely the paucity of data in this earlier survey on recreational fishing from charter boats that provided the stimulus to initiate this survey. As a consequence it is not surprising there are some differences between the two sets of results; perhaps the surprising thing is that there are so many similarities, especially in the ranking of the important species.

Data collected during this survey are robust, but assumptions made regarding the number of charter boats operating are the biggest limitation. Considering the expansion and changes in the industry over the last few years, it could be timely to update the database on charter vessels operating at present. The data obtained from this survey could then be relatively simply updated by modifying the expansion factors where necessary, and an up-to-date estimate produced of fish numbers caught by recreational fishing on charter boats.

12. Publications

James, G.D., Unwin, M.J. (submitted for publication as NIWA Technical Report. National Marine Diary Survey of Recreational Fishing from Charter Vessels, 1997–98.

13. Data Storage

To permit easy access to a simplified form of the database, we will supply the Ministry of Fisheries with a CD containing an Excel spreadsheet of the data on which this report is based. This will enable users to extract whatever combinations are required of catch and effort by method, species, month, and zone.

In addition, the data (but excluding individual operator names and addresses, and vessel names) will be stored on an MFishe EMPRESS database at NIWA, Greta Point.

Appendix A. Full report to be submitted as a NIWA Technical Report.

**National Marine Diary Survey
of Recreational Fishing
from Charter Vessels, 1997–98**

**G. D. James
M. J. Unwin**

**NIWA Technical Report
1999**

Preface

The catch and effort estimates tabulated in this report, based on the 1997–98 Diary Survey, are subject to considerable uncertainty. In addition to the usual statistical errors associated with sample surveys, additional uncertainties arise because the “expansion factors” we use – the ratio by which the sample data must be multiplied to represent the charter industry as a whole – are imperfectly known. Readers wishing to use these estimates for their own purposes should therefore pay particular attention to the Data Analysis section of this report, where we discuss the various expansion factors used, and our underlying assumptions, in more detail.

These uncertainties do not preclude derivation of useful catch and effort estimates from the survey data. Our purpose in introducing our concerns in this preface is simply to ensure that all readers are aware of them. These concerns notwithstanding, we are confident that the results capture general trends in the industry with sufficient precision for both managers and fishers. In the absence of any previous catch and effort statistics for the marine recreational fishing charter industry, these data fill a significant gap, with no guarantee that new or better information will become available in the immediate future. Meanwhile, fisheries management continues.

Abstract

James, G.D., Unwin, M.J. 1999: National Marine Diary Survey of Recreational Fishing from Charter Vessels, 1997–98.

Annual catches of fish and shellfish species taken by recreational fishers aboard marine charter boats, were estimated from a year-long voluntary diary survey in 1997–98, involving 85 charter-boat operators around New Zealand. Estimated numbers of fish landed are listed by species, QMS status, fishing method, area (QMA, Fishstock, recreational survey diary zone) and season, while estimated landings (tonnes) are provided by Fishstock for 16 QMS species. The survey also provided estimates of fishing effort (hours) by fishing method, area, and month, as well as the proportion of overseas anglers involved, and the percentage of each species released. The survey was run from 1 November 1997 to 31 October 1998.

Numerically, snapper was the most important species landed (310 000 fish), followed by blue cod (250 000), and tarakihi (171 000). A total of 105 species (or species groupings) were recorded. While 25% of all fish and shellfish caught were released, the percentages varied greatly between species. Success rates for trips (based on species targeted which were caught) averaged 82%, but were much lower for big game (17%), and specifically marlin trips (5%).

The north east coast (QMA1) was the most important area with 75% of effort expended, followed by the Marlborough Sounds with 13%. Inshore lining was the most important method (72% of total hours), followed by big game (15%), deepwater line (10%), extractive diving (3%), and other (<1%), although set net and potting effort was not measured. Seven percent of all fishers were overseas visitors, with the highest participation rates in northern north east New Zealand (14% in the North Cape to Bay of Islands area).

Introduction

Quantitative information on marine recreational fishing catch and effort in New Zealand has only recently become available, initially through a series of regional surveys conducted by the Ministry of Fisheries beginning in 1991, and then culminating in a major national telephone and diary survey undertaken in 1996 (Bradford *et al.* 1998a). Results from the latter survey have been extensively reported (Bell & Associates 1996, Bradford 1998a, Bradford 1998b, Bradford 1998c, Bradford *et al.* 1998a, Bradford *et al.* 1998b, and Fisher & Bradford 1998 unpubl).

One limitation of the national survey data was that marine recreational fishing from charter boats formed too small a proportion to permit statistically valid estimates of fish catch and effort to be made. In addition the national survey could not sample overseas fishers so their contribution to the catch was unknown. Finally, it was recognised that charter boat operations are increasingly becoming an important part of the recreational fishing sector, and more recent data were required. While the big game charter boat fishery for billfish off the northeast coast of the North Island has been long established, many types of charter boat operations, including those for inshore and deepwater bottom species, diving, and an expansion of the big game fishery to include tunas, sharks, and some inshore species, are now of major importance throughout New Zealand.

Thus in 1996 the Ministry of Fisheries initiated a two-year programme to estimate national fish catch and effort in the marine recreational charter boat industry.

Survey Methods

The Questionnaire

The programme developed by NIWA to survey recreational fishing from charter vessels was divided into two phases: a Questionnaire Survey, and a Diary Survey. The questionnaire survey was sent to 366 possible charter boat operators in early 1997, seeking basic information on the charter operation, including the operator's name and address, vessel size and name, number of anglers carried, and fishery type by general area fished and season. Replies were received from 62% of respondents, with 54% indicating they were actively fishing during 1996. Results from this questionnaire describing the main characteristics of the New Zealand marine recreational charter boat fleet and fishery in 1996–97 have been published (James, Unwin & Boustead 1997).

Information from the questionnaire was used to plan the second phase of the programme – a year-long diary survey to provide estimates of national fish catch and effort by recreational fishers using charter vessels, which was conducted from 1 November 1997 to 31 October 1998. The results of the diary survey constitute this report.

The Diary Survey

Design

Following completion of the 1996–97 questionnaire survey, all 365 operators on the original mailing list (including 147 who had not replied to this survey, and reduced from 366 in the questionnaire report (James, Unwin & Boustead 1997) because one operator had duplicate company names) were sent a follow-up letter (Appendix 1). This invited them to keep records for the proposed diary survey, on a voluntary basis, during 1997–98. In the interim, a further 11 operators were added to the mailing list, bringing the total to 376. A total of 85 operators eventually completed diaries, including 6 who were recruited by word of mouth after completion of the 1996–97 survey.

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sent in as soon as possible and at least every quarter, so that operators were eligible for the prizes being offered, and so that the data being provided could be checked. We also emphasised that returns should be provided for periods when no fishing was being undertaken. It was indicated that additional books were available on request.

A vital part of any voluntary diary scheme is regular communication with participants, and this was achieved primarily through the use of newsletters, sent out at least quarterly. These provided general information on progress with the survey, mentioned any problems that had arisen, and re-emphasised important matters. Copies of the 5 newsletters are attached as Appendix 3. Communication with operators was also made, when necessary, using telephone, fax and occasionally email. All diarists who had not sent in records for a 3-month period were contacted by telephone as a reminder, and to check if any assistance was required. To further publicise the diary survey, we had an article published in a magazine read by many charter boat operators (Ingram 1998). It is our intention to send all participants in the diary survey a copy of this report.

As an incentive for operators to participate, we organised a draw for three travel prize packages at the completion of the diary survey, with a total value of over \$5000. Each prize included return air travel for two persons; the first prize was to Australia, while the second and third were mystery weekends within New Zealand. Each diarist had one chance to participate in the draw for each 3-month period for which they sent in records. At the suggestion of one diarist, we also offered reduced rates for access to NIWA's sea surface temperature website.

Data analysis

Data checking and cleaning

The standard of the completed diary pages returned to NIWA was generally good, most of the 85 operators who participated having little difficulty coming to grips with our data capture requirements. Data were stored in a Microsoft™ Access database, providing linkages between records of catch and effort for individual vessels, and between return data for vessels and operators which had also participated in the 1996–97 postal survey. Routine data checks included validation of fields (such as hours per trip or trip date) for which only values within a specified range were legal, and referential integrity checks on cross-linked fields such as species codes.

Approximately 10% of the completed pages showed evidence of some confusion over precisely what was meant by a “charter trip”, defined in the diary instructions as “...one fishing charter, with one group of fishers, using one fishing method, for at most one day ...”. In many instances these could be resolved quite simply, e.g. by splitting data for what was clearly a two or three day charter into appropriate daily units. More difficult situations arose when the species caught on a given trip were inconsistent with the fishing method used or the area of operation, such as snapper during a big game trip, or hapuku by diving. In most such cases careful inspection of the data suggested that two or more “trips” had been inadvertently listed as one, such as a trip which involved extractive diving, or inshore line fishing (often for bait) as a small part of a big game trip. We resolved these cases using whatever data were available, such as other records for the same vessel in the same zone, our own knowledge of species likely to be taken in each zone, and (in some cases) follow up

calls to the operator involved. Although some such errors are likely to have gone undetected, we believe that the number of records affected is small in relation to the full data set (roughly 20 000 catch records in 8 000 trips), and that any resulting errors in our estimates of catch and effort are negligible in relation to statistical and non-sampling errors.

Scaling from Survey to Total Estimates

The 85 operators who participated in this diary survey represented only a proportion of the total charter fleet. To estimate statistics such as total catch and total fishing effort from the survey records, the raw data must be scaled up to represent the contribution from charter operators who did not participate in the survey. Estimating the appropriate “expansion factor” – the number by which catch statistics for the diarists must be multiplied to yield estimates for the whole industry – requires answers to two related questions. First, how many charter vessel operations were operating in New Zealand during 1997–98? Second, to what extent were the operators who participated in the survey representative of the whole industry?

Neither of these questions can be answered with complete certainty. The charter vessel industry is constantly changing, with new operators coming in and existing operators closing down, taking on new vessels, or shifting their base of operation. Consequently, the expansion factor (which for a simple random sample is simply the ratio of the total number of operators to the number of operators sampled) is not known exactly. In addition, the operators who participated in this diary survey are unlikely to have been a random subsample of the total. Of the 376 potential operators on the revised mailing list, 85 participants eventually completed diaries.

Because these individuals were volunteers, prepared to take on the additional task of maintaining a diary, their patterns of activity may have differed from those of their non-participating colleagues. Participation rates also varied between regions, and during the course of the 1997–98 survey; most diarists furnished returns for the full 12 month period (even for months during which they had not fished), but a few diarists dropped out at various times during the season. To address these biases we considered four possible sources of error in deriving appropriate expansion factors: variation in participation rates between regions; monthly variation in participation rates during the survey; variation in vessel length between participants and non-participants; and variation in fishing activity between participants and non-participants.

Regional variation: At the broadest level, we assumed that the charter fleet at the time of the 1997–98 survey numbered 376 vessels, representing one for each operator on the 1997–98 mailing list. Diary returns were obtained for 88 vessels (maintained by 85 operators), representing an average expansion factor of 4.27:1. In reality, the number of vessels per address is likely to have been slightly greater than one, so this figure is conservative. We then estimated expansion factors for 11 regions (corresponding to those used in the 1996–97 survey), based on the number of participating vessels within each region (Table 1). These expansion factors (E_{region}) ranged from 7.1 for the west coast of the North Island to 1.8 for Fiordland.

When applying these expansion factors, we took into account both the origin of each vessel (based on its home port) and the diary zone in which it was fishing. For example, zone 5 (Great Barrier) was fished by vessels operating out of Paihia (zone 2), Tutukaka and Bream Bay (zone 3), Tryphena (zone 5), Leigh (zone 6), Auckland

(zone 7), Whitianga and Tairua (zone 10), and Tauranga (zone 11). Catch and effort estimates for zone 10 (and for all other zones) were therefore derived by summing expanded estimates for each contributing region as defined in Table 1.

Monthly variation: The instructions on the first page of each diary asked operators to return completed diary records every three months, or more often if completed sheets were available. At the end of each three month period, an attempt was made to contact all non-respondents and encourage them to forward their returns. Well over two thirds of the diarists kept records for the full twelve months, but response rates declined notably towards the end of this period, probably reflecting a loss of interest by the less committed diarists. To adjust for these individuals, we introduced a second level of expansion factors, specific to each region and quarter, which compensated for level of non-response (Table 2). These expansion factors (E_{quarter}) varied from 1 (100% response rate) to 2 (50% response rate), and averaged 1.22 (82% response rate). We then multiplied the regional and quarterly expansion factors to yield 44 distinct expansion factors ($E_{\text{region} \times \text{quarter}}$) ranging from 2.0 (area 11, all months) to 10.0 (area 4, all months except February to April).

Vessel length and fishing activity: To gauge the extent of biases arising from either of these two sources, we used data from the 1996–97 survey to compare vessel length and fishing activity for vessels operated by the 1997–98 diarists (75 and 71 vessels, respectively) with vessel length and fishing activity for all vessels recorded during the 1997–98 survey (207 and 197 vessels, respectively). This analysis suggested that vessels operated by the 1997–98 diarists were not significantly biased with respect to vessel length (Table 3), but that there was some tendency for diarists to be more active (in terms of number of fishing days per year) than non-diarists (Table 4). The diary scheme participation rate for 1996–97 respondents who fished for less than 50 days per year (15 out of 56, or 27%) was half that of the most active operators who fished for more than 200 days a year (14 out of 26, or 54%). Considered in isolation, this effect means that results derived from the 1997–98 diary scheme will tend to slightly overestimate total catch and effort in comparison to what would be expected had all 1996–97 respondents participated in the diary survey.

By analogy, one would also expect some non-response bias because respondents to the 1996–97 survey may have been more active than non-respondents from the original mailing list of 376 operators. However, anecdotal evidence suggests that charter fishing is steadily increasing in popularity, with many new operations coming into existence over the last few years, particularly in the South Island. This means that expansion factors based on a total charter fleet of 376 operators will tend to underestimate catch and effort statistics, and will tend to compensate for any non-response bias. In the absence of any data which would help to quantify either source of bias, we simply assumed that (a) with respect to vessel length and fishing activity the 88 vessels for which 1997–98 diary records were available constituted a simple random sample of the total charter fleet, and (b) that this fleet numbered 376 vessels. Neither assumption is likely to be correct, but the foregoing analysis suggests that any resulting errors will tend to cancel rather than reinforce.

Data Reporting

All estimates of catch and most estimates of effort tabulated in this report are based on expanded data, as detailed in the previous section. We did not attempt to estimate total numbers of fishers because the survey emphasised fishing trips rather than individual fishers: simply adding the number of fishers for each trip would overestimate the number of individuals involved in multi-day charters, or charters where fishers used more than one fishing method. Catches are presented as total numbers of fish, and effort as total fisher-hours, i.e. a four hour charter trip taken by five fishers was counted as 20 fisher-hours. Effort associated with incidental methods such as potting and set-netting (for which "soak" hours were not usually supplied) was calculated as the number of trips, based on unexpanded data. All figures are rounded to the nearest whole number, although this is a matter of convenience rather than accuracy: given the uncertainties surrounding the various expansion factors, digits other than the most significant should be ignored.

Many varied cross-tabulations of the survey results are possible. To keep this report to a reasonable size we present a relatively limited set of tables, concentrating on cross-tabulations and groupings of data which capture the key results of the survey (such as effort by area, catches by area, catches of QMS species by Fishstock etc.). For readers seeking more detail we include a partially digested form of the data (as a Microsoft Excel workbook) from which readers can generate their own summaries. This summary file gives MFish users full access to any cross-tabulations they may require in the future, while at the same time preserving complete anonymity of individual respondents.

The Replies

Approximately 2000 completed diary pages were returned to NIWA, representing 7941 fishing trips during the survey period by 50 421 fishers. Fishing activity (at least one trip by at least one vessel) was recorded in all zones except zone 8 (Firth of Thames); zone 16 (Wairarapa east coast from Cape Turnagain to Turakirae Head); zones 22 and 24 (Kaipara Harbour to Reef Point); zone 32 (Canterbury Bight between the Rakaia and Waitaki rivers); and zone 34 (south Otago from Tokomairiro River to Slope Point). A total of 20 341 catch records were provided, representing 105 species.

Fishing effort

Four methods – inshore line fishing, big game fishing, deepwater line fishing, and extractive diving – accounted for 95.9% of the charter trips recorded during the diary survey (Table 5). Other methods recorded included potting, set netting, scallop dredging, and very occasionally saltwater flyfishing.

For the four main fishing methods, estimated fishing effort by charter vessels from 1 November 1997 to 31 October 1998 totalled 1.12 million hours. The distribution of effort was strongly skewed (75% of total effort) towards zones 1 to 13 (QMA1), along the east coast of the North Island from North Cape to Cape Runaway (Figure 1, Table 6), with a lesser concentration (13%) around the Marlborough Sounds (zones 26 – 28). Inshore line fishing was by far the most commonly used method, accounting for 72% of the total effort.

Effort varied significantly throughout the season (Table 7). This trend was most marked for big game fishing, over 70% of which was recorded over the three months from February to April 1998. Other fishing methods also showed a tendency for activity levels to drop off during winter, although the seasonal pattern was much less marked for extractive diving and inshore line fishing than for deepwater line fishing.

Characteristics of fishers

The number of fishers per charter trip averaged 6.5, and varied relatively little between fishing methods (Figure 2). Big game charters tended to involve the smallest number of individuals (4.5 per trip), whereas inshore line trips involved the most (7.2 per trip). Fishing hours per day varied depending on the type of charter. Mean hours per day ranged from 1.5 for extractive diving to 6.5 for big game charters. Deepwater line fishing and inshore line fishing trips were of intermediate duration between these two values, averaging 3.7 hours and 4.4 hours, respectively.

Fishers of overseas origin accounted for 7.3% of the total fishers (Table 8, Table 9). Overseas participation rates were similar (6.5% – 8.5%) for big game fishing (6.5%), deepwater lining (8.4%), and inshore lining (7.8%), but were substantially lower for extractive diving (2.2%). The highest participation rates tended to be associated with area and season of peak activity, in the Bay of Islands/Hauraki area during February and March. For zones 1 to 4 (North Cape to Bay of Islands), overseas fishers comprised 14% of the total (for all methods combined), and over 28% of those participating in deepwater line fishing charters.

Trip duration (defined as hours per day) varied substantially between fishing methods (Figure 3). Diving trips were the shortest, seldom exceeding 2 hours in length, whereas big game trips averaged 6.5 hours per day. In practice, many big game trips (and some deepwater line trips) were multi-day charters lasting up to five days.

Species targeted and successful trips

Of the 7941 trips recorded by diarists, information on target species was available for 7643 (96.3%) trips. A total of 54 species were listed at least once, although within each fishing method the most popular target species seldom numbered more than two or three (Table 10). Key target species were marlins and tuna (for big game charters); hapuku/bass and kingfish (for deepwater line charters); rock lobster (for extractive diving charters); and snapper and blue cod (for inshore line charters).

To characterise the fishing success rate for each target species, we adopted the definition (given by Bradford et al. 1998) that a successful trip was any charter during which at least one individual of the specified target species was caught. Success rates averaged 82%, and were usually high (over 80%) for fishing methods other than big game. By contrast, the success rate for big game trips averaged 17%, and was only 5% (31 successes out of 630 trips) for marlins (predominantly striped marlin, although respondents did not always specify a single species).

Total Catches

Estimated catches for all 105 species taken during the survey are listed in Table 11, expressed both as the total catch (including fish caught and released), and the total harvest (including only fish caught and kept). Catches of individual species ranged from 455 000 snapper (of which 310 000 were kept) to single figure estimates (invariably based on isolated catches of a single individual) for 16 minor species such as stargazer, elephant fish, and turbot. For most of the remaining tables in this report we concentrate on 32 species, comprising QMS species for which the estimated catch exceeded 1000 individuals (18 species), plus a further 14 non-QMS species of particular significance to the charter fishing industry. These included all species with an estimated catch of over 2000 individuals, together with spiny dogfish (estimated catch 1253 fish), yellowfin tuna (estimated catch 1130 fish), and butterfly or greenbone (estimated catch 521 fish).

Catches of the main species

Estimated numbers of the 32 main species landed (i.e. caught and killed), are listed in Table 12 by fishing method. The top 11 species were all QMS species, with snapper the most important, followed by blue cod, tarakihi, scallops, jack mackerel, sea perch, dredge oysters, rock lobster, trevally, hapuku/bass, and barracouta. As expected, snapper, blue cod and tarakihi were predominantly taken by inshore lining, with small numbers by deepwater lining. Of those species taken in large numbers by "other" methods, scallops were taken by extractive diving and scallop dredging, rock lobster by extractive diving and potting, and butterfly/greenbone and tarakihi by set netting.

Table 13 lists the numbers of the main species landed by Quota Management Area. Snapper are mostly taken in QMA1, blue cod in QMA's 3, 5, and 7, and tarakihi in QMA's 1 and 7. Fully 75% of fish species are taken most commonly in QMA1, the exceptions being blue cod, sea perch, hapuku & bass, trumpeter, red cod, spiny dogfish, and butterfly (or greenbone).

The estimated numbers of the main species landed are listed in Table 14 by annual quarter. For the most important three species, landings were spread over the year, with peak catches of snapper and blue cod in February – April, and of tarakihi in November – January. Migratory species such as the tunas were noticeably absent during cooler periods.

To aid fisheries managers we have listed in Table 15 the estimated number of fish landed by Fishstock (as defined in Anon. 1998), for all QMS species recorded. For 16 species for which data on mean green weights (by Fishstock) are readily available (Bradford 1998c), these estimates are also tabulated as tonnages (Table 16)¹. In Table 17 we provide estimates of the number of fish landed by QMA and the 40 zones used in the diary survey (see Appendix 2), for eight species considered of particular importance.

¹ Similar estimates could be made for any species for which adequate data on mean green weights are available elsewhere in the literature, or become available in the future.

Discussion

Estimates of the numbers of fish landed, as determined from this survey, were compared with those derived by Bradford (1998d) from data supplied by the very small number of diarists using charter boats (3.3% of trips) in the National Marine Recreational Fishing Survey in 1996. Although the ranking of species importance is broadly similar in both reports, the estimates obtained from this survey were usually markedly higher, often by a factor of between 2 and 3. For the three most important species snapper, blue cod and tarakihi, the factors were similar at 2.4, 2.8 and 2.3 respectively. For a small number of species such as kahawai and rock lobster, estimates from the two sources were similar, while for a few others e.g. sea perch and jack mackerel, estimates from this survey were about 10–15 times greater.

This diary survey provided vastly more information on which to base estimates of fish catch than was available to Bradford in the earlier survey; in fact it was largely the paucity of data in this earlier survey on recreational fishing from charter boats that provided the stimulus to initiate this survey. As a consequence it is not surprising there are some differences between the two sets of results; perhaps the surprising thing is that there are so many similarities, especially in the ranking of the important species.

Data collected during this survey are robust, but assumptions made regarding the number of charter boats operating are the biggest limitation. Considering the expansion and changes in the industry over the last few years, it could be timely to update the database on charter vessels operating at present. The data obtained from this survey could then be relatively simply updated by modifying the expansion factors where necessary, and an up-to-date estimate produced of fish numbers caught by recreational fishing on charter boats.

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This report would not have been possible without the major contribution by the 85 operators who kept records over the year-long period of the survey. Many of the records had to be made at sea, and this is often a difficult task, particularly when also needing to look after clients. Our grateful thanks are due these participants, and we hope this report is worth their efforts. Particular thanks go to Keith Ingram, former president of the Marine Transport Association, for his advice and assistance when developing the survey. Bell & Associates kindly allowed us to use the area maps developed for the 1996 National Marine Recreational Fishing Survey. This work was carried out by NIWA under contract to the Ministry of Fisheries (project REC9703).

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Table 1: Expansion factors by region for the 1997–98 diary survey

Region	Details	Number of addresses	Number of vessels	Participation rate	Expansion factor
East Northland	North Cape to Bream Head	83	13	16%	6.4
Hauraki	Bream Head to Cape Colville	76	14	18%	5.4
Bay of Plenty	Cape Colville to Cape Runaway	91	24	26%	3.8
East Coast North	Cape Runaway to Titahi Bay	20	3	15%	6.7
West Coast North	North Cape to Tirua Point	7	1	14%	7.0
Egmont	Tirua Point to Titahi Bay	10	3	30%	3.3
Tasman	Marlborough Sounds/ Tasman Bay/Golden Bay	45	15	33%	3.0
East Coast South	Clarence River to Slope Point	17	5	29%	3.4
Southern	Slope Point to Puysegur Point	14	3	21%	4.7
Fiordland	Puysegur Point to Awaraua Point	11	6	55%	1.8
West Coast South	Awaraua Point to Farewell Spit	2	1	50%	2.0
	Total, all areas	376	88	23%	4.3

Table 2: Expansion factors by region and month, as used in the 1997–98 diary survey

Region	Nov 97 – Jan 98	Feb 98 – Apr 98	May 98 – Jul 98	Aug 98 – Oct 98
1	1.00	1.08	1.44	1.44
2	1.00	1.27	1.40	1.56
3	1.09	1.20	1.33	1.60
4	1.50	1.00	1.50	1.50
5	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00
7	1.15	1.15	1.15	1.36
8	1.25	1.00	1.67	1.25
9	1.50	1.00	1.00	1.00
10	1.50	1.50	1.50	2.00
11	1.00	1.00	1.00	1.00

Table 3: Recruitment of diarists from the 1996–97 survey in relation to vessel length

Vessel length (m)	Number of vessels recorded in 1996–97 survey	Number of vessels maintaining diaries in 1997–98	Diaries as % of total vessels
5–10	60	21	35
10–15	128	46	36
>15	19	8	42
Total	207	75	36

Table 4: Recruitment of diarists from the 1996–97 survey in relation to annual fishing effort

Days 97–98	Number of vessels recorded in 1996–97 survey	Number of vessels maintaining diaries in 1997–98	Diaries as % of total vessels
<50	56	15	27
50–100	52	20	38
100–200	63	22	35
>200	26	14	54
Total	197	71	36

Table 5: Fishing effort (trips recorded and hours fished) during the 1997–98 diary survey, by fishing method (unexpanded data)

Fishing method	Trips recorded		Hours fished	
	N	%	N	%
Big game/offshore	1 015	12.7	6 607	19.6
Deepwater line	1 058	13.3	3 943	11.8
Extractive diving	669	8.5	1 034	3.1
Inshore line	4 953	62.4	21 940	65.3
Potting	141	1.8		
Set netting	58	0.7		
Scallop dredging	42	0.5	69	0.2
Other	5	0.1	18	0.1
All methods	7 941		33 610	

Table 6: Estimated annual fishing effort (hours) by fishing method, diary zone, and QMA.
Methods not measurable in fisher-hours (potting and set netting) are not included

Area	Diary zone	Big game	Deepwater line	Extractive diving	Inshore line	All methods
QMA1	1	59 488	27 165	205	63 552	150 410
	2	466	5 224		6 410	12 100
	3	14 452	760	468	87 722	103 402
	4			11	243	254
	5	6 120	1 554	5 705	40 383	53 762
	6	290	207	895	62 661	64 053
	7	22			87 203	87 225
	9				4 436	4 436
	10	14 875	2 199	8 385	142 297	167 757
	11	10 244	7 644	7 127	79 502	104 517
	12	1 190	836	58	1 613	3 697
	13	23 972	30 337	2 591	27 252	84 152
	Total, QMA1	131 119	75 927	25 444	603 274	835 764
QMA2	14	2 958	4 430	362	10 993	18 743
	15	640	2 915		11 207	14 762
	17				2 727	2 727
Total, QMA2		3 598	7 345	362	24 927	36 231
QMA 3	29	408	85	116	5 786	6 395
	30		1 955	116	9 515	11 586
	31				673	673
	33				13 134	13 134
Total, QMA3		408	2 040	231	29 108	31 787
QMA 5	35				1 400	1 400
	36			620	6 669	7 289
	37				3 948	3 948
	38	8	55	2 325	12 454	14 842
Total, QMA5		8	55	2 945	24 471	27 479
QMA 7	26		5 054	1 538	63 484	70 076
	27		1 122	673	25 957	27 752
	28		16 307	1 219	25 853	43 379
	39	46	8		92	146
	40		69	233	2 388	2 690
Total, QMA7		46	22 560	3 663	117 774	144 043
QMA 8	18				233	233
	19				127	127
Total, QMA8					360	360
QMA 9	20	280			189	469
	21	280			7 455	7 735
	23	3 220			560	3 780
	25	26 348	3 129	392	3 035	32 904
Total, QMA9		30 128	3 129	392	11 239	44 888
Total, all areas		165 307	111 056	33 036	811 152	1 120 551

Table 7: Estimated annual fishing effort (hours) by fishing method and calendar month. Methods for which the effort is not measurable in fisher-hours (such as potting) are not included

Month	Big Game	Deepwater line	Extractive diving	Inshore line	All methods
January	24 103	10 856	3 802	90 457	129 217
February	44 345	11 799	4 045	93 934	154 124
March	38 777	12 533	2 738	90 113	144 161
April	33 479	8 932	2 638	83 639	128 688
May	14 001	10 181	2 163	69 351	95 695
June	1 586	8 624	1 131	46 364	57 705
July	197	4 578	1 797	35 524	42 095
August		2 767	2 368	49 314	54 449
September	1 025	6 854	1 957	39 863	49 699
October	1 080	7 943	1 349	50 840	61 212
November	627	15 108	5 739	75 939	97 412
December	6 087	10 883	3 310	85 814	106 094
Annual total	165 307	111 056	33 036	811 152	1 120 551

Table 8: Participation in recreational charter fishing by overseas fishers, expressed as a percentage of the total number of fishers, by fishing method and calendar month

Month	Big Game	Deepwater line	Extractive diving	Inshore line	All methods
January	4.1	9.1	3.9	9.6	8.5
February	11.8	15.1	2.3	9.1	9.9
March	2.2	15.0	2.6	9.4	8.4
April	9.6	9.9	0.7	5.8	6.6
May	6.3	6.2	6.2	6.7	6.5
June	6.1	6.7	0.0	7.9	7.2
July	0.0	4.9	0.4	3.2	3.0
August		2.7	0.0	5.3	4.3
September	1.9	2.8	1.3	3.8	3.4
October	0.0	3.9	2.9	5.6	4.9
November	0.0	3.7	2.2	7.3	6.1
December	3.0	12.9	3.8	12.1	11.1
Annual total	6.5	8.4	2.2	7.8	7.3

Table 9: Participation in recreational charter fishing by overseas fishers expressed as a percentage of the total number of fishers (N), by fishing method and QMA. Data for QMA1 have been divided into three sub-areas, representing the Bay of Islands (zones 1–4), the Hauraki Gulf (zones 5–9), and the Bay of Plenty (zones 10–13)

QMA	Zones	Big Game		Deepwater line		Extractive diving		Inshore line		All methods	
		N	%	N	%	N	%	N	%	N	%
QMA1	1–4	9 304	7.8	7 078	28.3	594	0.0	34 054	13.1	51 031	14.1
	5–9	825	2.0	403	11.6	1 847	0.0	38 763	8.4	41 837	7.9
	10–13	10 689	4.1	11 120	2.7	9 504	3.2	53 124	6.2	84 438	5.1
	Total	20 817	5.7	18 601	12.7	11 946	2.5	125 941	8.7	177 306	8.4
QMA2		1 000	5.0	1 507	0.7	317	3.2	4 283	3.8	7 107	3.3
QMA3		27	0.0	541	5.0	306	5.6	7 242	6.7	8 117	6.5
QMA5		8	0.0	55	0.0	2 552	0.3	8 056	8.0	10 672	6.1
QMA7		14	0.0	9 193	1.0	2 228	2.2	29 739	4.3	41 174	3.5
QMA8		0		0		0		97	0.0	97	0.0
QMA9		4 886	10.0	1 113	10.1	224	3.1	2 674	10.7	8 897	10.1
Total, all QMAs		26 753	6.5	31 010	8.4	17 572	2.2	178 033	7.8	253 368	7.3

Table 10: Number of charter trips (unexpanded) by fishing method and target species. See text for the definition of “success”

Fishing method	Species	Trips	Success	Success rate
Big game	Marlins	630	31	5%
	Yellowfin tuna	181	58	32%
	Albacore tuna	98	30	31%
	Skipjack tuna	43	38	88%
	Sharks	21	10	48%
	Broadbill swordfish	12	0	0%
	Southern bluefin tuna	4	1	25%
	other species	12	5	42%
	All species	1001	173	17%
Deepwater line	Hapuku & bass	433	323	75%
	Kingfish	428	371	87%
	Bluenose	62	44	71%
	Snapper	33	31	94%
	Tarakihi	24	23	96%
	other species	62	50	81%
	All species	1042	842	81%
Extractive diving	rock lobster	544	519	95%
	Scallop	64	61	95%
	Oysters dredge	21	21	100%
	other species	24	20	83%
	All species	653	621	95%
Inshore line	Snapper	2439	2291	94%
	blue cod	981	970	99%
	Tarakihi	392	367	94%
	jack mackerel	313	311	99%
	Hapuku & bass	201	169	84%
	Kingfish	149	113	76%
	Kahawai	40	40	100%
	School shark	33	29	88%
	Quinnat salmon	31	16	52%
	pink maomao	24	23	96%
	other species	98	70	71%
	All species	4701	4399	94%
Other methods	All species	246	220	89%
Total, all methods	All species	7643	6255	82%

Table 11: Estimated catch and landings (expressed as total number of fish) by recreational fishers from charter vessels, November 1997 to October 1998, by species. Numbers and % killed are listed by species. Species subject to the QMS are identified

Code	Common name	QMS?	Total catch	Total killed	% killed
ALB	Albacore tuna		3 874	2991	77
BAR	Barracouta	yes	34 601	26034	75
BAS	bass groper	yes	1 116	1116	100
BCO	blue cod	yes	333 659	250 473	75
BEM	blue marlin		32	25	78
BIG	bigeye tuna		11	11	100
BKM	black marlin		21	14	67
BMA	blue maomao		17 983	14 023	78
BNS	Bluenose	yes	3 208	3056	95
BPE	butterfly perch		529	419	79
BPF	banded wrasse		645	119	18
BRC	northern bastard cod		231	192	83
BUT	butterfish or greenbone		521	521	100
BWH	bronze whaler shark		86	0	0
BWS	blue shark		2 223	785	35
BYS	Alfonsino	yes	17	17	100
CAR	carpet shark		717	66	9
CON	conger eel		586	307	52
CRA	rock lobster	yes	54 558	41 115	75
CUC	cucumber fish		6	0	0
DOF	Dolphinfish		83	83	100
EGR	eagle ray		56	0	0
ELE	elephant fish	yes	3	3	100
EMA	blue mackerel		7 864	7 744	98
FLO	Flounder		72	72	100
FLY	flying fish		1 148	1 148	100
FOX	fox fish		27	27	100
FRO	Frostfish	yes	474	398	84
GAR	Garfish		17	17	100
GTR	Marblefish		52	0	0
GUR	Gurnard	yes	8 266	7 453	90
GWR	green wrasse		54	0	0
HAG	Hagfish		91	45	49
HAP	Hapuku	yes	35 596	32 035	90
HEP	sharpnose sevengill shark		97	0	0
HHS	hammerhead shark		75	21	27
HOK	Hoki	yes	10	10	100
JDO	john dory	yes	10 621	10 459	98
JGU	spotted gurnard		144	99	69
JMA	jack mackerel	yes	67 714	66 656	98
KAH	Kahawai		36 568	25 006	68
KEL	Kelpfish		4	0	0
KIN	Kingfish		36 243	14 404	40
KOH	Koheru		15 150	12 506	83
LEA	Leatherjacket		1 037	807	78
LIN	Ling	yes	452	331	73

Table 11: (continued)

Code	Common name	QMS?	Total catch	Total killed	% killed
LIZ	synodus spp		3	3	100
MAK	mako shark		1 841	678	37
MOK	Moki	yes	880	823	93
MOR	moray eel		460	0	0
OCT	Octopus		196	135	69
OYS	oysters dredge	yes	51 100	51 100	100
PAR	Parore		475	239	50
PAU	black & yellowfoot paua	yes	509	405	80
PHC	packhorse rock lobster	yes	158	106	67
PMA	pink maomao		31 105	25 943	83
POR	Porae		1 923	1 831	95
POS	porbeagle shark		4	4	100
PPI	Pipi		1 629	1 629	100
RBM	rays bream		30	30	100
RBP	red banded perch		211	61	29
RBY	ruby fish	yes	243	221	91
RCO	red cod	yes	8 426	4 230	50
RMO	red moki		120	120	100
RMU	red mullet		31	17	57
RPI	red pigfish		2 822	1 065	38
RRC	scorpion fish		3 288	920	28
RSN	red snapper		26 341	22 204	84
SAM	quinnat salmon		268	215	80
SBG	spotted black grouper		7	0	0
SBR	southern bastard cod		3	3	100
SCA	Scallop	yes	143 040	101 547	71
SCH	school shark	yes	7 481	3 734	50
SHA	Shark		247	67	27
SKA	Skate		146	108	74
SKI	Gemfish	yes	1 428	1 391	97
SKJ	skipjack tuna		14 142	13 398	95
SNA	Snapper	yes	454 844	310 294	68
SOL	Sole		5	0	0
SPD	spiny dogfish		8 616	1 253	15
SPE	sea perch	yes	96 786	55 761	58
SPF	scarlet wrasse		5 311	1 472	28
SPO	Rig	yes	523	315	60
SPP	splendid perch		11	0	0
SQX	Squid		2 081	1 917	92
SSF	shortbill spearfish		7	7	100
STG	Stargazer	yes	6	0	0
STM	striped marlin		799	221	28
STN	southern bluefin tuna		3	3	100
STR	Stingray		168	0	0
STU	slender tuna		6	6	100

Table 11: *(continued)*

Code	Common name	QMS?	Total catch	Total killed	% killed
STY	Spotty		125	48	39
SUR	Kina		12 160	12 160	100
SWE	Sweep		17 537	12 959	74
SWO	broadbill swordfish		7	7	100
SWR	sandagers wrasse		9	0	0
TAR	Tarakihi	yes	189 554	171 402	90
THR	thresher shark		30	15	52
TRE	Trevally	yes	44 418	36 702	83
TRI	tripod fish		7	7	100
TRU	Trumpeter	yes	10 970	10 798	98
TUR	Turbot		3	3	100
WAR	common warehou	yes	74	71	96
WSE	Wrasses		3 691	146	4
YFN	yellowfin tuna		1 258	1 130	90
Total, all species			1 824 109	1 369 533	75

Table 12: Estimated landings (number of fish killed) by recreational fishers from charter vessels, November 1997 to October 1998, for 32 selected species, by fishing method. "Other methods" includes principally potting, set netting, and shellfish dredging; ‡ denotes QMS species

Species	Big game	Deepwater line	Extractive diving	Inshore line	Other methods	All methods
snapper ‡		3 697		306 583	14	310 294
blue cod ‡		15 764	170	234 453	87	250 473
tarakihi ‡		10 122	126	160 923	232	171 402
scallop ‡			52 548		48 999	101 547
jack mackerel ‡	91	1 306		65 259		66 656
sea perch ‡		6 098	52	49 612		55 761
oysters dredge ‡			51 100			51 100
rock lobster ‡			35 551	68	5 496	41 115
trevally ‡		1 083	21	35 586	11	36 702
hapuku & bass ‡		18 439		14 712		33 151
barracouta ‡	55	2 086		23 875	17	26 034
pink maomao		1 902	26	24 015		25 943
kahawai	841	662	8	23 446	48	25 006
red snapper		5 237	4	16 962		22 204
kingfish	428	7 954	1 290	4 721	10	14 404
blue maomao		37	0	13 986		14 023
skipjack tuna	11 958	415		1 024		13 398
sweep		0		12 959		12 959
koheru		614		11 891		12 506
kina			12 157		3	12 160
trumpeter ‡		739	3	10 052	3	10 798
john dory ‡		2 628	5	7 826		10 459
blue mackerel		453		7 290		7 744
gurnard ‡		69		7 381	3	7 453
red cod ‡		467	12	3 751		4 230
school shark ‡		558		3 176		3 734
bluenose ‡		2 410		645		3 056
albacore tuna	2 935	55				2 991
gemfish ‡		1 312		79		1 391
spiny dogfish	0	92		1 158	3	1 253
yellowfin tuna	922	209				1 130
butterfish/greenbone			251		270	521
Total	17 230	84 409	153 325	1 041 435	55 199	1 351 598

Table 13: Estimated landings (number of fish killed) by recreational fishers from charter vessels, November 1997 to October 1998, for 32 selected species, by QMA. ‡ denotes QMS species

Species	QMA1	QMA2	QMA3	QMA5	QMA7	QMA8	QMA9	Total
snapper ‡	296 063	4 690	21		4 501		5 019	310 294
blue cod ‡	2 257	293	71 554	62 885	113 268	7	210	250 473
tarakihi ‡	118 247	9 323	606	388	40 128	107	2 604	171 402
scallop ‡	51 489			475	49 584			101 547
jack mackerel ‡	65 585	210			861			66 656
sea perch ‡	822	43	24 950	2 893	27 043	10	0	55 761
oysters dredge ‡				51 100				51 100
rock lobster ‡	25 174	160	3 361	4 571	7 451		399	41 115
trevally ‡	34 792	950	4	6	215		735	36 702
hapuku & bass ‡	5 407	7 963	5 146	843	13 491		301	33 151
barracouta ‡	20 109	1 167	1 062	0	3 640	7	49	26 034
pink maomao	25 819	47					77	25 943
kahawai	18 203	1 917	73		2 556	73	2 184	25 006
red snapper	21 899	130					175	22 204
kingfish	12 248	1 930	3		69		154	14 404
blue maomao	13 640	383					0	14 023
skipjack tuna	11 599	70					1 729	13 398
sweep	12 959						0	12 959
koheru	12 506							12 506
kina	450	11 700			10			12 160
trumpeter ‡	124	663	1 537	7 670	804			10 798
john dory ‡	10 337	50			52		21	10 459
blue mackerel	7 578			4	93		70	7 744
gurnard ‡	3 557	1 350	56	11	1 044		1 435	7 453
red cod ‡	1 127	20	2 246	22	812	3	0	4 230
school shark ‡	2 849	40	81		722		42	3 734
bluenose ‡	2 833	173					49	3 056
albacore tuna	1 429	1 050	3		4		504	2 991
gemfish ‡	1 391							1 391
spiny dogfish	131	0	609	41	472		0	1 253
yellowfin tuna	1 039						91	1 130
butterfish/greenbone	53				469			521
Total, all species	240 979	44 323	111 312	130 907	267 288	207	15 848	1 351 598

Table 14: Estimated landings (number of fish killed) by recreational fishers from charter vessels, November 1997 to October 1998, for 32 selected species, by annual quarter. ‡ denotes QMS species

Species	Nov-Jan	Feb-Apr	May-Jul	Aug-Oct	Annual total
snapper ‡	69 372	111 308	72 371	57 243	310 294
blue cod ‡	49 716	79 018	74 302	47 438	250 473
tarakihi ‡	67 947	37 596	24 894	40 964	171 402
scallop ‡	23 050	5 845	12 336	60 317	101 547
jack mackerel ‡	22 275	23 813	9 773	10 796	66 656
sea perch ‡	13 773	18 042	9 912	14 034	55 761
oysters dredge ‡			36 400	14 700	51 100
rock lobster ‡	12 329	16 251	6 217	6 318	41 115
trevally ‡	8 832	11 444	8 305	8 122	36 702
hapuku & bass ‡	8 852	6614	9 123	8 562	33 151
barracouta ‡	7 033	3332	4 160	11 509	26 034
pink maomao	8 691	12 450	2 040	2 762	25 943
kahawai	7 447	9 580	5 933	2 047	25 006
red snapper	9 077	8 359	2 431	2 336	22 204
kingfish	5 406	5 012	2 316	1 669	14 404
blue maomao	4 532	4 328	2 272	2 891	14 023
skipjack tuna	847	8 648	3 903		13 398
sweep	5 433	3 621	2 284	1 621	12 959
koheru	2 940	4 683	3 699	1 183	12 506
kina	11 700	10	329	121	12 160
trumpeter ‡	643	1 791	4 410	3 954	10 798
john dory ‡	2 405	2 941	2 202	2 911	10 459
blue mackerel	3 403	499	2 759	1 083	7 744
gurnard ‡	3 588	1 541	816	1 509	7 453
red cod ‡	1 490	1 316	788	637	4 230
school shark ‡	436	984	1 282	1 032	3 734
bluenose ‡	504	772	1 112	667	3 056
albacore tuna	1 641	1 165	142	42	2 991
gemfish ‡	360	632	192	206	1 391
spiny dogfish	365	272	329	286	1 253
yellowfin tuna	420	711			1 130
butterfish/greenbone	111	240	138	33	521
Total, all species	354 617	382 818	307 169	306 993	1 351 598

Table 15: Estimated landings (number of fish killed) by recreational fishers from charter vessels, November 1997 to October 1998, for all QMS species, by Fishstock. Each non-empty cell in the table denotes the catch for the Fishstock denoted by the intersection of the corresponding row (species code) and column (stock number). For example, estimated landings of barracouta (BAR) were 22 338 fish for Fishstock BAR1, and 3 696 fish for Fishstock BAR7

Code	Common name	Fishstock							Total
		1	2	3	5	7	8	9	
BAR	Barracouta	22 338				3 696			26 034
BCO	blue cod	2 467	293	71 554	62 885	113 268	7		250 473
BNS	Bluenose	2 882	173						3 056
BYS	Alfonsino	17							17
CRA	rock lobster	738	24 835	160	10 811		4 571		41 115
ELE	elephant fish					3			3
FRO	Frostfish	398							398
GUR	Gurnard	4 992	1 350	67		1 044			7 453
HOK	Hoki	10							10
HPB	hapuku and bass	5 708	7 963	5 146	843	13 491			33 151
JDO	john dory	10 358	50			52			10 459
JMA	jack mackerel	65 795				861			66 656
KAH	Kahawai	18 203	1 917	2 702				2 184	25 006
LIN	Ling	312		12		7			331
MOK	Moki	782		41					823
OYU	oysters dredge				51 100				51 100
PAU	black & yellowfoot paua	232				173			405
PHC	packhorse rock lobster	106							106
RBY	ruby fish	221							221
RCO	red cod	1 127	23	2 268		812			4 230
SCA	Scallop					101 547			101 547
SCH	school shark	2 891	40	81		722			3 734
SKI	Gemfish	1 391							1 391
SNA	Snapper	296 063	4 690	21		4 501	5 019		310 294
SPE	sea perch	822	43	24 950	2 893	27 043	10		55 761
SPO	Rig		20	214		81			315
TAR	Tarakihi	120 851	9 323	606	388	40 128	107		171 402
TRE	Trevally	34 792	950	10		950			36 702
TRU	Trumpeter	124	663	1 537	7 670	804			10 798
WAR	common warehou	6	10	8		47			71

Table 16: Estimated landings (tonnes) by recreational fishers from charter vessels, November 1997 to October 1998, for 16 QMS species, by Fishstock. Each non-empty cell in the table contains the catch for the Fishstock denoted by the intersection of the corresponding row (species code) and column (stock number). For example, estimated landings of barracouta (BAR) were 169.9 t for Fishstock BAR1, and 28.1 t for Fishstock BAR7

Code	Common name	1	2	3	5	7	8	9	Total
BAR	Barracouta	169.9				28.1			198.1
BCO	blue cod	2.4	0.2	58.3	51.3	76.0	0.0		188.2
CRA	rock lobster	0.5	15.3	0.1	9.3		3.2		28.4
GUR	Gurnard	4.1	0.6	0.1		0.5			5.2
HPB	hapuku and bass	98.5	68.7	44.4	7.3	116.5			335.4
JDO	john dory	39.4	0.2			0.1			39.7
JMA	jack mackerel	37.4				0.7			38.1
KAH	Kahawai	26.2	2.9	6.5				2.2	37.9
MOK	Moki	5.8		0.1					5.9
RCO	red cod	2.3	0.0	4.7		0.8			8.0
SCH	school shark	11.5	0.1	0.2		1.4			13.1
SNA	snapper	270.9	6.0	0.1		10.8	8.7		296.5
SPE	sea perch	0.5	0.0	15.2	1.6	14.1	0.0		31.6
SPO	rig		0.0	0.5		0.1			0.7
TAR	tarakihi	147.9	5.3	0.3	0.1	13.8	0.0		167.5
TRE	trevally	42.1	1.4	0.0		3.2			46.7

Table 17: Estimated landings (number of fish killed) by recreational fishers from charter vessels, November 1997 to October 1998, for 8 selected species, by QMA and diary zone

QMA	Zone	snapper	Blue cod	tarakihi	rock lobster	trevally	hapuku/ bass	kahawai	kingfish
1	1	22 285	380	8 824	339	3 411	595	2 319	5 592
	2	637		148		114	28	53	852
	3	57 485	411	8 977	578	6 366	237	2 307	858
	4	137		23					
	5	17 319	206	1 621	5 669	5 071	244	1 111	250
	6	33 924	131	341	353	2 988		1 932	312
	7	91 454	29	15	46	1 706		3 626	229
	9	3 501				8		438	61
	10	47 643	678	50 800	11 637	6 437	1 117	2 087	985
	11	15 271	354	38 288	2 833	7 470	1 100	3 333	700
	12	185		1 415	108		29	40	13
	13	6 222	67	7 794	3 611	1 221	2 057	959	2 397
2	14	797	210	8 630	160	617	6 880	317	1 170
	15	3 893		673		293	1 073	1 500	760
	17		83	20		40	10	100	
3	29		6 088	99	2 043		67	65	
	30		37 335	97	1 318		533	9	3
	33	21	28 132	410		4	4 546		
5	35		7 000				163		
	36		27 281						
	37		5 017						
7	38		23 587	388	4 571	6	679		
	26	3 844	58 889	13 644	3 562	149	3 027	1 764	65
	27	11	18 476	12 848	1 033		283	217	
	28	629	33 356	13 488	2 534	66	10 099	574	3
	39		220	76			10		
8	40	17	2 326	73	322		73		0
	18		7					73	
	19			107					
9	20	238		119			70		
	21	4 095				441		1 862	70
	23	112				21		280	
	25	574	210	2 485	399	273	231	42	84
Total		310 294	250 473	171 402	41 115	36 702	33 151	25 006	14 404

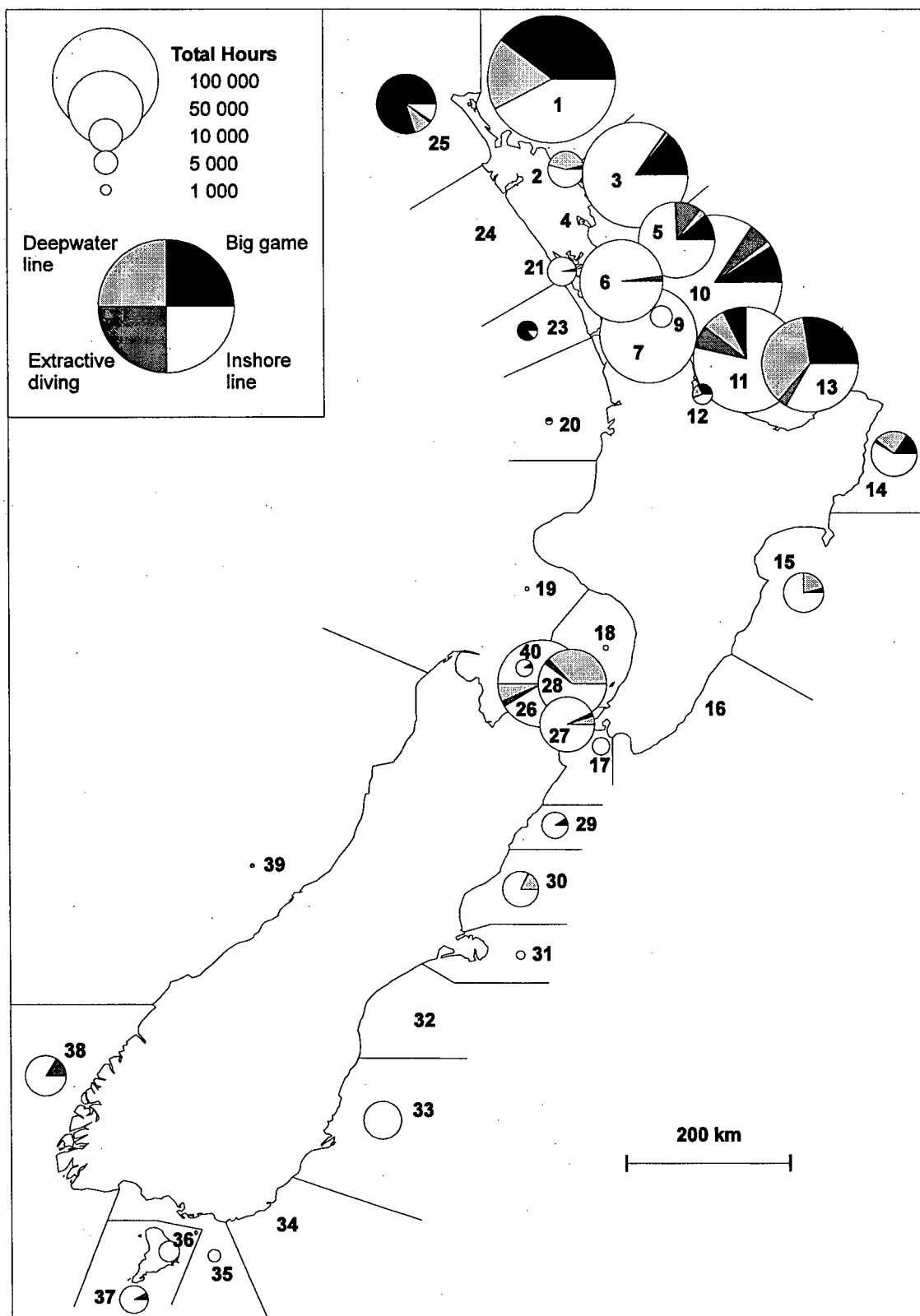


Figure 1: Estimated annual fishing effort (hours) by recreational fishers from charter vessels, for the 1997–98 Diary Survey, by diary zone and fishing method.

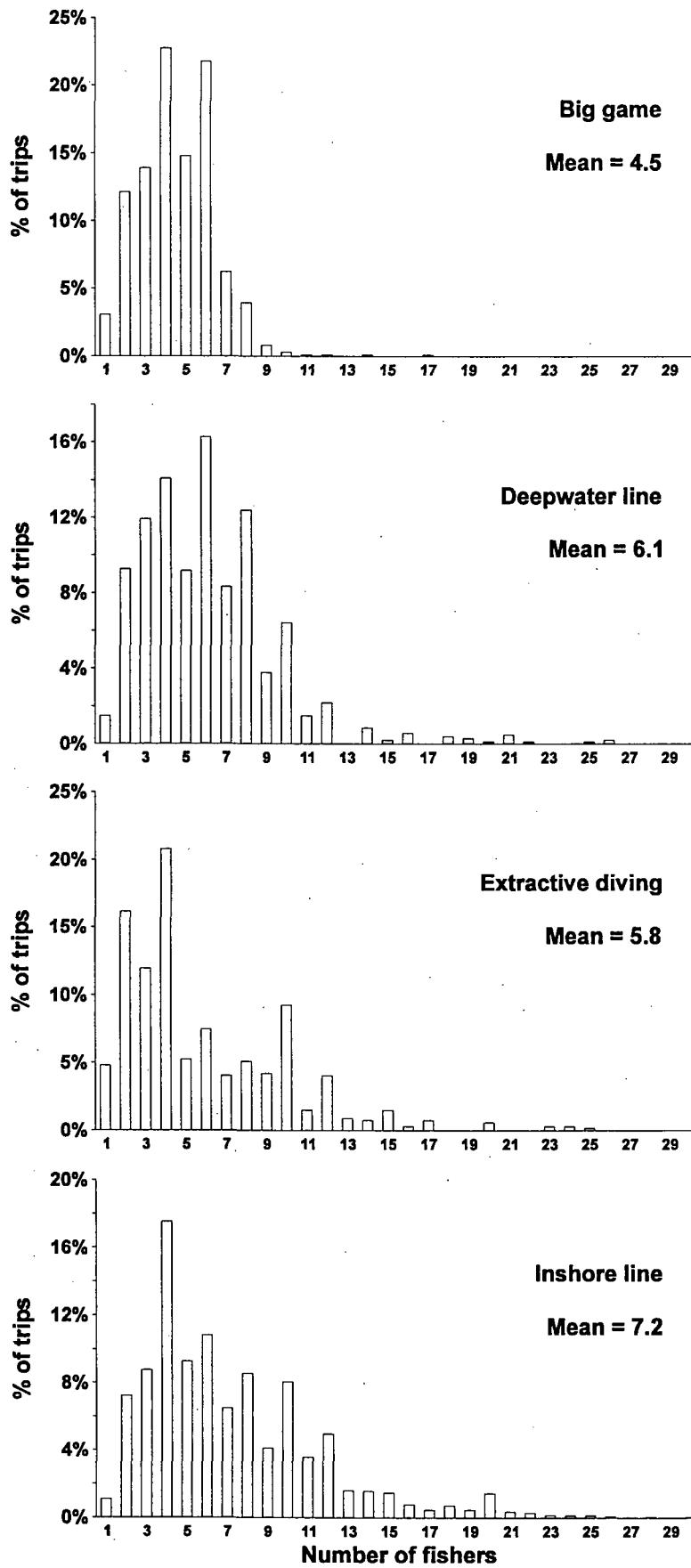


Figure 2: Number of fishers per charter trip by fishing method.

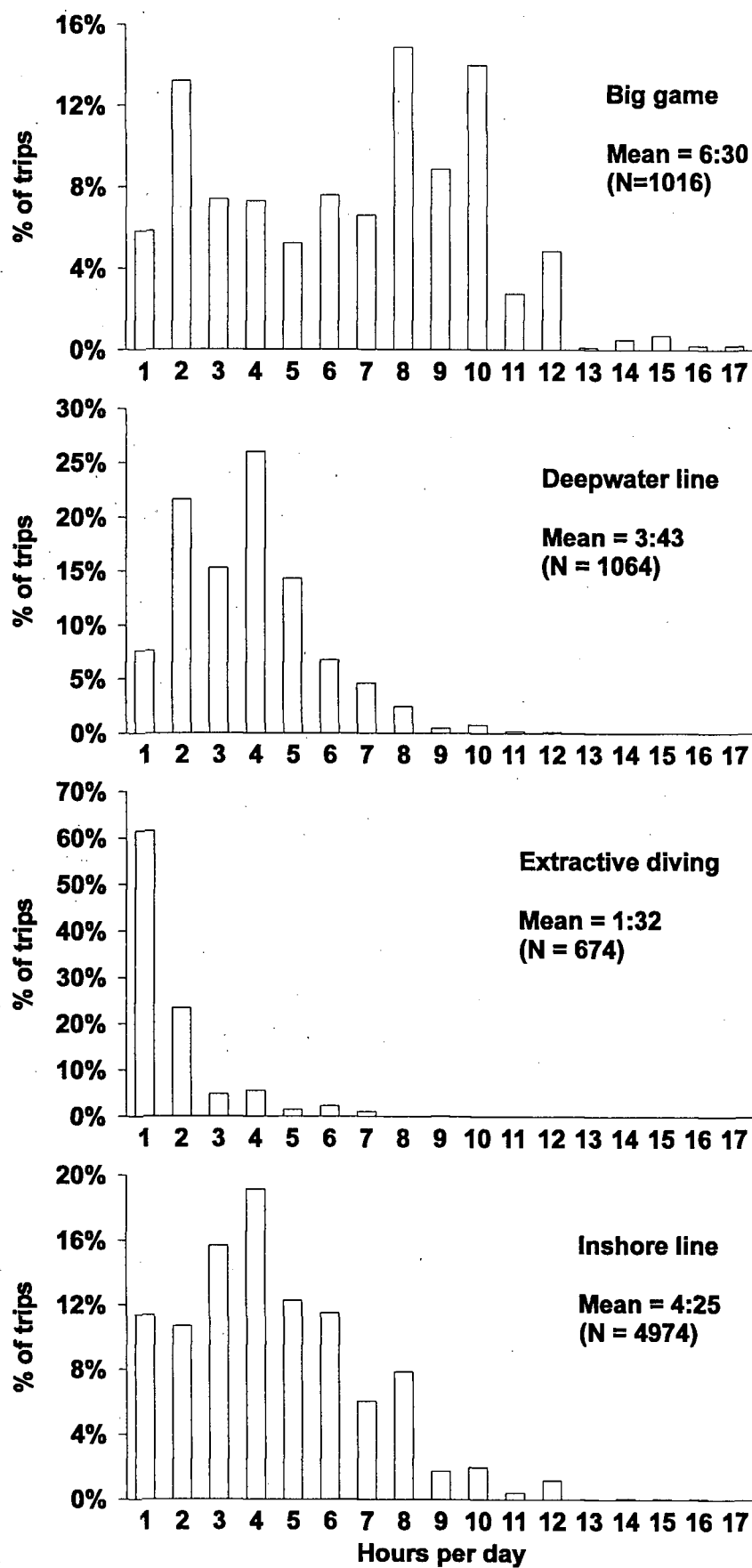


Figure 3: Trip length (hours per fishing day) by fishing method.

Appendix 1

14 October 1997

RFN703

«FirstName» «LastName»
«Company»
«Address1»
«Address2»
«City»

Dear Sir

Earlier this year, as part of a Ministry of Fisheries (MFish) research programme, a questionnaire on marine recreational fishing from charter boats was sent to most charter boat operators. Thanks to a good response rate from operators throughout New Zealand we received over 200 replies, allowing us to build up a comprehensive profile of the charter boat fleet, and the fishery over 1996/97. This information has been summarised in a report to MFish, although individual responses remain on a confidential database held by NIWA and will not be made available to MFish. We thank all respondents for their co-operation, and hope the enclosed summary of the main findings will be of interest to you.

We have now been engaged by MFish to carry out the second phase of their programme, with the aim of collecting more detailed information on areas fished, species caught, catch rates, and hours fished. This will be implemented via a voluntary diary scheme which will run for one year from 1 November 1997. We are therefore writing to all operators to ask if you would be willing to take part in this scheme. The diaries will be designed so that completed pages for each day's operation can be detached and sent in regularly, leaving you with an intact copy for your own records. We anticipate keeping in regular contact with all diarists (by phone and newsletter) throughout the survey.

Please consider this request carefully, and return the enclosed form (in the FreePost envelope provided) indicating whether you are prepared to assist. We acknowledge that some operators may feel cautious about reporting catch data, but we agree with MFish that the best way to secure the future of your industry is to ensure that all parties have reliable information on figures such as total effort and total catch. Inaccurate or incomplete information runs the risk of either underestimating the true value of the fishery to the New Zealand economy, or overestimating catch rates and potentially running into conflict with other sectors of the fishing industry. We would also emphasise that, as with the initial postal survey, all individual data will remain confidential to NIWA.

As a further incentive to take part, all operators who maintain diaries throughout the survey period will be entered into a lottery draw, and we are currently negotiating with several sponsors to arrange suitable prizes. Details of these prizes will be included when the diaries are mailed out in October. At odds of 1 in 200, we feel this will be a much better deal than Lotto!

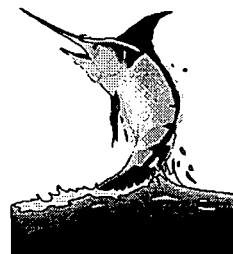
Thanks once again for your co-operation to date, and we look forward to hearing from you. Please contact Gavin James or Nelson Boustead at NIWA's Christchurch office, or at one of the home phone numbers below, if you have any queries.

Yours sincerely

Gavin James
(Survey Co-ordinator)

Home phone numbers: Gavin James 03-351-7333; Nelson Boustead 03-358-4912

MARINE RECREATIONAL FISHING FROM CHARTER BOATS



Diary Scheme to Determine Catch and Effort from
Charter Boat Operations in New Zealand Coastal Waters

Are you prepared to keep a diary of your charter fishing activities during the coming fishing season
(November 1997 - October 1998)? Please tick the appropriate panel below and return this slip in the
FreePost envelope provided. If you tick **Yes**, your diary will be forwarded to you in October, together
with full instructions as to how to fill in the required information.

Yes, I am prepared to keep a diary ☐

No, I do not wish to keep a diary ☐

Name Address	
-----------------	--

Appendix 2



1997/98 Fishing Charter Vessel Diary Survey

**Charter vessel operator
personal diary**

**Conducted for the Ministry of Fisheries by the
National Institute of Water and Atmospheric Research (NIWA)**

NIWA - the National Institute of Water and Atmospheric Research, is a New Zealand Crown Research Institute. Our mission is to provide a scientific basis for the sustainable management of New Zealand's atmospheric, marine and freshwater systems and associated resources.

NIWA's Maori name *Taihoru Nukurangi* - where the waters meet the sky - describes our work studying the waterways and the interface between the earth and the sky. Our rainbow logo also reflects the intersection of air and water.

More information about NIWA is available on the World Wide Web at our homepage <http://www.niwa.cri.nz/>, or in our quarterly publication *Water & Atmosphere*. This magazine aims to publicise and promote research undertaken by NIWA, and is distributed free of charge. Circulation inquiries should be directed to:

Water & Atmosphere
Private Bag 99940
Newmarket
Auckland

email: m.hill@niwa.cri.nz

All inquiries or correspondence regarding this survey should be directed to:

FreePost 83636
1997/98 Charter Vessel Diary Survey
NIWA
PO Box 8602
Christchurch

1997/98 Fishing Charter Vessel Diary Survey

Thank you for taking part in the 1997/98 diary survey of recreational fishing from marine charter vessels. Over 100 operators are involved in the survey, representing about third of the active charter vessel operators in New Zealand. Your information, together with the records supplied by other diarists, will help to build an accurate and up to date picture of the charter vessel fishery. This information will be used by the Ministry of Fisheries and the charter boat industry, to help resolve management issues relating to the fishery. **The data you supply will remain confidential, with only combined results being reported to MFish.**

Thank you once again for taking part.

INSTRUCTIONS

1. The diary scheme runs from 1 November 1997 until 31 October 1998. During this period, you should fill in the diary every time you make a charter trip with recreational fishers to catch fish or collect shellfish (including rock lobsters). For the purposes of this survey, **please note the definition of a charter "trip" on page 2 of these instructions.**
2. Each diary contains both fixed and detachable pages, each with space for recording five trips. The detachable pages are to be forwarded to NIWA, while the fixed pages (every second sheet) are for your own records.
3. Send in your completed pages every three months (or earlier, if you are nearing the end of your book). Simply tear out the relevant page(s) and post them back to the FreePost address shown on the inside front cover. Every 3 months we will send you an update and an additional diary (if necessary), together with a reminder to send in your records for that period if you have not already done so.
4. Record the **total** catch and fishing effort for **all** fishers on your vessel, including yourself. It is very important to fill in the diary for **every day of every trip** you make, even if your clients caught nothing.
5. **Please send in a 3-monthly trip record sheet even if you didn't do any charter fishing!** (Just write "didn't fish" across the sheet). This is because it is vitally important we know what times of the year charter operators are not fishing.
6. **Remember**, every 3-monthly return that we receive, whether blank (showing that you didn't go fishing during the period) or one detailing many trips, will go into a draw to win prizes, and at the end of the year all returns will go into a draw for a substantial prize (details of prizes will be included with the regular updates).
7. If you are a commercial fisher, please **do not** include any trips where you caught fish or shellfish to sell.
8. The examples over the page show how the diary should be filled in.
9. If you have any questions about the diary or the survey, contact Gavin James or Nelson Boustead by either:
Phone (day): 03-348-8987 After hours: 03-351-7333 (Gavin); 03-358-4912 (Nelson)
Fax: 03-348-5548 email: g.james@niwa.cri.nz (Gavin); n.boustead@niwa.cri.nz (Nelson).

TRIP RECORD *(this copy for yourself)*

[illegible]

What is a Charter “Trip”?

For the purposes of this diary scheme, a **charter trip** is the basic unit used to record your fishing effort and catch. A charter boat “trip” is defined as one fishing charter, with one group of fishers, using one fishing method, for at most one day. For example:

- a **one-day** charter with one group of clients, for the sole purpose of diving, would be recorded as **one** trip
- a **one-day** charter with one group of clients, which included inshore line fishing and diving, would be recorded as **TWO** trips
- **two half-day** charters with two groups of clients, for the sole purpose of inshore line fishing, would be recorded as **two** trips
- a **two-day** charter with one group of clients, for the sole purpose of big game fishing, would be recorded as **two** trips
- a **two-day** charter with one group of clients, which included line fishing and big game fishing, would be recorded as **FOUR** trips

Trip date: Please record as day/month/year.

Zone: Please record the zone number where your clients went fishing, diving or dredging etc., as identified on the maps on pages 4 and 5. Rock lobster fishers should also record the area code from the map on page 6 as well as the zone number from pages 4 and 5.

If you fished in more than one zone during a single trip, please record only the zone in which you spent the majority of your time.

Locality: Please record the name of the bay, island, sound, headland, point, or beach etc. where you were fishing.

Number of fishers: Please record separately the number of **New Zealand resident** and **overseas** fishers carried on this trip. **Do not** include any passengers who did not fish, but include yourself if you also took part.

Hours spent fishing: Please record, to the nearest hour, the length of time your clients actually spent fishing. This will normally be the number of hours during which your clients had their fishing gear in the water. **Do not** count the time you spent travelling or resting. When analysing the results, we will use this figure to estimate the total number of "fisher-hours" for each trip. For example, if you carried six clients, and recorded that you spent five hours big game fishing, we would estimate a trip total of 30 fisher-hours.

Type of fishing method: Please specify which of the following fishing methods your clients used on this trip. If you prefer, you may use the corresponding two letter short code:

BG	Big game fishing	Includes trolling for billfish, tuna, and oceanic sharks.
IL	Inshore line fishing	Includes stationary/drift line fishing for snapper, blue cod, tarakihi, kingfish, trevally, kahawai etc.
DL	Deepwater line fishing	Includes stationary/drift line fishing for hapuka (or groper), bass, bluenose, and kingfish etc.
ED	Extractive diving	Includes diving for rock lobster, scallops, paua, etc.
SD	Shellfish dredging	Includes dredging for scallops, etc.
	Other	Please specify. Could include longlining, set-netting etc.

Species targeted: Please specify the main species that your clients set out to catch, using the names or codes on page 7.

Species caught: Please record **all** species of fish and/or shellfish that your clients caught, using the names or codes on page 7. Include any dead fish that you discarded or used as bait. Be as precise as you can when naming species. For example, was it a rig or school shark? Do not use general names such as "tuna", but refer to the species as (e.g.) albacore or skipjack.

Number of fish caught: Please record the total catch of legal-sized fish by all fishers on the vessel, including yourself (if appropriate). Record separate tallies for fish killed (including fish discarded or used as bait), and legal-sized fish released alive.

Comments: If you wish to make any comments about a particular trip, please write these on the back of the trip record page.

North Island Fishing Zone Location Map

Zone No. Fishing Zone Description

North Cape - Cape Brett (excluding the Bay of Islands)

Bay of Islands (Cape Wiwiki - Cape Brett including the area around the Ninepin and Piercy Island))

Cape Brett - Cape Rodney (excluding Whangarei Harbour)

Whangarei Harbour and entrance area (including Mair Bank)

Barrier Islands (including the Mokohinau Islands, Little Barrier and Great Barrier)

Western Gulf (Cape Rodney - Piripiri Point)

Inner Gulf (Piripiri Point - Orere Point)

Firth of Thames (Orere Point - Deadmans Point)

Eastern Gulf (Deadmans Point to Cape Colville, including Chanel Island)

Eastern Coromandel (Cape Colville to Waihi Bluffs, excluding Mayor Island)

Waihi Bluffs to Tarawera River (excluding Tauranga Harbour)

Tauranga Harbour (including both entrance areas)

Tarawera River - Cape Runaway (including Rurima Islands)

Cape Runaway - Whareongaonga

Whareongaonga - Cape Turnagain

Cape Turnagain - Turakirae Head

Turakirae Head - Titahi Bay

Titahi Bay - Waitotara River

Waitotara River - Tirua Point

Tirua Point - entrance area of Manukau Harbour

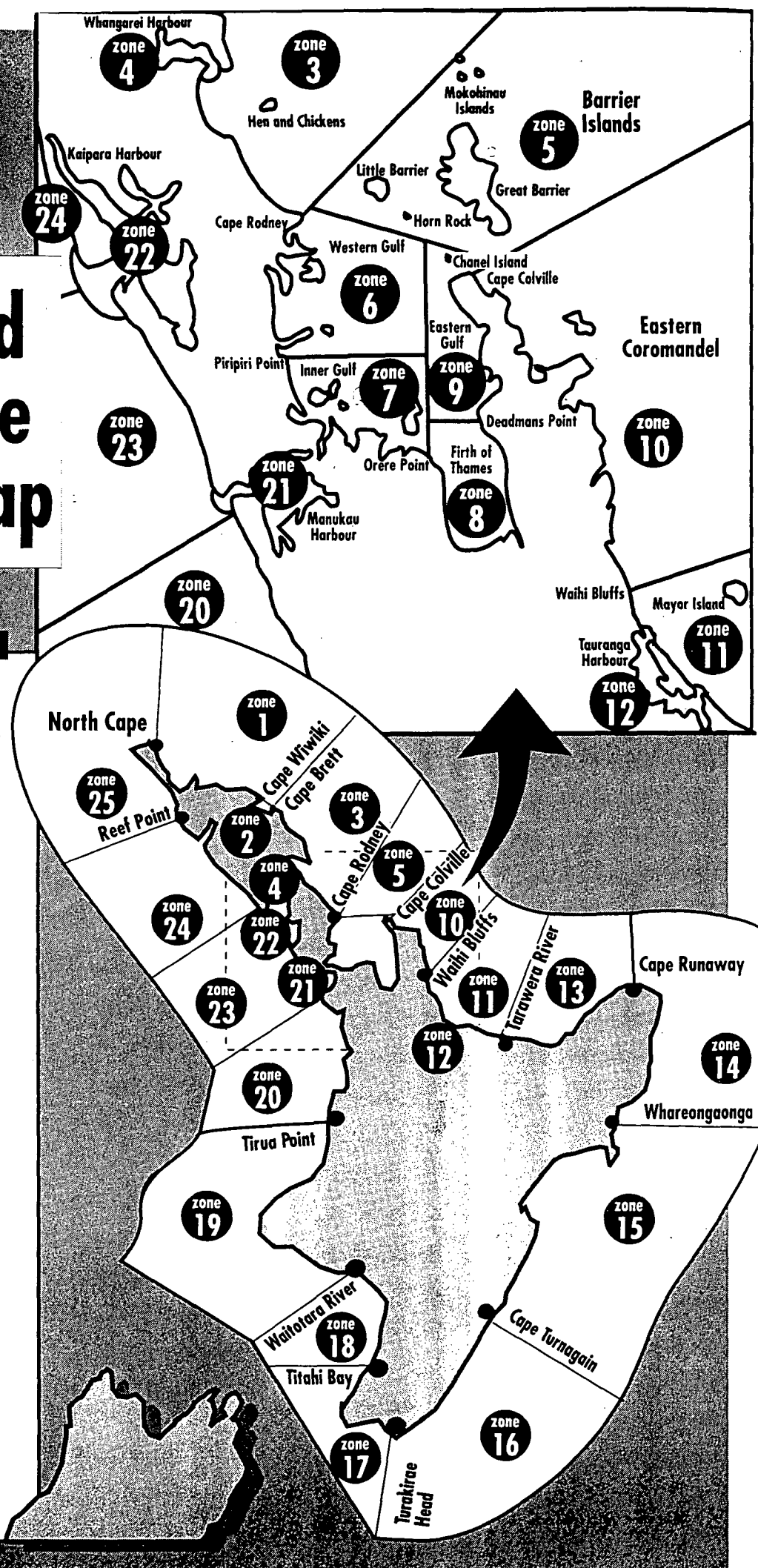
Manukau Harbour and entrance area

Kaipara Harbour and entrance area

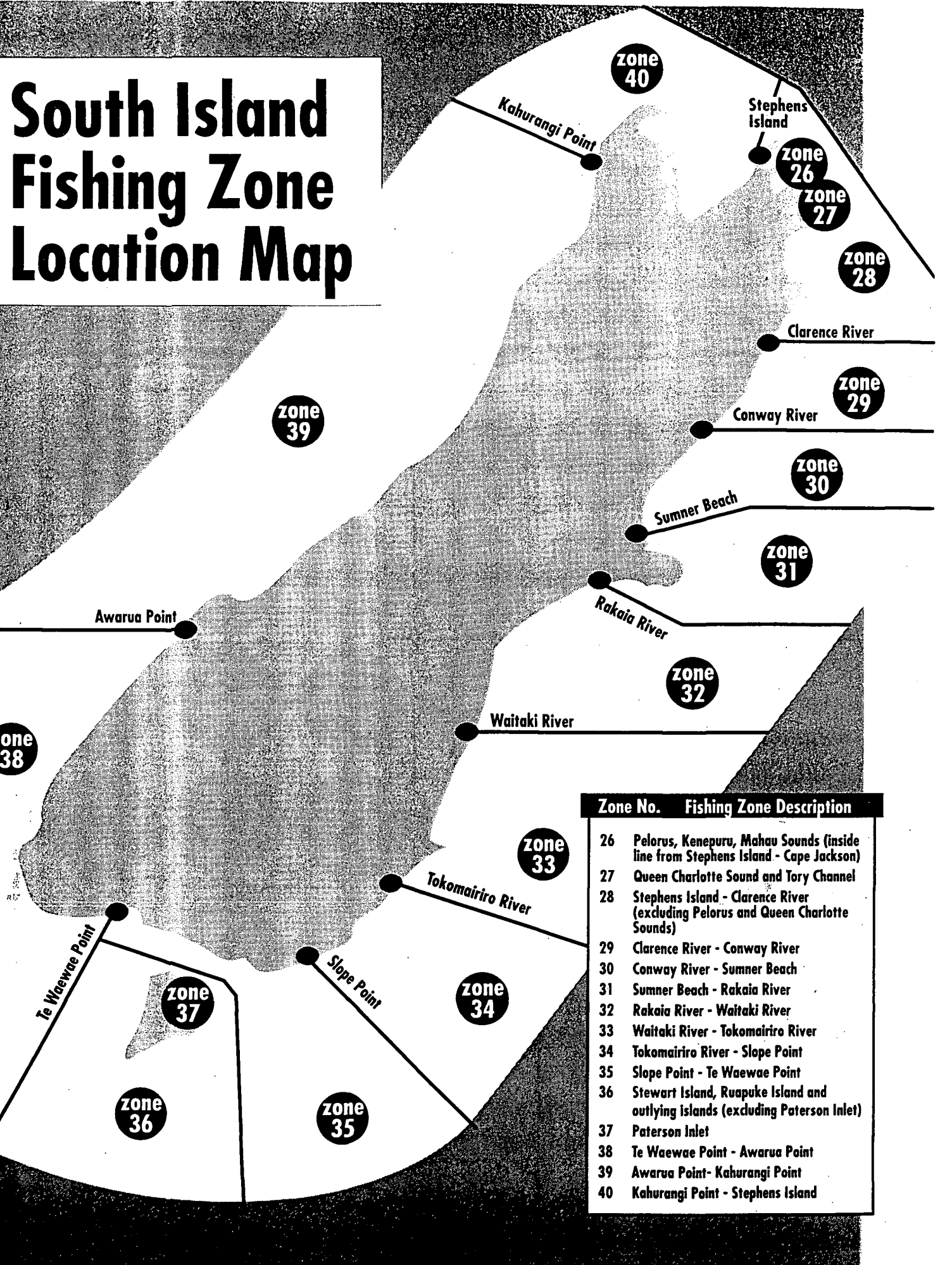
Southern Manukau entrance to the northern Kaipara entrance (excluding the Manukau and Kaipara Harbours)

Northern Kaipara entrance - Reef Point (excluding the Kaipara Harbour)

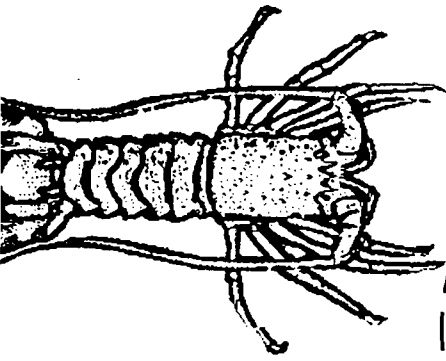
Reef Point - North Cape



South Island Fishing Zone Location Map

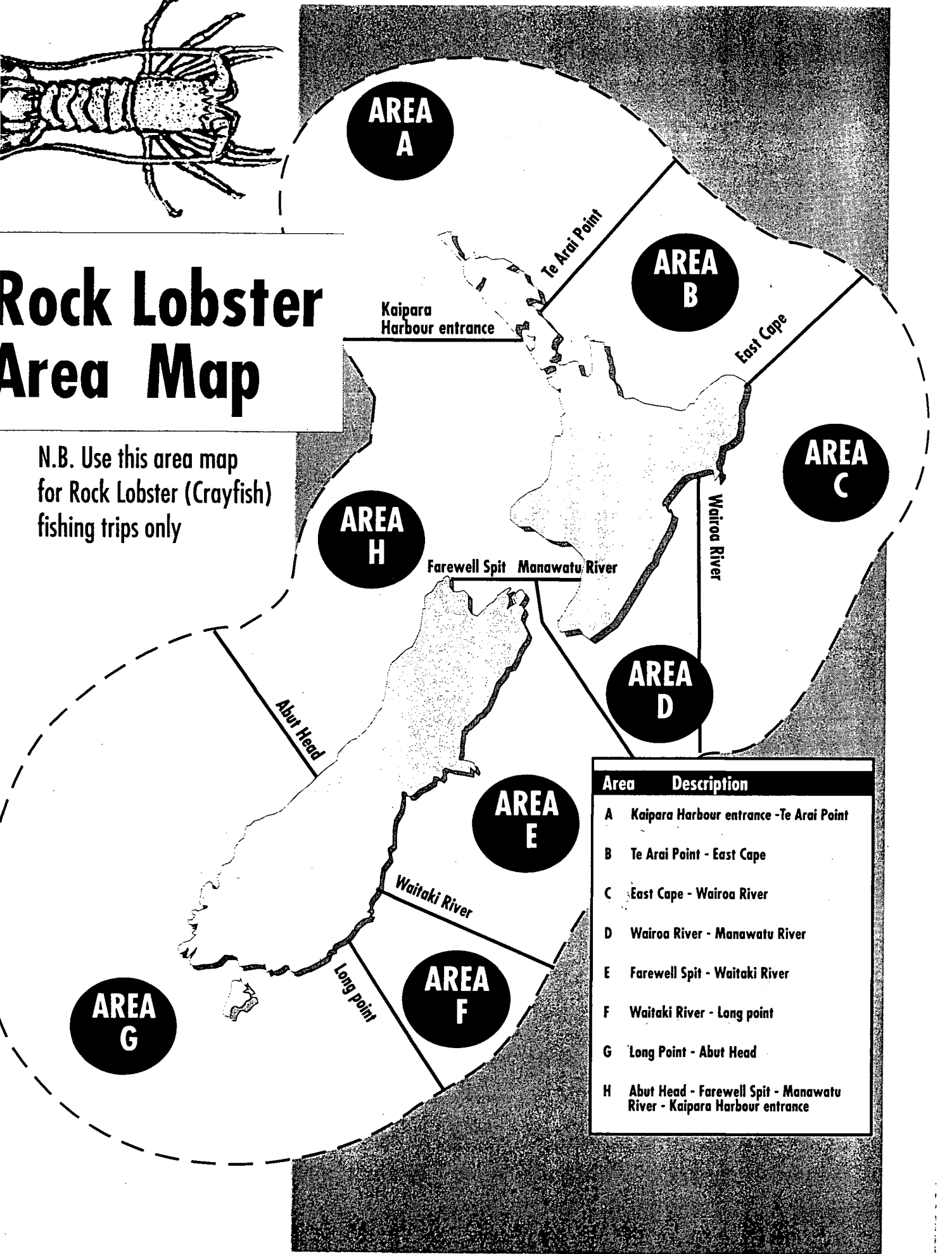


Zone No.	Fishing Zone Description
26	Pelorus, Kenepuru, Mahau Sounds (inside line from Stephens Island - Cape Jackson)
27	Queen Charlotte Sound and Tory Channel
28	Stephens Island - Clarence River (excluding Pelorus and Queen Charlotte Sounds)
29	Clarence River - Conway River
30	Conway River - Sumner Beach
31	Sumner Beach - Rakaia River
32	Rakaia River - Waitaki River
33	Waitaki River - Tokomairiro River
34	Tokomairiro River - Slope Point
35	Slope Point - Te Waewae Point
36	Stewart Island, Ruapuke Island and outlying islands (excluding Paterson Inlet)
37	Paterson Inlet
38	Te Waewae Point - Awarua Point
39	Awarua Point - Kahurangi Point
40	Kahurangi Point - Stephens Island



Rock Lobster Area Map

N.B. Use this area map for Rock Lobster (Crayfish) fishing trips only



Area	Description
A	Kaipara Harbour entrance - Te Arai Point
B	Te Arai Point - East Cape
C	East Cape - Wairoa River
D	Wairoa River - Manawatu River
E	Farewell Spit - Waitaki River
F	Waitaki River - Long point
G	Long Point - Abut Head
H	Abut Head - Farewell Spit - Manawatu River - Kaipara Harbour entrance

For recording purposes, MFish uses a standard three letter code to identify all marine fish species found in New Zealand waters, some of which (for species likely to be taken by charter fishers) are listed below. To save time, and avoid possible confusion, you may wish to use these short codes on your diary sheet. However, if you encounter a species not listed here, or simply prefer to use the common name, we will assign the correct species code on receiving your data sheets.

Major species

albacore tuna	ALB
barracouta	BAR
bass groper	BAS
blue cod	BCO
bluenose	BNS
gumard	GUR
hapuku	HAP
jack mackerel	JMA
john dory	JDO
kahawai	KAH
kingfish	KIN
ling	LIN
mako shark	MAK
red cod	RCO
rig	SPO
rock lobster	CRA
school shark	SCH
sea perch	SPE
skipjack tuna	SKJ
snapper	SNA
spiny dogfish	SPD
striped marlin	STM
tarakihi	TAR
trevally	TRE
trumpeter	TRU
yellowfin tuna	YFN

Other species:

banded wrasse	BPF
black marlin	BKM
blue mackerel	EMA
blue marlin	BEM
blue shark	BWS
broadbill swordfish	SWO
butterfish or greenbone	BUT
butterfly perch	BPE
common warehou	WAR
conger eel	CON
eagle ray	EGR
elephant fish	ELE
gemfish	SKI
hammerhead shark	HHS
koheru	KOH

Other species (continued):

moki	MOK
packhorse rock lobster	PHC
pink maomao	PMA
quinnat salmon	SAM
rattails	RAT
red pigfish	RPI
red snapper	RSN
sand flounder	SFL
scarlet wrasse	SPF
skate	SKA
slender tuna	STU
southern bluefin tuna	STN
thresher shark	THR
yellow-belly flounder	YBF

number:

TRIP RECORD *(this copy to be returned to NIWA)*

Date	Zone	Locality	Number of fishers		Hours spent fishing	Fishing method	Target species	Species caught	Number of fish caught	
			NZ	Overseas					Killed	Released

Please refer to instructions and example sheet on pages 1-3.
 If you have any comments, please write these on the back of this page.

TRIP RECORD (*this copy for yourself*)

Date	Zone	Locality	Number of fishers		Hours spent fishing	Fishing method	Target species	Species caught	Number of fish caught	
			NZ	Overseas					Killed	Released

Appendix 3

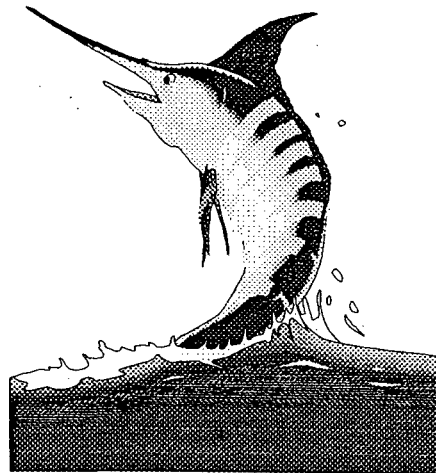
LOGBOOK

Number 1

December 1997

A quarterly newsletter for operators and skippers taking part in the 1997/98 Recreational Fishing Charter Vessel Diary Survey

Published by the National Institute of Water and Atmospheric Research (NIWA), Christchurch



A Great Response!

A big thanks to all of you out there for agreeing to keep diary records of your fishing charter trips for the next 12 months. When we were engaged by MFish to carry out this diary survey, we were a little concerned that too few charter vessel operators would take part in the scheme to make the results either worthwhile or representative of the whole charter fleet. So we were absolutely delighted when over 120 operators responded positively to our original approach. Although individual operators come and go almost every day, so that we can never be sure exactly how many vessels are fishing at any one time, our best guess is that this survey includes about one third of the total charter fleet.

By now, you should all have received your diaries (which we sent out in late October), and we hope you have had no trouble in entering information for any fishing trips since the November 1 start date. However, if you have any concerns or questions about the diary, please contact us by phone, fax, FreePost or email (see overleaf for our contact details). Although we have had positive feedback from several operators, we appreciate that some of you may be uncertain about how to fill in some sections, particularly if you have not started the season yet or are fishing infrequently. So if you have any problems at all, **please contact us** - we are only too happy to help sort out any difficulties.

What's it all for?

The 1997/98 Diary Survey is being conducted by NIWA for the Ministry of Fisheries (MFish), and is one of the many research projects which

MFish put out for tender earlier this year. As such, the data will be available to both the recreational fishing sector and the Ministry to help resolve future fisheries management issues.

Although the survey is funded by MFish, the original impetus actually came from within the charter vessel industry, who have been lobbying the government for some years over the need to establish exactly what percentage of the amateur catch is taken during charter trips. As most operators will no doubt be aware, this is an area of some controversy between the recreational and commercial sectors of the industry. Readers who wish to learn more

Prizes to be Won

All operators who send in a complete set of diary records for each three month period (November to January, February to April etc.) will be entered into a draw for one of three holiday prizes, to be drawn in December 1998. The first prize is a trip for two to Australia (your choice of Melbourne, Sydney or Brisbane), including spending money, valued at \$3000. Our two second prize winners will receive a New Zealand "mystery weekend" travel voucher (for two persons), valued at \$800 each.

We emphasise that to be eligible for one of these prizes, all you need do is *provide a complete set of diary records for each three month period*. Even if you did not operate for several months, you will still go into the draw as long as you forward a diary return (marked "did not fish") for each return period. So if you provide complete records for the full 12 month survey period (November 1997 to October 1998), you go into the draw four times.

about the background to the survey might like to check out the article by Keith Ingram in the latest (spring) issue of *NZ Professional Skipper*.

A Few Reminders...

After phone calls from a couple of diarists, it seems there are a few points you need to bear in mind when filling in your diary.

Record catch information separately for each fishing method type used each day on a charter. For example, if you are doing inshore line fishing, deepwater lining, and trolling all in one day, then you should record catch and other information separately for each. This will mean that operators involved in several methods may fill up their books relatively quickly, so let us know if you are running out of pages several days beforehand. We have plenty of extra diaries available!

Included with each diary is a cardboard backing sheet to be inserted between each pair of pages (the carbonised NIWA copy and your personal copy). This will prevent your writing being copied to several unwanted pages.

When you are nearing the end of a diary, please mail the completed torn-out pages to FreePost 83636, and request another book (or books). Remember to mail in completed

sheets at the end of each 3 month period (31 January, 30 April, 31 July, and 31 October). If you did not fish during a particular period, just enter "no fishing" on a single sheet.

- included with the diary was a small sheet which asked for any corrections to the details we currently hold on your fishing vessel(s) and operation. Please remember to return this along with your first set of completed diary sheets, at the end of January (or earlier, if you wish).

Confidentiality

Several diarists have asked us about the issue of confidentiality. To reinforce the message we sent out in our original letter, we must emphasise that **individual records supplied as part of this survey will remain confidential to NIWA**. The only data reported to MFish will be summaries (e.g. by region or month), from which any reference to operators or vessels have been deleted, so that it will not be possible to link individual operators with catch data.

As a further safeguard, we have now decided that at the conclusion of the survey, once all the data have been checked and validated, any operator will be free to ask for their original diary sheets to be returned. While we acknowl-

edge there are such things as photo-copiers, we hope that you will take this as a further indication of our commitment to ensuring individual confidentiality.

How to Contact Us

Any problems? Call Gavin James or Nelson Boustead at:

Phone: 03-348-8987

Fax: 03-348-5548

After hours:

Gavin: 03-351-7333

Nelson: 03-358-4912

email:

g.james@niwa.cri.nz

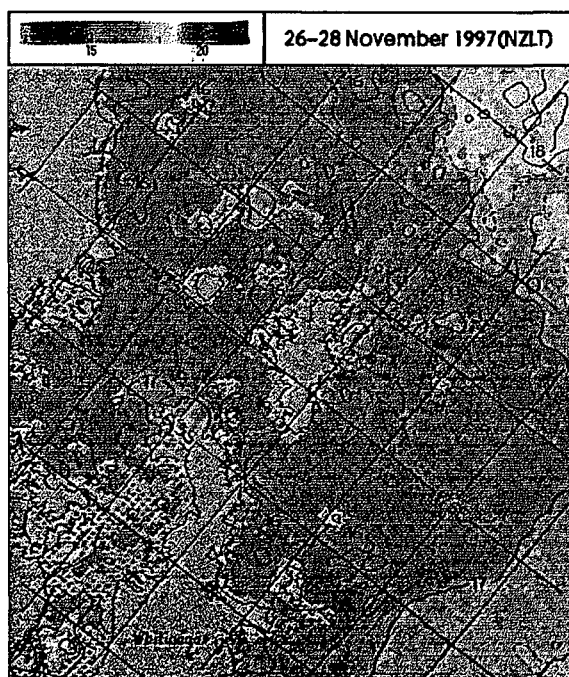
n.boustead@niwa.cri.nz

FreePost No. 83636

Sea Surface Temperature Plots via the Internet

All diarists are entitled to 6 free accesses of NIWA's Sea Surface temperature charts. The plot at right, showing the area around Great Barrier in late November, shows fairly uniform temperatures (around 16°C) over most of the area, with slightly warmer water to the north and east.

If you would like to take up this offer, but have mislaid the instruction sheet, please let us know. The Web site "knows" about the diary scheme, and now includes a check box which you should tick so that it will recognise you as a diarist. You can find the site at <http://www.sst.niwa.cri.nz/>



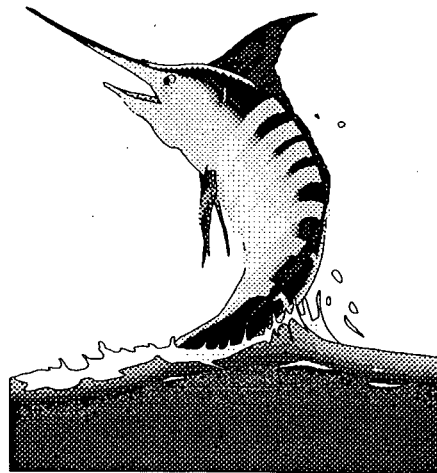
LOGBOOK

Number 2

April 1998

A quarterly newsletter for operators and skippers taking part in the 1997/98 Recreational Fishing Charter Vessel Diary Survey

Published by the National Institute of Water and Atmospheric Research (NIWA), Christchurch



Keep those diaries rolling in!

With the Diary Scheme now well into its second quarter (February to April 1998), we thought it high time for a second newsletter. We have been kept busy with the flood of replies which poured in during January and February, which have made for a substantially larger data entry job than we anticipated. To date, we have had replies from nearly 70 operators, representing a total of over 2100 charter trips. These have involved just under 14 000 individual fishers, of whom 12 700 (just over 90%) were New Zealand residents. Trip hours total around 1200, which - assuming all fishers were active - represents a total fishing effort of over 120 million angler hours.

Catches so far have been dominated by snapper, blue cod, and tarakihi, which collectively make up about half of the total. But there are many more species lurking out there which turn up from time to time, and our catch database currently includes 95 individual species. One or two of these may turn out to be coding or transcription errors (we periodically screen the data to look for any real oddballs), or possibly the same species masquerading under two different names (see *What's in a name?* overleaf), but most of the records are quite clear. The prize for the most unwelcome catch must surely go to one Bay of Plenty operator, who turned up a hagfish. Not surprisingly, it was not kept.

Thanks for the feedback

In general, we have been very pleased with the quality and clarity of the diary records we have received. Particularly for the more active operators, maintaining the diary records has

not been an easy task, and we really appreciate the efforts you have made to provide clear and informative records.

Notwithstanding this, however, several diarists have identified what they see as problems with the diary layout, and have made positive

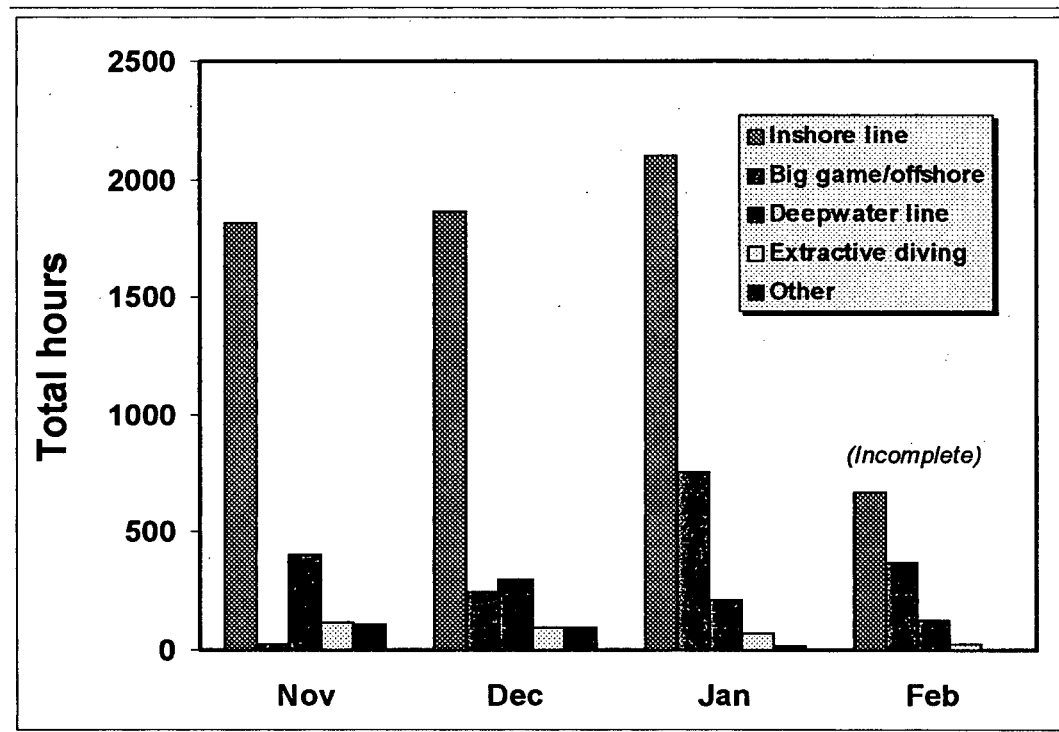
No Reply?

In *LogBook* #1, we mentioned how pleased we were to hear from just over 120 operators who were prepared to fill in diaries for the 1997/98 survey. With replies from 70 diarists so far, however, this means that around 50 potential diarists have yet to send in a return.

If you happen to be one of these operators, we really would like to hear from you. Even if you did not fish at all for a particular month, your information is still valuable. This is because without your data our final estimates of catch and effort will be based on records for the most active operators only, which means our figures will almost certainly be overestimates. Bearing in mind that one of the main purposes of the survey - which is supported by charter industry representatives - is to establish how much of the recreational catch is taken by charter vessel, we don't think it is in anyone's interests if the survey produces inaccurate figures.

So please - even if your diary has been lying unused somewhere for the last few months, you can still contribute to the survey by dusting it off and starting this month. It doesn't matter if your records cover only half the season, as we will adjust our totals for each month to take account of the number of diarists involved. And of course all completed diaries will go into a draw for one of our end-of-scheme travel prizes.

With the big game season only just starting to kick in, the season to date has been dominated by the inshore line fishery. Other fisheries, such as deepwater line fishing and diving, account for a relatively small part of the total. Over the next few months, as your replies continue to come in, we would expect to see a big increase in the big game effort.



of your diary. For species not on this list, most operators have been very careful to use a generally accepted common name which clearly identifies the species involved. However - while this process has catered adequately for most catches - there have been a few situations where we have had to check back with the operator involved, or use a little inspired guess work, to identify some of the more obscure species.

To help us resolve such problems over the rest of the survey, it will make life easier for us if - whenever possible - you are as specific as possible when identifying your

suggestions as to how these might be rectified. Unfortunately - while we really appreciate receiving these sorts of comments - we would prefer not to change the diary format mid-way through the scheme.

These sorts of problems highlight the fact that designing any sort of questionnaire or survey form is always a tricky business, and that there is no substitute for extensive field testing before a survey actually gets off the ground. The existing diary format already incorporates a number of improvements, based on an earlier draft circulated to a few operators, but we're well aware that it's always possible to improve. The best we can promise at this stage is that - in any future scheme with which we are involved - we will try to correct as many of these problems as possible.

What's in a name?

When designing the diaries, we gave some thought to which species were most likely to be caught by charter vessels, and came up with the list of 55 species which appears on page 7

catch. Some of the species which have caused the odd problem to date are as follows:

- maomao: blue maomao, pink maomao, and sweep have all been identified during the survey so far. To avoid making us guess, please try to use one of these terms rather than just "maomao".
- marlin: most marlin caught have been striped marlin, but a few operators have reported blue marlin and even black marlin are a possibility.
- sharks: please try to identify the species (e.g. mako shark, blue shark) rather than just recording "shark". particularly for small bottom species such as spiny dogfish, rig, school shark, and carpet shark.
- hapuku & groper: please try to distinguish bass groper (BAS) from hapuku (HAP).

To help keep tabs on all these species during the remainder of the survey, we have enclosed an updated list of species codes with this newsletter. We suggest you keep this with your diary for future reference. If necessary, we will issue a further update as the survey proceeds.

1997/98 Charter Vessel Diary Survey

Species codes (master list)



Common name	Code
albacore tuna	alb
alfonsino	bys
banded wrasse	bpf
arracouta	bar
ass groper	bas
blue cod	bco
blue mackerel	ema
blue maomao	bma
blue marlin	bem
blue shark	bws
bluenose	bns
butterfish or greenbone	but
butterfly perch	bpe
carpet shark	car
common warehou	war
conger eel	con
eagle ray	egr
ying fish	fly
costfish	fro
garfish	gar
gemfish	ski
green wrasse	gwr
gurnard	gur
lagfish	hag
hammerhead shark	hhs
hapuku	hap
jack mackerel	jma
john dory	jdo
ahawai	kah
elpfish	kel
ina	sur
ingfish	kin
oheru	koh
weatherjacket	lea
ng	lin
nako shark	mak
noki	mok
noray eel	mor
northern bastard cod	brc
ctopus	oct
ackhorse rock lobster	phc
arore	par

Common name	Code
parrotfish	pot
paua	pau
pink maomao	pma
pipi	ppi
porae	por
porbeagle shark	pos
quinnat salmon	sam
rays bream	rbm
red banded perch	rbp
red cod	rco
red moki	rmo
red pigfish	rpi
red scorpion fish	rrc
red snapper	rsn
rig	spo
rock lobster	cra
ruby fish	rby
scallop	sca
scarlet wrasse	spf
school shark	sch
sea perch	spe
sea urchin	psn
sharpnose sevengill shark	hep
skate	ska
skipjack tuna	skj
snapper	sna
sole	sol
spiny dogfish	spd
spotted gurnard	igu
spotty	sty
squid	sqx
stargazer	stg
stingray	str
striped marlin	stm
sweep	swe
tarakihi	tar
thresher shark	thr
trevally	tre
trumpeter	tru
turbot	tur
yellowfin tuna	yfn

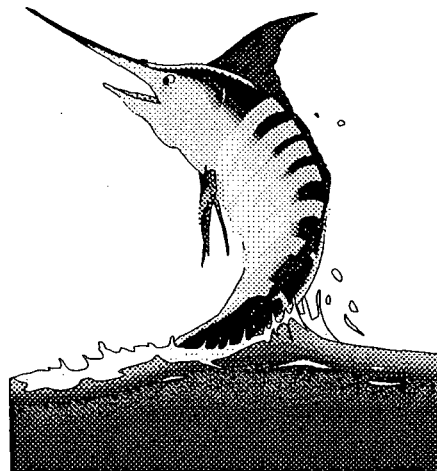
LOGBOOK

Number 3

July 1998

A quarterly newsletter for operators and skippers taking part in the 1997/98 Recreational Fishing Charter Vessel Diary Survey

Published by the National Institute of Water and Atmospheric Research (NIWA), Christchurch



Only another three months to go!

With the Diary Scheme now three-quarters of the way through the year-long survey which began on 1 November 1997 and ends on 31 October 1998, it is time to send all you hard-working diarists the third of our four scheduled LOGBOOK newsletters. We realise it is a real effort to keep filling in the diary forms for every trip for a year, especially when there are often other sets of records to be kept as well. So thanks to all of you who are continuing to send in forms. For all of you, and especially those who may have slipped behind a bit with sending in their forms, see the box below describing the travel prizes, as well as the section at the end reiterating reasons for the survey. Please remember you will need to send in diary forms for each three-month period even if they just indicate "no fishing"), to maximise your chances of winning.

To date, we have had replies from nearly 80 operators, which is very pleasing. Information on over 3000 charter trips has been sent in, with trip hours to date totalling around 18 000. About 26 000 individual fishers are

represented, of whom just over 90% were New Zealand residents.

Catches continue to be dominated by blue cod, snapper, tarakihi, and sea perch, which collectively make up about two-thirds of the total number of all fish recorded. This is not too surprising given that inshore line fishing makes up over 60% of the total fishing hours recorded. Recreational anglers commonly release fish, so it is not surprising to find that about one quarter of all fish caught have been released. Of course this varies considerably by species; suffice to say the outlook does not look good if you happen to be a butterfish (or greenbone), hapuku, john dory, moki, or trumpeter! On the other hand, most sharks and rays, wrasses, moray eels, and of course spotties, tend to lead more of a charmed (if slightly interrupted) life!

We hope the more comprehensive list of common names of fish and corresponding codes sent out with the last newsletter has been helpful. Judging by the records being sent in this seems to be the case. If you still have doubts about codes for some of the more

Prizes to be Won

All operators who send in a complete set of diary records for each three month period (November to January, February to April etc.) will be entered into a draw for one of three holiday prizes, to be drawn in December 1998. The first prize is a trip for two to Australia (your choice of Melbourne, Sydney or Brisbane), including spending money, valued at \$3000. Our two second prize winners will receive a New Zealand "mystery weekend" travel voucher (for two persons), valued at \$800 each.

We emphasise that to be eligible for one of these prizes, all you need do is *provide a complete set of diary records for each three month period*. Even if you did not operate for several months, you will still go into the draw as long as you forward a diary return (marked "did not fish") for each return period. So if you provide complete records for the full 12 month survey period (November 1997 to October 1998), you go into the draw four times.

obscure species, please just write the full common name rather than the code, and we will do the coding.

A reminder...

Since it is some time since we said anything about the background to the survey, it may be worth repeating some of this. The 1997/98 Diary Survey is being conducted by NIWA for the Ministry of Fisheries (MFish). As such, the data will be available to both the recreational fishing sector and the Ministry to help resolve future fisheries management issues. Although the survey is funded by MFish, the original impetus actually came from within the charter vessel industry, who have been lobbying the government for some years over the need to establish exactly what percentage of the amateur catch is taken during charter trips. It is also worth re-emphasising that **individual records supplied as part of this survey will remain confidential to NIWA**. The only data reported to MFish will be summaries (e.g. by region or month), from which any reference to

operators or vessels have been deleted, so that it will not be possible to link individual operators with catch data.

Finally, although we expect many of your charter fishing activities to be less over winter, please remember we still need your returns, even if it is just one form for each of the three-monthly periods (May to July, and August to October) stating "no fishing" if you did no fishing charter work at all.

How to Contact Us

Any questions? Call Gavin James or Nelson Boustead at:

Phone: 03-348-8987

Fax: 03-348-5548

After hours:

Gavin: 03-351-7333

Nelson: 03-358-4912

email: g.james@niwa.cri.nz

n.boustead@niwa.cri.nz

FreePost No. 83636

LOGBOOK

Number 4

November 1998

Quarterly newsletter for operators and skippers taking part in the
1997/98 Recreational Fishing Charter Vessel Diary Survey

Published by the National Institute of Water and Atmospheric
Research (NIWA), Christchurch



Please return any remaining diaries...

This is the fourth and last of our newsletters to
fishers involved in the 1997/98 Recreational
Fishing Charter Vessel Survey. Thanks to all of
you for keeping diaries for this year-long survey
which finished on the 31 October 1998. We
realise it has been a major effort to fill in the
diary forms, especially when there are usually
other sets of records to be kept as well.
However, now is the time to unearth any diary
forms which may have got overlooked, or are
still awaiting mailing. All diary forms need to be
returned as soon as possible, and by the 27
November at the latest, so that we can produce
a report for the Ministry of Fisheries, a
summary of which will be sent to all diary
participants in early 1999.

If you have slipped behind with sending in the
diary forms, see the box below describing the travel
prizes. Please remember you will need to send
diary forms for each three-month period
even if they just indicate "no fishing", to
maximise your chances of winning. If
necessary, an ordinary envelope addressed to
NIWA, FreePost 83636, PO Box 8602,
Christchurch, will suffice.

Further Preliminary Results...

Early figures indicate that about 7% of all
recreational fishers using charter vessels are
from overseas. Another figure that will probably
not surprise many of you is that of the over
250,000 fish reported caught in the survey to
date, slightly over a quarter were released.

Snapper and blue cod continue to be the
species caught most often, followed by tarakihi
and sea perch. These four species collectively
make up about two-thirds of the total number of
all fish recorded.

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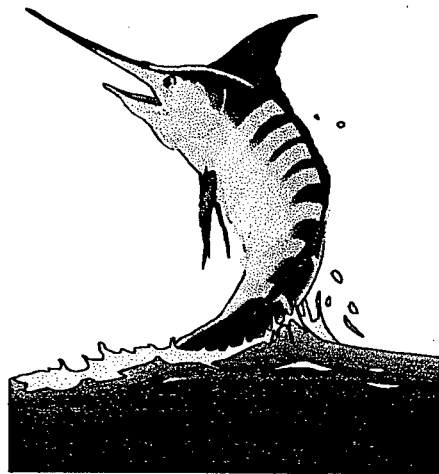
LOGBOOK

Number 5

December 1998

A newsletter for operators and skippers taking part in the
1997/98 Recreational Fishing Charter Vessel Diary Survey

Published by the National Institute of Water and Atmospheric
Research (NIWA), Christchurch



Diary Survey Finished...

As mentioned in our November Newsletter, the year-long diary survey has now finished – at the end of October 1998 to be precise – and we will shortly start analysing the large amount of data sent in by the 80 or so participants. For those of you who have got into the habit of keeping records and now cannot stop!, we have to reluctantly inform you that we are only able to use the information recorded between 1 November 1997 and 31 October 1998. For any of you who wish to continue keeping your own records for yourself, we have a supply of surplus logbooks which could be used for this purpose, and are available upon request.

If you still have any copies of diary forms for the 1/11/97 to 31/10/98 period, then please mail them to us urgently, as we need all of these to be able to produce reliable estimates of catch and effort for the New Zealand charter boat fishery – something that will be of considerable value to the charter boat industry in the future when negotiating with other sectors of the fishing industry. If you do not have an official envelope to return the forms, just use an unstamped ordinary envelope addressed to NIWA, FreePost 83636, PO Box 602, Christchurch.

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Fax: 03-348-5548

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Stop Press – Prize Winners...

Following completion of the diary survey, and after reminders to participants to send in any outstanding forms, we have drawn the winners of the three travel prizes. Remember that there was one chance of winning for each complete set of records sent in for each quarter of the year. The winners were:

First prize: Return airfares to Australia for two, plus accommodation for 5 nights, plus \$1000 spending money. Winner: Mr David Franks, Kaeo. Vessel "Diomedea".

Second and third prizes: Luxury mystery air travel within New Zealand for two with one night's accommodation and other goodies.

Winners:

Mr. Graham McRae, Wellsford. Vessel "Maggie Mae".

Mr. Bill Ayto, Bluff. Vessel "Takaroa II".

Congratulations to the winners – we hope they enjoy their travel, and thanks to all of you for your commitment to this major record-keeping exercise.

Finally...

We will be in touch again about April 1999 when we intend to distribute a summary of the Charter Vessel Diary Survey to all participants. Thanks again for your help.

Gavin James

